



 2013 Annual report

AGENCE NATIONALE DE LA RECHERCHE

ANR





Pascale Briand

Editorial



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In both basic and applied research fields, funding is becoming increasingly more competitive. ANR, the French National Research Agency, has taken steps to increase the quality of science funding through new instruments, restructured application processes and a drive toward international collaboration and interdisciplinary partnerships. We have now financed more than 12,000 research projects, including 1,040 international projects in partnership with funding agencies in other countries.

Since its creation in 2005, ANR has thus undergone profound changes to transform and consolidate its position in the French research ecosystem and the European Research Area. 2013, and more generally the years 2012-2014, represent a period of listening and professionalisation, refocusing and widening of ANR's remit, a transition period in which we have innovated - as much in our organisation as in our funding offering - in response to the needs of the scientific community and Government guidelines. Noteworthy in the 2013 agenda was the preparation for the changes in ANR methods of proposal submission and evaluation with the introduction of the two-stage evaluation process.



ANR uses eminent scientists in all disciplines from all over the world to evaluate and select the best projects among those submitted. It has funded more than 12,000 research projects to date.

The year also saw the extension of our networks of partners, thereby allowing an increase in co-funding and in the services we can offer to other players. As it approaches its tenth anniversary, ANR is now well established on the European and international scene and acknowledged for the effectiveness of its actions, as witnessed by its presence in numerous global forums and its fruitful partnerships with the main funding agencies abroad. Examples illustrating this include ANR's entry onto the governing board of Science Europe, its co-chairing of the Belmont Forum and the driving role it plays within the Open Research Area (ORA) initiative in social sciences.

From the moment it was created, ANR concentrated on rapidly integrating the European and Global networks, thereby facilitating the international collaborations of the French teams levered by project-based funding. This makes sense and mirrors the development of ANR's counterparts in the leading countries for research which, quite rightly in my opinion, have been constantly reinforcing their funding agencies for a good number of years already.

Let us wager that France will share this benevolent pro-innovation attitude and give project-based funding the resources necessary to finance the most ambitious scientific research work at a level commensurate with the stakes.

DIRECTOR GENERAL

Almost ten years after its creation in 2005, ANR has achieved many milestones, at both national and international level.



I • ANR's curriculum vitae



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Our Profile

Name: Agence Nationale de la Recherche, the French National Research Agency (ANR)

Date of creation: In two steps: creation of ANR in February 2005 as a public interest grouping, then, further to the decree of 1st August 2006, ANR became an "EPA" (public administrative establishment) on 1st January 2007. The decree of 24th March 2014 has consolidated the missions of ANR.

Location: Paris

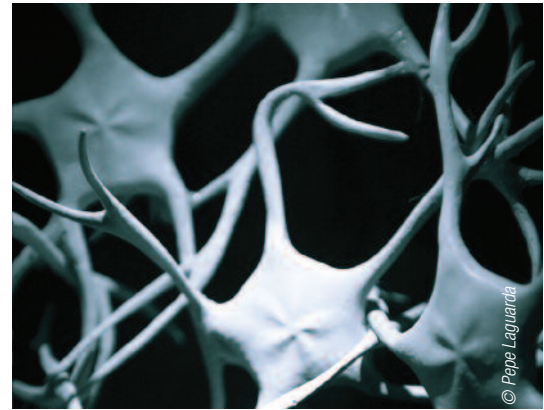
Role and missions: ANR's chief mission is to organise the funding of research projects on a competitive basis. It provides funding in all fields of science – for both basic and applied research – to public research organisations and universities, as well as to private companies. It not only acts as a catalyst for creativity but also contributes to scientific dialogue and interdisciplinary research. Ultimately, it is a question of both enhancing the competitiveness of France and developing the visibility and renown of its research beyond France's borders.

Distinguishing features: The ANR's work seeks to encourage new young talents, targeting new areas to invest in, developing ties and partnerships between the public and private sectors, and facilitating collaboration between French teams and the best foreign teams. To achieve this, ANR has a whole range of funding instruments adapted to the various challenges and needs of the scientific community. Since 2010, ANR is also prime manager of the Investments for the Future programme, with responsibility for project selection, funding and monitoring.

