



FRENCH NATIONAL RESEARCH AGENCY

ANNUAL REPORT

14
ANR



MICHAEL MATLOSZ

EDITORIAL

With new governance models, the expansion of its missions, the completion of its first Work Programme deeply rooted in the European strategic agenda and the merging of its personnel onto a single site, 2014 has been a landmark year for ANR! Adaptation, agility, flexibility, continuous improvement are the year's watchwords... Throughout 2014, ANR has picked up momentum, staying the course laid out at the time of its creation.

ANR is a one-of-a-kind establishment with features found nowhere else on the national research and innovation landscape. With every passing year, ANR evolves and reinvents itself in order to better serve the scientific communities. In 2014, ANR seized the opportunity to carry out an in-depth organisational overhaul of the agency, formally introduce a new two-stage selection process as well as create new funding instruments to support a wide array of research in a great number of scientific disciplines and themes.

With its ten-year anniversary drawing near, one might most aptly sum up the agency with the word “living”, which strikes me as quite fitting. ANR is without a doubt an elastic and continuously transforming organisation, one which is very much alive. These are essential qualities for serving research and researchers, as well as the many supporting structures and entities which interact in ways which are at once collaborative, competitive, and synergetic. Within the living, complex, and many-shaped ecosystem that is French research, the agency has successively enlarged its scope each year for nearly a decade. The best evidence of this is the French State's entrusting the agency with new missions in 2014, further cementing ANR's position in the European and international ecosystem. The government has also renewed its trust in ANR as an “Investments for the Future” manager in the fields of higher education and research, extremely strategic programmes for French growth and competitiveness which position national research structures advantageously in a globally competitive environment.

Further evidence of ANR's quality and professionalism can be seen in the number of partners that entrust ANR to handle their calls for proposals, with such names as the General Secretariat for Defence and National Security (SGDSN), the French Armaments Procurement Agency (DGA) and Andra.

The agency has maintained its powerful upswing on the European and international scene. It chairs two European Joint Programming Initiatives (JPI) and is hosting the Belmont forum's world secretariat comprising funding agencies with a focus on climate change. The agency has asserted itself as an outward-looking organisation, a driving force within the European Research Area and a player in scientific policy discussions on the world stage.

These successes are the fruit of the momentous commitment made by ANR's 275 personnel, who boast an incredible diversity of skills and talents. Their dedication and the complementary nature of their competencies are what make us able to work seamlessly and transparently with international scientific communities closely involved in the evaluation of projects submitted to the agency.

For 2015 and in the years to come, ANR and its collaborators will be called upon to take up new challenges swiftly and decisively. Two challenges stand out from the rest; the need to emphatically consolidate our European and international policy and the need to design and implement a novel approach for analysing the evolution of project proposals submitted to the agency and the impact of ANR funding.

There is no doubt in my mind that ANR's personnel will once again take up these challenges and drive the agency ever forward, enhancing its service and carrying out its missions with ingenuity!

WITH EVERY PASSING
YEAR, ANR EVOLVES
AND REINVENTS ITSELF
IN ORDER TO BETTER
SERVE THE SCIENTIFIC
COMMUNITIES.”



CONTENTS

01
WHO WE ARE

6

02
THE NUTS AND BOLTS OF
PROJECT-BASED FUNDING

16

03
RESEARCH HIGHLIGHTS

26

04
ANR ON THE INTERNATIONAL STAGE

56

05
INVESTMENTS FOR THE FUTURE,
A SPECIFIC ASSIGNMENT

68

06
BEHIND THE SCENES

82

07
PERFORMANCE & STATISTICS

98

01 WHO WE ARE

- ▶ Our Profile
- ▶ ANR, facts and figures
- ▶ Projects for science
- ▶ ANR in the research landscape
- ▶ 2014, a year of noteworthy developments
- ▶ Quality and ethics at the core of our work

07

08

09

10

12

14

A **public**
body under
the authority of
the Ministry of
research

A **COMPETITIVE
PROJECT-BASED
RESEARCH FUNDING
AGENCY**

A French organisation with
a **European** and
global outlook



OUR PROFILE

NAME

Agence Nationale de la Recherche - the French National Research Agency (ANR)

DATE OF CREATION

In two phases: **February 2005** as a public interest grouping / **January 2007** as a public administrative institution further to the decree of August 1, 2006.

The Decree of March 24, 2014 sets out the agency's missions and introduces a new governance model.

LOCATION

Paris

ROLE AND MISSIONS

ANR provides funding for project-based research in **all fields of science** - for both basic and applied research - to public research organisations and universities, as well as to private companies (including SMEs). Employing a method based on competitive peer reviews compliant with international standards, ANR provides the scientific community with instruments and programmes promoting creativity and openness, and stimulate new ideas and partnerships, particularly between academia and industry. Its activity also contributes to enhancing the competitiveness and the influence of French research in Europe and across the world.

Since 2010, ANR has also been the lead manager of the Investments for the Future programme in the field of higher education and research, in charge of project selection, funding and monitoring.

ANR FACTS AND FIGURES

€553.7 M

2014 funding
budget,
including €414.3 M
allocated through calls
for proposals



275

staff,
representing
250 full-time
equivalents

**€5.6
billion**
devoted
to the funding
of research projects
since 2005



More than
13,000
projects funded
since ANR

was created in 2005,
including 1,256 international
projects co-funded
with foreign
counterparts

10%

of projects funded
are international
projects co-funded
with foreign
counterparts

More than
8,000
peer reviewers
from all over the world

More than
75%
of the projects
funded
are collaborative
projects



18%

academia-industry
projects
funded



Targeting and focusing resources on the **best research projects**



Directing the research to **societal challenges**



Promoting **excellence** and **creativity**



Preparing a new generation of **talents**



Facilitating **European** and **international partnerships**



Fostering **interdisciplinary** work & **dialogue** between disciplines



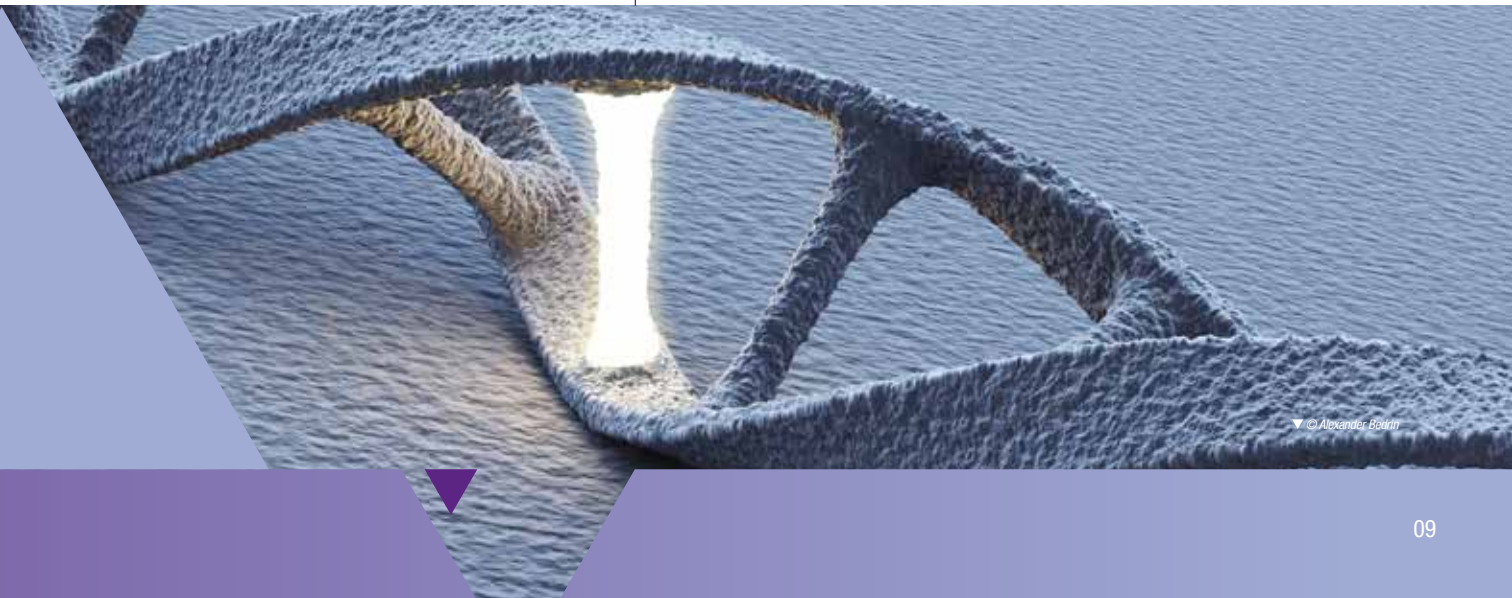
Speeding up production & transfer of knowledge in **academia-industry partnerships**

Projects FOR SCIENCE

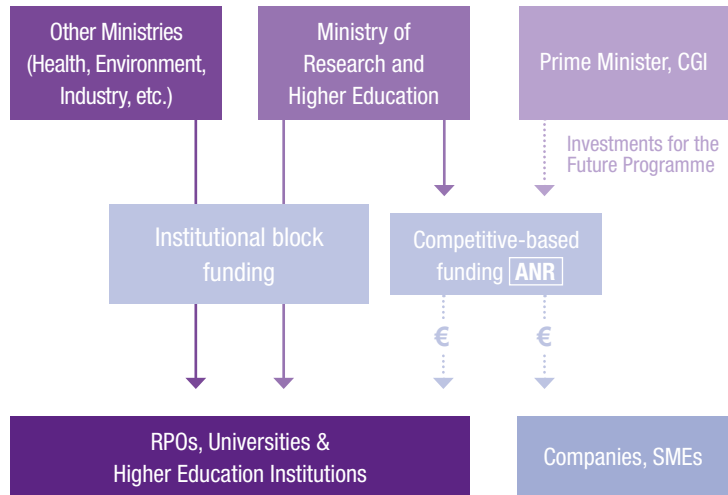
Project-based research funding is a well established practice in many countries, as it has proven to stimulate research organisations and strengthen their synergies. The inception in 2005 of project funding via ANR has been genuinely beneficial for France's research system.

The project approach allows for precise tracking, in terms of financial tracking and research activities for the various research domains, while at the same time intensifying and accelerating research on scientific priorities through the deployment of top-level teams.

This paradigm has a number of beneficial effects above and beyond the financial realm. Competitive and independent selection procedures that meet international standards, as well as fair and equitable assessment of all applications, allow funding to be allocated to the top-performing research teams. Projects for solving scientific challenges and societal issues spur creativity and promote collaboration between scientific teams from various disciplines, and between public and private sector actors, for the purpose of achieving common goals. Promoting dialogue between disciplines is vital for addressing societal issues targeted by French and EU strategies and that entail complex problems requiring synergy between diverse disciplines, in order to promote the rapid production of new knowledge that can be used to solve these problems.



ANR in the research LANDSCAPE



ANR IN THE FRENCH RESEARCH LANDSCAPE - FUNDING

ANR is a component of the French system for **funding public research**. Placed under the authority of the French Ministry of Research, which allocates ANR's annual budget, the agency funds both public research actors (CNRS, INRA, INSERM, CEA, INRIA, etc.), universities, higher education institutions and private actors (companies, SMEs, associations, NGOs, etc.), on the basis of a competitive selection process. Public research actors, placed for the most part under the authority of ministries corresponding to their respective areas of activity, benefit additionally from what is known as "recurrent" funding from the government.

ANR is also tasked with implementing the Investments for the Future programme, whose budget is provided by the Commissariat-General for Investment (CGI). Like other research projects, Investments for the Future are also subject to a competitive selection process.

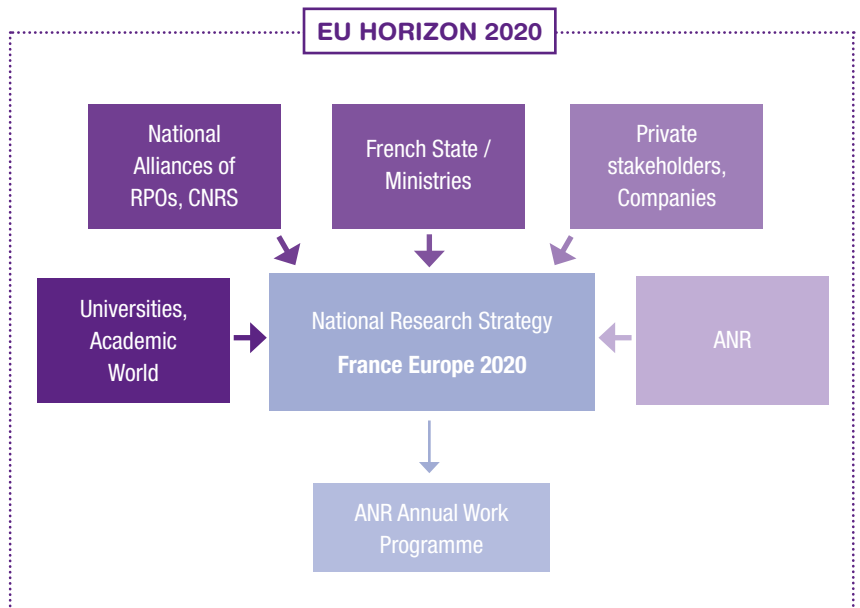


ANR IN THE FRENCH RESEARCH LANDSCAPE - PROGRAMME PLANNING

ANR is not only a research funder, but **an actor in the discussion on national programming and a full-time participant in developing the national research strategy.**

This strategy, developed in accordance with the European Union’s own agenda, identifies a limited number of scientific and technological priorities for responding to the major challenges of the coming decades. The strategy was drawn up in conjunction with the national scientific and academic communities as well as social and economic entities.

ANR’s Work Programme is the agency’s programming roadmap for a given financial year. It falls within the framework laid out by the “France Europe 2020” strategic agenda, commensurate with the European Commission’s Horizon 2020 Framework Programme for funding research. ANR’s Work programme is based on the nine major societal challenges identified in “France Europe 2020.”

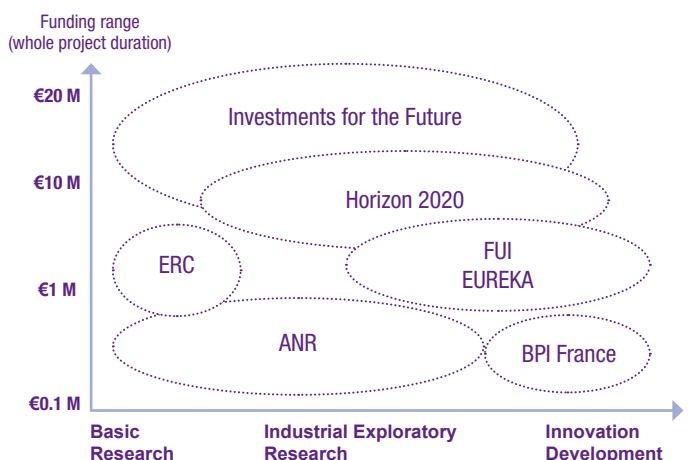


ANR’s programming takes into account priorities identified in the development of a national research strategy (SNR) and contributions made by thematic research alliances - Allenvi for the environment, Allistene for information and communication sciences, Ancre for energy, Athena for humanities and social sciences, Aviesan for health. These alliances are made up of French research organisations belonging to various thematic areas. The national research strategy is also supported by relevant ministries (Ministry of Higher Education and Research, Agriculture, Ecology, Health, Industry, Defence, Foreign Affairs, Culture) and by private actors (companies, associations, NGOs, etc.).

Lastly, ANR has implemented **scientific steering committees (CPSD)** to address the challenges that fuel the agency’s programmatic reflection processes.

ANR IN THE RESEARCH FUNDING ECOSYSTEM

ANR’s funding covers a wide range of activities including both fundamental and applied research. Its project-based funding method complements current national-level provisions: the French Public Investment Bank for SMEs and innovation (BPI France), the single interministry fund dedicated to applied research, Investments for the Future. ANR’s funding instruments dovetail with those of European instruments, including the European Commission’s Horizon 2020 Framework Programme, the European Research Council which funds fundamental research and the intergovernmental EUREKA initiative dedicated to precompetitive technology.



2014, A YEAR OF NOTEWORTHY DEVELOPMENTS

2014 was an eventful year for ANR from an institutional standpoint. New missions were assigned by the government, a new method of governance was introduced and a new President and CEO appointed, the personnel were grouped onto one location and the in-house reorganisation plan drafted in 2013 was implemented.

Other highlights were the effective implementation of the Work Programme, the agency's brand new programmatic roadmap, and the start of the complete restructuring of its calls for proposals. 2014 also provided the opportunity to test the two-stage selection process designed for its generic call.


On the eve of its tenth anniversary, the agency is set to embark on an exciting new chapter.

REORGANISATION

Following an audit procedure launched in 2013, ANR's Governing Board approved a new organisation structure in June 2014. The biggest change is the creation of two operating divisions: the Grant Agreement and Funding division, which will handle all operations related to contractual arrangements with beneficiaries of ANR subsidies and manage the grant agreements until their completion, and the Scientific Operations division which, since autumn 2014, has grouped together all scientific departments under one division. This involves grouping together many operational tasks shared by these departments: organising evaluation panels and monitoring committees, managing partnerships and collaboration, coordinating and devising methods for studies and impact analyses, operational planning and coordination. This reorganisation will be achieved by ensuring consistent practices and increasing operational efficiency, clarifying individual roles and improving services provided to the agency's representatives.

ENTIRE PERSONNEL RELOCATED TO ONE SITE

One of the reorganisation's recent milestones was a relocation in mid-July bringing together all ANR personnel onto a single site at 50 avenue Daumesnil in the 12th arrondissement of Paris. In addition to generating savings, the move facilitates interaction between teams, improves agents' day-to-day work experience, but also the agency's overall efficiency and performance, while crystallising the reorganisation.



ON THE EVE OF ITS TENTH
ANNIVERSARY, THE AGENCY
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EXCITING NEW CHAPTER."

WORK PROGRAMME 2014 IMPLEMENTED AND THE TWO-STAGE PROCESS

In 2013, in the space of a few months, ANR designed a new work method to benefit the scientific community. The focal points of this redesign are the creation of a Work Programme to restructure the agency's funding, the grouping of the majority of funding together under a generic call for proposals and the introduction of a two-stage selection process.

These new concepts were effectively implemented in 2014. Issued in July 2013, ANR's Work Programme 2014 foresaw introducing a generic call for proposals comprising a two-stage selection process. It groups together the various funding allocated by the agency for five funding instruments (collaborative projects, public-private partnership projects, international projects, young researcher projects and research "networks") organised into nine societal challenges and one "all-knowledge challenge". Alongside this generic call which makes up most of ANR's funding offer, specific calls are devoted to certain activities, particularly international activities, but also national ones.

The entire agency has rallied around this project which has introduced sweeping changes to ANR's programming structure and to its selection process.

FOUNDING LEGISLATION IN VIEW OF ANR'S 10TH ANNIVERSARY

In March 2014 the government modified the agency's governance methods and broadened the tasks entrusted to it through Decree 2014-365 of March 24th. This decree establishes a new executive presidency position, for which Michael Matlosz was appointed on September 11, 2014 as President and CEO. It also alters the composition of the Board, whose first meeting in its new form was held on December 18, 2014. Additionally, it provides for a Scientific Steering Committee, whom the agency's President shall consult for the purposes of preparing the Work Programme, the progress report, to implement work to analyse offers and measure impacts, create and eliminate scientific departments and appoint department directors. The Committee will be created in 2015. This decree bolsters the agency's responsibilities and broadens its tasks to include analysing developments in research offered and measuring the impact of the funding it allocates on national scientific production. In addition, the decree reinforces the agency's European and international activities.

A NEW NATIONAL LEGISLATION NOTABLY REINFORCES THE AGENCY'S GLOBAL ACTIVITIES. ONE OF ANR'S MISSIONS IS INDEED TO STRENGTHEN SCIENTIFIC COOPERATION AT EUROPEAN LEVEL, BY HINGING ANR'S PROGRAMMING AROUND THE EUROPEAN AND INTERNATIONAL INITIATIVES."

Quality and ethics AT THE CORE OF OUR WORK

The prime role of ANR is to organise the funding of project-based research. To do this, it relies on a competitive selection process compliant with the applicable international standards. Over the last few years, the agency has adopted various means of guaranteeing process transparency, compliance with research project selection criteria and sound management of public funds.

Since 2009, ANR's code of ethics has set out best practices with which all persons and entities involved in the agency's activities must comply. This charter guarantees processes' transparency, compliance with the research project selection criteria and sound management of public funds.

In 2014 ANR gave itself additional means by developing a **policy for ethics and research integrity**. This document - which describes the fundamental principles to abide in the exercise of research or research training activities along with the rights and duties of those who support, evaluate and perform research work - is applicable to researchers, applicant organisations and all persons involved in the activities of ANR. This policy is in line with the principles set out in the Singapore Statement on Research Integrity (July 2010) and the "European Code of Conduct for Research Integrity" published by the European Science Foundation (ESF) in 2010. It is also compliant with the Statement of Principles for Research Integrity adopted at the Global Research Council meeting in May 2013 and the recommendations of the European funding programme Horizon 2020.

WORTH KNOWING

Back in April 2011, ANR created a body - **the Redress Committee** - dedicated to examining and analysing cases of flaws in the selection process. This is a collegial authority to which cases can be referred by the research project applicant, by a member of ANR staff, or by the committee itself at any stage of the ANR selection process (pre-selection or selection) and for all calls for proposals launched by the agency (generic or specific). The scope of competence of the Redress Committee excludes calls launched under the Investments for the Future programme. Save for exceptions requiring that the applicant be heard directly, the Committee rules on cases.



A QUALITY POLICY SERVING THE ANR USERS AND THE SCIENTIFIC COMMUNITIES

Thanks to its quality initiative, ANR has shored up its procedures and has made continuous adaptations to meet the expectations of the research community. The quality policy of ANR hinges around three strategic axes:

- ▶ Improving the contribution of all ANR personnel to the agency's missions
- ▶ Optimising and managing our interactions with the French, European and international actors in research
- ▶ Managing and capitalising on information to optimise the use of data in the performance of our missions



INTERVIEW

In order to better understand this approach, and especially the user feedback system which is currently being set up, **Caroline Lefebvre - ANR's Organisation and Processes Quality Manager** - sat down to answer questions about the quality policy.

WHAT ARE THE OBJECTIVES OF ANR'S QUALITY MANAGEMENT SYSTEM?

"ANR developed its very first quality approach in 2007. Its first certification, obtained in 2008, only concerned the project selection process. In 2010 it obtained certification for all its activities. One of the goals of our General Management is to ensure that this quality approach is maintained over the long term and to honour its commitments in terms of "customer satisfaction" and continuous improvement. Quality management guarantees our "customers" impartial treatment, control of conflicts of interests, high-quality selection by peers, traceability of ANR's activities, confidentiality of data, effectiveness and efficiency of its processes and optimisation of processing times. ANR's "customers" are the researchers, the project principal investigators, our partners and our ministerial supervisory bodies."

WHAT CAN YOU TELL US ABOUT THE ANR USER FEEDBACK SYSTEM?

"ANR has always addressed user claims, but never in a cross-departmental manner. The system that we are currently putting in place will be centralised and thus allow faster handling of claims, ensuring their traceability. There will be a single feedback address on the ANR website and I will be responsible for guaranteeing that all issues are addressed by personally contacting the person concerned and keeping track of their follow-up. The content of the claims will be analysed, and a corrective action plan to improve our procedures will be established where necessary. We will do our utmost to satisfy our users' needs while adhering to our objectives and the requirements set by our ministerial supervisors."



THE NUTS AND BOLTS OF PROJECT-BASED FUNDING

▶ A wide range of funding instruments serving
the scientific communities

17

▶ The Work Programme, our roadmap

20

▶ Our principles of action

22

▶ Key figures of the 2014 selection

24

A wide range of funding instruments SERVING THE SCIENTIFIC COMMUNITIES

ANR has designed and deployed a range of funding instruments to satisfy both the project-based funding needs of the research communities and the public policy for research and innovation in France.

Each of these instruments meets a clearly identified end-purpose.



COLLABORATIVE RESEARCH PROJECTS

- ▶ Reinforcing the synergies between research teams, and enabling them to achieve more ambitious results which break away from the conventional paths, by pooling the skills and resources of various academic or public sector research teams.

COLLABORATIVE RESEARCH PROJECTS INVOLVING ENTERPRISES

- ▶ Supporting research results that will be advantageous to both parties (public institutions and industry), by enabling public research facilities to address new research issues, or address them in a different way, and by enabling companies to access high-level public research to improve their innovation capacities.

INTERNATIONAL COLLABORATIVE RESEARCH PROJECTS

- ▶ Simplifying and strengthening the bilateral research partnerships.

CHALLENGE COMPETITION

- ▶ Encouraging several teams to work on the same topic & enabling them to compare their respective approaches to a scientific application or question.

LABCOM

- ▶ Developing joint research laboratories between public research institutions and SMEs or intermediate-sized companies.

OH RISK

- ▶ Supporting exploratory research projects involving a very high level of scientific risk but with strong potential for scientific, technological and economic impacts.

YOUNG RESEARCHERS

- ▶ Promoting a new generation to lead French research.
- ▶ Fostering the empowerment and innovative capacity of young researchers; providing them with the means to develop and carry out a project so that they can work independently on original topics.

HOSTING HIGH-LEVEL RESEARCHERS

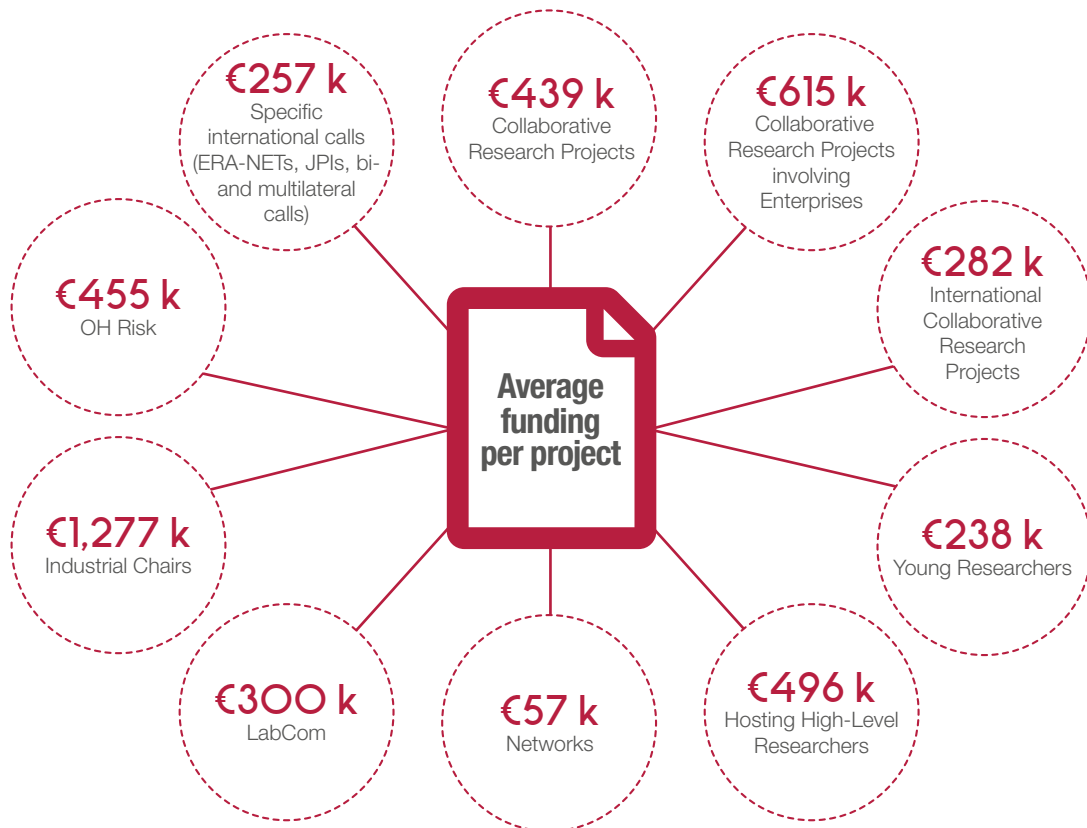
- ▶ Offering leading foreign scientists excellent working conditions within prominent French research organisations.