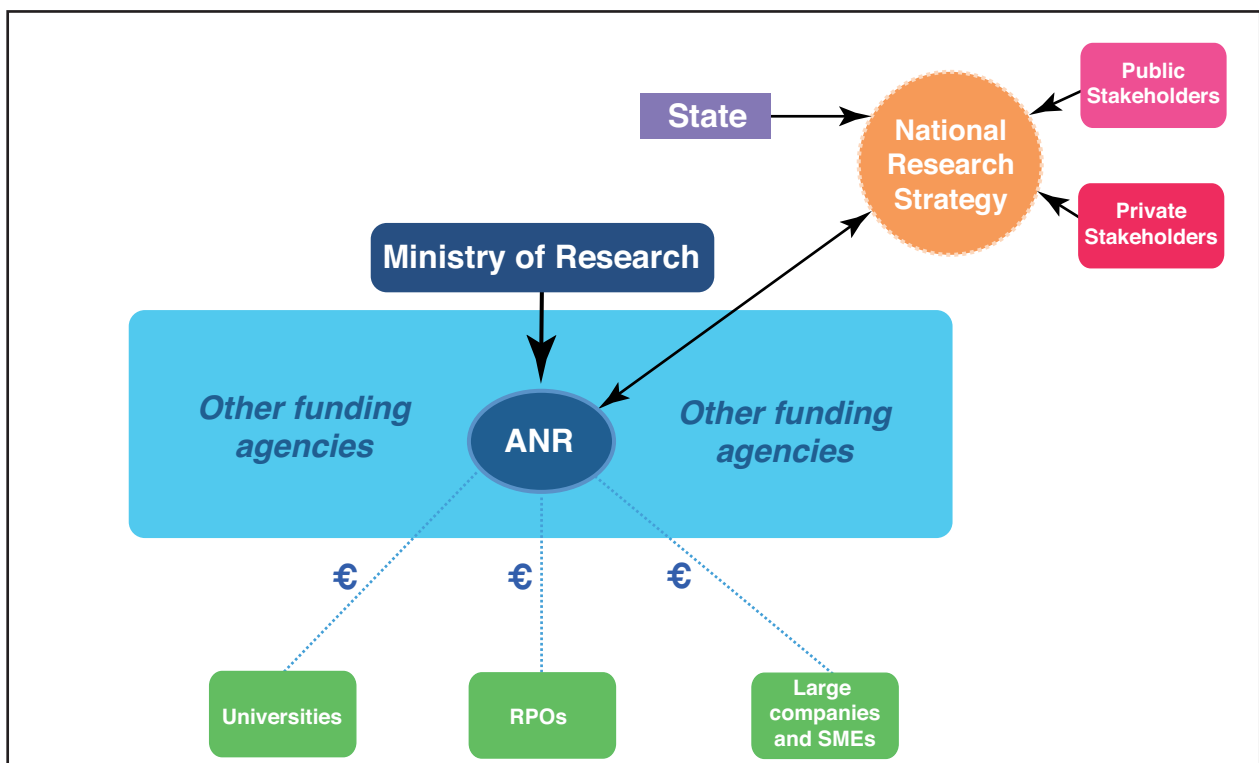


Projects for science

- Directing the research to scientific, technological and societal issues
- Targeting and focusing resources on the best projects
- Encouraging creativity and generating leaps in scientific knowledge
- Keeping or acquiring leadership on new topics
- Assisting young researchers
- Facilitating European and international partnerships
- Speeding up production and transfer of knowledge in public-private partnerships
- Fostering interdisciplinary work and dialogue between disciplines



ANR in the French research landscape



ANR is a research funding agency that reports to the Ministry of Higher Education and Research. It funds both public entities (Research Performing Organisations - RPOs and universities) and private entities (large groups, SMEs).

The ANR programme planning defined in its "Work Programme" is the result of collaborative work between the various national research system stakeholders (alliances of RPOs, CNRS, ministries, private stakeholders, etc.). Thus, the ANR Work Programme is firmly rooted in the French national research strategy (SNR).

ANR also creates partnerships with other French research funders, such as the DGA - defence procurement agency and the DGOS - general directorate for healthcare.

Within the framework of Investments for the Future, ANR is the main operator of the Commissariat-General for Investment (CGI), which is under the authority of the Ministry of the Economy.

ANR in figures

432.5

million euros
2013 budget devoted to
the funding of research
projects

279

staff, representing

245

full-time equivalents worked,
taking into account the part time personnel

€320 k to €880 k

this is the average range of the amount of the
grants awarded to the projects selected by the ANR

More than **12,000**

this is the number of projects
funded since ANR was created
in February 2005

including

1,040

international projects co-funded
with foreign counterparts

4,850 ongoing projects
in the portfolio

More than

15,000

peer reviewers, including
45% of high-level experts
from all over the world

20,300 ongoing grant
agreements

A wide range of funding instruments serving the different scientific communities

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

Three types of instrument are available:

- funding instruments dedicated to individuals,
- funding instruments targeting collaborative research,
- funding instruments for project initiation.

Each of these instruments meets a clearly identified end-purpose, including fostering the autonomy and scientific innovation capacity of young researchers, enhancing the international appeal of the French research system, encouraging the creation of lasting bonds between academic and industrial spheres, increasing the collaboration between research teams who would not habitually have worked together, with a view to obtaining more ambitious results that break away from conventional paths. These instruments can also be used on behalf of other public or private entities who wish to benefit from ANR's know-how in project-based research funding.

Hosting High-Level Researchers • FLASH
 call for proposals • Industrial chairs • Challenge
 competition • Young researchers • LabCom •
 OH Risk • International projects • Academic
 collaborative projects • "Enterprises" collaborative
 projects • (formerly public-private partnership
 projects) • Research networks • OH Risk
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2013, an “experimental year”

ANR reinvented - in just a few months - its way of working for the scientific community. Judicious simplification of procedures, greater clarity of the funding offering and saving time for the scientific communities are the guiding principles of this reform.

A clearer funding offering

To replace the three-yearly programme planning documents and the calls for proposals, ANR began drafting an **annual Work Programme** designed to present the research priorities and the available funding instruments to the scientific communities from the public and private sectors as a whole. This document is consistent with the national strategic research agenda, “France Europe 2020”, which itself is linked to the European research programme, Horizon 2020.