INDUSTRIAL CHAIRS

- ▶ Contributing to the development of lasting relations between public research centres and private companies.
- ▶ Facilitating the implementation of a research and higher education chair within the public body, funded in part by the company.

SPECIFIC INTERNATIONAL CALLS

- ▶ Supporting binational or multinational research teams consortia on specific topics.



FLASH CALL: AN EFFICIENCY-ENHANCING INSTRUMENT

FLASH DRONES FOR PROTECTING HIGH-RISK AREAS AGAINST DRONES

With the development and use of drones, also known as unmanned aerial vehicles (UAV), for civil applications, and flyovers of facilities of vital importance, ANR launched a Flash call for proposals in December 2014.

The use of civilian and leisure drones is in full expansion. Driven by its outstanding product and service offering, France is among the leading countries in this area. As with any new technology, the use of drones brings not only progress but also new risks which must be anticipated.

On behalf of the General Secretariat for Defence and National Security (Service of the French Prime Minister) and alongside industrial security sector actions, ANR launched a Flash call for projects on this subject in December. The aim was to fund, for twelve to eighteen months, research work to evaluate the technical solutions applicable in the medium term for the detection and even the neutralisation of aerial drones. Ultimately, the goal is to rapidly obtain demonstrators working in operational environments. Twenty-four candidacies have been received for this call.

THREE PROJECTS FUNDED

ANGELAS brings together three industrial partners and four cutting-edge public research laboratories under the coordination of ONERA. This project will propose several demonstrations in an operational environment over the next eighteen months.

BOREADE is led by the company CS Systèmes d'information in association with two innovative SMEs. It aims to build an operational demonstrator in twelve months.

SPID, coordinated by the Byblos group, draws on a panel of experts in detection, neutralisation, data processing, surveillance and law. SPID will also rely on support from complementary technologies (acoustics, optronics, radio direction finding and radar) to come out with a prototype within twelve months.

FLASH CALL

- ▶ Responding to an urgent need for research whose scientific relevance is linked to an event or a major natural disaster
- ▶ Funding the work necessary to acquire rare information and data impossible to obtain in normal situations

A NEW INSTRUMENT TO BOOST FRENCH PARTICIPATION IN EUROPEAN AND INTERNATIONAL CALLS FOR PROPOSALS

The aim of "Setting up European or International Scientific Networks" is to encourage the formation of transnational networks coordinated by French researchers. Funding is only provided for research networks which have specifically been set up to submit a collaborative project in response to a large-scale European or international call for proposals. These networks can cover any number of scientific disciplines related to a topic with recognised scientific, technological or societal impact. This instrument was designed to be flexible and effective, facilitating swift decision-making and deployment of funds.

The Work Programme, OUR ROADMAP

The Work Programme is ANR's roadmap for a given financial year. It details the main actions and calls for proposals, sets out research priorities and funding instruments available, providing a general overview of the agency's research funding offer. It is intended for all scientific communities and all public or private players (including small and medium-sized enterprises and very small enterprises) involved in the research ecosystem.

HOW IT WORKS

A large part of ANR's funding offer is included in one generic call for proposals, launched annually. Funding is open to all scientific disciplines and types of research, from basic research through to applied research carried out in partnership with private companies. The submission and selection procedure for this call for proposals proceeds in two stages. Part of the generic call is open to international collaborations through bilateral partnerships with counterpart agencies abroad.

The generic call is supplemented by a number of additional specific calls, including calls launched under ERA-NET networks and Joint Programming Initiatives (JPIs), bilateral and multilateral calls with counterpart funding agencies, and other dedicated instruments such as Hosting-High Level Researchers, Industrial Chairs, etc.

► 4 COMPONENTS, 9 SOCIETAL CHALLENGES

GENERIC CALL	SPECIFIC CALLS
Major Societal Challenges	
9 societal challenges Collaborative Research Projects (PRC) & Young Researchers (JCJC)	Challenge competitions
At the Frontiers of Research	
All-knowledge challenge Collaborative Research Projects (PRC) & Young Researchers (JCJC)	OH Risk
Building the European Research Area and France's international attractiveness	
International Collaborative Research Projects (PRCI)	Setting up European or International Scientific Networks, Hosting High-Level Researchers, Bi- and multilateral calls
Economic Impact of Research and Competitiveness	
Collaborative Research Projects involving Enterprises (PRCE)	LabCom, Carnot Institutes, Industrial Chairs

▼ *The Work Programme comprises four interlinked components, each with a specific budget and governance*

THE 4 COMPONENTS IN A NUTSHELL

Major Societal Challenges:

- ▶ Funding basic cognitive research, as well as targeted and often applied research responding to major challenges facing our societies

At the Frontiers of Research:

- ▶ Providing support for basic cognitive research, fostering prospective or exploratory research that can potentially expand the frontiers of knowledge beyond that related to the major societal challenges

Building the ERA and developing France's international attractiveness:

- ▶ Providing French researchers and teams with funding instruments that allow for the influence and appeal of French research to be expanded, and promoting the building of the European Research Area

Economic Impact of Research and Competitiveness:

- ▶ Facilitating partnerships with private companies and promoting the transfer of public-funded research to industrial applications

A STRONG COORDINATION WITH HORIZON 2020

As a funding agency, one of the greatest challenges lies in coordinating the different funding instruments that exist at the national and European levels. This is one reason why ANR has threaded together much of its Work Programme with the funding programme Horizon 2020, and more broadly with the European policy agenda. Its programming is structured around major societal challenges that are common to the national and European societies. ANR has set itself the priority of improving coordination between national and European funding schemes within the European Research Area. ANR's Work Programme is therefore divided into four components, one of which is entirely dedicated to building the ERA and developing France's attractiveness abroad.



OUR PRINCIPLES OF ACTION



The ANR selection process is based on the principle of peer review, in accordance with the international standards for research project selection. To this end, ANR relies on the assistance of regularly renewed panels of scientific personalities external to ANR, and the **widest possible international community of scientific experts** external to the committees (ad hoc peer reviewers).

The peer reviewers (not members of the panels) are French or foreign scientists, depending on the competencies required for each of the project proposals. They are invited by ANR upon proposal by the evaluation panels based on criteria of competency, reputation, independence and integrity. Before being given access to the complete proposal file, the reviewers are required to sign a confidentiality agreement, declare that they have no conflicts of interest and accept the principles of non-disclosure and management of conflicts of interest described in ANR's code of ethics.

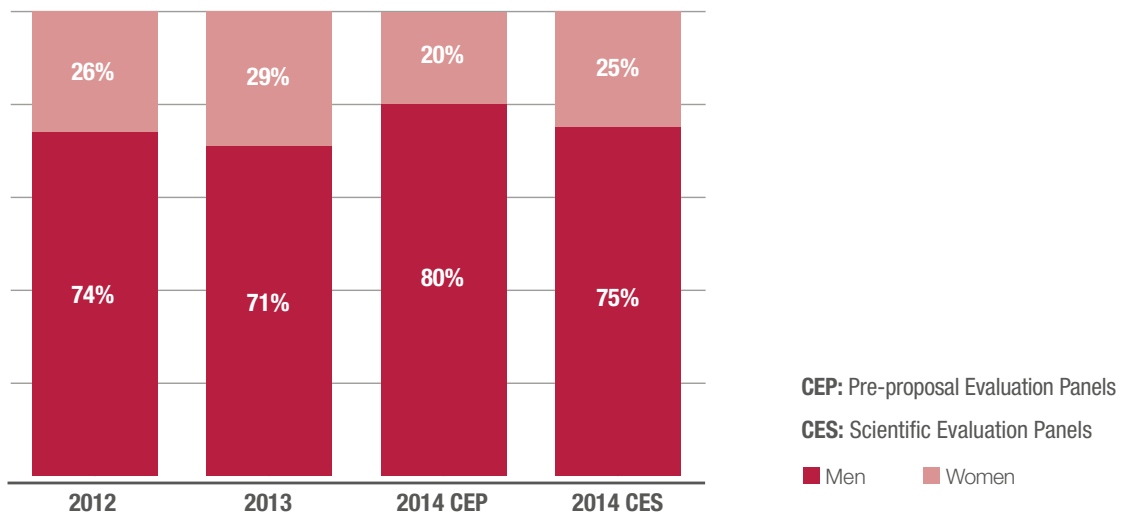
These peer reviewers play a key role in the process for selecting project proposals submitted to ANR, given that the discussions of the evaluation panels are based on the peer reviewers' assessment

reports. At least three peer reviewers' reports are required per project proposal and it is these assessments - whether consensual or contradictory in their opinions - that fuel the panels' discussions to reach the ranking of the proposals.

Each year more than **8,000** peer reviewers assist ANR by providing expertise. The agency is very grateful to them for the work they accomplish and their assistance in guaranteeing the selection of projects of a very high standard.

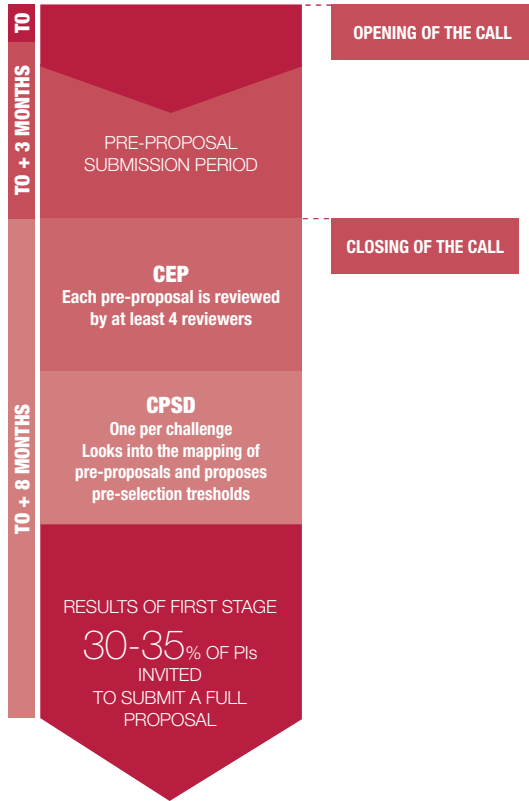
In 2014, **3,849** peer reviews were carried out by foreign experts under the generic call for proposals.

► MEN AND WOMEN DISTRIBUTION IN THE EVALUATION PANELS

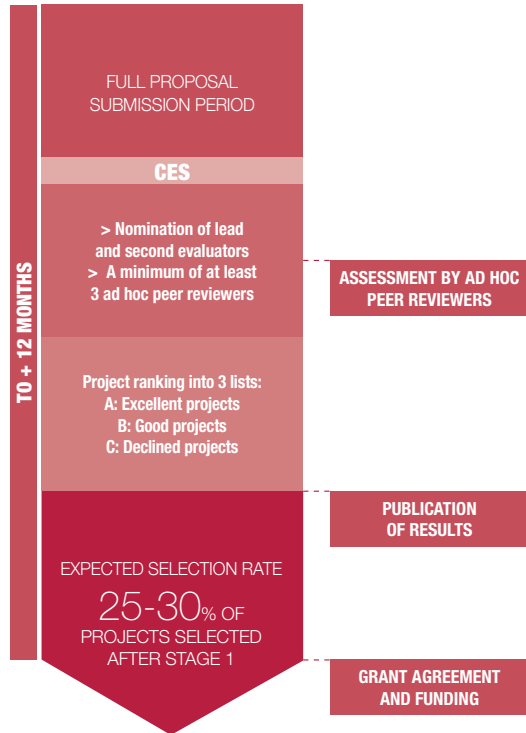


► GENERIC CALL FOR PROPOSALS, A TWO-STAGE SUBMISSION PROCESS

STAGE 1: PRE-PROPOSALS



STAGE 2: FULL PROPOSALS

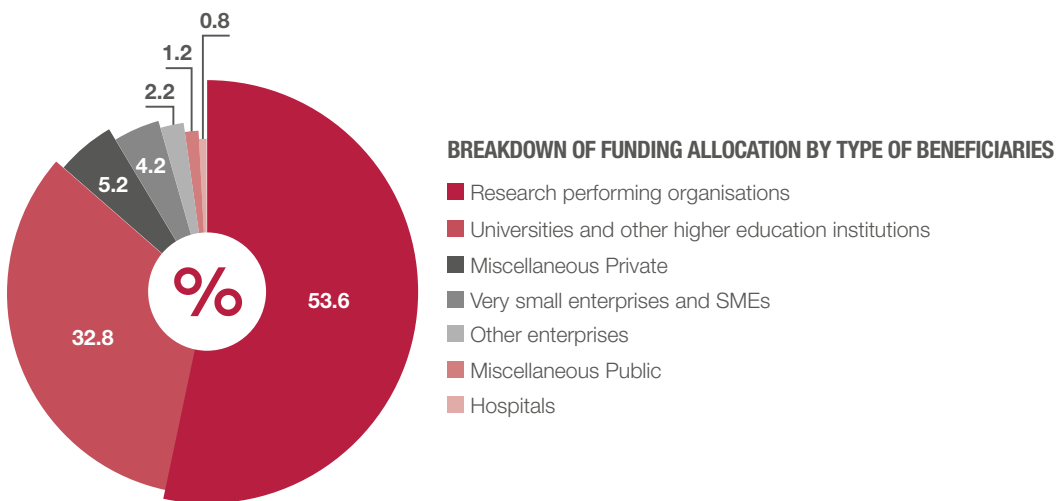
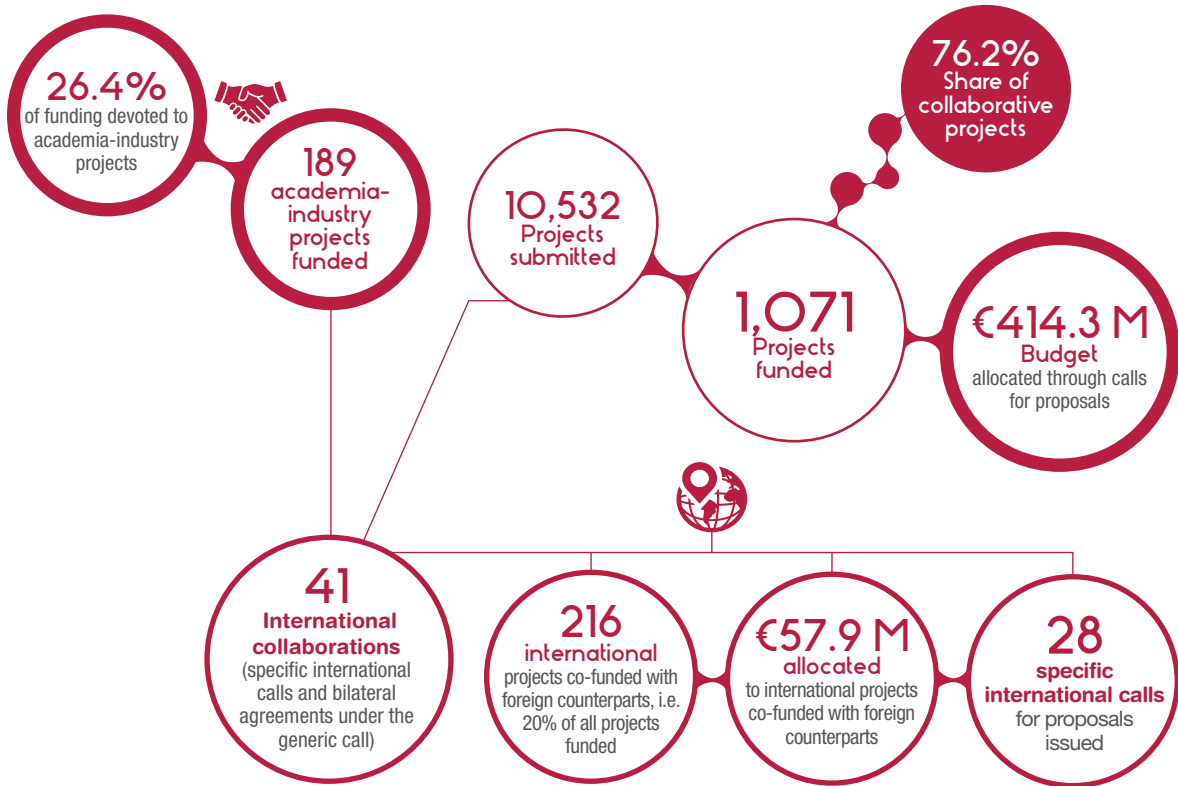


CPSD: Scientific Challenge Steering Committee
 CEP: Pre-proposal Evaluation Panel
 CES: Scientific Evaluation Panel

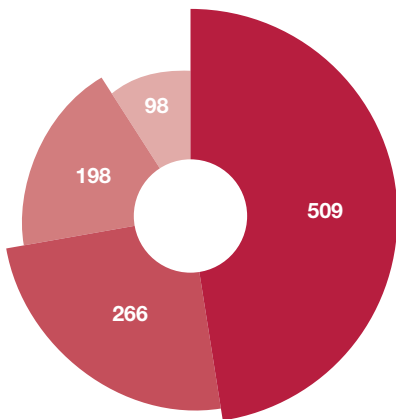
▼ On account of budget constraints, a large proportion of ANR's actions were transferred in 2014 to a two-stage selection process through the generic call for proposals, but without changing their scope. For the scientific community, the added value of this system is that the first stage requires less preparation, with the prospect of a much higher success rate in the second stage with a "target" success rate of 30% for the projects selected from the first evaluation stage.



KEY FIGURES OF THE 2014 SELECTION

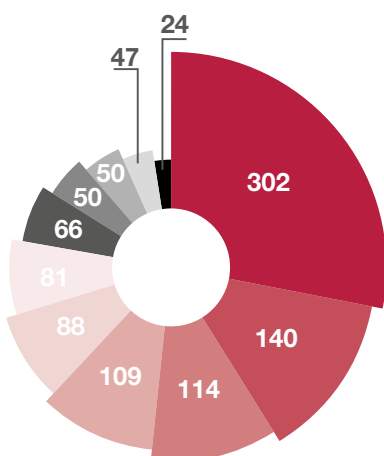


NUMBER OF PROJECTS FUNDED



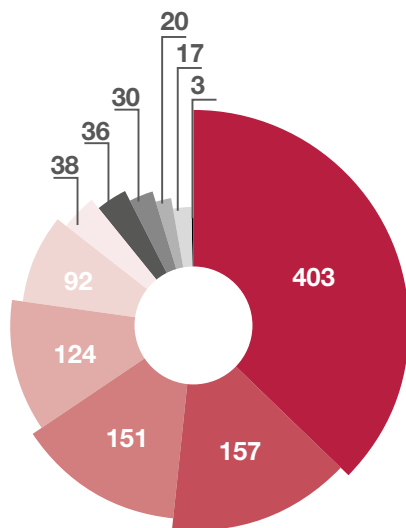
GRANTS AND PROJECTS FUNDED IN 2014 BY COMPONENT

- Major Societal Challenges €195.6 M
- Building the European Research Area and France's international attractiveness €73.9 M
- Economic Impact of Research and Competitiveness €108.9 M
- At the Frontiers of Research €36 M



GRANTS AND PROJECTS FUNDED IN 2014 BY CHALLENGE

- Health and well-being €119.6 M
- Information and communication society €58.7 M
- All-knowledge challenge €35.9 M
- Industrial renewal €42.3 M
- Other (OH Risk, Hosting High-Level Researchers, Industrial Chairs, LabCom) €34.8 M
- Efficient resource management and adaptation to climate change €29.3 M
- Food security and demographic challenges €25 M
- Clean, secure and efficient energy €22.1 M
- Freedom and security of Europe, its citizens and its residents €20.6 M
- Innovative, inclusive and adaptive societies €13.4 M
- Sustainable mobility and urban systems €12.7 M



GRANTS AND PROJECTS FUNDED IN 2014 BY TYPE OF INSTRUMENTS

- Collaborative Research Projects €176.8 M
- Collaborative Research Projects involving Enterprises €96.6 M
- Young Researchers €35.9 M
- Specific international calls (ERA-NETs, JPIs, bi- and multilateral calls) €31.9 M
- International Collaborative Research Projects €25.9 M
- LabCom €8.4 M
- ASTRID €11.1 M
- Hosting High-Level Researchers €14.9 M
- Networks €1.1 M
- OH Risk €7.7 M
- Industrial Chairs €3.8 M

RESEARCH HIGHLIGHTS

- ▶ Encouraging collaborations and synergies 27
- ▶ Stimulating interdisciplinary research 30
- ▶ Fostering the emergence of new knowledge 32
- ▶ Preparing a new generation of talents 36
- ▶ Boosting research, taking on major societal challenges 38
- ▶ Building bridges between the academic world and industry 45
- ▶ Facilitating researchers' international partnerships 50
- ▶ Attracting research talent in France 54

Encouraging collaborations AND SYNERGIES

By pooling different teams' skills and resources, collaborative research reinforces the synergies between teams which would not usually work together, enabling them to achieve more ambitious results which break away from the conventional paths.

Collaborative projects give pride of place to scientific audacity and interdisciplinarity to foster the development of emerging themes, disciplinary and transdisciplinary breakthroughs, new models and methods, or advances in theory to improve the position of French teams in European and international programmes. One of the vocations of a collaborative project is to increase the production of knowledge with potential to bear fruit in terms of innovation.

WHAT IS COLLABORATIVE RESEARCH?

Collaborative research is based on the pivotal principle of collaboration between researchers from different horizons and with different outlooks, coming from public research laboratories from France or abroad and the laboratories of large private groups, and from small- and medium-sized enterprises, thereby pooling their skills and working together on a given research project in order to innovate. Adopting a collaborative research approach means counting on the complementarity of skills rather than on competition. Each of the partners contributes its unique features to the group, its knowledge, its technical, financial and human resources, and its perception of the joint research project.

The key figure

75%

of projects funded by ANR
are collaborative research
projects

ANR encourages collaborative research in France and across the world. Collaborative projects, whether academic, international or through academic-enterprise partnerships, represent the main mode of ANR funding.



PROJECT ID

- ▶ **Title:** BioNutriNet - Organic foods consumption: determinants and motivation as regards sustainability, nutritional, economic, environmental and toxicological impact
- ▶ **ANR Programme and Edition:** ALID - Sustainable Food Systems programme - 2013
- ▶ **Coordinating body:** INRA, EREN
- ▶ **Partners:**
 - Bio Consom'acteurs Association
 - Grenoble University Hospital Centre
 - Technical Institute of Biological Agriculture
 - NORT UMR Laboratory "Nutrition, Obesity and Thrombotic Risks"
 - Solagro Association
 - INRA Toxalim
 - INRA ALISS
- ▶ **ANR Funding:** €673 k
- ▶ **Contact:** e.kesse@eren.smbh.univ-paris13.fr
- ▶ **Project website:** <http://bionutrinet.etude-nutrinet-sante.fr/>



PROJECT STORIES

ORGANIC FOOD AND HEALTH

BIONUTRINET IS COUNTING ON INTERNET USERS TO CAST SOME LIGHT ON THE SUBJECT

Who consumes organic products? For what reasons? What are the impacts of such consumption habits on health and the environment? The BioNutrinet study, a specific component of the NutriNet-Santé study, was launched to answer these questions. Of a scale unparalleled to date, BioNutrinet receives almost €700 k funding from ANR.

The BioNutrinet study is a world-first by virtue of the number of persons monitored and the method used. For four years, tens of thousands of Internet user volunteers with various organic food consumption habits will be asked to provide regular data on their food consumption and their state of health. A sub-sample of 300 volunteers will undergo biological analyses to establish their nutritional and toxicological status and determine the impact of their eating habits on these points.

MULTIPLE SKILLS COMBINED

To succeed in this task, a broad panel of disciplines (epidemiologists, nutritionists, biologists, economists and agronomists) has been assembled thanks to the collaboration of teams from INRA (French agricultural research institute), INSERM (French health and medical research institute), CNAM (National conservatory of arts and crafts), Paris 13 University, the Grenoble University Hospital Centre, ITAB (Technical Institute of Biological Agriculture) and the associations Bio Consom'acteurs and Solagro. All the information collected will be of value for guiding public policies.

The BioNutrinet study is a world first by virtue of the number of persons monitored and the method used"

NUTRINET-SANTÉ, THE ONLY STUDY OF ITS KIND IN THE WORLD

The NutriNet-Santé study is a unique and ground-breaking project created to study eating habits and nutrition-health relationships by monitoring over a five-year period a cohort of 500,000 volunteers recruited via the Internet. It is underpinned by the financial commitment of exclusively institutional and public partners: the Ministry of Health, InVS (French health monitoring institute), INPES (National institute for prevention and education for health); and the personnel of INSERM, INRA, the CNAM and University Paris 13. It is also backed by foundations: FRM (Medical research foundation), ARC (Cancer research association), FCA (Heart and arteries association) and CORDDIM, a research association in the French Ile-de-France region.

HIGH-PERFORMANCE COMPUTING

YVES ROBERT, WINNER OF THE IEEE TCSC AWARD FOR EXCELLENCE

Yves Robert is one of the world's foremost specialists in algorithmic research. In May 2014 he became the first European to win the IEEE TCSC (Institute of Electrical and Electronics Engineers - Technical Committee on Scalable Computing) Award for Excellence, in recognition of his work in the field of high-performance computing. In 2010, ANR supported his RESCUE project, which focused on the resilience of scientific applications on exascale machines.

WORTH KNOWING

Yves Robert, who holds a PhD degree from the National Polytechnic Institute of Grenoble, currently lectures at the Computer Science Laboratory (LIP) at the Ecole Normale Supérieure de Lyon. He is a Fellow of the IEEE, and has been a member of the Institut Universitaire de France since 2007. Since 2011 he has also been a visiting research scholar at the University of Tennessee, Knoxville. His research focuses on the development of algorithms for high-performance computing (HPC) platforms, and in particular on massively parallel algorithms, able to carry out multiple calculations simultaneously.

IEEE is the world's largest professional association dedicated to advancing technological innovation and excellence for the benefit of mankind.

THE RESCUE PROJECT: RESILIENCE

Yves Robert's research also focuses on the development of resilience techniques. This was the subject of his RESCUE project, funded by ANR in 2010 through the Blanc programme entitled "Sciences of Information, Matter and Engineering: Hardware and Software for Systems, Computers, Communications". The aim of this project was to solve the problem of failure tolerance in exascale computing (exascale machines are able to execute at least one ExaFLOPS, or a billion billion calculations per second).



INTERVIEW

YVES ROBERT, WHAT ARE YOUR MAIN RESEARCH TOPICS?

Yves Robert: "I am working on parallel and distributed algorithms for use on high-performance computing platforms. These relate to what we call "cloud computing", or simply "cloud". In practice this means that I make use of the resources of several thousand or million computers to solve a given problem using algorithms. For the last five years I have also been working on resilience problems, in other words the capacity of algorithms to resist machine failure."

THIS WAS THE FOCUS OF YOUR RESCUE PROJECT, FUNDED BY ANR IN 2010. WHAT DID THIS FUNDING ALLOW YOU TO ACCOMPLISH?

Yves Robert: "RESCUE was launched four years ago with the aim of facilitating the implementation of new resilience methods for exascale machines. The existing methods at that time consisted of periodically saving the application by synchronising all processors and transferring their data to a reliable storage system.

Application of these techniques to all exascale processors would significantly slow them down. The aim of RESCUE was to solve this problem and develop new backup protocols. The work we undertook in this field

has been integrated into the development of applications by physicists and biologists in such diverse fields as climate or neurology."

WHAT ARE YOUR PRIORITIES OVER THE NEXT FEW YEARS?

Yves Robert: "The RESCUE project spawned collaborative initiatives between various research teams with complementary expertise. These initiatives have grown under the auspices of the Joint Laboratory for Extreme Scale Computing (JLESC), headed up by Franck Cappello. I am currently highly involved in this laboratory, which brings together several international teams from the French National Computer Science Institute (INRIA), the University of Illinois at Urbana-Champaign, Argonne National Laboratory, Barcelona Supercomputing Centre, Jülich Supercomputing Centre and the Riken Advanced Institute for Computational Science in Tokyo. It would be hard to tell you what I might be working on in the more distant future. Algorithmics enables me to pursue a diversity of research topics, and so I am open to all possibilities!"