A simplified calendar

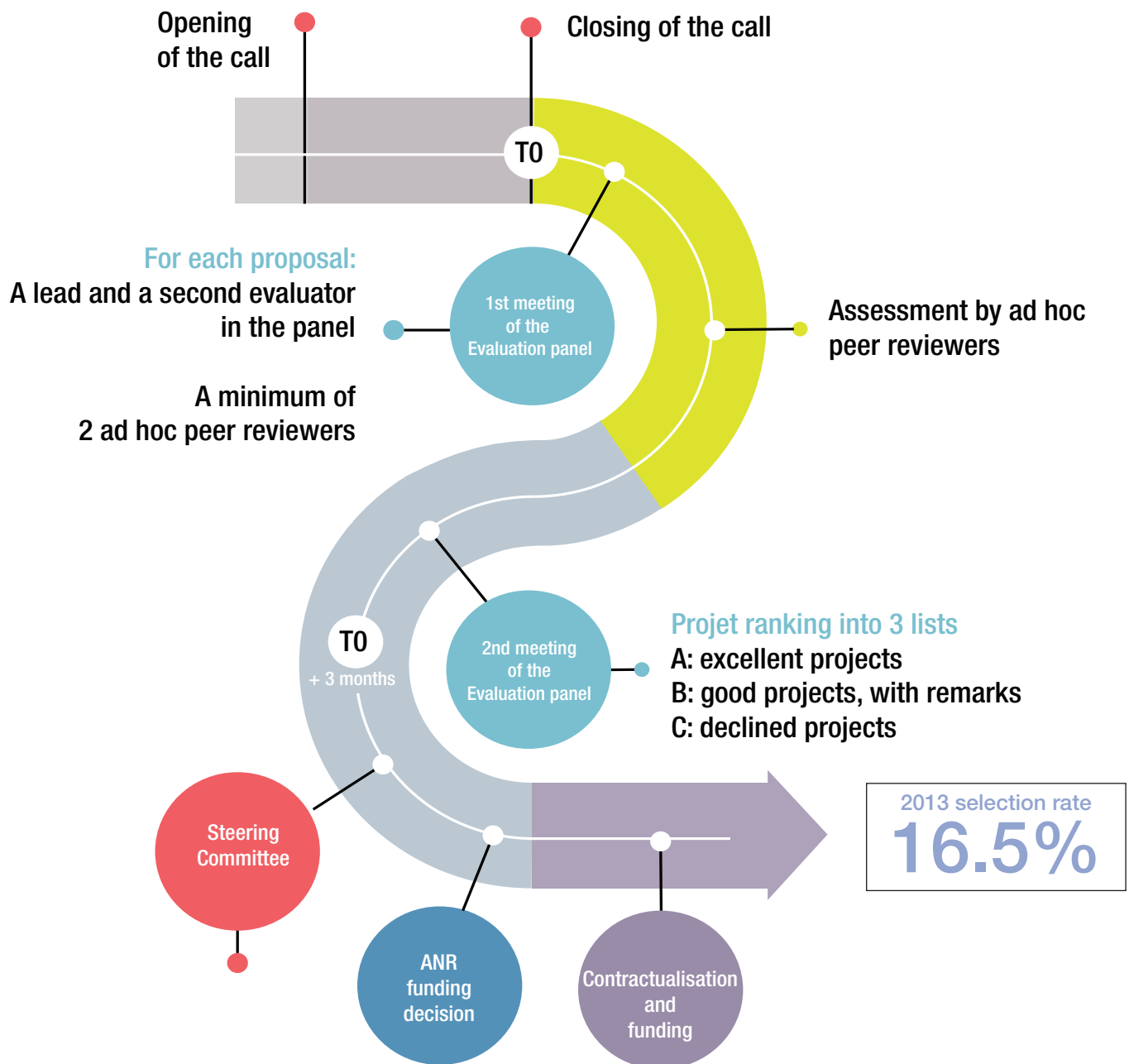
Since its creation in 2005, ANR's calls for proposals were organised on a three-yearly basis through thematic and bottom-up non-thematic programmes (“Blanc” programme). Some fifty calls for proposals were thus launched each year following a specific calendar. The entire year was dotted with opening dates, submission deadlines, and results publication dates. To clarify its funding offering, the majority of the calls for proposals are now brought together within **a generic call for proposals** supplemented by calls corresponding to specific instruments (ERA-NETs, JPIs, bilateral or multilateral calls with other agencies, LabCom, etc.).



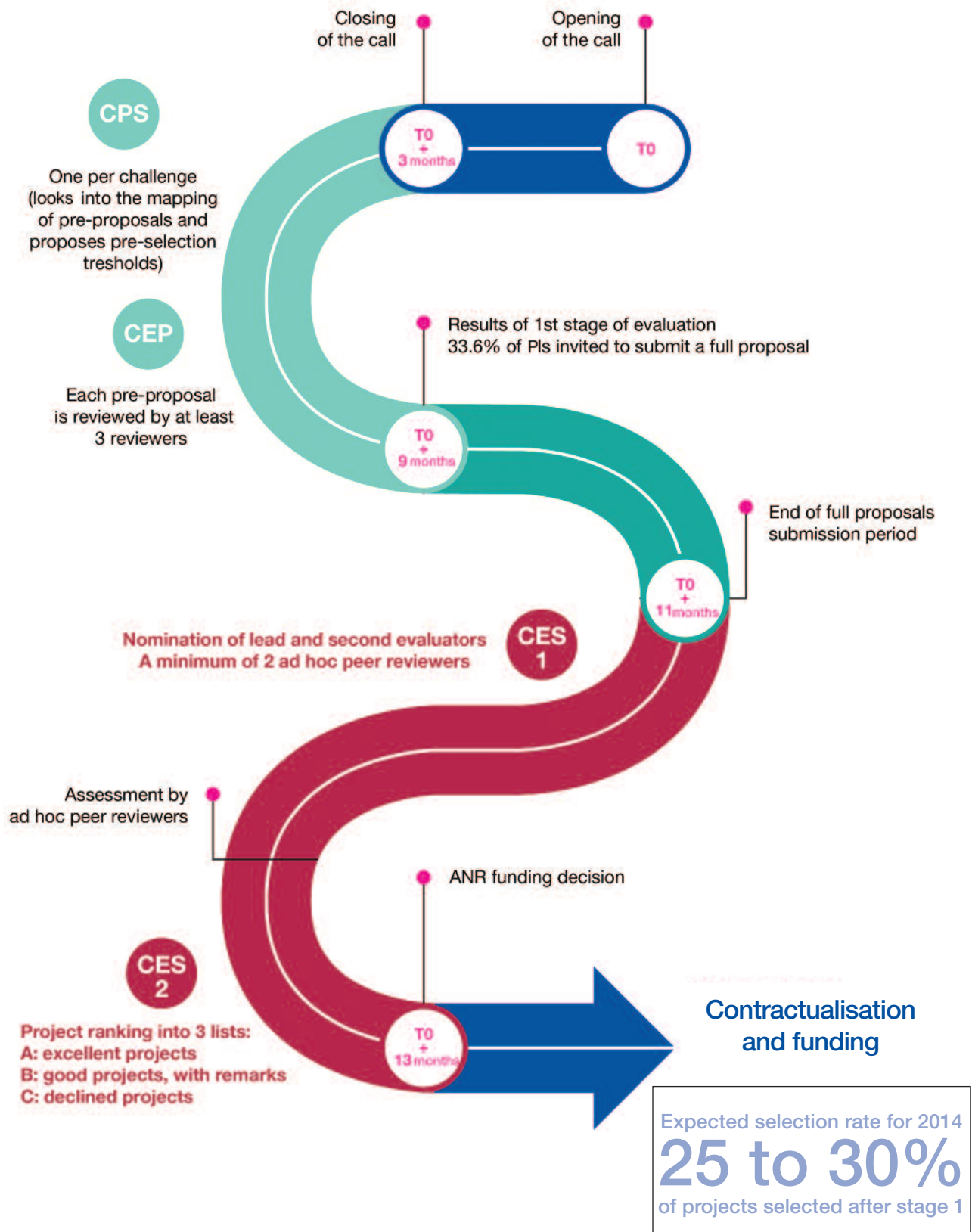
A streamlined submission process

The main demand of the community was the setting up of a **"two-stage" selection process** with the aim of saving time for the project principal investigators (PIs), and more widely for the scientific community on which the peer review process is based. This means that the selection is carried out in two stages instead of one. The PIs submit a pre-proposal comprising 5 pages at the most. Then, at the end of the preliminary evaluation phase, only the selected PIs will submit a complete file of about 40 pages. Previously, all the candidates had to draw up a full proposal. This system, which underwent a trial with the “Agrobiosphere” programme in 2012, has been extended to the single generic call in 2014.

One-stage selection process 2013 and previous editions + a few 2014 specific calls



Two-stage selection process 2014 generic call for proposals



CPS = Scientific Steering Committee

CEP = Pre-proposal Evaluation Panel

CES = Scientific Evaluation Panel

The key figures

WORTH KNOWING

Within the framework of the selection process, thousands of peer reviews are carried out each year by French and foreign scientists external to ANR. This ensures equitable application processing and competitive selection in compliance with international standards, including ISO 9001.

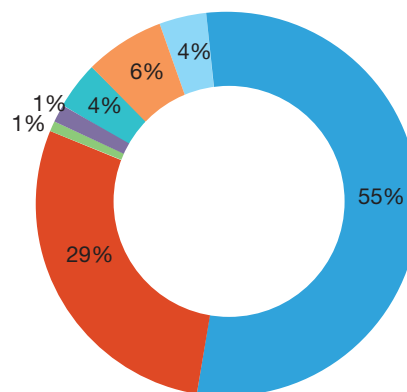
51 calls for proposals launched, of which **19** were exclusively international

7,209 projects submitted of which **1,431** projects were international

1,068 projects funded of which **186** were international co-funded projects

16.5% average success rate

Breakdown of funding allocation by type of beneficiaries



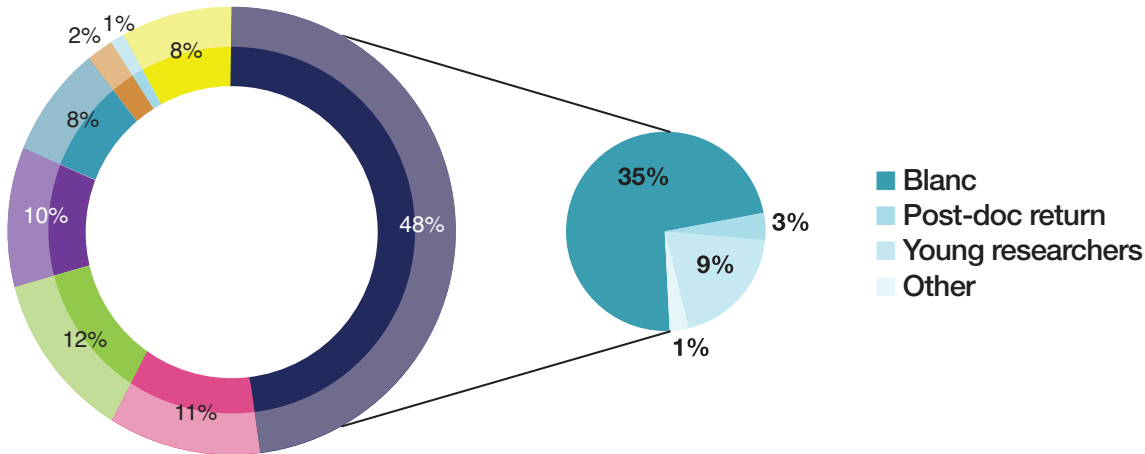
- Research performing organisations
- Universities and other higher education institutions
- Hospitals
- Miscellaneous public
- Other enterprises
- Very small enterprises and SMEs
- Miscellaneous private

DID YOU KNOW?

In April 2011, ANR created a Redress Committee to analyse and examine any cases of malfunctions 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. The redress committee can be called upon at any stage of the selection process (pre-selection or selection) and for all calls for proposals launched by ANR (generic call or specific calls), excluding the calls launched under the Investments for the Future programme, which are outside the scope of competence of the committee.

of 2013 selection

Breakdown of funding allocation by scientific area

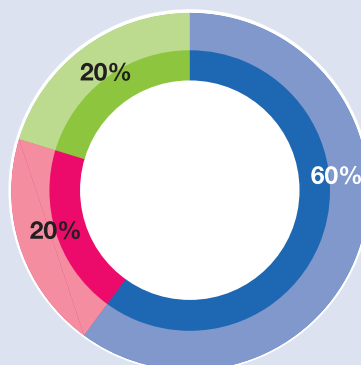


Average funding per project by scientific area (€K)



Distribution of projects funded by type of instruments

- Academic collaborative projects
- Collaborative projects including private companies
- Single partner projects (mainly Young researchers and Post-doc return)



17% of projects co-funded with foreign agencies

Quality at the core of ANR's actions



3 QUESTIONS FOR

VINCENT BRUNIE

Director of Performance, Improvement and Process at ANR

The prime role of ANR is to organise the funding of project-based research. To do this, the ANR relies on a competitive selection process that complies with the applicable international standards. We wanted to find out what this actually means in practice.