"The RESCUE project spawned collaborative initiatives between various research teams with complementary expertise."

PROJECT**ID**

- ▶ **Title:** BIOPAC - Biomolecules as hydrogen oxidation catalyst in fuel cells
- ▶ **ANR Programme and Edition:** Bioenergies (Bio-E) - 2010
- ▶ **Coordinating body:** Laboratoire de Bioénergétique et Ingénierie des Protéines (BIP)
- ▶ **Partners:**
 - Institut de Sciences des Matériaux de Mulhouse (IS2M)
 - Laboratoire de Chimie de Provence (LCP, now Madirel)
 - Laboratoire de Biochimie Théorique (LBT)
- ▶ **ANR Funding:** €597 k
- ▶ **Contact:** lojou@imm.cnrs.fr
- ▶ **Project website:** <http://www.lojou.fr/biopac/>

Stimulating INTERDISCIPLINARY RESEARCH

Decomartmentalising research and federating skills is a top priority. Interdisciplinarity fosters the emergence of new themes, little known disciplines and unexplored methods, thereby leading to paths of innovation.

Cross-disciplinary work is vital for developing innovative approaches that will provide effective answers to the major societal and global issues. Some topics and problems, by their nature, their cause or their impact, involve a number of sectors and can only be analysed by completely interdisciplinary methods.

ANR encourages dialogue and helps to break down barriers between disciplines. In the light of the challenges faced by today's society, it is becoming increasingly necessary to take advantage of various types of expertise and know-how in an integrated fashion. ANR facilitates research that aims to provide answers and solutions to the major societal issues, by bringing together scientific communities from various horizons to work on research projects.

**PROJECT STORIES****FUEL CELLS**

THE BIOPAC PROJECT IS PROPOSING NEW CATALYSTS EXTRACTED FROM MICROORGANISMS

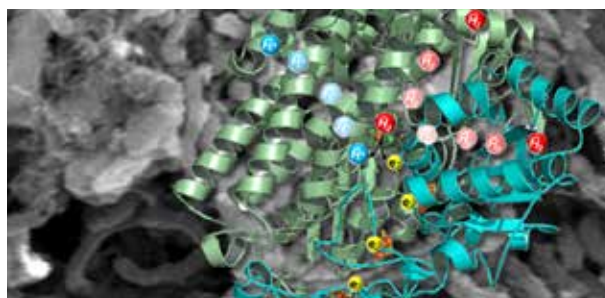
In order to pave the way for biofuel cells, the highly multi-disciplinary Biopac project looked at conditions enabling bacterial enzymes to be used. The project should also increase the understanding of how enzymes operate in a structured environment, which is relevant for any process using enzymes and by extension, for bioenergetics.

There continue to be numerous technological barriers impeding the development of fuel cells, in particular the cost and limited specificity of the chemical catalysts currently used (particularly platinum). In nature, many microorganisms synthesise enzymes known as hydrogenases, which oxidise hydrogen very effectively, a reaction fundamental to so-called "H₂/O₂" cells. The Biopac project partners therefore considered using these bacterial enzymes as catalysts. However, in order to develop such "biofuel cells", it is necessary to control enzyme orientation on the electrode and increase the number of electrically-connected enzymes to increase current density and power supplied.

IMPLICATIONS FOR ALL PROCESSES USING ENZYMES

Through modelling, it has been possible to determine and optimise physicochemical and structural parameters that affect interaction between the enzyme and electrode. On this basis, new carbonaceous

materials with controlled porosity and suitable surface chemistry have been developed and categorised. When used in H₂/O₂ biofuel cells, they enable an electrode to be defined based on the long-term immobilisation of enzymes. Work carried out has enabled the BIOPAC partners to identify the main factors that limit the functional immobilisation of enzymes, including membrane-bound enzymes. These crucial findings will have implications for any process using enzymes (biofuel cells, bioreactors, biosensors, etc.). In fundamental terms, this project has paved the way to understanding how enzymes function in a structured environment. Since the project has generated extensive new knowledge, it was also awarded the ADEME "innovative techniques for the environment" prize at the 2012 Pollutec exhibition.



▼ © BIOPAC

PROJECT ID

- ▶ **Title:** From natural vision to digital application: a new vision of our retina
- ▶ **ANR Programme and Edition:** Blanc International - 2010
- ▶ **French Coordinating body:** INRIA Centre Nancy Grand-Est
- ▶ **Partners:**
 - INRIA Sophia Antipolis-Méditerranée / France
 - Universidad de Valparaiso / Chile
 - Universidad de Chile, Faculty of Physical and Mathematical Sciences / Chile
 - Universidad Técnica Federico Santa Maria / Chile
- ▶ **ANR Funding:** €300 k
- ▶ **CONICYT Funding:** €112 k
- ▶ **Contact:** Thierry.Viewille@inria.fr



PROJECT STORIES

PEERING INTO THE HUMAN EYE

RESEARCHERS WORKING ON THE KEOPS PROJECT STUDY NEURAL ENCODING MECHANISMS

Retinas are much more than little webcams; this tiny though relatively accessible part of the brain is nothing less than the tissue on which the image of the world around us is projected, pre-processed and compressed before being carried to the brain. The KEOpS project, funded by ANR and Chilean National Research Commission CONICYT, is looking to expand engineering applications inspired by retinal behaviour while exploring the way in which the retina encodes visual information and interacts with the rest of the brain.

NEW SET OF TOOLS AND METHODS FOR THE SCIENTIFIC COMMUNITY

The KEOpS project, headed up by two INRIA Research Teams and Chilean University partners (Universities of Valparaiso, Chile and Técnica Federico Santa Maria) have fashioned new, custom-built software, numerical models and methods to understand the retina's computational capabilities, including the lesser known non-standard ganglion cells. KEOpS could eventually provide new insight for the modelling of visual stimulation and early vision in the visual cortex in human and animal subjects. Chilean team members specialised in biology and French team members with expertise in computer science have crossed global and scientific boundaries in this novel, interdisciplinary undertaking.

UNEXPECTED OUTCOMES OF THE PROJECT

Creating a model with demonstrable accuracy is the best way to prove full understanding of a system, but unexpected and unintended findings are sometimes made in the process. Case in point, neuroscientists at Universidad de Valparaiso have pursued a research track based on neural plasticity and memory dysfunction in Alzheimer's patients which builds on parts of the work achieved by KEOpS.

FUNCTIONALLY SPEAKING

When light is reflected through the eye's interior onto the retina, visual scenes are broken down into spatial, temporal, and chromatic channels in order to extract and compress information received and detect visual events. Once thought to be performed by higher brain centres, scientists now realise that the retina is in charge of a part of this cognitive task. Thanks to recent advances in computational science and innovative neurobiological observations, KEOpS and subsequent projects will enable the science community to better reproduce natural processes, opening up new possibilities for biomedicine. If the eye is much more than a camera, then visual prostheses must necessarily go beyond the role of mere visual captors.

Fostering the emergence OF NEW KNOWLEDGE

Fostering knowledge production and scientific progress across all disciplines is one of the ANR's scientific priorities. Promoting development and scientific advances - whether or not they are in line with established schools of thought - based on curiosity, creativity, observation, and in some respects, risk-taking.

ANR favors a creative environment for researchers by giving them total freedom to defining research themes thereby paving the way for advances in S&T and innovative developments. The only rationale that prevails is the acknowledgement of excellence and the support given to innovative or interdisciplinary approaches in order to open new paths in research and thus push back the frontiers of knowledge. The projects financed are thus a necessary forerunner to striking scientific discoveries.

ANR' support to bottom-up initiatives acknowledges excellence and enhances the French potential for innovative research. Since its creation in 2005, ANR has given researchers a real opportunity to submit single or multipartner projects assessed on the sole criteria of originality and excellence.

PUSHING BACK THE FRONTIERS OF KNOWLEDGE

ANR's Work Programme targets major societal issues via a mix of programmatic and non-programmatic funding. The societal challenges are eligible for basic research within their clearly delineated thematic scopes. The "At the Frontiers of Research" component of the Work Programme is in turn a completely non-programmatic element that grants researchers complete freedom to define their research themes and topics. It encourages prospective of exploratory research.

Such research is particularly valuable in that it is in reference to these frontiers that society constructs its capacity to evolve and project itself into the future. This need for knowledge, whether it involves the quest for understanding the world around us and the laws that govern it, or the desire to develop abstractions, will thus have a major impact on future decisions far exceeding the bounds of its initial quest.



PROJECT ID

- ▶ **Title:** Animots - Animals and Animality in French and Francophone Literature (20th-21st Centuries)
- ▶ **ANR Programme and Edition:**
Blanc - Social sciences and humanities: "Culture, arts and civilisations" - 2010
- ▶ **Coordinating body:** EHESS - School for Advanced Studies in the Social Sciences
- ▶ **Partner:**
- Paris 3 University
- ▶ **ANR Funding:** €190 k
- ▶ **Contact:** anne.simon@ehess.fr
- ▶ **Project website:** <http://animots.hypotheses.org>



PROJECT STORIES

FRENCH LITERATURE

THE ANIMOTS PROJECT EXPLORES ANIMALITY IN LITERATURE

The Animots project, funded by ANR since 2010, has enabled national and international research to be organised around animal-related issues and representations in French language literature in the 20th and 21st centuries. This literary theme had been little studied until now.

A VIRTUALLY UNCHARTED RESEARCH FIELD

The question of animality federates disciplines such as philosophy, biology, cognitivism, history and political sciences, within which the animal is envisaged as an essential object of study. Apart from individual contributions, literature researchers did not take part in debates of social, political and scientific importance. The Animots project therefore aimed to overcome this deficiency by initiating the study of animality in the French literature of the 20th and 21st centuries.

AN INNOVATIVE APPROACH: "ZOOPEPTICS"

Animots has been organised around a variety of disciplines such as philosophy, ethics, ethology, history and anthropology. This interdisciplinary approach, a basis for "zoopetics", differs from conventional lines of literary studies. It has enabled the animality issue to be extended to societal problems such as hunting, contemporary rurality or industrial-scale livestock rearing, and to open up the debate to the general public through articles and participation in popularisation broadcasts. The project has helped build a research network on this theme between French, North American and British researchers. It has resulted in 130 publications, including ten collective publications, and the setting up of dedicated training courses. Five collective books and two essays are moreover going to be published in 2015-2016. Animots has promoted the institutionalisation of an emerging research field in France. It has become an international point of reference for animal studies in the French language literary field.





PROJECT STORIES

PROJECT

ID

- ▶ **Title:** CHIRGEN - The Chirality of Genes
- ▶ **ANR Programme and Edition:**
Blanc International II - Molecular, organic, coordination chemistry, catalysis and biological chemistry - 2012
- ▶ **Coordinating body:** Institut de chimie de Nice
- ▶ **Partners:**
 - Institut d'astrophysique spatiale
 - Synchrotron SOLEIL
 - Autonomous University of the State of Morelos / Mexico
 - National Autonomous University of Mexico / Mexico
- ▶ **ANR Funding:** €245 k
- ▶ **CONACYT Funding:** €219 k
- ▶ **Contact:** Uwe.Meierhenrich@unice.fr

IMPROVING OUR UNDERSTANDING OF THE LIFE'S ORIGINS

THE FRANCO-MEXICAN CHIRGEN PROJECT HAS UNCOVERED NEW KNOWLEDGE

The robotic lander Philae is exploring the comet Churyumov-Gerasimenko. Philae is carrying the COSAC instrument which will examine the comet's core. This instrument and the analyses it performs are linked to work carried out within the scope of the Franco-Mexican CHIRGEN project, jointly funded by ANR and the Mexican National Council for Science and Technology (CONACYT).

So-called "chiral" chemical molecules can occur in two forms referred to as "left" and "right". When produced in a laboratory, chiral substances form a mixture comprising equal quantities of the two types.

Chiral molecules include those which are fundamental to life, such as the sugars that constitute our genetic material. However, in living organisms, they only occur in one of these two forms, a phenomenon known as "homochirality".

There are currently two hypotheses regarding the causes of this idiosyncrasy. The first assumes that life emerged from a mixture of the two forms and asymmetry only occurred over the course of evolution. The second suggests that the imbalance between chemical forms was created in space and therefore the molecules from which life originated were brought to earth on meteorites.

REPRODUCING THE CORE OF A COMET

Having created samples of simulated interstellar ice in a laboratory, the French partners in the CHIRGEN project subjected them to irradiation reproducing conditions that exist in space to determine whether an imbalance is created between the chemical forms present in the ice. The Mexican partners are subsequently performing autocatalysis experiments in order to establish whether or not this imbalance is amplified. These findings as well as those made by Philae will be precious in improving our understanding of the origin of genetic code asymmetry, a crucial step toward understanding the origins of life.



PROJECT ID

- ▶ **Title:** MechaStem - The physics of plant morphogenesis: dynamics and mechanics of the plant cell wall in the meristem
- ▶ **ANR Programme and Edition:**
Blanc - Life sciences, health and ecosystems - 2010
- ▶ **Coordinating body:**
Laboratoire de Reproduction et Développement des Plantes - Ecole normale supérieure de Lyon, INRA, CNRS, UCB Lyon 1
- ▶ **Partners:**
 - Laboratoire Joliot Curie - ENS Lyon
 - IJPB - INRA Versailles
- ▶ **ANR Funding:** €460 k
- ▶ **Contact:** olivier.hamant@ens-lyon.fr



PROJECT STORIES

FROM CELL MECHANICS TO DEVELOPMENT IN PLANTS

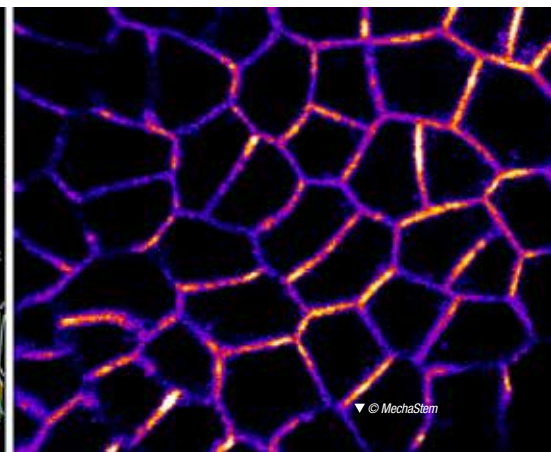
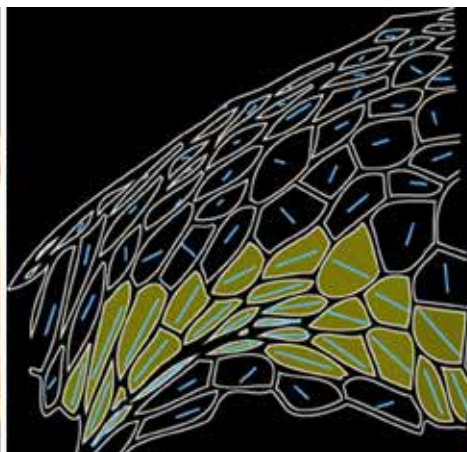
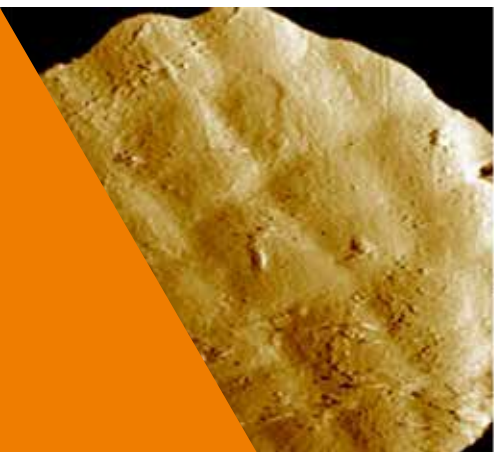
THE MECHASTEM PROJECT IS EXPLORING THE ROLE OF MECHANICAL STRESS IN MORPHOGENESIS

Over the past thirty years, significant progress has been made in our knowledge of organism development, mostly in genetic terms. However, to causally link genes and multicellular shapes, the structure needs to be analysed and this, in essence, involves the laws of mechanics. Capitalising on the simpler mechanics of plants, the Mechastem project focused on this missing link.

The partners first sought to take a local measurement of meristem mechanical properties (the meristem is a group of dividing cells that generate all aerial organs). The mechanical measurements were then correlated with gene expression, biochemical changes in the cell walls and cell growth. This approach is therefore an initial step towards coding genetic activity into mechanical terms, thus formally linking gene activity to shape changes. In turn, growth creates mechanical stress and the project showed that these forces affect cell processes and morphogenesis. The consortium not only revealed the impact of stresses on the cytoskeleton, gradients of morphogens and gene expression, but also identified an unexpected role of mechanical stress in maintaining heterogeneous growth as a prerequisite for organ formation.

Methodologically, several quantitative approaches were developed. Atomic force microscopy techniques were adapted to measure the mechanical properties of living tissue from the nanometric to the cellular level. New biocomputing tools for interpreting AFM and cytoskeleton quantification data were generated. 3D reconstruction and tissue segmentation methods were also developed to measure growth parameters. Models were built to predict the pattern of stress and simulate growth. This work has led to the publication of several articles in prestigious journals and the dissemination of methodological articles.

Due in part to the success of this project, three European Research Council (ERC) grants totalling €5 million have been awarded to allow further exploration of the avenues that this work opened.



THE KEY FIGURES

€35.9 M

ALLOCATED
BY ANR IN 2014 TO150
YOUNG RESEARCHERS,
THROUGH THE
"YOUNG RESEARCHER"
INSTRUMENT

Preparing A NEW GENERATION OF TALENTS

The talents of today are the future of research. Research funding agencies play a crucial role in supporting the development of talents and research careers. Developing creativity and encouraging boldness and talent are among ANR's top priorities.

ANR encourages young researchers to submit projects, promoting their empowerment and capacity to innovate. The agency has set up a specific funding instrument for them: the "Young Researcher" programme gives the youngest researchers the means to develop and carry out a project so that they can work independently on original and exceptional subjects that take them away from the well-trodden paths. It is also a way of initiating the hiring of new teams of researchers and preparing a new generation of imaginative and inventive scientists: **today's new faces, tomorrow's scientific pioneers.**

A SPRINGBOARD TO EUROPE

The "Young Researcher" instrument is also a springboard for young French researchers who, thanks to a first grant from ANR, will find it easier to consider submitting a project in response to calls for proposals from the European Research Council (ERC) and with a greater likelihood of success.





STRUCTURAL BIOLOGY DISORDERED PROTEINS ARE THE FOCUS OF MALENE RINGKJØBING JENSEN, A TALENTED YOUNG RESEARCHER

Disordered proteins are a class of proteins that remain functional despite the lack of a well-defined three-dimensional structure. This plasticity allows them to operate within numerous biological phenomena. They are associated with human diseases such as Alzheimer's and Parkinson's diseases as well as with cancer. Malene Ringkjøbing Jensen, researcher at CNRS, is a young specialist in this field. Her project ProteinDisorder was funded by ANR in 2010 under the Young Researcher programme.

MALENE JENSEN, WHAT ARE YOUR MAIN RESEARCH TOPICS?

My research focuses on the use of nuclear magnetic resonance (NMR) spectroscopy to study the structure and dynamics of proteins. In particular, I am interested in proteins that remain functional despite the lack of a well-defined three-dimensional structure. These so-called intrinsically disordered proteins (IDPs) are estimated to represent around 40% of the proteins encoding by the human genome, and their characterisation poses a number of challenges for modern structural biology due to their inherent flexibility. My research aims at understanding the conformational behaviour and interaction mechanisms of IDPs in order to elucidate their role in biological processes related to the development of human diseases.

WHAT DID THE ANR "YOUNG RESEARCHER" GRANT ALLOW YOU TO ACCOMPLISH?

The financial support from the young researcher programme has allowed us to develop novel computational approaches using NMR data for describing disordered proteins in terms of structural ensembles. Using these approaches, we have obtained insight into the role played by IDPs in the replication machinery of measles virus and other members of the paramyxovirus family.

In a more general context, the Young Researcher grant has provided me with a unique possibility to interact with internationally recognised scientists within my research field. I believe that the funding has enhanced my international visibility and has laid a solid foundation for continued success in my research projects.

WHAT ARE YOUR UPCOMING PROJECTS?

I will continue my research on the role of protein disorder in biology, with particular emphasis on signalling specificity within the mitogen-activated protein kinase cell signalling pathways. Deregulation of these pathways has important consequences for the development of human cancers. In general, IDPs have remained largely unexplored in terms of drug developments. My aim is to elucidate the molecular mechanisms controlling the function of these proteins in order to propose novel pharmacological solutions.

Malene Ringkjøbing Jensen received a bronze medal at the CNRS 2015 research competition. This distinction rewards an on-going and fruitful research activity, acknowledging her status as a talented specialist within a particular research field.



BOOSTING RESEARCH, TAKING ON major societal challenges

Promoting research and innovation is key to tackling some of the major challenges facing today's societies, e.g. climate change, energy security, ageing populations. In recent years, those challenges have in turn become major drivers for promoting research. ANR has adopted a challenge-driven approach which pools resources and knowledge across different fields, technologies and scientific disciplines, covering a lengthy section of the innovation chain spanning basic research to applied research.

9 MAJOR SOCIETAL CHALLENGES

A significant part of ANR's Work Programme is organised around nine major societal challenges identified in the France-Europe 2020 Strategic agenda, itself consistent with the structure of the European Horizon 2020 framework programme:

- Efficient resource management and adaptation to climate change
- Clean, secure and efficient energy
- Industrial renewal
- Life, health and well-being
- Food security and demographic challenges
- Mobility and sustainable urban systems
- The information and communication society
- Innovative, inclusive and adaptive societies
- Freedom and security of Europe, its citizens and its residents

Science and technology have a major impact on societies, transforming means of communication, transport and the food industry and even helping to improve living conditions and increase life expectancy. The knowledge acquired through scientific research and technology development can have amazing repercussions on human societies, giving rise to new ethical and moral questions, but also provide answers to key philosophical questions like "how we can all live together" and the meaning of life in society. ANR supports research projects responding to essential societal needs such as health care or burning social issues and analysing the major changes of our time. Moreover, the intensive use of natural resources by human societies leads to the dual planetary challenge of maintaining resources to cope with food and energy requirements and maintaining environmental, ecosystem and biodiversity services, necessary for the development and safety of human, animal and plant populations. The energy transition also interacts closely with environmental preservation issues, from a development perspective, stemming from a virtuous circle in which all changes in societies follow the guidelines of reducing emissions of pollutants and greenhouse gases. ANR promotes innovative research that finds solutions to these major issues for human societies. Scientific and technological progress is also key for modernisation and economic growth or for increased productivity. Support is therefore provided to research in key economic sectors with high potential for innovation (ecotechnology, biotechnology...) but also to the development of key enabling technologies fueling all sectors of the economy (information and communication technologies, nanotechnology...), with a true leverage effect on industrial productivity, employment and company competitiveness, contributing to sustainable development in industry.



PROJECT ID

- ▶ **Title:** Opportunité(E)⁴ - Chemical recovery and green recycling of mining waste: an Environmental, Ecological, Ethical and Economic opportunity
- ▶ **ANR Programme and Edition:** Sustainable production and environmental technologies - 2011
- ▶ **Coordinating body:** CNRS (Regional Delegation of Languedoc Roussillon)
- ▶ **Partner:**
 - New Caledonian Agronomic Institute (IAC)
- ▶ **ANR Funding:** €212 k
- ▶ **Contact:** claud.grison@cnrs.fr
- ▶ **Project website:** <http://www.labochemeco.com/>



PROJECT STORIES

SOIL DECONTAMINATION AND CHEMISTRY OF THE FUTURE

PLANTS ARE THE FOCUS OF THE OPPORTUNITÉ(E)⁴ PROJECT

Historically, mining activities have led to high levels of soil pollution as a result of the accumulation of substances such as zinc, nickel, manganese, palladium or copper. In addition, the depletion of mineral resources has become a major source of concern for the chemical industry in the Western world. France faces a twofold challenge: the development of innovative recycling processes to counteract the increasing scarcity of minerals, and the restoration of polluted ecosystems.

A REVOLUTION IN THE FIELD OF CHEMISTRY

The Opportunité(E)⁴ project draws upon the remarkable adaptive capacity of certain plants to accumulate metals, and combines ecological restoration of mining sites with the recovery of chemicals from plant species with high concentrations of Trace Metal Elements.

Endemic or native plants that accumulate metals are used for sustainable restoration of degraded mining sites. The project uses substances extracted from plants as reagents and catalyzers for chemical reactions. This novel approach offers an initial prospect for recovering this unique biomass and heralds a new branch of green chemistry, known as ecological catalysis.

The substances extracted may be used for reactions paving the way towards molecules with high added value and a significant social impact (anti-cancer agents, antivirals, biocosmetics, green pesticides, key feedstock for industrial chemistry applications, etc.). Compounds extracted from plants have specific properties, which make them far more than mere substitutes for catalysers derived from the metallurgy industry and mean that they are tools in their own right. This new branch of green chemistry may aid in the development of a new activity enabling the revegetation of New Caledonian mining sites. Said activity would help combat soil erosion and protect the lagoon, a UNESCO World Heritage site.

A PROJECT WITH MULTIPLE REWARDS

Though still in progress, Opportunité(E)⁴ is experiencing huge success. Treatment contracts for new sites are under way and currently being implemented. During the 8th edition of "Ecotechnology Days", organised by ANR in April 2014, project - which is considered to be one of the most innovative among the projects in this field funded by the agency - received the jury's special prize. Project coordinator Claude Grison, who is coordinating the project, also received the CNRS 2014 Innovation Medal and the Legion of Honour in 2015 for her work.

The substances extracted may be used for reactions that will pave the way towards molecules with a significant social impact: anti-cancer agents, antivirals, biocosmetics, green pesticides, key feedstock for industrial chemistry applications. . ."

PROJECT ID

- ▶ **Title:** BRAIN e-novation: Digital Brain Health Innovation
- ▶ **ANR Programme and Edition:** LabCom - 2013
- ▶ **Coordinating institution:** The Brain and Bone Marrow Institute (ICM)
- ▶ **Partner:**
 - Genius Group
- ▶ **ANR Funding:** €300 k
- ▶ **Contact:** Marie-Laure.Welter@psl.aphp.fr
- ▶ **Project website:** <http://www.brainnovation.com/>



PROJECT STORIES

PARKINSON'S DISEASE

REHABILITATION TOOLS DEVELOPED BY THE REHAB E-NOVATION PROJECT

The LabCom BRAIN e-NOVATION project REHAB e-NOVATION is a World Innovation 2030 Award winner, and its objective is to develop rehabilitation tools for people suffering from Parkinson's disease.

Parkinson's disease is a neurodegenerative disease characterised by the progressive destruction of a specific population of neurons producing dopamine, a substance essential for controlling body movements. It progresses slowly, and is a primary cause of disabilities in the elderly. It is the second most common neurodegenerative disease in France, after Alzheimer's.

REHABILITATION TOOLS USABLE AT HOME

To combat this problem, LabCom BRAIN e-NOVATION is developing tools that combine physical training activities for strengthening muscles and therapeutic games for functional rehabilitation. This project has been named REHAB e-NOVATION, and aims to offer Parkinson's patients rehabilitation tools that can be used both at home and in a patient care setting. In the long term, this project will enable remote monitoring by healthcare workers of disease progression in Parkinson's patients and personalised adaptation of rehabilitation programmes.

WORLD INNOVATION AWARDS

In line with the work carried out by the 2030 Innovation Commission, the World Innovation Awards programme was launched by the French Government to identify talents and future champions of the French economy and support their growth around projects offering a particularly strong potential for the national economy. REHAB e-NOVATION is the project being conducted by the joint research laboratory BRAIN e-NOVATION, and is among the 10% of award winning projects in this prestigious initiative.