How do you ensure competitive project selection and equitable treatment of the candidates?

“The selection process is based on the principle of peer review. To achieve this we rely on regularly renewed panels of scientific personalities external to ANR, and the widest possible international community of peer reviewers external to the committees. We place a great deal of importance on close management of conflicts of interest. Once the selection has been made, the list of reviewers having participated in the evaluation and the panels is published on our website. Equity of treatment is also based on widespread advertising of the calls for proposals which must be open to all potential candidates.”

What criteria are used to select the funded projects?

“The first selection criterion is scientific excellence. Other criteria serve to evaluate the expected impact of the work and the quality of the proposed partnership and set-up. The expected impact differs according to the chosen funding instruments. This is why the call texts set out the objectives and expected effects of the funded projects, along with the participation rules and the selection criteria. The selection procedure is based exclusively on the criteria published in the calls.”

What does this process entail for the project principal investigators?

“In 2014, ANR took it upon itself to do away with a large number of rules of form, thereby enabling the candidates to focus their written presentation on the expected benefits of their proposed projects with respect to the requirements expressed in the generic call for proposals. At the end of the procedure, ANR draws up a synthesis of the evaluation of each proposal submitted. This document goes over the factors considered for each of the evaluation criteria so that the candidates can understand the reasons governing the final decision concerning their project.”



An agency that is attentive to its users

Out of concern to explain its operating methods and processes, ANR creates numerous opportunities to exchange views with its user communities. Such exchanges are a valuable source of information for the agency, enabling it to obtain a clearer view of users' expectations and questions and thus identify avenues for improvement or a need to devise new funding instruments, for example.

The **Users' Committee** brings together people with different professional profiles, such as project PIs, heads of laboratories or research organisations, administrators and consultants. The committee meets twice a year to pass on users' questions and expectations and the difficulties they have encountered. The committee members are elected for a one-year mandate, renewable three times.

CAP ANR is an inter-university network made up of the advisory teams from the organisations involved in helping to set up the projects applying for ANR funding. Comprising nearly 80 members, it meets regularly to share experience and solutions for optimising practices.

During summer 2013, ANR deployed a **specific communication campaign** to accompany the launching of Work Programme 2014, the generic call system and the two-stage selection procedure. ANR's website conveyed a regular flow of information. A special space was created on the home page, a telex was set up to keep track of each key stage in the work programme, and a dedicated mailbox was created for questions from the project PIs. This mailbox received some fifty questions which were processed each week from September to the end of October 2013, and gave rise to the publication of regularly updated FAQs (Frequently Asked Questions) as of the summer. A specific brochure, "The keys to the work programme", was also published on the ANR website. Alongside these measures, ANR's scientific staff took part in a large number of meetings held to inform the stakeholders of changes in funding instrument structures and submission procedures.

WORTH KNOWING

ANR's Work Programme comprises four interlinked components each with a specific budget and governance:

- **Major societal challenges**
- **At the frontiers of research**
- **Building the European Research Area (ERA) and France's international attractiveness**
- **Economic impact of research and competitiveness**



A commitment towards Open Access to scientific publications

As part of its involvement in the European Research Area, ANR has reaffirmed its commitment to the development of open access to the results of research financed with public funds. The dissemination, sharing and long-term archiving of scientific publications relating to projects funded by ANR help reinforce the visibility and the attractiveness of French research. This moreover avoids having multiple information entries and the documents are made readily accessible to all the researchers. As a signatory to the "Partnership agreement to foster open archives and the HAL (Hyper Articles on Line) shared platform", ANR recommends that in compliance with the rules relative to intellectual property and any embargo durations, the full texts of all publications resulting from the projects it funds should be posted in the open archives, directly in HAL or via a local institutional archive.



WORTH KNOWING

On 2nd April 2013 at the Academy of Sciences, Pascale Briand, Director General of ANR, signed the Partnership agreement to foster open archives and the Hyper Articles on Line (HAL) shared platform. This agreement fits into the framework of the French national policy in favour of open access, and the sharing, dissemination and preservation of research results.



3 QUESTIONS FOR

MARTINE GARNIER

Manager of the "Digital contents and interactions" programme at ANR

What is Open Access ?

"Open Access (OA) is a movement that was initiated in Budapest in 2002 and reinforced one year later by the Berlin Declaration. It arose from the desire to make the results of research financed by public funds accessible to all, thereby fostering the dissemination and sharing of knowledge. The deployment of OA called into question the very roots of the economic models associated with scientific publications and resulted in the emergence of new editorial practices. It mobilised all the stakeholders in the scientific publishing world (researchers, publishers, libraries) to define a new balance and an equitable distribution of publication costs between publishers, readers and authors. Today OA is supported at international level, as the European Commission has made it a contractual obligation in Horizon 2020. In January 2013, the French Ministry of Research reiterated an essential principle, namely that scientific information "is a common good that should be available to all"."

What is ANR's position in this respect ?

"ANR announced its support for Open Access back in 2007. It reaffirmed its commitment in 2013 by signing the new partnership agreement to foster open archives and the Hyper Articles on Line (HAL) shared platform, along with more than 25 education and research organisations. ANR takes part in debates at



national, European (Science Europe) and international level through the Global Research Council. Furthermore, ANR recently signed an agreement with the CCSD (French Centre for Direct Scientific Communication) with the aim of facilitating the entry of publications resulting from ANR-funded projects."