PROJECT ID

- ▶ **Title:** WHIM-TERNET - WHIM syndrome: Pathological basis and development of therapeutic molecules
- ▶ **ANR Programme and Edition:** E-Rare - 2011
- ▶ **Coordinating institution:** Paris Sud University)
- ▶ **Partners:**
 - Brescia University (Italy)
 - Research Institute of the Strasbourg Biotechnology School (France)
 - Ulm University (Germany)
- ▶ **ANR Funding:** €188 k
- ▶ **Contact:** francoise.bachelerie@u-psud.fr



PROJECT STORIES

RARE DISEASES

EUROPEAN PROJECT WHIM-THERNET SHOWS PROMISING RESULTS

Focusing on the causes of the WHIM syndrome, an orphan disease, the WHIM-THERNET project resulted in the development of a promising animal model laying the groundwork for novel treatments that will soon be tested on humans. Bringing together four partners from three European countries and funded under the ERA-NET E-Rare programme, the project is an emblematic achievement of the transition from bench to bedside.

The WHIM syndrome is an extremely rare disease which traditionally occurs during early childhood. Patients suffering from the disease usually show a reduction of immune response capability, numerous warts resulting from the human papilloma virus, and recurrent respiratory infections.

The goal of the WHIM-Thernet project was to better understand the role of identified proteins (CXCL12/CXCR4) in this rare congenital immunodeficiency disorder. WHIM means Warts, Hypogammaglobulinemia, Infections, and Myelokathexis, a congenital disorder of the white blood cells that causes severe, chronic leukopenia. Ultimately, the aim was to identify the key markers of the disease and to provide the bases for therapies in order to improve patients' access to diagnosis and treatments.

ENCOURAGING RESULTS PREFIGURE NEW OPPORTUNITIES FOR TREATMENT

The consortium of this European project gathered together clinicians and scientists in immunology and physiopathology from Italy, France and Germany. Relying on complementary skills and expertise, the consortium created a unique mice model of the WHIM syndrome and described the French cohort of patients suffering from the disease. It also showed the therapeutic impact of antagonists of the CXCL12/CXCR4 axis. The work served as the framework for a proof of principle clinical trial based on a specific treatment for patients. A recent application to the Horizon 2020 European call for clinical trials for rare diseases ("CUREWHIM") extends the WHIM-Thernet project with the main goal of performing a phase I clinical trial coordinated by the National Institutes of Health and based on the chronic administration of CXCR4 antagonist - Mozobil®.

This study could also benefit other human pathologies involving this pathway (e.g. cancers and viral pathogenesis).

Relying on complementary skills and expertise, the consortium created a unique mice model of the WHIM syndrome"

PROJECT ID

- ▶ **Title:** MALINA - How changes in ice cover, permafrost and UV radiation impact on biodiversity and biogeochemical fluxes in the Arctic Ocean
- ▶ **ANR Programme and Edition:** Blanc - 2008
- ▶ **Coordinating body:** Laboratoire d'océanographie de Villefranche
- ▶ **Partners:**
 - Station biologique de Roscoff
 - Laboratoire d'océanographie biologique de Banyuls Solagro Association
- ▶ **ANR Funding:** €1,020 k
- ▶ **Contact:** marcel.babin@takuvik.ulaval.ca
- ▶ **Project website:** <http://malina.obs-vlfr.fr/>



PROJECT STORIES

GIVING GLOBAL WARMING THE COLD SHOULDER RESEARCHERS WORKING ON THE MALINA PROJECT HONE IN ON CLIMATE CHANGE

How does climate change impact Arctic environments now and in years to come? How does the shrinking of the ice pack and the thawing of permafrost ice caps affect surrounding rocks, flora, and fauna in the Arctic ocean? The MALINA project, in cooperation with Canadian partners ArcticNet and US partners ICESCAPE, are raising questions that an increasingly climate-curious global society yearns to know. Their five-year-long project was funded in part by ANR.

The Malina project seeks to further man's knowledge of the extreme and relatively unknown Arctic regions by establishing a permanent observatory. In the years to come, MALINA will help gather sweeping, ecologically applicable data concerning biogeochemistry, the study of chemical, physical, geological and biological processes and spheres.

STARTING FROM THE BOTTOM UP

MALINA employs new remote sensing tools in order to monitor phytoplankton and bacteria at the base of the food chain. Microbial biodiversity is but one of the project's many wide-ranging study subjects, with others including industrialisation, permafrost (soil below the freezing point of water), and UV levels, the idea being to gauge interactions between these phenomena.

A STUDY WITH WORLDWIDE APPLICATIONS

The MALINA study, by linking the overexploitation of resources and other man-caused damage with permanent changes in ecosystems, responds to a demand from governments and peoples around the world. Its focus on contrasting time scales means that the populations of infinitesimally small organisms can be "tracked" in a sense, allowing for the extrapolation of useful data about sediments, carbon fluxes, and bacterial activity over a 1,000-year time slice.

ABOUT THE COORDINATOR

The MALINA project, which brings together French, Canadian and US teams under one heading, has also been a unique opportunity to reinforce international networking. Project coordinator Marcel Babin was recently appointed to the Chair of Excellence in Canadian Research in remote sensing of Canada's new Arctic frontier at Laval University (Canada), and is the director of CNRS and Université Laval's International Joint Unit "Takuik," with 150 people under his responsibility.



COPING WITH CLIMATE CHANGE

Over the course of thirty years, the international scientific community has developed many research studies about how the Earth's climate functions and the role of human activities in observed climate change. The contributions of the French scientific community have not gone unnoticed, especially the research efforts in the areas of reconstruction of past climates, greenhouse gas cycle, Earth observation, climate scenarios and their impacts. Beyond these works, new multidisciplinary themes have emerged over the last ten years, enhancing societies' abilities to cope with climate change impacts. Since its creation, ANR has funded a great number of collaborative and multidisciplinary projects that contribute significantly to increasing knowledge on fundamental processes related to climate change, and observation and simulation methods; impacts of climate variability and change on various environment and induced vulnerabilities for societies; mitigation strategies in terms of modes of governance, policies and instruments for implementation, forms of adaptation for ecosystem management and production patterns; potential alternatives in terms of resource management (water, soil, land and marine biodiversity, forest), agricultural and food production, management of urban and rural areas, waste recovery and energy production.



▼ © Jean-Jacques Paragrazzi, Eclats de Lumière

PROJECT ID

- ▶ **Title:** RIPOST - Cross-disciplinary research on the issue of oyster farming in Arcachon Bay: in situ and experimental approaches
- ▶ **ANR Programme and Edition:** Contaminants, Ecosystems, Health - 2009
- ▶ **Coordinating body:** EPOC lab, Bordeaux 1 University
- ▶ **Partners:**
 - IRSTEA
 - Pau and Pays de l'Adour University
- ▶ **ANR Funding:** €690 k
- ▶ **Contact:** p.gonzalez@epoc.u-bordeaux1.fr



PROJECT STORIES

ARCACHON BAY

THE RIPOST PROJECT IS LOOKING AT THE IMPACT OF CHEMICAL CONTAMINANTS ON OYSTER HEALTH

Farming of pacific oysters (*Crassostrea gigas*) in the Arcachon Bay region of France is a major economic activity. It is symbolic of the high quality of water in the bay and is an important element in regional heritage, attracting tourists to the area. In recent years, the oyster farming sector has experienced a number of successive crises. Following several instances of contamination, oysters were declared unfit for consumption on a number of occasions. Moreover, the population was significantly reduced by episodes of excess mortality mainly affecting young molluscs (spats).

ACKNOWLEDGING THE PRESENCE OF ENVIRONMENTAL CONTAMINANTS DURING EPISODES OF TOXICITY

Little or no consideration has been given to pollutants such as polycyclic aromatic hydrocarbons, pesticides, trace metals and organometallic compounds as potential contributors to these events. In this context, the RIPOST project partners sought to cast light on the impact of these agents on oysters. To achieve this, they categorised sources of contamination in Arcachon Bay and studied the dynamics of contaminants. Regional differences were observed, particularly in terms of pesticides originating from the main fresh water tributaries.

At the same time, the impact of these agents on oysters in the larval and adult phases was examined both in situ and under experimental conditions. Various lesions were observed in the adult and larval phases indicating that the contaminants present in the environment must be considered as contributing factors to episodes of toxicity in oysters.





Building bridges between THE ACADEMIC WORLD AND INDUSTRY

ANR invests in the development of public-private partnerships. The principle is to open up these two worlds to each other. To achieve this, ANR wants to initiate exchanges, create bridges between the two sectors and compare their points of view. The aim is to speed up technology transfer and create economic value from the products of public research. Encouraging the opening of public research to the business world. Providing incentives so that the current and future needs of industry are better catered to in the academic research work.

3,009
ACADEMIA-
INDUSTRY
PROJECTS
FUNDED BY ANR
SINCE 2005



INTERVIEW

Jean Michel Le Roux, Deputy Director at ANR Investments for the Future and Competitiveness Division, shares his thoughts and insights on collaborative research, the Labcom instrument, and a host of features which characterise ANR. Peering into the years ahead, ANR-facilitated public-private partnerships, as well as its industrial chair instrument and fund-matching ability will help France maximize its potential on the technological vanguard and bring together like-minded partners from a variety of backgrounds.

WHAT IS ANR DOING TO STRENGTHEN RELATIONS BETWEEN THE BUSINESS WORLD AND THE ACADEMIC COMMUNITY?

“The ANR has a dedicated tool for collaborative research in the private and public sectors called Collaborative Research Projects involving Enterprises (PRCE). This instrument enables public research organisations and companies of all sizes to work hand in hand on a mutually agreed upon topic. A strong relationship is forged between both structures as they take on a joint project. The instrument is especially relevant for companies, introducing them to new topics and deepening insight into themes they’ve previously dealt with.

Mention must also be made of the LabCom instrument, designed to build a (physical or virtual) joint laboratory between a public body and a company based on a common strategy headed up by both entities. This tool also makes it possible to significantly improve companies’ competitiveness through reinforcement and innovative diversification of product and service lines.”

WHAT ARE SOME OF THE UNIQUE FEATURES OF THE AGENCY’S PROPOSED INSTRUMENTS?

“Their originality lies in the fact that they’re completely bottom-up from a themes standpoint. For collaborative projects and joint laboratories, applicants are free to jointly define their research topics. By responding to questions relating to their own financial needs, companies become actors

in creating these partnerships on the same basis as academic teams. For public laboratories, this is an opportunity to explore new economically driven research fields. Lastly, these public-private partnerships could not take place without both actors, the core underlying philosophy being teamwork.

ANR also has an Industrial chairs instrument. Though smaller, it provides genuine added value to the company participating in the chair. The instrument gives companies access to the expertise of research laboratories and project actors. Last but not least, ANR matches the company’s funding!”

WHAT OBJECTIVES AND MILESTONES LIE AHEAD?

“We’re currently examining the Carnot system, undoubtedly one of the more efficient in public-private research tools. The agency will soon begin preparing for its next labelling wave, set to get underway as soon as the (French) ministry of research has worked out the exact details.

We are also working closely with competitiveness clusters across all themes. The clusters are very much involved in the ANR’s selection process, and their label allows companies included in the project proposals to benefit from valuable support in developing their projects.”



▼ © TomasSereda

PROJECT**ID**

- ▶ **Title:** ORTESA - Optimisation and Research on Extraction Technologies and Alternative Solvents
- ▶ **ANR Programme and Edition:** LabCom - 2013
- ▶ **Coordinating body:** the GREEN team, UMR408, University of Avignon and Pays de Vaucluse
- ▶ **Partner:**
 - Naturex
- ▶ **ANR Funding:** €300 k
- ▶ **Contact:** farid.chemat@univ-avignon.fr

**PROJECT STORIES**

TOWARDS SUSTAINABLE EXTRACTION TECHNOLOGIES AND ALTERNATIVE SOLVENTS

THE LABCOM ORTESA PROJECT IS MAKING PROGRESS

The joint research laboratory (“LabCom”) Ortesa project is working towards the development of green extraction processes and solvent technologies. It brings together the GREEN team, from the University of Avignon, and Naturex, an intermediate-sized company. ANR has granted funding of €300 k over a three-year period.

BOOSTING FRENCH COMPETITIVENESS

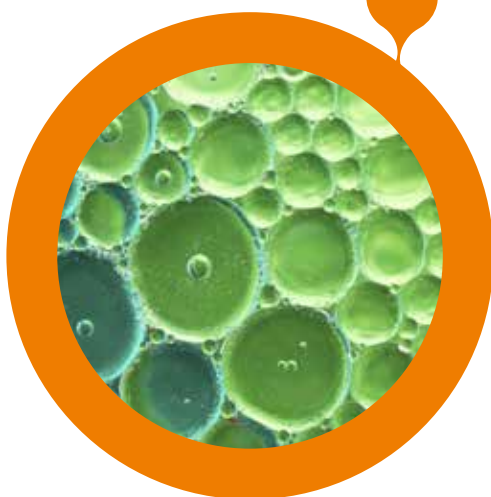
On average, the extraction of natural products accounts for 70% of capital investment and 50% of the energy consumed in the food, chemical, pharmaceutical and cosmetic industries. French technology in this field is competitive, but its renewal is hindered by technological barriers such as a reduction in spending on energy, a fall in processing costs, legal constraints, control and safety of end products or the need to accommodate environmental constraints. These are challenges that the LabCom Ortesa project intends to meet head-on.

TOWARDS ENVIRONMENTALLY FRIENDLY EXTRACTION PROCESSES

Investigating green extraction from laboratory to industrial scale, ORTESA's objective will also be to contribute to defining green extraction. The goal would be to ultimately reach a positioning of green extraction in an EU standard. The industrial partner has opened a 75 m² laboratory and carried out the first trials. In terms of R&D, the aim is to model the necessary expertise and tools for cost-effective and environmentally friendly extraction. The subsequent, applied research phase aims to find alternatives to solvents that are harmful to the environment, the user or the consumer. Publication of a number of books and articles was followed by a patent, filed in April 2015, and a second patent application is currently under way.

WHAT IS A “LABCOM”?

“LabCom” was an idea that emerged in 2013, with the aim of encouraging public research stakeholders to create new partnerships with the private sector. Each joint research laboratory brings together a public research organisation and a small to medium-sized company or an intermediate-sized company around the same roadmap. This funding instrument offers project holders simplicity of implementation and allows the stakeholders concerned to submit their applications concurrently with the development of their projects. It is not even necessary to have a physical structure: for example, an application from a virtual laboratory would be eligible. Selected LabComs are then allocated flat-rate funding of €300 k by ANR for a period of three years.



PROJECT ID

- ▶ **Title:** LiO₂, Development of a rechargeable lithium-air battery with very high energy density
- ▶ **ANR Programme and Edition:** Innovative Energy Storage (Stock-E) - 2010
- ▶ **Coordinating body:** EDF Recherche et Développement
- ▶ **Partners:**
 - Institut de Chimie de la Matière Condensée de Bordeaux (ICMCB)
 - Centre Interuniversitaire de Recherche et d'Ingénierie des Matériaux (CIRIMAT)
 - Céramiques Techniques Industrielles (CTI SA)
 - Laboratoire de Physicochimie des Polymères et des Interfaces (LPPI)
 - Solvay
 - Renault
- ▶ **ANR Funding:** €989 k
- ▶ **Contact:** philippe.stevens@edf.fr

WORTH KNOWING

This project resulted in the submission of

37

patent applications
(34 international and 3 national)

17

had been obtained on closure of the project

1 demonstration prototype has also been produced



PROJECT STORIES

AUTONOMY OF ELECTRIC VEHICLES

THE LiO₂ PROJECT, BASED ON A PARTNERSHIP BETWEEN ACADEMIA AND INDUSTRY, IS PRODUCING REMARKABLE RESULTS

In France, the transport sector is reportedly responsible for one third of the carbon dioxide (CO₂) emissions from energy sources. The development of electric vehicles thus constitutes one of the key levers for reducing greenhouse gas emissions. The use of electric vehicles is still limited however, particularly because of their low range (100 to 150 km). The aim of the LiO₂ project was to remedy this situation by developing a new type of battery with very high energy density.

TARGETING INDUSTRIALISATION 10 TO 15 YEARS FROM NOW

This "aqueous Lithium-air battery" technology is based on the use of lithium as the active material of the negative electrode and oxygen from the air for the positive electrode. The product of the discharge reaction is stored in the aqueous electrolyte and not in the porosity of the air electrode (concept demonstrated in the LiO project supported by ANR in 2007).

The LiO₂ project involved several public partners and two industrial groups (Solvay in the field of chemistry and Renault, the automobile manufacturer in addition to EDF, the coordinator). They obtained remarkable results, far better than the state of the art, whether in terms of the current density obtained (10 mA/cm²), energy density (500 Wh/kg) or capacity of the lithium electrode (200 mAh/cm²). The developed batteries demonstrate a lifetime of more than hundred cycles (more than 700 in some cases).

These results pave the way for the industrialisation in 10 to 15 years of a new type of large capacity, less toxic and safe battery, which will enable a range of 800 km to be envisaged for an all-electric vehicle.

PROJECT**ID**

- ▶ **Title:** OXYTEC - Oxy-combustion and heat transfer for new energy technologies
- ▶ **ANR Programme and Edition:**
Industrial Chairs - 2012
- ▶ **Coordinating body:**
EM2C lab, Ecole Centrale Paris / CNRS
- ▶ **Partner:**
- Air Liquide
- ▶ **ANR Funding:** €1,176 k
- ▶ **Contact:** thierry.schuller@ecp.fr

**PROJECT STORIES****TOWARDS CARBON-FREE ENERGY GENERATION**

THE OXYTEC INDUSTRIAL CHAIR REACHES ITS HALFWAY POINT

The OXYTEC industrial chair launched in September 2012 is a partnership between the company Air Liquide and the French National Centre for Scientific Research (CNRS). This work has increased our knowledge of oxy-combustion, a process that paves the way to cleaner energy and fuel production.

Oxy-combustion is a process whereby air is replaced with pure oxygen in the combustion process. This substitution produces emissions that essentially contain only steam and carbon dioxide (CO₂) providing an opportunity to recycle the CO₂ emitted and thus produce carbon-free energy.

Managed by Thierry Schuller, a professor at CentraleSupélec and researcher at EM2C, a unit affiliated to the CNRS, the OXYTEC chair aims to improve our knowledge of controlling this technology for systems operating under pressure with gaseous fuels, liquid fuels (heavy fuel oil, petroleum distillation residue) and, in future, solid fuels.

SIGNIFICANT PROGRESS ALLOWS MANUFACTURER AIR LIQUIDE TO DEVELOP ITS EXPERTISE

Thanks to progress made in these areas and methods and tools devised for the chair, Air Liquide will be in a position to increase its expertise on these processes and apply it to carbon-free power generation as well as the production of synthetic gas for the chemicals industry, synthetic gasoline and biofuels.

Two years after project launch, the high pressure system required for the chair's work was researched, sized and designed. Trials on the atmospheric pressure injector began in September 2014. Two interns, two research engineers and three PhD students at CentraleSupélec are currently working on the chair. Modelling carried out in parallel has enabled the genuine morphology of soot particle aggregates to be defined in detail (an object that measures a few hundred nm to a few µm). Methods have also been devised to link simulations of the turbulent flow within the combustion chamber with a calculation of heat transfer to the solid parts. These tools provide the foundations for simulating the oxy-combustion processes that the chair wishes to achieve. Finally, a methodology developed within the scope of the chair for manufacturing burner moulds by rapid prototyping is already being used by the manufacturer.



CARNOT INSTITUTE MICA

- ▶ **Location:** Alsace
- ▶ **Speciality:** Materials
- ▶ **Research staff:**
1,000 full time equivalents, including 448 PhDs

THE CARNOT INSTRUMENT

Created in 2006 by the French Research Ministry, the "Carnot Institute" label recognises and supports laboratories that commit themselves to putting partnership-based research at the core of their research strategy and showing consideration for economic realities.

ANR has managed the programme since its inception: launching of three calls for candidacies (2006, 2007 and 2011), and monitoring and evaluation of Carnot Institutes labelled by a dedicated peer review panel, the Carnot panel.

Every year, a contribution calculated on the basis of contractual revenues generated by the partnership is paid by ANR to the Carnot Institutes.



PROJECT STORIES

POLYMER SYNTHESIS

CARNOT INSTITUTE MICA INVESTS IN LEDs

Polymers are one of the chemicals with the broadest industrial applications. In order to develop more energy-efficient, lower-risk polymers, the Carnot institute MICA is engaged in research aimed at developing an innovative synthesis pathway using LEDs.

Polymer synthesis has traditionally been performed using high energy consumption, high temperature processes; however, photo-polymerisation, requiring ultraviolet (UV) radiation sources, has long been used for drying varnished, and could be an alternative. From an industrial standpoint, this technique has two drawbacks: high energy consumption and potential risks associated with the intrinsic properties of UVs.

REINVENTING PHOTO-POLYMERISATION

To get around these obstacles, the Carnot Institute MICA set out to achieve photo-polymerisation by using LEDs (electroluminescent diodes). With low energy consumption, a longer operating life and lower cost, this technology's features allow for simple and environmentally friendly polymerisation. Although preliminary work suggested that this path could be expanded, a great deal of testing remained before the concept could be approved and transposed into industrial solutions. To confirm the process's feasibility, a yearlong exploratory research mission was undertaken, yielding two key publications in high-profile journals, the filing of a patent and a new partnership with an industrial group that tests out solutions developed by MICA on its own polymers.

DEVELOPING PHOTOCATALYSERS

Complementary research was undertaken to make processes developed more efficient. The objective was both to collect energy from photons emitted by LEDs in the most efficient way possible using the minimum amount of additives. To this end, the institute worked jointly with the STAR Carnot Institute on copper-based photocatalysers. Over forty of these compounds were synthesised this way by STAR and then tested at MICA's facilities. Nearly half a dozen proved capable of carrying out the functions expected of photocatalysers. The compounds were transported to an industrial partner currently evaluating their effectiveness on its products. Work continues on this new technology at MICA in order to design new, organic photocatalysers, as well as photocatalysers based on other metals. Said work falls under the purview of the ANR PHOTOREDOX project jointly managed with an Alsatian SME, Photon & Polymères.



1,256
INTERNATIONAL
PROJECTS CO-FUNDED
BY ANR WITH FOREIGN
COUNTERPARTS
SINCE 2005

MORE THAN
€350 M
OF ANR FUNDING

Facilitating researchers' INTERNATIONAL PARTNERSHIPS

Acting internationally - Facilitating cooperation

ANR supports the development of international research projects as part of its international cooperation policy.

The agency collaborates with the research funding agencies of other countries in order to remove obstacles to cooperation. It signs agreements that serve to facilitate collaboration between teams from different countries. They can concern targeted themes or be open to all the research themes funded by ANR. In this case, each agency funds the teams from their respective country. These agreements are implemented in the context of ANR's generic call for proposals or through the launching of specific international calls for proposals.

3 INSTRUMENTS TO FACILITATE RESEARCHER INTERNATIONAL COLLABORATIONS



Outside the scope of inter-agency agreements, French research teams can submit projects involving one or more foreign research teams from any country to the generic call for proposals of ANR. In this case the foreign partners ensure their own funding.



PROJECT ID

- ▶ **Title:** Enpolitique.com - Strategies, contents and perceptions of political usage of the web during election periods. The case of the French presidential election campaign and the Québécois legislative campaign
- ▶ **ANR Programme and Edition:** France-Quebec ANR-FRQSC collaboration programme in social sciences and humanities - 2011
- ▶ **Coordinating body in France:** Université de Lorraine
- ▶ **Coordinating body in Québec:** Université Laval
- ▶ **Partners:**
 - Université Lille III (France)
 - Université Paris-Est Créteil Val de Marne (France)
 - Université de Montréal (Quebec)
 - Université du Québec à Trois-Rivières (Quebec)
- ▶ **ANR Funding:** €150 k
- ▶ **Contact:**
 - fabienne.greffet@univ-lorraine.fr
 - thierry.giasson@pol.ulaval.ca
- ▶ **Project website:**
 - www.enpolitique.com



PROJECT STORIES

POLITICS ON THE WEB

THE FRANCO-QUÉBÉCOIS PROJECT ENPOLITIQUE.COM STUDIES THE WAYS IN WHICH THE WEB IS USED IN POLITICS DURING ELECTION SEASON IN FRENCH-SPEAKING COUNTRIES

How do politicians use the web and social media throughout France and Quebec? Enpolitique.com performed a comparative survey of political websites in the two countries during the 2012 election campaigns. The project sheds light on new socio-political realities, including online campaigns, political blogs and digital social networks, offering a back-to-back analysis of political websites within French-speaking states, in a domain where most scientific output is geared towards the English-speaking world.

AN ANALYSIS OF WEB CAMPAIGNS AND THEIR AUDIENCES

Enpolitique.com gathered comparative information about campaign strategies and how audiences receive them by contrasting analyses of candidates' online activities and political parties with analyses of online questionnaires, semi-structured interviews and citizens' groups. The survey demonstrates that in France, as in Quebec, political actors are devoting more time and energy to digital election campaign tools and demonstrate increasing professional savvy, even though practices related to population "targeting" are less common than in English-speaking countries. Especially in France, the web has by and large remained used toward activities garnering support for campaign activities, such as disseminating messages and organising events highlighting candidates.

A WAY TO MAINTAIN ELECTORAL MOMENTUM?

The purpose of the project was to gain insight concerning online communication strategies employed by politicians to engage or retain their constituencies. It was demonstrated that, in cases in which strategies have been implemented, their effectiveness is predicated on the degree of participation of web users, who care less about opportunities to get involved offered by official campaign sites than about reading up on the campaign itself. From a sociological standpoint, evidence shows that this audience is more diversified than offline audiences, in which young people number fewer. Online tools are nevertheless characterised by sociological features in terms of gender, social status (privileged) and interest in politics. Enpolitique.com further notes that online political commitments do not generally carry over offline, but rather exist in parallel to them.



PROJECT**ID**

- ▶ **Title:** WITH - Wireless communication using TeraHertz plasmonic - nano ICT devices
- ▶ **ANR Programme and Edition:** ANR-JST bilateral Franco-Japanese call for proposals - 2010
- ▶ **Coordinating body:** Montpellier 2 University, France
- ▶ **Partners:**
 - University of Savoie, France
 - CNRS/IEMN, France
 - Tohoku University, Japan
 - Osaka University, Japan
 - RIKEN Institute, Japan
- ▶ **ANR Funding:** €1,2 M
- ▶ **Contact:**
 - knap.wojciech@gmail.com
 - guillaume.ducournau@iemn.univ-lille1.fr

**PROJECT STORIES****WI-FI OF THE FUTURE****WITH: A FRANCO-JAPANESE PROJECT ON TERAHERTZ WAVE TECHNOLOGY**

In the field of wireless communications, the complexity of systems is increasingly pushed to its physical limits in order to convey ever more information, ever more quickly, to users who are in the main nomadic. The Franco-Japanese WITH project has enabled real advances to be made in this field, meeting society's needs in terms of very high speed wireless communication and offering concrete solutions to improve the transmission speed of Wi-Fi data.

Current wireless communication systems have limited capacity owing to the very nature of the waves that are used. Their frequency is relatively low - in the order of a few gigahertz (GHz). The development of communications is increasingly dependent upon increased frequency, including up to the terahertz (THz) range. Like radio waves, these electromagnetic waves have a frequency ranging between 100 and 10,000 GHz. In more concrete terms, they fall between microwaves (1 to 100 GHz) and infrared (10,000 to 100,000 GHz).

An experimental research project, WITH explored wireless communication limits via the use of innovative technologies based on terahertz waves.

DEVELOPMENT OF A WIRELESS TRANSMISSION SYSTEM USING TERAHERTZ WAVES

The project's key innovations were born out of the use of new principles for generating and detecting THz waves.

In specific terms, this Franco-Japanese project demonstrated: the use of THz detectors using plasma oscillations in nanotransistors in the terahertz domain; and the use of ultra-broadband photonic THz emitters for ultra-high-speed THz generation using existing fibre optics networks, with which the systems developed as part of the WITH project offer full compatibility.

Combining these two technological building blocks, which are essential for creating a complete wireless transmission system (emission and detection), has generated vast improvements in the performance of the Wi-Fi systems currently in use.

Close collaboration between the French and Japanese teams resulted in demonstrations of functional THz communication systems. The complementary nature of the skills sets within the partnership led to demonstrations in operational situations enabling preindustrial tests to be carried out in France and Japan.