What are the forthcoming important events on this subject?

"First the creation of a working group dedicated to OA within the Global Research Council further to the last annual summit held in Beijing in May 2014. The strong mobilisation of the community in France will result in the organisation of the seventh edition of the Open Access Week in October, coordinated by the Couperin consortium. The European programme FOSTER, in which the French consortium "Couperin" (standing for "unified consortium of university and research establishments for access to digital publications") participates, began last February with the aim of "integrating the OA principles into researchers' working methods and practices". Lastly, the French Ministry of Research is continuing its negotiations with the leading publishers, an obligatory step in the implementation of a true OA policy."



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II • Investments for the future, a specific assignment



Launched by the French Government at the end of 2009, the Investments for the Future programme (“Investissements d’avenir”) aims to enhance French competitiveness by investing in higher education and vocational training, in research, in industry and small- and medium-sized enterprises (SMEs), in sustainable development and in all sectors with promise for the future, such as digital technology, biotechnologies and nuclear energy.

The government has tasked ANR, as State operator, with management of the research and higher education part, that is to say managing the calls for proposals, setting up the evaluation and selection processes, negotiating the grant agreements with the teams, funding the projects, as well as monitoring the various activities.

The support to research and innovation will...

- Promote excellence and the development of high-level projects and clusters
- Strengthen France's capacity for innovation
- Increase competitiveness and attractiveness of French research and higher education
- Generate growth
- Help build a true knowledge society in France

... through three types of actions:

- Centres of excellence
- Health and biotechnology
- Technology transfer and valorisation

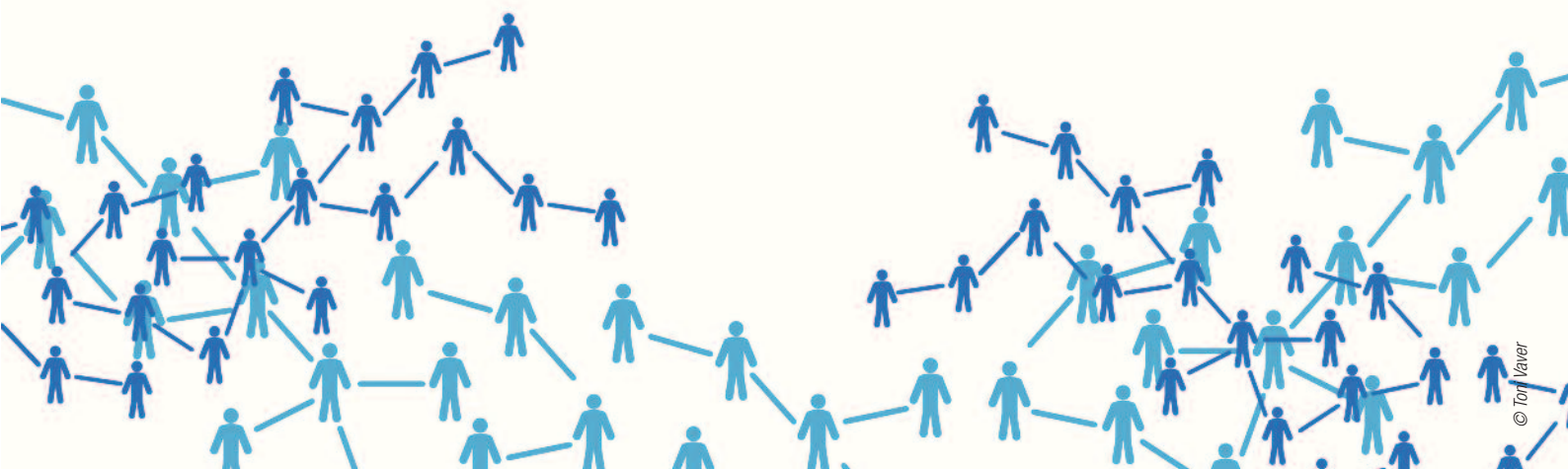
... in a manner that promotes collaboration among researchers.

WORTH KNOWING

The Investments for the Future programme represents **35 billion euros** of which **22.6 billion euros** are allocated to higher education and research.

WHY IS IT A SPECIFIC ASSIGNMENT?

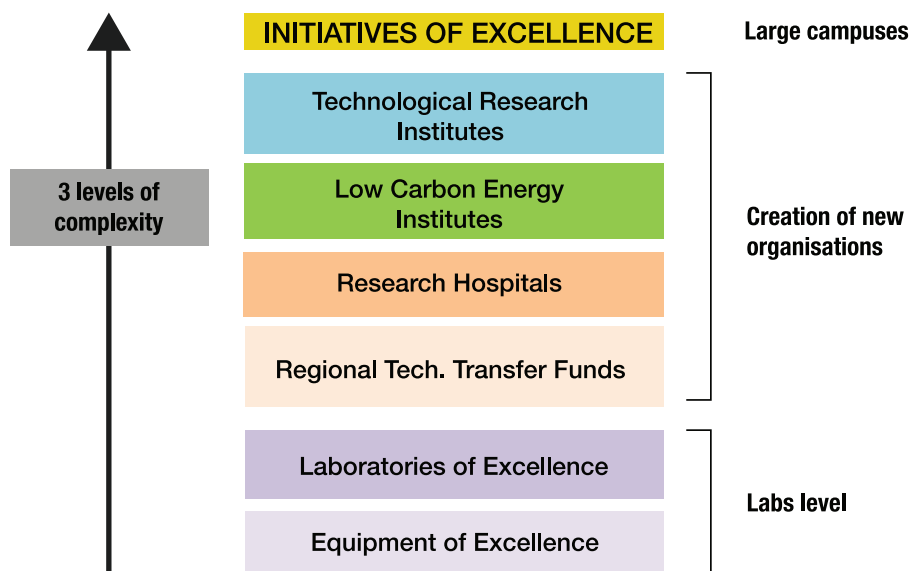
By virtue of their exceptional nature, the Investments for the Future have some particularities. The project evaluations are systematically conducted by international panels, with the project selection criteria being defined according to the priorities for Investments for the Future. The amount of funding assigned to the projects is quite substantial, and covers “ten year projects”, opening up new perspectives and leading to collaborative associations that would otherwise never have existed. Furthermore, they enable not only the financing of large scale research projects, but also the implementation of new “objects” such as intermediate-size research equipment, infrastructure for research into biology and health, and the emergence of global research and higher education clusters.