SOME KEY FIGURES**22**

transnational publications produced jointly by the French and Japanese teams in leading international scientific journals, as well as some twenty publications in scientific journals in each of the two countries

2

national patents - one in each country

1

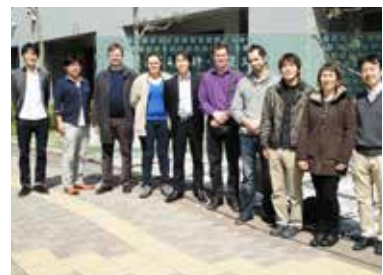
Special Feature in the international journal *Electronics Letters* on the first Franco-Japanese demonstration of ultra-sensitive terahertz transmission

166

international conferences, including

43

resulting from bilateral collaboration



▼ Y. Yoshimizu, Shintaro Hisatake, JF Lampin (IEMN), Lucie Tohme (UM2), Tadao Nagatsuma, Guillaume Ducournau (IEMN), S. Blin (UM2), D. Coquillat (L2C), Osaka, 10 April 2013



▼ © Uni Halle / Maïke Glöckner



INTERVIEW

ELISABETH DÉCULTOT RECOGNISED FOR HER RESEARCH ON FRANCO-GERMAN AESTHETICS

Elisabeth Décultot, a Germanist specialising in German aesthetics of the 18th-20th centuries, has been awarded a prestigious Alexander von Humboldt professorship at Halle University in Germany. Research Director at CNRS, Dr. Décultot also coordinated the Franco-German humanities and social sciences project Aisthesis, co-funded by ANR and the German Research Foundation DFG from 2009 to 2013. A question-answer session with Dr. Décultot provides some background on this major distinction for recent work building on her previous ANR-funded research.

WHAT IS THE ALEXANDER VON HUMBOLDT PROFESSORSHIP?

“The professorship, open-ended in terms of time, is funded for an initial five-year period by the Alexander Von Humboldt Foundation and subsequently through the university hosting the professorship (in my case, the University of Halle). Every year, fewer than ten professorships are awarded for all scientific fields, with hard sciences strongly predominating, on the basis of a highly selective competition adjudicated by an international jury. Universities directly nominate candidates from all parts of the world. University of Halle approached me offering their sponsorship based on my profile as a pluridisciplinary German literature scholar with research interests including 18th and 19th century art history and aesthetics. Halle is host to the Interdisciplinary Centre for European Enlightenment Studies. Selection is based on the candidate’s overall research project, but also on their individual project and research orientations. The 2014 election was the first time a professorship went to a researcher of literature.”

HOW DID YOU BENEFIT FROM THE ANR FUNDING?

“From 2009 to 2013, I codirected the Franco-German Aisthesis project co-funded by ANR and DFG. During Aisthesis, I developed close relations with a number of German researchers and research centres. In particular, I worked with the University of Göttingen which also specialises in the 18th century. That was how I was put in touch with the University of Halle and German colleagues specialised in aesthetics. When the ANR project came to a close, I pursued further research with collaborators in Halle thanks to support from the Interdisciplinary Centre of Study and Research on Germany (CIERA). The professorship is both an extension and a separate offshoot of my previous work. The partnerships set up with Halle after the ANR project have unquestionably opened doors for me.”

WHAT ARE YOUR PLANS FOR THE FUTURE?

“With the fairly generous funding provided by the Humboldt Foundation, I don’t have any immediate funding needs, although I would like to give collaborators I recruited in Germany permanent posts. In a year or two, I’ll begin looking for funding again and will probably lean in favour of the ANR-DFG programme for its great flexibility and its providing an advantageous framework for cooperation with Germany; it offers a unique opportunity to work with German colleagues on co-publications and organise joint conferences... which only makes sense, since subjects like these can’t be considered from a national perspective. European collaborators are therefore crucial for French universities, and the ANR-DFG format is quite well suited for researchers and students alike.”





190
applications



30
Laureates carrying
out projects entailing a high
level of excellence



Nearly
two-thirds
of the laureates are from
European countries



About
40%
of them in the field
of health biology



€14.9 M
of ANR grants

FIRST
EDITION:
30
WORLD CLASS
RESEARCHERS
SELECTED

Attracting research talent IN FRANCE

In a global context of international research mobility, ANR wishes to promote France's international attractiveness by offering leading foreign scientists excellent working conditions within reputed French research organisations. ANR funding is designed to help French laboratories fulfil their role as host and researchers to conduct their research. This is a “win-win” initiative underpinned by a high level of commitment on the part of the hosting organisations.

“HOSTING HIGH-LEVEL RESEARCHERS” IN FRENCH RESEARCH CENTRES

“Hosting High-Level Researchers” is open to all scientific domains and targets two researcher profiles: leading “senior” scientists whose career is widely recognised at global level, and young researchers (“juniors”) with high potential who can prove a record of excellence on the international scene. The call follows in the footsteps of ANR's former “Post-Doctoral Return” and “Chairs of Excellence” programmes. The response to this call is a collaborative effort between the researcher and the hosting institution.

FOR FOREIGN RESEARCHERS IT IS AN OPPORTUNITY TO CONDUCT AMBITIOUS RESEARCH PROJECTS IN FRANCE UNDER EXCELLENT CONDITIONS

The selected candidates are hosted in a very high quality environment and attributed substantial resources to ensure the success of their scientific work, with a view to encouraging long-term residence in France. The ANR funding can reach up to €500 k for junior researchers and €1,000 k for senior profiles, and enables the successful candidate to set up a research team and carry out an ambitious three to four year project with high impact on a scientific subject that has received little, if any, attention in France. The grant can cover all or part of the researcher's salary as well as the operating and equipment expenses.

AN OPPORTUNITY FOR FRENCH RESEARCH ORGANISATIONS TO ATTRACT HIGH-LEVEL FOREIGN SCIENTISTS

This initiative aims to increase ties between foreign laboratories and French research institutions so as to give the latter enhanced visibility and appeal while enabling them to integrate new international networks. A strong commitment is therefore required on the part of the hosting organisations: right from the project proposal stage and in collaboration with the candidate researcher, they must detail the means to be provided, including the resources not covered by ANR funding. ANR will establish the grant agreement with the hosting organisation, not with the researcher.

PROJECT ID

- ▶ **Title:** TUCOROM - Closed-loop control of turbulent shear flows using reduced-order models
- ▶ **ANR Programme and Edition:** Chairs of Excellence - 2010
- ▶ **Coordinating body:** CNRS
- ▶ **Partner:**
- Ambrosys GmbH
- ▶ **ANR Funding:** €760 k
- ▶ **Contact:** bernd.noack@univ-poitiers.fr
- ▶ **Project website:** <http://BerndNoack.com>



PROJECT STORIES

TOWARDS GREENER TRANSPORT AND RENEWABLE ENERGY

THE TUCOROM "CHAIR OF EXCELLENCE" PROJECT IS DEVELOPING METHODS FOR CONTROLLING "TURBULENCE" IN ORDER TO REDUCE POLLUTION

The control of turbulent flows around vehicles plays an important role in developing more environmentally-friendly transport. Many projects have proposed revolutionary vehicle designs to make them more aerodynamic, limiting phenomena such as drag for cars, trucks, trains and boats. However, these solutions are up against a number of practical constraints. TUCOROM has developed a different concept based on intelligent control of these flows. This project is part of the 2010 edition of the ANR Chairs of Excellence programme.

The aim of the TUCOROM project is to control turbulence or the turbulent nature of liquids, fluids or gases. Using this approach, it is possible to control turbulent flow from vehicles, in other words their drag. However, it also allows us to manage the associated fuel consumption, pollutant emissions and the sonic signatures of aircraft on the ground. A "closed loop" strategy was developed whereby turbulent flow is modified using small actuators and sensors connected to computers. The approach falls within the field of experimental fluid mechanics and uses advanced reduced-order modelling methods based on mimetic observation of instances where turbulence is controlled solely by natural means. For example, riblets on shark skin reduce drag and special, more flexible feathers on the tips of eagles' wings allow the flow of air around them to be adjusted. The project took inspiration from such examples.

AN EFFECTIVE PARTNERSHIP WITH COMPANIES

This new turbulence control strategy is being explored by the French National Centre for Scientific Research (CNRS) in close partnership with industry (Ambrosys GmbH, Germany; PSA - Peugeot-Citroën, France; RENAULT, France) and laboratories in eight countries (Argentina, Australia, Canada, France, Germany, Poland, Sweden and the United States). Several industrial applications are being conceptualised. One of these is being developed in partnership with Peugeot-Citroën and relates to car transport while another concerning air transport is being pursued with Airbus.

FUNDING INSTRUMENTS TO ATTRACT HIGH-LEVEL RESEARCHERS TO FRANCE

The "Chairs of Excellence" programme which runs the TUCOROM project was developed by the ANR to attract high-level researchers from abroad to French laboratories. When the ANR Work Programme was introduced in 2014, this scheme and its links to the "Post-doctoral return" programme was reviewed. ANR has confirmed its commitment to improving the global appeal of France by setting up the new "Hosting High-Level Researchers" programme which provides a one-stop shop for all projects aimed at long-term hosting in France of high-level junior or senior researchers who have spent a significant part of their careers abroad. The framework has been considerably simplified enabling the programme to focus on the scientific excellence of candidates and their contribution to institutions that run projects.





ANR ON THE INTERNATIONAL STAGE

- ▶ A driving force in the European Research Area 57
- ▶ Bilateral collaborations with our major counterparts 62
- ▶ An increased presence at international forums 64
- ▶ Emerging partnerships with Southern countries 66

Scientific research is international by its very nature. In the execution of its mandate as an internationally-minded French research funder, ANR is making itself over, opening up to Europe and the rest of the world, and developing worldwide partnerships. ANR's actions are denotive of a broader internationalising shift in research, funding, and the great scientific challenges of our day.

By boldly positioning itself on the international stage, the agency has reaffirmed its enduring commitments to excellence, competitiveness, attractiveness and outreach, enthusiastically advocating for French research in Europe and throughout the world.

A driving force IN THE EUROPEAN RESEARCH AREA

ANR has positioned itself as a key player in the construction of the European Research Area (ERA) alongside other institutional stakeholders. ANR is forging strong partnerships and facilitating collaboration among European researchers through project-based funding. It has continued to play a crucial role in debates and reflections led by European research actors on scientific policy issues.

THE LEAD AGENCY: A HIGHLY ADVANCED FORM OF INTER-AGENCY PARTNERSHIPS

Open, cross-border exchange of knowledge and discovery is at the heart of science. To promote science inside Europe, it is essential to provide researchers with opportunities to collaborate across national borders in order to form collaborative research projects fostering the exchange of ideas and scientific expertise. Supporting research projects conducted in different countries requires arrangements between the funding bodies concerning application, review and funding processes. Apart from specific transnational calls involving a unique application and review process, project partners must apply to their respective funding agencies. To make for simpler and speedier scientific collaborations, to create seamless research funding areas and thereby help expand the ERA, ANR sets up bilateral "lead agency" collaborations with European funding agencies.

The "lead agency" procedure is undoubtedly the most advanced form of such inter-agency partnerships. It is based on transparency and mutual trust between the funding bodies: the lead agency takes responsibility for the receipt, evaluation and selection of projects for the countries involved. **In 2014, ANR implemented this procedure on a bilateral basis with the German Research Foundation (DFG), the Austrian Science Fund (FWF) and the Swiss National Science Foundation (SNSF).** The scheme had also been in use with the National Research Fund (FNR) in Luxembourg since 2013.

DEVELOPING COOPERATION THROUGH EUROPEAN INSTRUMENTS

European cooperation allows for mutual enrichment and increased efficiency. Without overlooking "natural" competition, we have created an environment conducive to synergy, shared vision and joint strategy.

The European Commission (EC) has developed a series of instruments facilitating Pan-European collaborations: ERA-NETs and ERA-NET Cofunds. In this context, funding agencies issue calls for transnational proposals which are rising in number and which are expected to complement the Horizon 2020 calls. ANR is a driving force in these programmes. Through joint calls, ANR promotes the notion of excellence throughout Europe. These instruments are also forums for discussion, joint analysis, networking and platforms to detect bottlenecks.

ANR meets with its European partners to define common priorities, hence facilitating the coordination of actions. Joint Programming Initiatives (JPIs) are inter-governmental initiatives that contribute to the construction of the ERA. They are designed to create synergies between scientific programmes to address those research needs with a strong societal impact on Europeans. They are also a tool to promote evidence-based policy making and thus go beyond research itself.

All of these activities contribute to a greater coordination of the national research agendas, and beyond, they are pushing towards an alignment of research programmes and greater integration.

FOCUS

ANR COORDINATES ITS FIRST ERA-NET COFUND IN 2014

By taking on coordination of E-Rare-3, the agency strengthened its commitment to promote transnational research on rare diseases. This has taken the form of an ERA-NET Cofund, a new Horizon 2020 instrument serving collaborative research funding in Europe.

The ERA-NET on rare diseases, baptised "E-Rare", was launched in 2006. Designed as a tool to initiate and coordinate collaborative action between research funders, it aims to fuse together fragmented and compartmentalised research in rare diseases inside and outside Europe. E-Rare's main objective is the creation of a transnational rare diseases research funding programme. In 2014, E-Rare entered into its third phase of implementation via the ERA-NET Cofund. As coordinator, ANR will lead and coordinate the network and its 25 European and Canadian partners over five years.

AN INSTRUMENT FOR FUNDING COLLABORATIVE RESEARCH IN EUROPE

The ERA-NET Cofund is a logical extension of the ERA-NETs created in 2002 under the European Commission's 6th Framework Research and Development Programme (FRDP). As a

network of funding agencies and research bodies, the objective of ERA-NETs is to develop and strengthen coordination between national research programmes, thereby aiding in the construction of the European Research Area. Research organisations pool their human and financial resources in the interests of joint activities, e.g. by launching calls aimed at funding international research projects.

In the context of an ERA-NET under the 6th and 7th FRDP, the European Commission reimburses the costs of setting up calls and the management fees of organisations participating in the ERA-NET. In an ERA-NET Cofund, the Commission joins forces with partner agencies in a large-scale call for proposals and cofunds research projects. This kind of call brings together at least five countries in a targeted field and must generate European added value in order to be given the green light.

E-Rare-3 intends to launch four calls for proposals, one of which will be co-funded by the European Commission. The network will also set up a close strategic collaboration with IRDiRC - the International Rare Diseases Research Consortium - as well as European Research Infrastructures. Last but not least, it will establish a co-funding model involving patient organisations.

ANR COORDINATES 5 ERA-NETS

- ▶ **CHIST-ERA, dedicated to Information and Communication Sciences and Technologies**
- ▶ **FLAG-ERA, designed to develop "FET Flagships," the European Commission's flagship projects on Future and Emerging Technologies**
- ▶ **EURONANOMED 2, dedicated to nanomedicine**
- ▶ **INFECT-ERA, dedicated to infectious diseases**
- ▶ **E-Rare-3, the ERA-NET Cofund on rare diseases**



FOCUS

ANR TAKES OVER THE PRESIDENCY OF JPI WATER

The European Joint Programming Initiative “Water Challenges for a Changing World” (Water JPI) aims to bolster Europe's leadership and competitiveness in the area of water research and innovation while preserving resources. In November 2014, ANR took over the presidency and assumed the role of coordinator for the JPI. All eyes on this flagship initiative.

Ensuring the adequate availability of quality water is a major issue of public interest on European and world scales. Water is a vital resource, used not only for direct consumption, but for health needs, the production of food, industrial assets and goods. The scale of the economic, ecological, environmental, technological, demographic and social issues relating to water makes adopting multidisciplinary and transnational approaches imperative.

DEVELOPING DURABLE WATER MANAGEMENT SYSTEMS FOR A SUSTAINABLE ECONOMY

With this in mind, the Water JPI was officially launched in late 2011, with special emphasis placed on uniting member countries' efforts in this area and promoting greater mobilisation of skills,

knowledge and resources. Bringing together twenty partner countries and four observers, the Water JPI has set out to achieve five major objectives between now and 2020: get water end-users thinking about research findings; attain a critical mass of research programmes; implement effective and sustainable coordination of European water research; harmonise national water agendas and activities in partner countries; and support European leadership in science and technology.

Its partners have jointly developed a common vision and established a strategic joint research and innovation agenda hinging around five priority research themes:

- Maintaining ecosystem sustainability
- Developing safe water systems for citizens
- Promoting competitiveness in the water industry
- Implementing a water-wise, bio-based economy
- Closing the water cycle gap

**AS COORDINATOR, ANR IS TASKED WITH GIVING THE INITIATIVE NEW IMPETUS.**

The agency will coordinate the future ERA-NET Cofund, enabling the JPI to launch a major pan-European call for proposals on the themes of water and agriculture. The call is to be prepared in close collaboration with FACCE, the Joint Programming Initiative on Agriculture, Food Security and Climate Change.

ANR AND JPIs: FINDING JOINT SOLUTIONS TO MAJOR SOCIETAL CHALLENGES THROUGH RESEARCH

Apart from JPI Water, ANR is a member of:

- **The JPND on Neurodegenerative Diseases:** Facilitating international research and funding in the fight against neurodegenerative diseases including Alzheimer's.
- **JPI FACCE on Agriculture, Food Security and Climate Change:** Constructing an integrated European Research Area to meet challenges related to sustainable agriculture, food security, and the impacts of climate change.
- **JPI HDHL, "A Healthy Diet for a Healthy Life":** Giving European citizens the motivation, ability, and the opportunity to eat healthy, to consume a wide variety of foods and maintain recommended levels of physical activity to stave off diet-related chronic diseases.
- **JPI AMR on Antimicrobial Resistance:** Coordinating research on antibiotic resistance has become one of the World Health Organisation's global priorities.
- **JPI-Climate "Connecting Climate Knowledge for Europe":** Enabling Europe to coordinate efforts to meet challenges brought about by climate change.
- **JPI-OCEANS "Towards healthy and productive seas and oceans":** Minimising fragmentation and redundant overlap of research on this topic and establishing cooperation mechanisms



between scientific and industrial policy communities and national political representatives with responsibility in this area.

- **JPI MYBL "More years, better lives":** Coordinating research efforts and activities dealing with ageing societies in a context of accelerated and globalised demographic change.

GERMANY, ANR'S LEADING PARTNER



Over 600 projects

including French and German partners co-funded between 2006 and 2014

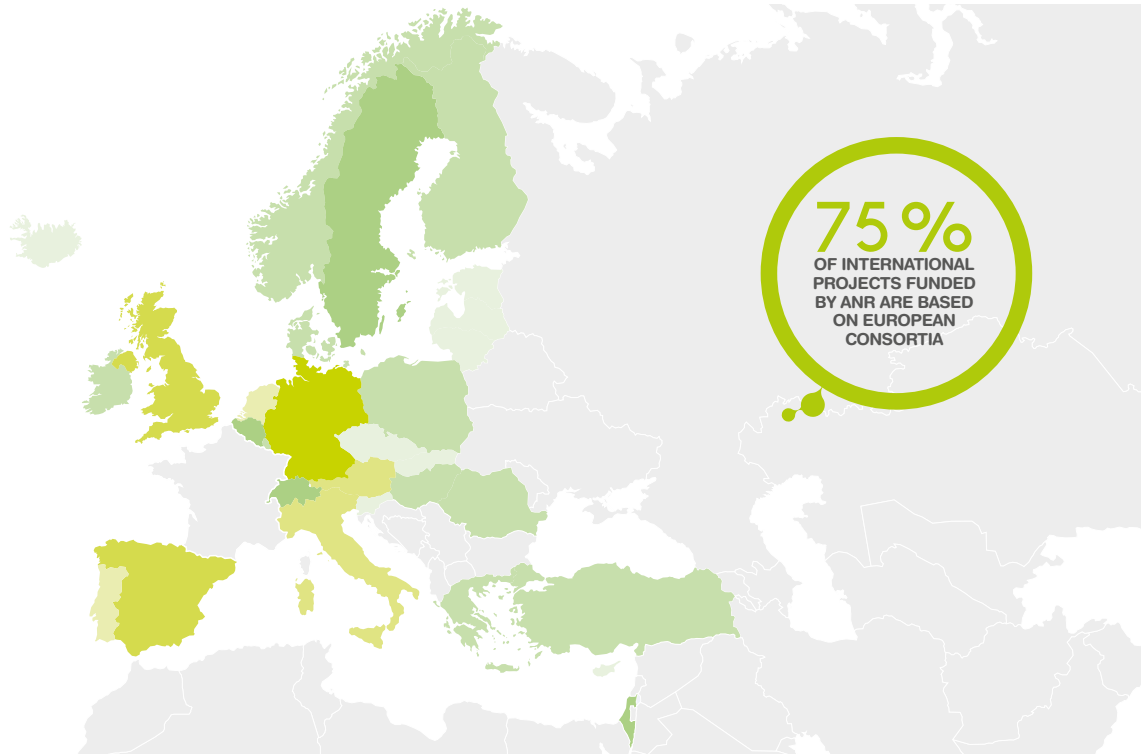


About 300 of which were bilateral France-Germany



For a total of €185 M of funding allocated by ANR

ANR has partnerships with DFG, the German Research Foundation and the BMBF, the German Ministry of Education and Research. In numerous fields, including global security, health and biology, chemistry, plant genomics, information and communication sciences and technologies. And in social sciences and humanities through the dedicated yearly ANR-DFG programme and "ORA - Open Research Area," a multilateral initiative for the creation of a social sciences research area.



- | | | |
|---|--|---|
| <p>■ More than 600
Germany</p> | <p>■ Between 61 and 100
Portugal, Netherlands, Sweden</p> | <p>■ Less than 10
Slovenia, Island, Latvia, Czech republic, Cyprus, Estonia, Slovakia, Lithuania</p> |
| <p>■ Between 151 and 200
Spain, United Kingdom</p> | <p>■ Between 31 and 60
Switzerland, Belgium, Israel, Romania</p> | |
| <p>■ Between 101 and 150
Italy, Austria</p> | <p>■ Between 10 and 30
Finland, Denmark, Norway, Poland, Turkey, Ireland, Luxembourg, Greece, Hungary</p> | |

ANR endeavours by various means to facilitate collaborations between French researchers and the top European researchers: launching bilateral or multilateral calls for proposals with the major countries contributing to European research, building strategic partnerships with sister agencies on specific topics, sharing best practices with European counterparts, or making the most of the European Commission's instruments.

In 2014, ANR launched a coordinated Franco-German call for proposals on Protection of Critical Infrastructures, in partnership with the German Federal Ministry of Education and Research (BMBF), building on the longstanding successful Franco-German collaboration in science and technology.

ANR and the European Research Area: Integrating and positioning activities into the context of Horizon 2020 through

- Coordination and inter-connection of national and European programmes/funding (see page 21)
- An instrument for enhancing the position of the French teams in Europe ("Setting up European or International Scientific Networks") (see page 19)



Bilateral collaborations WITH OUR MAJOR COUNTERPARTS

ANR is forming privileged partnerships with research funders from the most influential countries in the global scientific arena. In 2014, ANR set up a brand new partnership with National Research Foundation Singapore, and reinforced its cooperation with the American NSF and the JST in Japan. These bilateral partnerships are outstanding opportunities for researchers, as they facilitate collaboration with teams from these countries. In addition to strengthening ANR's position on the international stage, bilateral collaborations are a way to learn sound best practices from foreign colleagues and share valuable information about its core activity of funding research (peer reviews, terms and conditions for project funding), improving global performance and serving science communities.

SINGAPORE: AN AGREEMENT WITH NRF FACILITATES THE CO-FUNDING OF BILATERAL PROJECTS

ANR and National Research Foundation Singapore (NRF) signed on 20 May 2014 a scientific cooperation agreement aiming to strengthen bilateral cooperation between both countries through the funding of joint research projects. This agreement was put into effect the following summer via ANR's 2015 generic call for proposals. The specific area of scientific collaboration agreed upon must be jointly defined on an annual basis. For the first call, the selected research topics are materials, nanotechnologies and nanosystems.

JAPAN: MOLECULAR TECHNOLOGY PARTNERSHIP LAUNCHED WITH THE JST

In January 2014, ANR and the Japan Science and Technology agency (JST) launched a new funding programme in the field of "molecular technology for functional materials." Molecular technology is a new research discipline investigating how molecules are designed, synthesised and employed in order to create materials exhibiting specific physical, chemical and biological functions. The resulting innovations are likely to deliver solutions to the most pressing human problems, including energy, environmental, and human health issues. With regard to the JST, this cooperation draws on the CREST and PRESTO programmes and the network of Japanese researchers formed through it.

UNITED STATES: A NEW COLLABORATION WITH NSF

In February 2014, ANR and NSF concluded a new agreement within the framework of the American agency's PIRE, "Partnerships for International Research and Education," a multidisciplinary programme for supporting international collaborations. The goal is to fund outstanding research projects with a training dimension requiring international collaboration. Implemented in July 2014, this cooperation deals with three thematic areas: energy, advanced manufacturing, and the social sciences.



ANR-MOST 2014 JOINT WORKSHOP IN PARIS: FRANCO-TAIWANESE PROJECTS UP FOR REVIEW

On 2-3 October 2014, ANR organised the second Franco-Taiwanese workshop. Set within the framework of the collaboration programme with the Ministry of Science and Technology (Taiwan) launched in 2007, this event brought together French and Taiwanese researchers funded by ANR and MOST in a great number of scientific disciplines. The agenda for the day featured presentations on major advances made by the teams, exchanges and interactions between researchers, remarkable results and initial feedback from teams funded. An initial workshop was held in October 2011 in Taipei.

INTER-AGENCY PARTNERSHIPS: TRAINING SESSIONS AND SWAPPING OF BEST PRACTICES

ANR may be requested by its counterpart agencies to offer its expertise and share its experience in call management, research funding instruments (innovation, academia-industry partnerships, etc.) but also on administrative management of ERA-NET-type European contracts. In particular, ANR has begun training sessions with the National Science Centre (NCN), at the behest of the Polish Academy of Sciences (PAN) at ANR's offices. This collaborative approach was initiated by other agencies, particularly those located in Northern Africa.



▼ Visit from the Polish delegation composed of staff from NCBiR, NCN and PAN in February 2014 at ANR headquarters



▼ 48% of ANR's international collaborations are based on partnerships with counterparts in Asia, and 44% in the Americas.

An increased presence AT INTERNATIONAL FORUMS

ANR plays an active role in European and international research policy and makes French research more visible by taking an active part in a variety of European and worldwide forums and governing bodies.

At the European level, ANR is notably a member of Science Europe, the European association representing the interests of the research funding organisations in Europe. Michael Matlosz, President and CEO of ANR, sits on the association's Governing Board. ANR representatives also participate in working groups from Science Europe, allowing for exchanges, increased coordination and development of coherent European positions on the science policy issues that matter most to research funders.

At the global level, ANR is a member of:

- The **Global Research Council (GRC)**: a virtual organisation comprising the heads of science and engineering funding agencies from around the world, the GRC addresses issues of mutual interest and reaches agreements on principles and guidelines to encourage transnational collaboration
- The **Belmont Forum**: co-chaired by ANR between 2012 and 2014, it brings together the senior representatives of the principal funding agencies across the world and tackles challenges related to global environmental change
- The **International Rare Diseases Research Consortium (IRDiRC)**, an international consortium dedicated to research on rare diseases

GRC 2014: ANR A DRIVING FORCE BEHIND THE THOUGHT PROCESS ON “SHAPING THE FUTURE”

Meeting in Beijing, participants at the GRC 2014 set out to comprehend major issues including “Open Access” and “Funding the Future, shaping the next generation of researchers.” ANR, which conjointly hosted the European Regional Council Meeting during October 2013 in Paris with Science Europe, led the European working group dedicated to supporting young researchers.

Who are the researchers of tomorrow? What kind of environment will they work in? What kind of skills will they have? How will they be trained, recruited, and funded? How will they understand the concept of mobility (in terms of discipline, geography, and sector)? Funding agencies have a crucial role to play in figuring out how to develop promising talent, careers in research, and different types of mobility while promoting a researcher-friendly working environment. The members of the GRC have therefore set out the guidelines for an action plan and undertaken to develop programmes helping young researchers find their way into great careers and nurturing their talent.



ANR, the national research institutions, the Alliance of research organisations in the environmental field (Allenvi) and the French Ministry of Research have worked together these last years to promote France's position on the international stage and within environmental forums - JPIs, Belmont Forum as well as Future Earth, the latest global programme to tackle environmental change. The country's presence allows national research to play a significant role in the development of solutions to major environmental challenges and create synergies between actors.

THE BELMONT FORUM SHIFTS INTO HIGH GEAR

After co-chairing the Belmont Forum for two years, ANR welcomes in 2015 the Forum's new director and deputy director to the secretariat. The Belmont Forum, a "club" of funding agencies for research on climate change, is taking a new step forward with the transition to this new executive structure.

The Belmont Forum brings together the senior representatives of the principal funding agencies across the world. The aim of its work is to "deliver the necessary knowledge to mitigate and adapt to harmful environmental changes and extremely dangerous events". In order to meet these challenges, the members of the Belmont Forum jointly define priorities for the collaborative research actions (CRAs). The first CRAs have focused on coastal vulnerability, food security and digital infrastructures.

The agencies pool their resources by launching joint calls for proposals with the aim of enhancing scientific excellence and international collaboration, interdisciplinarity and the involvement of the stakeholders in defining the research questions and obtaining and disseminating knowledge in order to best meet the challenges facing us all.



▼ © SZE FEI WONG

Emerging partnerships WITH SOUTHERN COUNTRIES

ANR is building collaborations with the Southern countries on pressing issues with strong societal impacts in terms of public policy. This is the case in the Mediterranean, through ERA-NET MED in particular, where the agency plays a prominent role. By bringing together countries from the northern and southern shores of the Mediterranean, this network is responding to major challenges affecting the Mediterranean basin through a highly interdisciplinary approach.

ANR is a driving force in ARIMNET, an ERA-NET promoting synergies and encouraging cooperation between Mediterranean countries in the field of agricultural research.

ANR is also actively involved in the work to build a long-term “Partnership in Research and Innovation in the Mediterranean Area” (PRIMA).



FOCUS

“FLASH” HAITI: REVIEW OF POST-EARTHQUAKE PROJECTS IN PORT-AU-PRINCE

From 3 to 5 December 2014, ANR organised, with the Fondation de France, the closing conference of ANR's post-earthquake “Flash Haiti” programme as well as a programme spotlighting the Fondation's local innovations. Entitled “For sustainable reconstruction,” it brought together more than 150 people in Port-au-Prince, Haiti.

Almost five years after the earthquake that hit Haiti in 2010, the Fondation de France and ANR were keen to take stock of the research projects and local innovations they financially supported. Held in association with the State University of Haiti, Quisqueya University and the French Embassy in Haiti with the support of the Haitian GRET, the conference was attended by a large number of Haitian and French scientists - project coordinators supported by ANR and by the Fondation de France - and delegations from partners universities focused on sustainable initiatives and a shared concern for co-construction. National and international institutions, companies and non-governmental organisations were also represented.

FOUR THEMES EXPLORED

- ▶ Earthquakes, emergencies, and development
- ▶ Rural areas and agriculture
- ▶ Regional planning, habitats and urban service offering
- ▶ Education, health, and new digital technologies

TIMED TO COINCIDE WITH THE FIRST HAITIAN SESSIONS ON HIGHER EDUCATION

Three days of exchanges took place, moderated by Nesmy Namigat, the Haitian Minister of National Education and Vocational Training. By reiterating the necessity of higher education to open up to dialogue and heed society's needs, he voiced the desire that “this cooperation provide hope that Haiti's academic world has a role to play in transforming the lives of Haitians.”

Following an assessment of initiatives undertaken and a sharing of experiences, teams involved in the project volunteered their viewpoints, stressing closer bonds with Haitian public political actors and socio-economic development. These discussions have fuelled national reflections on the links between training, scientific research, societal expectations and development of public policy.



▼ From left to right: Yves Le Bars, President of the COS; Christine King of the ANR; Patrick Nicoloso, French Ambassador to Haiti; Nesmy Manigat, Minister of National Education and Professional Training; Michelle Oriol, Director of CIAT; Jacky Lumarque, Chancellor of Université Quisqueya; Jean-Vernet Henry, Chancellor of Université d'Etat Haiti; Henri Rouille d'Orfeuil, of Fondation de France. In the background is the children's exhibition of the ANR-funded RECREAHVI project.

TWO POST-EARTHQUAKE INITIATIVES FOR SUSTAINABLE RECONSTRUCTION

In the wake of the earthquake that ravaged Haiti in January 2010, the Fondation de France collected, thanks to an unprecedented outpouring of solidarity, 35 million euros to aid victims and help them rebuild their lives. The Fondation de France intervened over a four-year period by supporting sustainable projects, remaining as faithful as possible to the needs of Haitians. At the end of this period, 361 projects were supported, benefiting nearly 900,000 people. Beyond funding projects, the Fondation de France implemented a programme for analysing and promoting innovation in the field. The goal was to facilitate the duplication of proven solutions and their broad-scale roll-out.

As early as March 2010, ANR devised a new type of call for proposals, called “Flash,” in order to support research related to unforeseen events and channel research toward crisis management, with emphasis on the ways in which societies survive and fight back when disaster strikes. Within a short time frame, this call carried forward eight research projects launched with great speed after the selection phase. The funding allocated to the projects totalled €3.4 M, enabling society to learn lessons from the disaster through scientific analyses and the acquisition of data in an exceptional context very rarely studied in a post-emergency situation.

Fondation
de
France

“The funded projects, relating to health, education or economic development, were designed to promote and reinforce Franco-Haitian partnerships and encourage long-term collaboration.”



INVESTMENTS FOR THE FUTURE, A SPECIFIC ASSIGNMENT

- ▶ Managing strategic programmes 69
- ▶ Boosting competitiveness through large-scale projects in the areas of higher education and research 72
- ▶ Supporting innovative training initiatives with a global outlook: focus on IDEFI 78



The Investments for the Future programmes represent
47 billion euros
 of which
26.6 billion euros
 are allocated to higher education and research

2
 programmes were launched so far
 (€22.6 bn in 2010 and €4 bn in 2014)

Launched in 2009 by the French Government, the Investments for the Future programmes are strategic initiatives which aim to boost French competitiveness by investing in research, higher education and vocational training, in industry and SMEs, in sustainable development and in expanding sectors such as digital technology, biotechnology and nuclear energy. Drawing on ANR know-how and expertise, the French Government has entrusted the agency with management of the research and higher education component of the programmes.

The aim is to massively invest over the long-term in innovative S&T projects which will eventually be a source of growth and progress for the French economy. In a global context, an investing effort targeted towards research and innovation is a prerequisite for competitiveness, growth, and employment.

The initiative has a structuring and integrating purpose, and is part of a long-term and dynamic drive to transform higher education, research and innovation.

The programmes take the form of a series of calls for proposals designed to promote French excellence in fundamental research and industrial innovation, technology transfer, maturation, etc. One notable goal is to generate university clusters of excellence able to successfully compete on the international stage. A strong impetus is given to the deployment of basic research for the creation of social and economic values, and to developing resources to provide French research centres with the means to achieve excellence and speed up technology transfer. Part of the initiative also focuses on health and biotechnology, with a view to bolstering progress on specific areas of knowledge, developing new solutions and allowing for the anticipation, improvement, development and validation of new approaches in medicine and agronomy.

INVESTING TODAY FOR THE GROWTH TOMORROW
 A strong support to research, higher education and innovation aimed at:

- ▶ Promoting excellence and the development of high-level projects and clusters
- ▶ Strengthening France's capacity for innovation
- ▶ Increasing the competitiveness and attractiveness of French research and higher education
- ▶ Generating growth
- ▶ Helping to build a true knowledge society in France
 ... through three types of actions:
- ▶ Centres of excellence
- ▶ Health and biotechnology
- ▶ Technology transfer and valorisation
 ... and in a manner that promotes collaboration among researchers.

WHY IS IT A SPECIFIC ASSIGNMENT?

ANR is in charge of managing the calls for proposals, setting up the evaluation and selection process, preparing the grant agreements, funding the selected teams, and monitoring the activities, i.e. following up on the projects, including accompanying the project leaders, supporting them in their development, and ensuring the review and the provision of monitoring indicators and providing impact analyses for ten years to come.

By virtue of their exceptional nature, the Investments for the Future have some specific features and rely on an efficient and international approach to review and select projects.

National calls are jointly prepared by CGI (see below), Ministries and ANR and are launched around important promising themes. The project evaluations are systematically conducted by international juries: the evaluation panels are composed of high-ranking experts from all over the world and they possess a broad range of skills. Projects are assessed according to a peer review process based on international standards and on project selection criteria defined according to the priorities for the programme. The aim is to select innovative projects with a strong potential for growth.

The amount of funding assigned to the projects is substantial, and covers ten-year projects, opening up new perspectives and leading to collaborative associations that would otherwise never have formed.

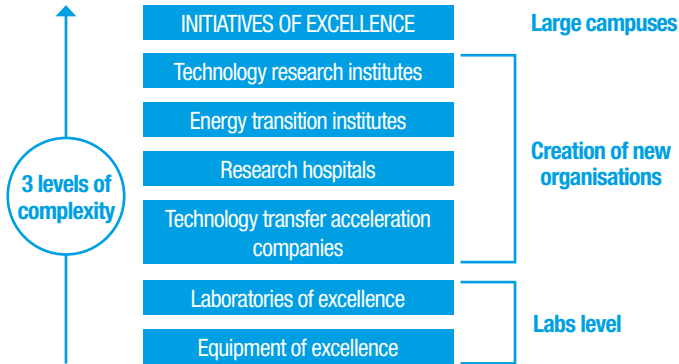
Furthermore, they enable not only the financing of large-scale research projects, but also the implementation of new objects such as intermediate-sized research equipment, infrastructure for research into biology and health, and the emergence of global research and higher education clusters.

28
calls for proposals

About
1,700
submitted projects

461
selected projects,
including pluridisciplinary projects that involve a strong participation of the business world and the civil society

COMPETITIVE CALLS FOR SELECTING DIFFERENT TYPES OF “OBJECTS”



“The amount of funding assigned to the projects is substantial, and covers 10-year projects, opening up new perspectives and leading to collaborative associations that would otherwise never have formed.”

A PROGRAMME STEERED BY A HIGH COMMISSION FOR INVESTMENTS (CGI)

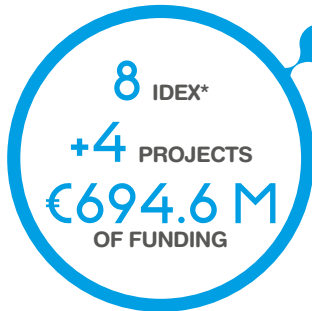
The Commissariat Général à l’Investissement - CGI is a government body which makes an integral part of the Prime Minister administration with public and private experiences overseeing the design, execution and follow-up of the programme. It is headed by Louis Schweitzer, Investment General Commissioner.

The CGI ensures the overall consistency of the State investment policy, and coordinates the efforts of the State operators which are in charge of the operational implementation of the programmes (ANR in the field of higher education and research, ADEME on the initiatives related to energy, BPI France concerning the support to enterprises, etc.), and in close connection with the ministries concerned. Final investment decisions are made by the French Prime Minister based on peer reviewers’ evaluation, the steering committee’s report and CGI’s opinion.



Boosting competitiveness through large-scale projects in the areas of higher education and research

CENTRES OF EXCELLENCE

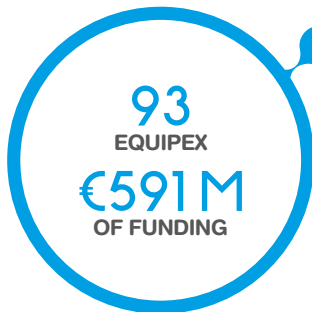


INITIATIVES OF EXCELLENCE, IDEX

Providing France with a number of world-class multidisciplinary universities in higher education and research, capable of rivalling with the world's top universities.

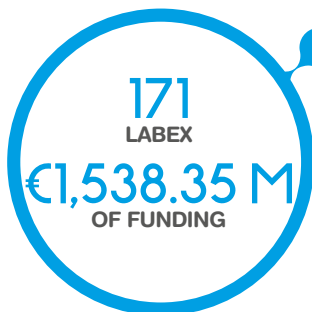
The programmes' flagship initiative.

The international dimension is a strong factor, both in the universities recruitment policy oriented towards top-level researchers, and in the training and courses provided. The global action of the IDEX follows a two-tier approach: forming international partnerships and setting up incoming and outgoing mobility scholarships; strengthening the global attractiveness of the universities for foreign students and researchers.



EQUIPMENT OF EXCELLENCE, EQUIPEX

Providing French research with very high quality scientific facilities, which comply with international standards and play a key developmental role at the national level.

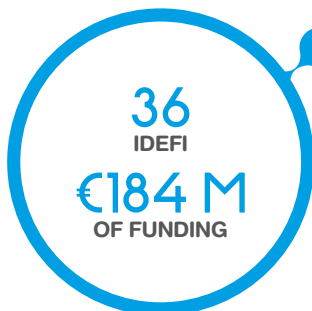


LABORATORIES OF EXCELLENCE, LABEX

Providing internationally visible labs the means to compete with their foreign counterparts on an equal footing, attract researchers and professors of international renown and build a high level research, training and value creation integrated policy.

Enhancing the attractiveness of French labs throughout the world:

800 postdoctoral fellows from foreign universities were recruited by **136** Labex.

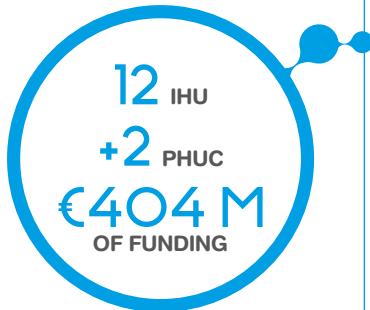


INITIATIVES OF EXCELLENCE IN INNOVATIVE TRAINING, IDEFI

Promoting innovation in training by supporting ambitious initiatives, at international standard and representative of university courses of the future.

*Total number of projects funded / Total amount allowed

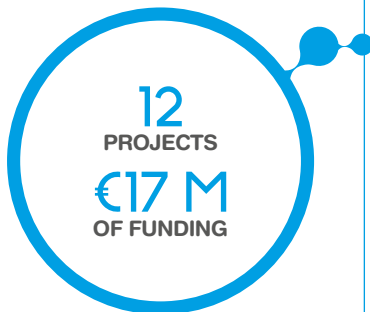
HEALTH & BIOTECHNOLOGY



RESEARCH HOSPITALS, IHU

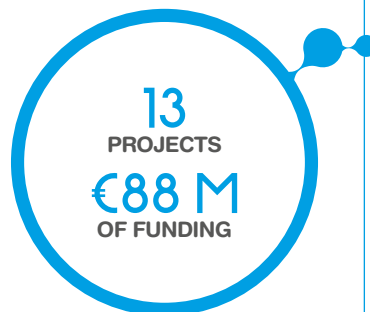
Supporting centres of excellence in research, care, training and technology transfer in the health field.

A specific initiative also aims at developing centres of excellence specialised in research, training and innovative treatments in oncology (PHUC).



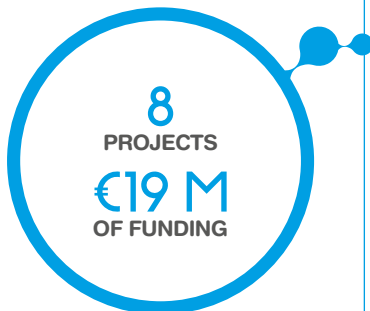
BIOINFORMATICS

Increasing our knowledge of biological mechanisms using mathematical models, algorithms and software programmes, in order to remove the obstacles identified in multi-scale and multi-physics modelling and to develop software solutions for health, biology, agronomy and the environment.



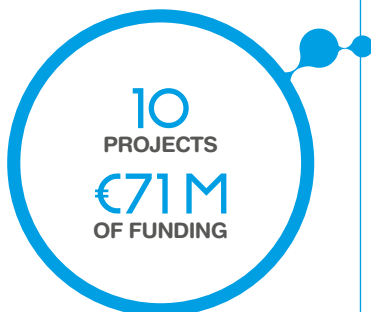
BIOTECHNOLOGY & BIORESOURCES

Towards a bio-economy based on knowledge of the living world and on new methods for recovering renewable biological resources.



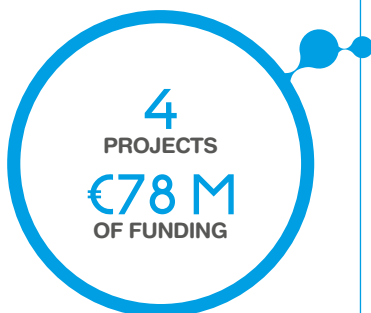
NANOBIOTECHNOLOGY

Exploring the potential of nanotechnologies to increase knowledge in the area of biology.



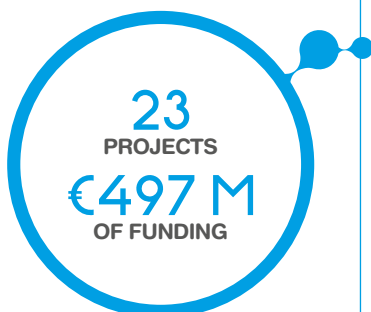
COHORTS

Providing long-term funding for cohorts with underlying health issues, in both general population and patients.



PREINDUSTRIAL BIOTECHNOLOGY DEMONSTRATORS

Allowing faster achievement of the proof of commercial concept by developing products or processes for which the proof of scientific concept has already been established.



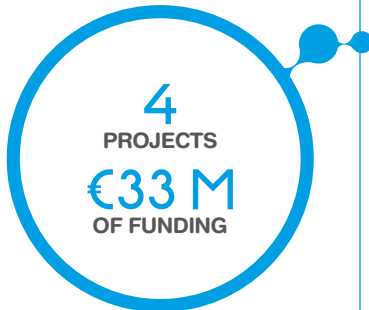
NATIONAL INFRASTRUCTURES IN HEALTH AND BIOTECHNOLOGY

Creating infrastructures suited to new needs relating to research on living matter, rapid growth in biotechnology and new approaches to medicine.

Promoting national infrastructures designed to serve ambitious and internationally competitive programmes, as well as European and global networks' French nodes.



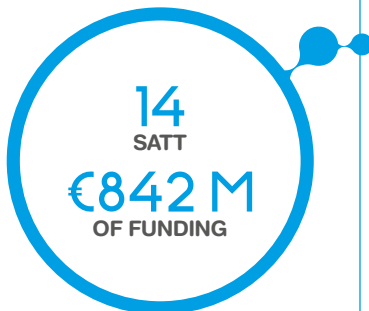
VALORISATION



CARNOT INSTITUTES

Supporting the development of Carnot institutes with SMEs, and at an international level.

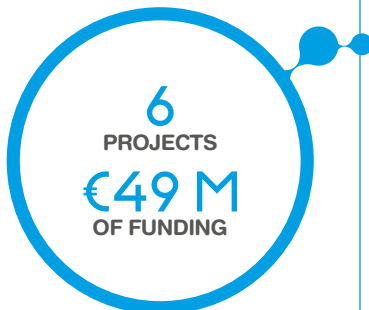
Global Care Initiative is a consortium of five Carnot Institutes that covers four therapeutic fields of major interest in human health markets: oncology, ophthalmology, infectious diseases and neurology. It brings together up to 6,000 researchers and wide technical assets and expertise and boasts a budget of €31 M for business development and research. Promoting French R&D in the field of health and life science, Global Care Initiative has a global outlook and intends to increase the international partnerships.



TECHNOLOGY TRANSFER ACCELERATION COMPANIES, SATT

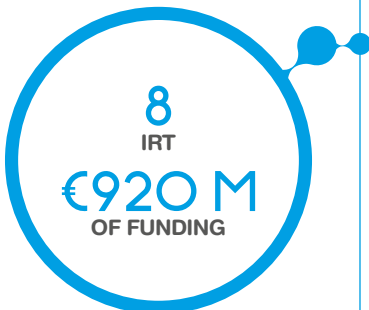
Improving the global efficiency of the French system of public research valorisation through the creation of local “one-stop services” allowing for the improvement of service provision to researchers and businesses.

Optimising the social and economic impact of the outcomes from academic research and facilitating technology transfer from public research to industry.



THEME-BASED TECHNOLOGY TRANSFER CONSORTIUMS, CVT

Setting up thematic consortiums entirely dedicated to the national and international valorisation of academic research and to the promotion of technology.

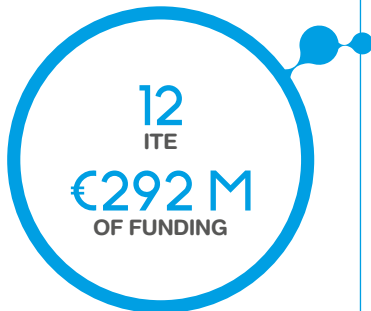


TECHNOLOGICAL RESEARCH INSTITUTES, IRT

Creating a limited number of technological innovation campuses with a global dimension.

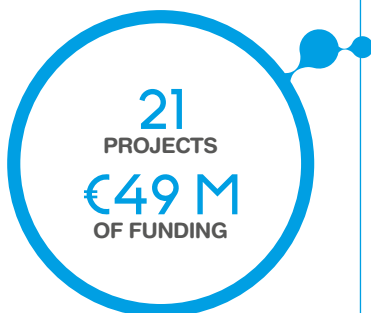
The IRT's international development is based on four dimensions:

1. Collaboration with international industry partners that contribute to the funding of their projects, their first partners being US corporations;
2. Partnerships with foreign institutes with similar missions;
3. European-wide projects with European Commission funding (Horizon 2020);
4. Presentations at international conferences and exhibitions (Las Vegas Consumer Electronics Show, etc.)



ENERGY TRANSITION INSTITUTES, ITE

Setting up, in the energy and climate sectors, a limited number of technological innovation campuses with potential global dimensions.



RESEARCH ON NUCLEAR SAFETY AND RADIOPROTECTION

Funding of academic-industry partnership projects, research infrastructures and technological platforms in the field of nuclear safety and radioprotection, including the participation of foreign researchers, the cooperation of Japanese authorities, international missions and specific nuclear power site investigations.

Launched in 2012, this call was focused on four main themes directly related to the Fukushima nuclear disaster: accident-initiating events (earthquake, flood, tsunami...); serious accident progress (fusing cores, hydrogen, radioactive emissions...); crisis management in accident and post-accident phases; consequences of a severe accident for humans and the environment.

A NEW WAVE OF CALLS LAUNCHED IN 2014: IDEX-I-SITE

As part of the second phase of the Investments for the Future, IDEX/I-SITE are designed to structure and integrate the French higher education and research institutions and reinforce the creation of multidisciplinary centres of excellence coherent and well suited to France's regions and which work in partnership with regional business entities.

The I-SITE label is one of the second waves innovative aspects. The main difference between IDEX and I-SITE is not the level of ambition or expected requirements, but rather the global scientific impact and potential of scientific excellence.



PROJECT ID

- ▶ **Title:** Brainomics
- ▶ **ANR Programme and Edition:**
Investments for the Future Programme 1
- ▶ **Coordinating body:**
Neurospin CEA SACLAY
- ▶ **Partners:**
 - SUPELEC
 - Pathophysiology of Psychiatric Disorders (LPMP) UMR 894 INSERM
 - UMR CNRS 8203 IGR
 - Logilab
 - Alliance Services plus
 - KEOSYS
- ▶ **ANR funding:** €860 K
- ▶ **Contact:** vincent.frouin@cea.fr
- ▶ **Project website:** <http://www.brainomics.net/>



PROJECT STORIES

NEUROLOGICAL APPLICATIONS OF BIG DATA

BRAINOMICS, FIRST PROJECT COMPLETED UNDER THE INVESTMENTS FOR THE FUTURE PROGRAMME

The Brainomics project was selected in December 2011 during the first edition of the Investments for the Future Programme. Its aim was to apply “Big Data” methods to genetic neuro-imaging data to further knowledge of the human brain. Completed in November 2014, Brainomics resulted in the development of software designed to discover the genetic and anatomic-functional underpinnings of certain neurological and psychiatric disorders.

Genetic neuro-imaging combines the use of medical and genomic imaging technologies. Imaging provides phenotypes, or intermediate measures that are used to study the potential role played by genes in psychiatric syndromes and neurological disorders. Brainomics is a crucial contribution in unravelling this mystery. It provides tools for organising genetic imaging data and strategies for analysing data produced. Some of the project's most notable achievements are a software prototype for sharing massive, complex data and an innovative algorithm designed to build predictors for certain clinical outcomes based on neuroimaging.

PROTOTYPE ALREADY UNDERGOING HOSPITAL TRIALS

Partners in fields spanning academics, industrial software design and clinician were convened for the project. A personalised healthcare sample management system derived from Brainomics research is on its way to being introduced in a live hospital setting. Algorithms developed have also given rise to initiatives tackling a bevy of clinical issues. They have also been used to provide predictive genetic markers in brain tumours. These algorithms have also been instrumental in identifying the potential involvement of SNP variants of a gene in the variations of grey matter volume in the putamen, a brain structure with a bearing on neurodegenerative diseases such as Parkinson's. These applications also help identify prognostic or predictive factors in patient cohorts suffering from drug-resistant depression. Using a structural MRI, the project has obtained results of patient cohorts with neurological pathologies in order to identify the biomarkers necessary for detecting Alzheimer's disease or factors correlated with the severity of cadasil syndrome. The project's finding should give France a competitive edge, helping it along as it jockey for position on future European projects in the field.





THE KEY FIGURES

€184 M
in subsidies

For
36
IDEFI

More than 60
guest professors from
outside France and
More than 100
double diplomas and joint
diplomas for the 2013-2014
academic year

Supporting innovative training initiatives with a global outlook: FOCUS ON IDEFI

The Initiatives of excellence in innovative training (IDEFI) are the flagship instrument in the investments for the future programmes in the field of training and education. Their aim is to promote innovation in training by supporting ambitious initiatives, at international standard and representative of university courses of the future. Interview with **Patrick Bourgin, programme manager at ANR**.



INTERVIEW

WHAT EXACTLY IS THE IDEFI INITIATIVE?

“The call for IDEFI projects was launched in 2011 at the request of the French President who wanted to add a specific action to support innovation in training to the “Research” section of the Investments for the Future programme. With €184 million in subsidies, the IDEFI initiative aims to find demonstrators as forerunners to university courses of the future, promote new training methods and new content and support exciting initiatives at international level. Led by universities and public and private graduate schools, these demonstrators are intended to foster attractiveness, multidisciplinary, student employability, links to research and educational engineering. IDEFI are by their nature and objectives geared essentially toward international cooperation.”

WHAT ARE THE FIRST CONCLUSIVE RESULTS?

“36 IDEFI have been launched and they have already undergone three full academic years of experimentation. The major projects, all international in scope, reveal three main types of achievements: cross-border initiatives leading to bi-cultural exchanges, initiatives that are active in international networks - the IDEFI label undoubtedly strengthens previously formed links - and lastly projects with a strong international presence. In these projects we have seen a large number of guest professors, with a great potential for conveying the “IDEFI” message in other countries and, in addition to the traditional student exchange programmes like ERASMUS, a considerable inflow of students from other countries.”

WHAT'S NEXT?

“In November 2015 we will be organising a meeting between IDEFI project leaders and the international jury to carry out an in-depth analysis of the past three academic years. Also, in association with the Higher Education and Research Ministry and the CGI, ANR is preparing the second seminar on training for the first semester of 2016. This will attempt to answer the question of “Innovation, renovation or revolution in teaching”. The agency is at the heart of an approach to encourage innovation in education. Finally, our teams continue to visit the field regularly, enabling us to ensure projects are living up to expectations. The Ministry provides support by validating the educational methods. In this monitoring stage, the international dimension is crucial: we encourage the projects to develop close links with other countries. We have finally launched a second call for proposals dedicated to innovative digital training methods (IDEFI-N), which closed out spring 2015. The process is ongoing.”

“ANR is at the heart of an approach to encourage innovation in education.”