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

CENTRES OF EXCELLENCE

Competitive calls for selecting centres of excellence



Equipment of excellence - Equipex

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

93 EQUIPEX
€578 M OF FUNDING

Laboratories of excellence - Labex

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

171 LABEX
€1,538.35 M OF FUNDING

Working towards an Institute of the Forest and Wood in the Lorraine region

Spotlight on the ARBRE Labex - “Advanced research on the Biology of Tree and Forest Ecosystems”

Bringing together a scientific community of some 300 people, this Labex aims at better understanding the mechanisms governing the adaptation and evolution of trees and forests in order to predict their responses to global changes (climate change and land use) in the medium and long term. It should propose new ideas concerning preservation and create value from acquired knowledge for the benefit of science and society.



© Alexandre Fuleux, INRA Centre Nancy-Champenoux

Carpet of bluebells (Hyacinthoides non-scripta) in Delville wood 2013 Somme, Picardie

Initiatives of excellence - Idex

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

This is the flagship initiative of the Investments for the Future programme.

11 IDEX
€1,027.6 M OF FUNDING

Initiatives of excellence in innovative training - Idefi

Nurturing true demonstrators that should prefigure the university training of the future, promoting new training approaches, in order to enhance the profile, the versatility and the employability of students and promote the link with research and training programme engineering

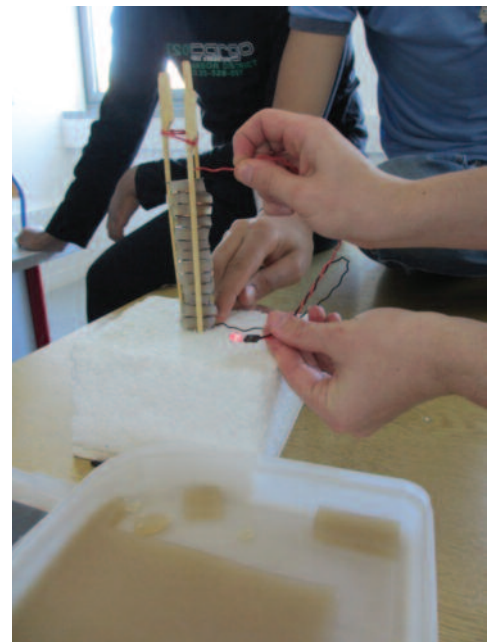
36 IDEFI
€184.1 M OF FUNDING

Facilitating access to excellence in higher education

Spotlight on the Villebon - Georges Charpak Institute

This institute is intended for young people who have intellectual capacities and potential but who, owing to shortcomings at school or lack of family support, hesitate - generally through self-censorship - to take the avenues that best prepare for long higher-education studies, or fail to get accepted. This most often concerns young people from sensitive urban areas or rural areas, sometimes with a disability.

The project aims at enabling these people to gain access to higher education programmes of excellence through a general and original scientific degree. On completion of their course, the graduates can, according to their choice, abilities and results, move on to do a master's degree, go to engineering school or begin an active career. The training is based on active teaching which develops the students' confidence and abilities, makes them want to be entrepreneurial and brings out their creativity. The students are accommodated on the campus to free them of material problems. They have a personalised accompaniment (tutorship, sponsoring, etc.). The graduates from this institute will thus constitute a new pool of students highly motivated by science and technologies, who are capable of working in a group and nurture a true taste for experimentation and innovation and a strong entrepreneurial spirit.



© Quentin Lisack / Villebon - Georges Charpak Institute

Challenge: manufacture a battery with salvaged materials

HEALTH – BIOTECHNOLOGY

Research Hospitals - IHU

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

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

**14 RESEARCH
HOSPITALS**
€404.3 M OF FUNDING

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...

12 PROJECTS
€17.1 M OF FUNDING

Developing "machines" that can smell odours by mimicking the behaviour of moths

Spotlight on the Pherotaxis project

The aim is to propose effective strategies for locating sources of odours. The main difficulty lies in extracting directional information from the complex structure of odorous plumes. This problem has been solved in nature, notably in moths, where the males are capable of locating females at great distance by detecting the pheromones emitted by the latter. Starting from an analysis of the strategy used by these moths, and using neurobiological models and models based on the information theory, Pherotaxis creates robots that mimic the behaviour of moths. The project brings together physicists, neurobiologists and computer scientists.



© boule13

Biotechnology and Bioresources

Bringing to light a bio-economy based on knowledge of the living world and on new methods for recovering renewable biological resources

Electrosynthesis of biofuels from organic waste

Spotlight on the BIORARE project

BIORARE (BIOelectrosynthesis for the Refining of REsidual waste) is a project that aims at developing innovative solutions for producing fuel and chemical products from organic waste. The work carried out to date confirms the potential of the BIORARE technology for the biorefining of waste. A first patent application in this area has been filed.