D.SCHOOL:

DESIGN THINKING, A NEW AND DISRUPTIVE APPROACH LED BY THE FRENCH D.SCHOOL

The ambition of the IDEFI D-SCHOOL is to promote an innovative teaching method in France based on design thinking. A combination of deductive and inductive thinking, design thinking is an integrative, comprehensive method combining the scientific desire to create an object, a marketing approach and placing the user right at the centre of the method. Led by the École des Ponts ParisTech, the French d.school is developing this interdisciplinary method in accordance with international standards. It aims to demonstrate teaching methods of the future, with the ambition of inspiring a new generation of exciting and innovative training courses using new methods from design thinking like those offered at Stanford University in the US. The d.school, in the national research and training ecosystem, marks a departure from the existing innovative training courses, particularly through very strong international cooperation. It belongs to a network of fifteen partners, including the universities of Stanford in the US, Potsdam in Germany and Aalto in Finland. The d.school is also helping to form a network of 25 universities by creating a collective work soon to be published. The number of students involved is rising rapidly: nearly 200 of them working on more than 20 projects in 2013-2014.



59

students have already benefited from cross-border internships, including 12 with a specific PYREN grant

More than
1,500

students have attended bicultural courses of at least 12 hours in France or Germany

PYREN AND NOVATRIS: TOWARDS DEVELOPING CROSS-BORDER SKILLS

Led by the University of Pau, IDEFI PYREN aims to develop cross-border curricula with three Spanish universities from the South Pyrenees foothills, and particularly the University of the Pays Basque, the Public University of Navarre and the University of Saragossa. The aim is to create a multi-disciplinary higher education space in three languages: French, Spanish and English, based on knowledge sharing, mobility, promoting internships and workforce preparation. In addition to professor and student mobility, the first important actions include successful three-language master's level curricula (the aim being to expand it to the whole curriculum), facilitating internships in the cross-border region, and setting up a "French and Spanish business law" course entirely by distance learning.



▼ © PYREN

IDEFI NovaTris argues that it is unthinkable to learn a language without knowing about the culture. This initiative from the University of Haute Alsace is taking place in the cross-border region between France, Germany and Switzerland. It promotes French-German bilingualism and biculturalism by developing linguistic and human skills from three angles. Firstly by awareness. NovaTris offers intercultural modules and encourages cultural mobility, by providing six-hour training sessions plus one half-day a week for a semester, followed by presentations before a panel of judges in Germany and Switzerland. After attending training sessions for intercultural awareness, 50% of students considered staying longer. It is also intended as a springboard for cross-border professional businesses. Secondly, by learning French or German through "student-tutor tandems": 25 teachers were trained to become tutors and 79 students attended their lessons in 2012-2013 and 2013-2014. And thirdly, by dissemination. NovaTris uses its expertise to get out the word about biculturalism in universities and graduate schools in the cross-border area, but also in high schools. Twelve seminars have provided information to 900 high school students about French-German bilingualism and biculturalism.



▼ © UHA - NovaTris



▼ © Ludovic Halbein

06

BEHIND THE SCENES

- ▶ Governance and Organisation 83
- ▶ Scientific and funding teams: continuous adaptation to serve research communities 86
- ▶ Ensuring compliance within and without: the dual role of Legal Affairs and Compliance 88
- ▶ Achieving transparency through informational clarity 89
- ▶ Getting the word out about funded projects' scientific findings 90
- ▶ ANR is made possible by... a patchwork of skills and professions supporting the agency in its missions 92
- ▶ Human resources: ensuring workplace quality, boosting empowerment 94

Governance AND ORGANISATION

ANR is a public establishment under the authority of the French Ministry of Research. It is administered by a Governing Board and directed by its President and CEO. The CEO is assisted by two Deputy Directors General as well as a Scientific Steering Committee.

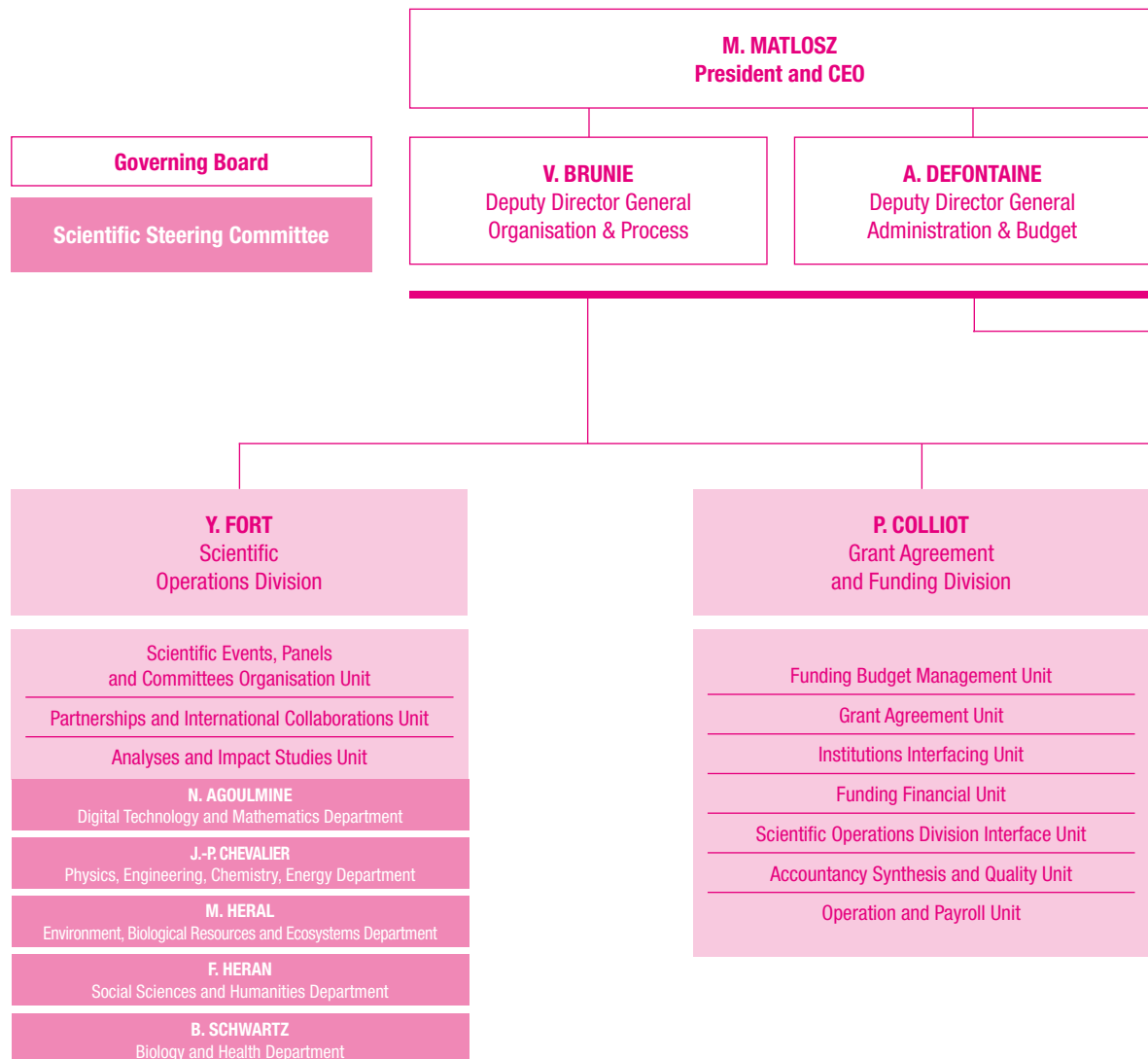
The agency is organised into three main operational departments. The **Scientific Operations Division** (DOS) encompasses all of the agency's science teams. These are spread across five departments and structured around five major scientific themes. A management team has also been formed to support the DOS, consisting of an information systems project manager, a planning manager, a "user" relations manager, a studies, data and impact manager, a unit dedicated to national and international partnerships and another tasked with logistical aspects for all committees and meetings related to projects' selection, monitoring, and review.

The **Grant Agreement and Funding Division** (DCF) includes the accountancy agency and the department in charge of establishing grant agreements with institutions benefiting from agency grants, as well as funding research projects.

The **Investments for the Future and Competitiveness Division** is in charge of managing the Investments for the Future programme. This division also manages instruments encouraging closer collaboration between academic communities and the business sector.

Support functions make up the final component of the agency's overall organisation; these include legal affairs and compliance, human resources, communication and information, general and logistical affairs, and information systems.





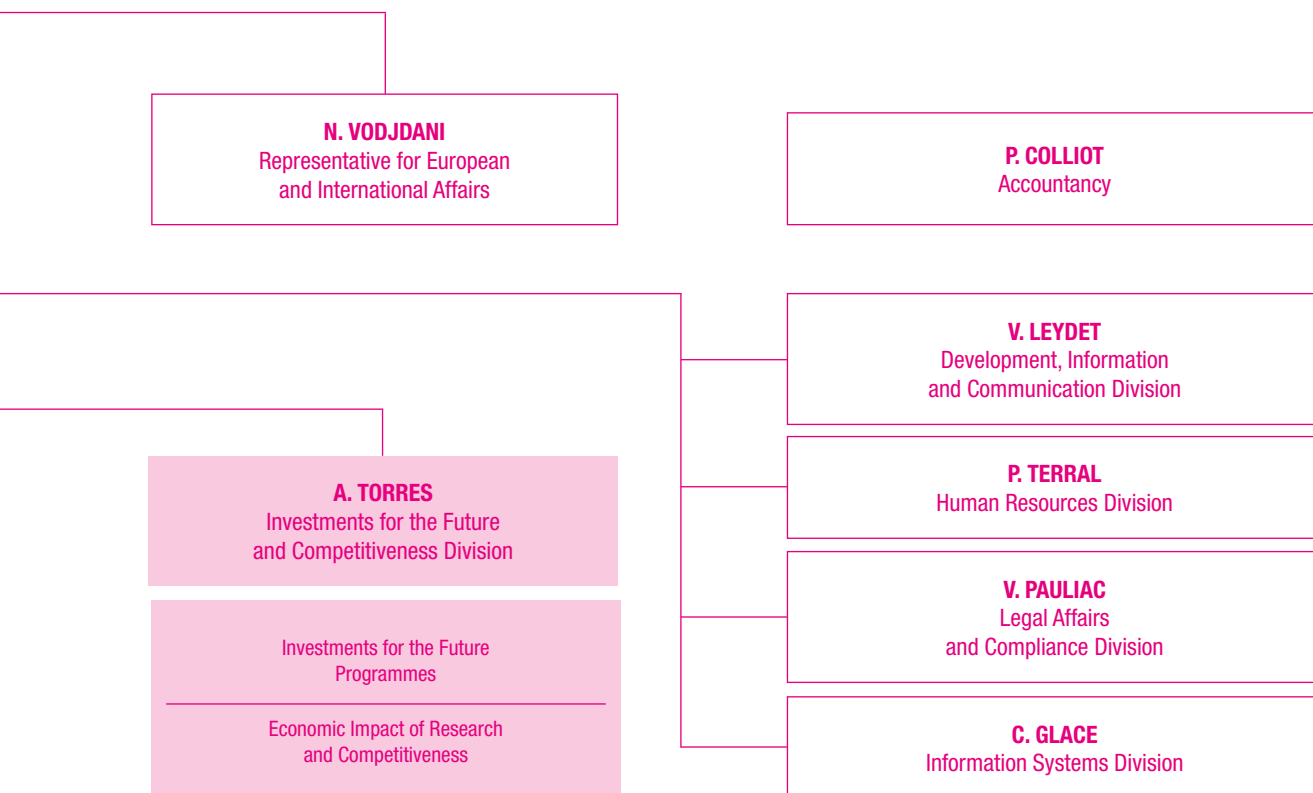
SCIENTIFIC STEERING COMMITTEE

The scientific steering committee is the agency's think tank for the development and implementation of its annual Work Programme. It assists the agency's President, who consults it in matters concerning:

- ▶ Preparing the annual Work Programme
- ▶ The implementation of evaluation work concerning the research offering and the impact of measures reported
- ▶ The Work Programme's implementation report
- ▶ Creating and eliminating scientific departments, determining their names and scope of action
- ▶ Appointing directors to the scientific departments, renewing their duties

The Committee also supports the agency's President with institutional strategy and its missions with regard to its core competencies: selecting and funding research projects.

This committee is currently being formed.



GOVERNING BOARD

The Governing Board settles the institution's affairs through its deliberations. More specifically, it deliberates on overall organisation, the institution's internal regulations, guidelines set out in the annual Work Programme, allocation and grant management policies, the budget and ANR's financial account. Besides the agency's President, it is made up of government representatives, qualified individuals representing the major fields of science and the socio-economic world, the Vice-Chairman of the National Strategic Council for Research and representatives as well as of the agency's elected personnel.

Scientific and funding teams: CONTINUOUS ADAPTATION TO SERVE RESEARCH COMMUNITIES



INTERVIEW

Darwin and other naturalists stipulated that organisms' success is predicated on their ability to change and adapt. Can the same logic be applied to ANR, a French project-based research funder? **Scientific Operations Director Yves Fort** talks us through some of the biggest changes undergone by ANR in 2014, with due consideration given to changes in scientific operations and handling feedback.

WHY WAS YOUR DIVISION CREATED?

"With the introduction of a generic call for proposals (part of the 2014 Work Programme), the previous structure of the agency's science division (six departments organised by scientific theme and one overarching, non-thematic department) was no longer adequate. Being able to offer the whole agency a cross-departmental call for proposals entailed implementing a structure (also cross-departmental) to round out the whole process.

The challenge for ANR was to improve organisation and anticipate the action plan and running order for the generic call, create a more flexible approach with regard to the agency's other divisions (particularly the recently implemented Grant Agreement and Funding division), and harmonise procedures within ANR's science division."

WHAT HAVE YOUR ROLES CONSISTED OF UNTIL NOW?

"Since autumn 2014, the agency's science teams have been divided into five departments broken down by scientific theme. A scientific operations management team has also been formed, with an information systems project manager, a planning manager, a "user" relations manager, a studies, data and impact manager, one unit dedicated to national and international partnerships and another in charge of logistical aspects for all events related to projects' selection, monitoring, and evaluation.

To encourage the spread of best practices, we have implemented in-house information sharing tools and routinely ask for user feedback. Measures taken in 2014 have allowed us to make changes to our

generic call evaluation process based on the 2014 Work Programme. A mapping tool of projects and experts was created via the principal research item and when applicable the principal research application. This mapping tool assures that our project portfolios are as consistent and coherent as possible and conversely that the peer reviewers we call upon to evaluate them are the best qualified to do so. Drawing from the experience had with 2014's Work Programme, we have also implemented a process enabling project coordinators to give comprehensive feedback regarding changes made to their proposals for the 2015 exercise. Also, in February 2015, over 28,000 peer reviews were submitted to the 2015 generic call's approximately 6,900 pre-proposal applicants."

WHAT ARE YOUR PRIORITIES FOR THE COMING MONTHS?

"Addressing our relationship with our users is of course an issue that encompasses many of the agency's divisions. For project coordinators, DOS is on the frontlines. In summer 2013, when the 2014 Work Programme was released, special efforts were made to support the communities throughout these changes. After DOS was put in place, these actions were formalised to a greater extent. Our ambition is to put out the most comprehensive information possible. We wish to support researchers as fully as we can, going beyond the role of research funder. This action is conducted jointly with DCF for the "Relations with the institutions" component.

Lastly, the evaluation of allocated funding's impact on communities via ANR is one of the new missions that the government has entrusted the agency. We must therefore settle on a definition of the word "impact" in our context and determine, in concrete terms, how we ought to undertake our mission. An inventory of our internal initiatives and a benchmark of our foreign counterparts are currently underway. Work on this long-term endeavour will last through the end of the year and into 2016."



INTERVIEW

Funding project-based research also means getting the right amount of money into the hands of the right research teams within a given stretch of time. In the following interview, **Grant Agreement and Funding Director Pierre Colliot** details the creation of the DCF and the generic call for proposals, which ANR hopes will sync the agency up better with calendar-based institutions, boost recruitment of young researchers and give project coordinators added wiggle room.

IN JULY 2014, THE GRAND AGREEMENT AND FUNDING DIVISION WAS CREATED. WHAT WAS THE GOAL OF THIS REORGANISATION?

“ANR’s internal reorganisation, which took shape with the creation of the DCF, must allow it to effectively fulfil its role as a funder of project-based research by meeting agreement deadlines and accelerating and securing payments to beneficiaries, all within the scope of ANR’s financial and budget constraints and those of the beneficiary institutions. The DCF was set up to ensure that payments to the institutions take place within contractual schedules. The ability to rapidly disburse funds is the result of a procedure involving selection processes, evaluation by committees and panels set up by the agency, and approval and monitoring of projects. This is one of the reasons why the Scientific Operations Division (DOS) and the DCF were created simultaneously.”

WHAT CHANGES WERE MADE TO THE GRANT AGREEMENT PROCESS IN 2014?

“Until 2013, each call for proposals had its own launch date. There were therefore several grant agreement phases per year, and each agreement was wedged between the launch date and the scientific project’s end date. In fact, the 2,000 agreements drawn up by the agency every year each had their own payment deadlines, making mass payment management impossible. Since 2014’s transition to the generic call for proposals, there is only

one single agreement phase. We therefore created a dedicated team, the Grant Agreement Unit, which works in tandem with the Financial Unit, itself in charge of payments. These two activities are complementary.

Moreover, it was decided that all of the generic call for proposals’ grant agreements would go into effect on 1 October irrespective of the agreement’s signing date and the scientific project’s launch date. This date was chosen in order to facilitate recruitment of PhD and post-doctoral scholars. Proceeding this way also secures institutions’ cash flow management, as they can count on being “paid” October of each year.

The most recent development to date is the grant agreement’s duration, which is now systematically given a twelve-month extension from the end date of the scientific project. This “systematicity” will provide coordinators with increased leeway, the ability to launch their projects when they see fit, and to extend them within the duration of the grant agreement without necessitating the formalisation of a legal act.”

Ensuring compliance within and without: THE DUAL ROLE OF LEGAL AFFAIRS AND COMPLIANCE

Project-research funding is replete with complex, multi-layered questions, scientific and legal alike. The job of ANR's Legal Affairs and Compliance division (DAJC) is to shed light on the latter, as well as provide a permanently consultable presence and address the agency's most pressing questions and everyday business from legal and ethical standpoints. Read on for a short interview with Legal Affairs and Compliance Director Véronique Pauliac.



INTERVIEW

WHAT ROLE DOES YOUR DIVISION PLAY WITHIN THE AGENCY?

"The DAJC's main missions include providing expertise and legal advice, drafting legal acts, and implementing and monitoring a compliance scheme. The DAJC also advises General Management and the agency's operational divisions by informing the agency's decisions and legally safeguarding ANR's operations. The DAJC is active in the legal fields encompassed by our activities. By way of example, economic public law blends disciplines such as European law, company law, public procurement law and intellectual property law. Spelled out in terms of ANR needs, economic public law covers the following two main areas:

Public orders and purchases, or checking compliance relative to different public procurement contracts, threshold control (amounts above which advertising and public procurement competitive tendering procedures are determined, ed.), procedure launches, processing of contracts and purchase orders.

The second area is legal frameworks for grants allocated by ANR, especially interpreting, drafting, and approving legal proceedings and documents applicable to ANR, as well as verifying the lawfulness of subsidies from a European Union law standpoint."

HOW DO YOU PERSONALLY DEFINE "COMPLIANCE?"

"Compliance, a new concept in France, gives companies' legal functions, including those of French public organisations, a new

dimension. Until recently, the sole mission of legal advisers was to handle litigation. Law issues have now seeped into all fields, with legal advisers called upon to participate in institutions' decisions and provide legal safeguards.

The key idea behind compliance is to encourage more ethical practices and safeguard performance. The current objective is to ensure that ANR entities execute their respective strategies in compliance with set values, which implies different functions: legal, risk, ethics, morality...

Compliance is a comprehensive approach that goes beyond abiding by applicable regulations, enabling evaluation of structural exposure to legal as well as operational, strategic, and reputational risk. Compliance is at the crossroads of ethical and legal questions and requires time and investment from virtually all departments to succeed.

At ANR, compliance designates the lawfulness of its activities relative to existing law, but also for example ethical principles and avoiding conflicts of interest. Conflicts of interest arise when individuals hold competing interests. The individual risks compromising his or her ability to make impartial judgements. ANR, which strives for transparency and integrity in its procedures, must protect itself from said risk.

In conclusion, the DAJC's ambition is to construct a corpus of specific and well-adapted rules capable of expressing our values and enabling their proper application in ANR's activities."

Achieving transparency THROUGH INFORMATIONAL CLARITY

By virtue of its missions as a scientific research funder, ANR is at the locus of a vast network of counterparts and contacts, including scientific project coordinators, research bodies, universities and other research funding agencies, just to name a few. Due to the diversity of these contacts, the agency clearly states its action areas and provides contacts with comprehensive, high quality information to accurately identify their expectations. Wide-ranging efforts have been made to this end.

In 2014, following the creation of the Scientific Operations Division (DOS) and the Grant Agreement and Funding Division (DCF), user-agency relations were split into two theme areas; DOS was assigned relations with project coordinators, and relations with beneficiary institutions were placed under the purview of the DCF. We had the chance to meet with Pierre Colliot (DCF Director/Accounting officer) and Laurence Guyard (User relations manager, DOS) for a couple of questions.



INTERVIEW

WHAT DOES ANR'S NEW RELATIONAL MODEL WITH INSTITUTIONS CONSIST OF?

Pierre Colliot, Grant Agreement and Funding Director (DCF), Accounting Officer

“The DCF handles the execution of grant agreements with institutions (ANR project coordinators' research institutions). Until now, such agreements were conducted between a grant manager at ANR and a project coordinator. It should be noted that grant agreements do not bind individuals, but rather two legal persons under public law: ANR and the project coordinator's institution.

So the challenge is to start from scratch, forging new, unfamiliar relationships with institutions, which requires a high degree of flexibility, especially given the diversity of partners involved. Partners can range from universities to private firms to research bodies to grandes écoles (prestigious top-ranking French schools).

We need to get our foot in the door and develop communication groups between like-minded partners. We have already begun working with CNRS to look at simplifying procedures, and hope to find a university contact for more expansive and transparent communication with academia.”



WHAT KINDS OF ACTIONS HAVE BEEN IMPLEMENTED REGARDING PROJECT COORDINATORS?

Laurence Guyard, User relations manager, DOS

“Our desire is to support project coordinators as best we can by providing the clearest and most appropriate information possible.

Implementing the Work Programme and the generic call for proposals has been a great change for the national scientific community. Since its launch in the summer of 2014, we have done our very utmost to explain these changes. Interactions with project coordinators have therefore been primarily focused on the generic call for proposals. During the summer of 2013, the DOS set up a single contact address for project coordinators. For each of the call process's key phases, a cell composed of resource persons was formed in order to rapidly and uniformly respond to coordinators' questions.

Several changes have been made to the 2015 exercise, guided by experiences had with the 2014 Work Programme. Substantive work was made in order to improve the quality of supporting documents (Work Programme, guides, etc.). The FAQ published on the agency's website is one example of such work.

Lastly, in order to make our processes more transparent, we have provided pre-proposal coordinators with project evaluations during the earliest selection stage.

Similar actions meant to support and inform have been set up for use by project evaluators.

Our goal is to never stop getting better; we will be gathering internal feedback concerning the 2014 exercise and have already conducted a survey of first-stage evaluators.”

Getting the word out ABOUT FUNDED PROJECTS' SCIENTIFIC FINDINGS

ANR strives to cater to the needs of the different scientific communities that populate the research landscape. It has fit itself out with the tools necessary to monitor projects and is gradually measuring the impact of funding tools offered in the research landscape.

The agency's communication has developed information tools directed to stakeholders, whether they be project-based funding users (research teams), partners within ANR's sphere of activity, national and international research and higher education institutional bodies. The agency also disseminates news to the general public when remarkable findings, successes, major scientific breakthroughs and results with major societal impacts are made by ANR-funded projects.

The communication and information division (DICO) manages communication campaigns and other operations. The DICO contributes its know-how to ANR teams, offering them a full range

of services from international and corporate communication, press relations, digital multimedia information, and planning and organisation of events and science conferences.

Throughout 2014, the ANR website, social networks, the annual activity report and events shone a spotlight on ANR actions as well as findings made by ANR-funded projects.

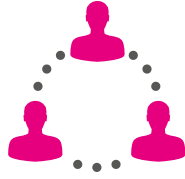
For 2015, the DICO has continued along lines set out for external communication by reaching out to an increasingly international audience. The DICO has been equally heedful of maintaining internal communication to keep ANR's performance on track. Motivation, involvement, and a skilled ANR staff are prime determinants of agency performance. These elements are predicated on accurately informed collaborators; a collaborative in-house social network, meant to reinforce the above-mentioned functions, is to be implemented in 2015.



► NUMBERS THAT MATTER...



11 events
organised promoting science



Over
2,000
attendees



1 French website and
dedicated international website



123 news
items posted:
80 in French, **43** in English
totalling **61,000** words



1,115,541
hits on the ANR website



605,765
different visitors



3,064,082
page views



575
website updates



3,561
followers on Twitter,
79%
more than last year



1,299
followers on LinkedIn

ANR is made possible by...

A PATCHWORK OF SKILLS AND PROFESSIONS SUPPORTING THE AGENCY IN ITS MISSIONS

A DEDICATED MANAGEMENT TEAM WITHIN THE SCIENTIFIC OPERATIONS DIVISION...

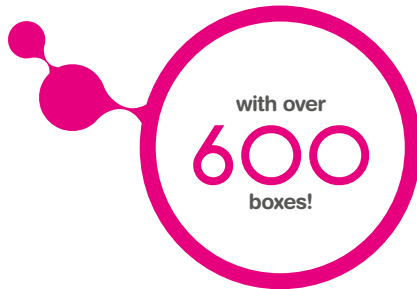
ANR relies on the expertise of a **scientific operations planning and steering manager**, a **user relations manager**, and a **studies, data and impact manager** tasked in particular with giving structure to the agency's brand new "impact" activity area.

A **unit devoted to national and international scientific partnerships** is also taking shape. Another unit handles the **logistical aspects of ANR events** dealing with projects' evaluation, selection, and monitoring: evaluation panels, steering committees, projects' midway review meetings, science conferences, etc.

Lastly, a **project manager develops, in collaboration with the Information Systems Division, a range of IT tools** to assist in the professional needs of science divisions throughout the entire project selection stage. In particular, it is possible to automatically generate mind-maps in order to visualise projects in their entirety using different analytical metrics.

HELPING TEAMS MOVE: GENERAL AFFAIRS AND LOGISTICS TAKES CHARGE!

In 2014, General Affairs and Logistics was given the responsibility of relocating all ANR agents. The massive undertaking set out to bring together all ANR teams in a single place: 50 avenue Daumesnil in Paris's 12th arrondissement. **350** people total made the move...



THE INFORMATION SYSTEMS DIVISION (DSI) IMPLEMENTS HIGH-PERFORMANCE INFORMATION TOOLS

Internal development efforts by the DSI have resulted in new turnkey information tools. **"Made in ANR"** solutions ensure the agency greater flexibility, responding effectively and rapidly to clients' needs, as well as those of agents and the international scientific community. Such tools are welcome in the complex and fluctuating field of project-based research.

One especially noteworthy example is the management application for the first stage of the generic call for proposals, a "100% home-brewed" product. This application allows project coordinators to submit their projects in a few clicks, for evaluators to highlight and publicise dossiers submitted and ANR agents to efficiently manage their portfolio of submitted projects.

MADE IN ANR

MULTIDISCIPLINARY PROFILES RECRUITED BY HUMAN RESOURCES



In 2014, **14**
senior scientists,



11
junior scientists



and **29**
administrative profiles
were recruited.



Human resources: ENSURING WORKPLACE QUALITY, BOOSTING EMPOWERMENT

The nearly decade-old ANR's organisation has never stopped evolving, with missions that continue to expand and move forward. This agility implies exacting policy, especially when it comes to human resources. Every effort has been made to provide attractive career development opportunities, including through mobility and training.

Following sharp growth between 2009 and 2012, ANR's workforce numbers are now relatively stable. Since 2013, the agency's human resources policy has succeeded in bringing down the rate of fixed-term contracts from 60% in 2012 to 23% at the end of 2014. Along with the stabilising of internal competencies, the agency is developing a team training policy. Promoting rich and diverse career paths, it endeavours to ease mobility for employees who wish to segue into new careers.

A CAREER PATH DEVELOPMENT TOOL

Professional mobility is a valuable skills and qualifications development tool. Experience gained in the exercise of different functions and diversity of career paths contribute to employees' enrichment, as well as that of the organisations employing them.

ANR strives to provide its employees with internal and external mobility opportunities. For the majority of its recruiting needs, the agency posts information concerning vacant in-house positions. The idea is also to strengthen bridges between differing but complementary professions and departments. In order to fill skills gaps while offering an effective means for furthering career paths, the agency is seeking to develop external mobility.

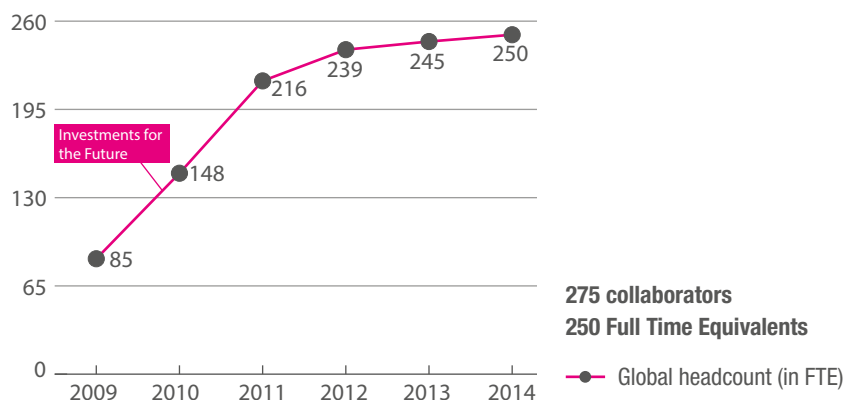
Along with INPI (National Institute of Industrial Property), France Agrimer and Ademe (French Environment and Energy Management Agency), ANR also signed on March 2014 a charter designed to facilitate inter-organisational mobility.

In concrete terms, a network of "mobility correspondents" was formed within the HR teams. This gives collaborators the possibility to "securely" apply to partner structures' offers, with each application receiving attention from the human resources department. Successful applicants are supported throughout the mobility period; employees are entitled to feedback from their institutions of origin upon completion.

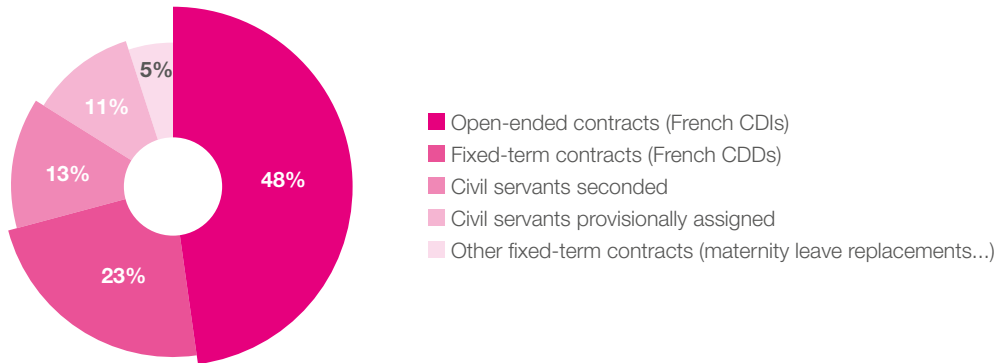
INTERNAL MOBILITY, BOOSTING EMPOWERMENT

In three years' time, nearly 60 people have switched positions at ANR in both the support teams and the scientific sphere. In 40% of cases, this mobility has resulted in increased empowerment and awareness of individual responsibilities.

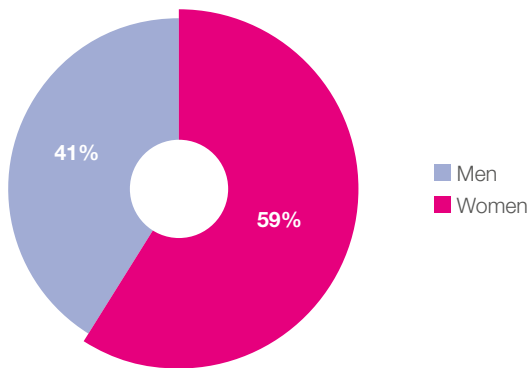
► WORKFORCE EVOLUTION 2009-2014 (IN FTE)



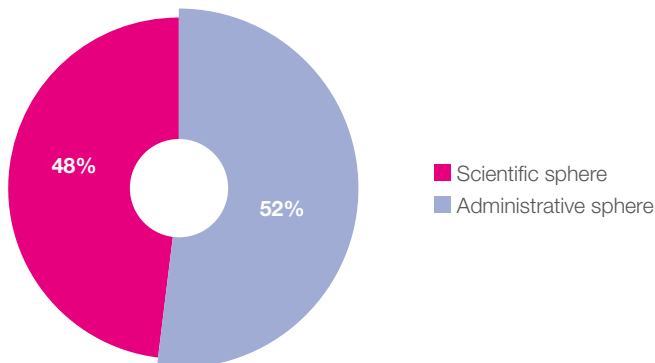
► WORKFORCE DISTRIBUTION BY STATUS AS OF 31 DECEMBER 2014 (% FTE)



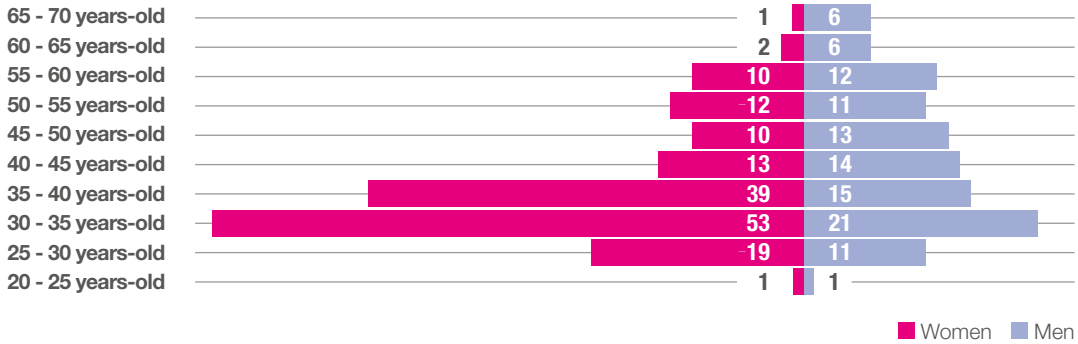
► WORKFORCE DISTRIBUTION BY GENDER AS OF 31 DECEMBER 2014 (% OF COLLABORATORS)



► WORKFORCE DISTRIBUTION BY POSITION AS OF 31 DECEMBER 2015 (% OF COLLABORATORS)



► MALE/FEMALE POPULATION PYRAMID AS OF 31 DECEMBER 2014



AN EXECUTIVE MASTER'S DEDICATED TO RESEARCH MANAGEMENT

At a time of deep-seated changes, opening up to international competition and organisational fine-tuning, research management is a profession which stands alone. Up until 2012, there was no dedicated training in the domain. To address this gap, ANR and Paris-Dauphine University created an executive master's from the ground up. Provided as part of in-service training, this degree offers research professionals from advanced scientific backgrounds with several years of experience a chance to professionalise this function via a certification-oriented high-level management training curriculum. Open to ANR employees, this training has also been accessible to staff from other structures since 2014. Three graduating classes and over 40 students have pursued and passed training courses.

2014, A YEAR MARKED BY CONCERTATION AND SOCIAL DIALOGUE

Since 2012, the social dialogue put in place at ANR featuring new representative bodies has collaboratively addressed both contract policy and remuneration, as well as the Agency's internal organisation. In 2014, agency employees were twice invited to elect its representatives.

- In June, two personnel representatives and their alternates were elected to represent employees on the agency's Governing Board.
- In November, staff members sitting on the Technical Institution Committee (CTE) and the Joint Advisory Committee (CCP) were renewed. The staff representatives on the newly created hygiene, safety, and working conditions committee (CHSCT) were designated as well.





INTERVIEW

In a brief interview, ANR **Human Resources Director Philippe Terral** explains that the agency's expertise, though manifold, is particularly specialised in matters of funding and drawing up grants based on scientific criteria. While assigning this function a more prominent role, internal adjustments have remained unerringly focused on workplace quality and input from personnel representatives, ensuring a smoother reshuffling of the talent pool and emphasising internal mobility.

THE AGENCY'S INTERNAL REORGANISATION HAS DETERMINED MOST OF 2014'S RHYTHM. HOW HAS HUMAN RESOURCES CONTRIBUTED TO THIS PROCESS?

"The goal of reorganising was to harmonise our practices, to improve our processes in order to better serve the research communities. The idea was to make our organisation more transparent, putting our two sources of expertise front and centre: our scientific vocation and the Scientific Operations Division, as well as our knowledge on the subject of funding and drawing up grants, with the aid of our dedicated department. From a human resources standpoint, this reorganisation, as well as the decree of March 24, have given rise to cross-departmental needs, especially within the scientific sphere, for planning of scientific operations integrating different entities' workload schedules, balance sheets and information on funding impact. We've been able to fill the vast majority of these posts through internal mobility, diversifying many a collaborator's career path, enabling them to take on greater responsibilities."

REORGANISATION, MODIFICATIONS TO SCOPE OF ACTION, NEW GOVERNANCE... ANR HAS RECENTLY UNDERGONE A GREAT DEAL OF CHANGES. HOW HAVE THESE CHANGES BEEN MONITORED AND ACCOMPANIED?

"You're right. Since its creation and especially in the last few years, the agency has never stopped evolving and demonstrating its ability to adapt. ANR's new CEO, with his awareness of demands in terms of energy and possible adjustment problems caused by change, undertook decisive action toward greater workplace quality shortly after taking up his position, in consultation with personnel representatives. A highly pragmatic approach was adopted toward improving workplace quality and addressing associated psychosocial risk factors. The action is steered by a working group bringing together the General Management, the human resources division and its hygiene, safety, and working conditions committee. An improvement and prevention action plan based on precise themes will be drawn up by this steering group and volunteer working groups. The objective is to implement an action plan before the end of 2015."



07

PERFORMANCE & STATISTICS

- ▶ Budget
- ▶ 2014 Calls for proposals
- ▶ 2014 Specific international calls for proposals
- ▶ 2014 International collaborations under the generic call for proposals
- ▶ Investments for the future - Cash outflow situation

99

102

104

108

110

BUDGET

Total expenditures in 2014 amount to €1,033.6 M:

- ▶ Expenditures related to the management budget (including investment expenses) amount to €33.3 M in payment appropriations.
- ▶ Funding expenses (including allocations to provisions) amount to €1,000.3 M in payment appropriations. The funding envelope makes up 97% of 2014's total expenditures.

FUNDING BUDGET

The 2014 funding budget was executed in the amount of €553.7 M in commitment appropriations, 96.6% (€534.9 M) of which was allocated by the Ministry of National Education, Higher Education and Research, with 3.4% (€18.8 M) from co-funders.

The 2014 funding costs amount to €622.2 M, breaking down into €460 M for calls for proposals and €162.2 M for actions not funded by calls for proposals (Préciput (praecipium), Carnot ...).

A volume of 91% (€416.6 M) of payment appropriations went to calls for proposals, corresponding to the coverage of liabilities prior to 2014. Liquidations in 2014 correspond to initial advances on projects selected in 2014 in the amount of €434 M for calls for proposals, or 9.4% of amounts committed in 2014 under calls for proposals.

Liquidations outside of calls for proposals amounted to €162.2 M in 2014, €88.4 M of which went toward commitments made prior to 2014 (Essentially Préciput and Carnot programme, subject to multiannual coverage). This €162.2 M sum includes inter alia €38 M paid in 2014 to INCa (French National Cancer Institute).

Allocations to provisions correspond to an evaluative amount for needs corresponding to 2014 commitments, which will fall due in the forthcoming years. Total provisions amount to €378 M. The overall amount of provisions recognised by ANR enables coverage of the institution's debt as estimated until 21/12/2014.

MANAGEMENT BUDGET

Expenditures relating to the management budget correspond to three envelopes: Personnel, Operation and Investment. In 2014, management budget expenditures amount to €33.3 M, down by €0.9 M from 2013 (or -2.6%).

ANR has a total 2014 workforce of 250.3 FTEs (full-time equivalents) with 36.4 FTEs working in activities in connection with the Investments for the Future programmes.

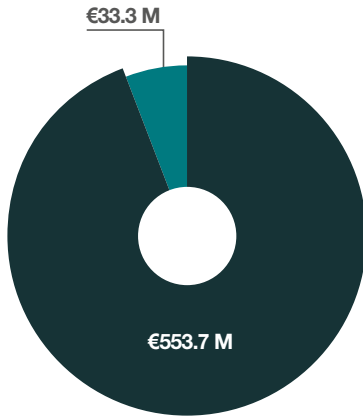
At the end of 2014, the workforce was comprised of 41% open-ended contracts (French CDIs), 14% fixed-term contracts (French CDDs) and 13% civil servants on secondment.

ANR's total 2014 workforce is comprised of 250 FTEs, which has remained stable compared to the 2013 exercise. Personnel expenditures totalled €14 M in 2014, down from €0.1 M from 2013.

The operating envelope includes all management costs recorded in ANR's statement of revenue and expense: purchases of goods for amounts lesser than ANR's €500 excl. tax capitalisation threshold, external services, hiring and maintenance, rents, repayment of personnel provided and depreciation charges. This envelope amounts to €17.2 M, or a consumption rate of 96%.

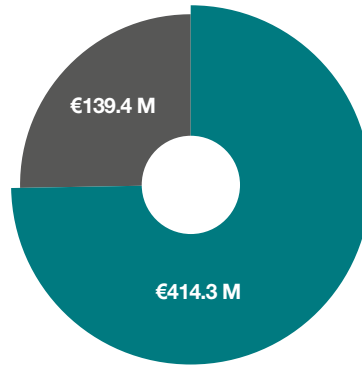
- ▶ Expenditures related to human resources management falling outside the personnel envelope amount to €4.3M.
- ▶ Overheads amount to €5 M.
- ▶ Expenditure in connection to evaluation panels and committees and project follow-up events amount to €4.7 M.
- ▶ Depreciation charges amount to €1.1 M.
- ▶ Investment expenditures in 2014 amount to €2.1M.

► ANR GLOBAL BUDGET (€M)



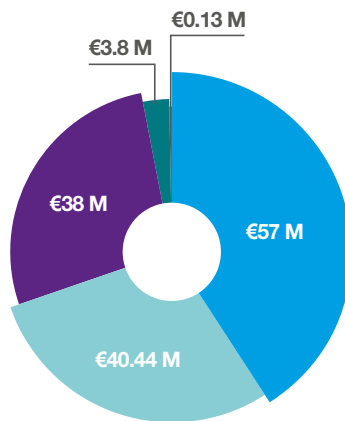
- Funding budget
- Management budget

► ANR FUNDING BUDGET (€M)



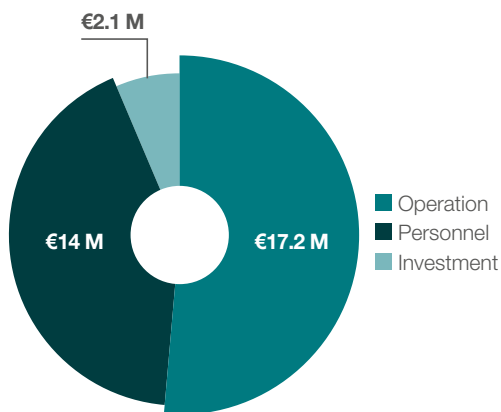
- Allocated through calls for proposals
- Allocated outside of calls for proposals

► FUNDING ALLOCATED OUTSIDE OF CALLS OF PROPOSALS (€M)



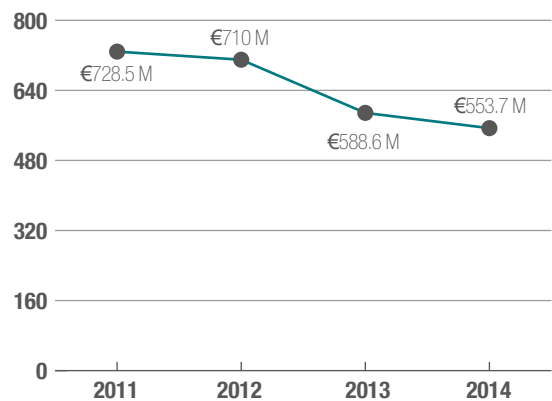
- Carnot Institutes
- Praecipium
- INCA
- RTB
- Animation

► ANR MANAGEMENT BUDGET (€M)



- Operation
- Personnel
- Investment

► FUNDING BUDGET EVOLUTION (2011-2014)



-73.2%

3%

-66.4%

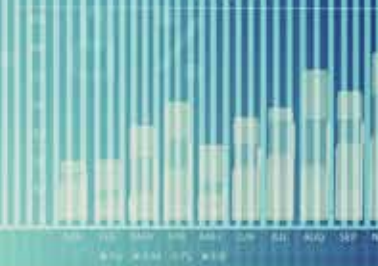
Sale Buy Grow



Gold	\$647.00	\$904.51	39.80%
Platinum	\$381.00	\$509.78	33.80%
Silver	\$74.00	\$1,061.93	37.20%
Copper	\$66.00	\$837.76	36.00%
Steel	\$449.00	\$537.90	19.80%
Beryllium	\$763.00	\$754.89	-1.60%
Manganese	\$598.00	\$795.34	33.00%
Aluminum	\$599.00	\$354.61	-41.60%
Chrome	\$680.00	\$727.47	7.00%
Nickel	\$421.00	\$451.84	7.80%
Bauxite	\$730.00	\$791.32	8.40%
Cotton	\$152.00	\$196.34	29.20%
Flax	\$172.00	\$192.97	12.20%
Textiles	\$243.00	\$330.48	36.60%
Wool	\$261.00	\$359.66	37.80%
Fur	\$116.00	\$118.49	2.10%
Satin	\$301.00	\$374.43	24.40%
Silk	\$177.00	\$171.79	-2.90%
Oil	\$69.00	\$81.19	17.70%
Gas	\$515.00	\$381.16	-26.20%
Electric power	\$578.00	\$88.44	-84.50%



Aluminum	354.61
Chrome	727.47
Copper	837.76
Gold	904.51
Iron	451.84
Nickel	451.84
Oil	81.19
Platinum	509.78
Silver	1061.93
Steel	537.90
Wool	359.66
Electric power	88.44



► 2014 CALLS FOR PROPOSALS

CALLS FOR PROPOSALS	ELIGIBLE PRE-PROPOSALS	ELIGIBLE FULL PROPOSALS (STAGE 2 OF EVALUATION OR 1-STAGE CALLS)
Major Societal Challenges		
Generic call (Collaborative Research Projects, Young Researchers)	5,779	1,953
ASTRID, including ASTRID Maturation (dual research)		128
Challenge competitions		
At the Frontiers of Research		
Generic call - All-Knowledge Challenge (Collaborative Research Projects, Young Researchers)	933	292
OH Risk		62
Building the European Research Area and France's International Attractiveness		
Generic call (International Collaborative Research Projects)		883***
Setting up European or International Research Networks ("Research networks" instrument in 2014)	31	29
Hosting High Level Researchers		185
Specific International calls for proposals*	822	532
Economic Impact of Research and Competitiveness		
Generic call (Collaborative Research Projects involving Enterprises)	1,463	441
LabCom		170
Industrial Chairs		8
TOTAL		4,683

*See the details of specific international calls page 104

** DGA (French Armaments Procurement Agency) budget

*** Includes pre-proposals

PROJECTS FUNDED	SUCCESS RATE / ELIGIBLE PROJECTS (STAGE 2 OF EVALUATION OR 1-STAGE CALLS)	ANR FUNDING (€M)	AVERAGE FUNDING PER PROJECT (€k)
473	24.2%	184.4	389.9
36	28.1%	11.1**	308.5
81	27.7%	28.3	349.3
17	27.4%	7.7	454.7
92	Not applicable	25.9	281.9
20	69%	1.1	57.3
30	16.2%	14.9	495.7
124	23.3%	31.9	257.4
157	35.6%	96.6	615.5
38	22.4%	8.4	300
3	37.5%	3.8	1,277.2
1,071	25.8%	414.3	386.8

► 2014 SPECIFIC INTERNATIONAL CALLS FOR PROPOSALS 1/2

CALLS FOR PROPOSALS	THEME
Challenge 1. Efficient resource management and adaptation to climate change	
Multilateral call under FACCE-ERA-NET+	Smart agriculture and climate change
Multilateral call under JPI Climate	Societal Transformation in the Face of Climate Change
Multilateral call under Belmont Forum	Scenarios of Biodiversity and Ecosystem Services
Multilateral call under Belmont Forum	Arctic Observing and Research for Sustainability
Sub-total CHALLENGE 1	
Challenge 3. Industrial renewal	
Multilateral call under ERA-NET M-ERA.NET	Integrated Computational Materials Engineering
Multilateral call under ERA-NET ERA-MIN	Sustainable Supply of Raw Materials in Europe
Bilateral ANR-JST Franco-Japanese call	Molecular Technology for Functional Materials (shared with challenges 2,4,7)
Sub-total CHALLENGE 3	
Challenge 4. Health and well-being	
Multilateral call under ERA-NET Infect-ERA	Human infectious diseases
Multilateral call under ERA-NET E-Rare-2	Rare diseases
Multilateral call under ERA-NET Neuron II	Neuroinflammation
Multilateral call under ERA-NET EuroNanoMed II	Nanomedicine
Multilateral call under ERA-NET ERASynBio	Synthetic biology
Multilateral call under JPND	Neurodegenerative diseases (cohorts)
Multilateral call under JPND	Neurodegenerative diseases (pathways)
Multilateral call under JPI AMR	Antibacterial resistance
Sub-total CHALLENGE 4	

ELIGIBLE FULL PROPOSALS INCLUDING FRENCH PARTNERS (STAGE 2 OF EVALUATION OR 1-STAGE CALLS)	SELECTED PROJECTS INCLUDING FRENCH PARTNERS	ANR FUNDING (€M)
20	7	1.42
5	3	0.58
6	3	0.26
7	3	0.57
38	16	2.83
25	4	1.41
1	1	0.33
37	4	0.93
63	9	2.67
23	6	1.30
26	9	2.22
25	8	1.65
16	4	1.56
20	3	0.95
11	1	0.05
22	8	1.89
15	4	0.98
158	43	10.60

► 2014 SPECIFIC INTERNATIONAL CALLS FOR PROPOSALS 2/2

CALL FOR PROPOSALS	THEME
Challenge 5. Food security and demographic challenges	
Multilateral call under ERA-NET SUSFOOD	Sustainable food production and consumption
Multilateral call under ERA-NET BIODIVERSA 2 in association with JPI FACCE	Agriculture and biodiversity
Multilateral call under ERA-NET ANIHWA	Animal Health and Welfare
Multilateral call under ERA-NET COFASP	Fisheries, Aquaculture and Seafood Processing
Multilateral call under Belmont Forum in association with JPI FACCE	Food security
Multilateral call under JPI HDHL	Biomarkers in Nutrition and Health
Sub-total CHALLENGE 5	
Challenge 7. Information and communication society	
Multilateral call under ERA-NET CHIST-ERA	Information and Communication Sciences and Technologies
Franco-American call ANR/NSF/NIH	Computational neurosciences (shared with Challenge 4)
Sub-total CHALLENGE 7	
Challenge 8. Innovative, inclusive and adaptive societies	
Multilateral call under ERA-NET+ NORFACE	Welfare State Futures
Multilateral call under the ORA initiative with Germany, the Netherlands, United Kingdom and China	The Green Economy and Understanding Population Change
Multilateral call under ERA-NET+ Heritage+	Cultural heritage
Sub-total CHALLENGE 8	
Challenge 9. Freedom and security of Europe, its citizens and its residents	
Bilateral Franco-German ANR-BMBF call	Protection of critical infrastructures
Sub-total CHALLENGE 9	
Challenge 10. All-knowledge Challenge	
Bilateral Franco-German ANR-DFG call in social sciences and humanities	Social sciences and humanities
Sub-total CHALLENGE 10	
TOTAL	

Please note: This table does not include bilateral collaborations implemented under the Generic call for proposals

ELIGIBLE FULL PROPOSALS INCLUDING FRENCH PARTNERS (STAGE 2 OF EVALUATION OR 1-STAGE CALLS)	SELECTED PROJECTS INCLUDING FRENCH PARTNERS	ANR FUNDING (€M)
6	2	0.52
31	6	1.70
24	8	1.24
2	1	0.43
4	2	0.68
10	2	0.84
77	21	5.42
56	5	1.70
31	6	1.61
87	11	3.31
7	0	
16	6	1.17
23	6	1.17
22	3	2.91
22	3	2.91
77	15	3
77	15	3
532	124	31.91

► 2014 INTERNATIONAL COLLABORATIONS UNDER THE GENERIC CALL FOR PROPOSALS

COUNTRY	THEMES
Brazil (FAPESP and FACEPE)	Microbiology, immunology, infectiology Marine research Social sciences and humanities
Canada (NSERC)	Scope of the target areas of the NSERC's Strategic Projects Grant (SPG) programme and within the scope of ANR's challenges (societal challenges and all-knowledge challenge)
China (NSFC)	Information and communication sciences and technologies
Hong Kong (RGC)	Major societal challenges and all-knowledge challenge
India (DST)	Neurosciences; Engineering science
Luxembourg (FNR)	Major societal challenges and all-knowledge challenge
Romania (ANCS)	Major societal challenges and all-knowledge challenge
Taiwan (MOST)	Major societal challenges and all-knowledge challenge
USA (NSF)	Chemistry
Collaborations under Lead Agency Process (Lead agency outside ANR)	
Austria	Major societal challenges and all-knowledge challenge
Germany	Major societal challenges and all-knowledge challenge
Switzerland	Major societal challenges and all-knowledge challenge
TOTAL	

PRE-PROPOSALS SUBMITTED (WHEN APPROPRIATE)	ELIGIBLE FULL PROPOSALS	PROJECTS SELECTED	ANR FUNDING (€M)
26	16	2	0.91
27	8	3	1.25
46	5	3	0.79
63	16	5	1.4
87	9	2	0.34
52	21	4	1.31
110	22	2	0.58
54	28	8	2.06
16	7	5	1.55
N/A	79	11	2.88
N/A	239	35	9.66
N/A	82	12	3.23
	532	92	25.96

► INVESTMENTS FOR THE FUTURE - CASH OUTFLOW SITUATION AS OF 31 DECEMBER 2014

ACTION	NUMBER OF PROJECTS FUNDED	TOTAL AMOUNT ALLOWED (€M)	TOTAL AMOUNT DISBURSED AS OF 31/12/2014 (€M)
Bioinformatics	12	17	12.4
Biotechnology & Bioresources	13	88	38.8
Cohorts	10	74.5	25.5
Theme-based Technology Transfer Consortiums	6	49	11.7
Pre-industrial Biotechnology Demonstrators	4	78	36.8
Equipment of Excellence	93	591	406.9
National Infrastructures in Health and Biotechnology	23	497	240.8
Initiatives of excellence (including LABEX and IDEFI in IDEX)	117	2,211	801.8
Initiatives of Excellence in Innovative Training (excluding IDEX)	27	138	55.4
Carnot Institutes	38	79	23.5
Technological Research Institutes	8	920	197.7
Energy Transition Institutes	12	411	61.4
Research Hospitals	6	349	200.8
Research Hospitals B	6	35	21.8
Laboratories of Excellence (excluding IDEX)	75	684	254.9
Nanobiotechnology	8	19	11.2
Research Hospitals in Oncology	2	20	11.2
Technology Transfer Acceleration Companies	14	857	285.6
Nuclear Safety and Radioprotection	21	50	4.9
TOTAL	495	7,167.5	2,703



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Sophie Ferrand

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