13 PROJECTS
€88.2 M OF FUNDING



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Nanobiotechnology

Exploring the potential of nanotechnologies to increase knowledge in the area of biology and turn it to good account

8 PROJECTS
€18.8 M OF FUNDING

Cohorts

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

10 COHORTS
€74.5 M OF FUNDING

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

4 PROJECTS
€78 M OF FUNDING

National infrastructures in health and biotechnology

Forming national networks and equipping them for the future, from medicine to biodiversity to fundamental biology

23 PROJECTS
€496.6 M OF FUNDING

Spotlight on the French National Infrastructure for Mouse Phenogenomics – PHENOMIN

PHENOMIN is a partner in the European infrastructure INFRAFRONTIER and a major player in the international strategic mouse phenogenomics effort. It provides the scientific community as a whole with services to support research in mouse genetic engineering, in animal production and in standard functional analysis techniques.



Here is illustrated a visual phenotyping test in which the mouse, at the centre of a rotating cylinder covered with alternating black and white bands, will make movements of the head to follow these alternations once the cylinder is in motion. The blind mice display no head movements.

© Patrice Latron / INSERM

TECHNOLOGY TRANSFER – VALORISATION

Technology transfer acceleration companies - SATT

Putting an end to the fragmentation of structures, reaching a critical size and speeding up the professionalisation of skills by bringing together the technology transfer teams of a large university campus

14 SATTs
€900 M OF FUNDING

Theme-based technology transfer consortiums

Offering technology transfer services with high added value to technology transfer structures of universities on given themes

6 CONSORTIUMS
€50 M OF FUNDING

Technological research institutes - IRT

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

8 INSTITUTES
€920 M OF FUNDING

Energy transition institutes - ITE

Setting up, in the energy and climate sectors, a limited number of technological innovation campuses capable of acquiring a global dimension

12 INSTITUTES
€410.7 M OF FUNDING

Spotlight on PIVERT, an institute engaged in plant chemistry

The PIVERT (Picardy Plant Innovations, Teaching and Technological Research) Energy Transition Institute is an interdisciplinary project. Ultimately it should bring advances in the field of industrial ecology, the development of course offerings tailored to this promising economic sector, and the creation of 5,000 jobs in 10 years. Its financial set-up is original: it is supported by technical and research centres, universities such as the Technological Universities of Compiègne and Troyes, the IAR (Agro-Resources Industries), industrialists and private players. It will have a budget of 220 million euros spread over 10 years and the support of the local authorities, particularly the Picardy region and the town of Compiègne. Located in Compiègne, on the Rives de l'Oise technological park, PIVERT is specialised in plant chemistry, the technologies and the economics of 3rd generation biorefineries, and in the area of oilseed and forestry biomass. This first European centre aims at transforming oilseed biomass into renewable chemical products. Its activity thus addresses sectors as varied as food supply, health, cosmetics and construction materials.

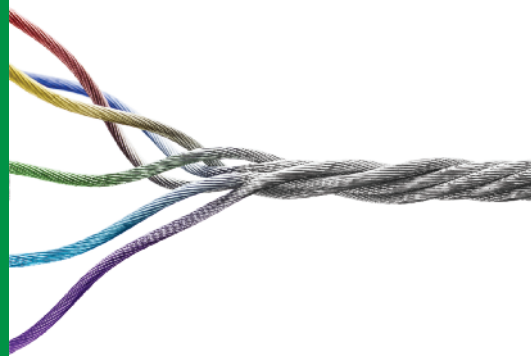


Research on nuclear safety and radioprotection

Supporting public-private partnership projects and the infrastructures and platforms in the field of nuclear safety and radioprotection

21 PROJECTS
€50 M OF FUNDING

III • Encouraging collaborative work and synergies



© Ken Drysdale

By pooling the skills and resources of different teams, collaborative research reinforces the synergies between teams who would not habitually have worked together, and enables 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. The vocation of the collaborative project is to incite 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 and the laboratories of large private groups, and from small- and medium-sized enterprises (SMEs), 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 own particularities to the group, its knowledge, its technical, financial and human resources, and its perception of the joint research project.

THE KEY FIGURE

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 and account for **80%** of projects funded by the agency in 2013.



RESEARCH HIGHLIGHTS

An international consortium looks into the creation of computer models of tomatoes to improve the quality of the fruit

In the context of this international systems biology project, co-funded by ANR as part of the EraSysBio+ 2009 ERA-NET, an unprecedented quantity of data has been collected to develop a series of computer models that can predict a range of traits of the tomato plant and of its fruit according to its metabolic characteristics and to the environment.

WITH WHOM?

The "FRIM" project involved the collaboration of French teams (INRA-Bordeaux, Bordeaux University, INRA-Avignon) with British (Oxford University, Oxford Brookes University), German (Max Planck Institute of Golm) and South-African (Stellenbosch University) teams.

HOW?

The transnational consortium of the "Fruit Integrative Modelling" project initiated the development of a suite of computer models for predicting the growth and the quality of the fruit according to the climatic scenario and characteristics of the fruit coded by its genome. The consortium concentrated in particular on the metabolism of the fruit that gives it its sweet and acidic characteristics.

This project, which demonstrates the interest of the transnational collaborative work, made use of the complementarity of the teams' expertise: the biologists and ecophysiologicalists from France (INRA of Bordeaux and Avignon and Bordeaux University) and the United Kingdom (Oxford University) grew hundreds of wild and transgenic tomato plants from seeds obtained in Germany (Max Planck Institute of Plant Molecular Physiology), to generate data that were modelled in the UK (Oxford



Brookes University), in France (INRA of Bordeaux and Avignon and Bordeaux University) and in South Africa (Stellenbosch University). This enabled the "virtual fruit" model to be developed, parameterised and validated. Virtual growth simulations have already been carried out, providing deeper knowledge of the fruit and paving the way for better tomatoes.

The scientists harvested 3,000 tomatoes grown under different conditions and at nine different stages of development. They assayed 40 enzymes involved in carbon central metabolism and quantified 140 metabolites.

FOR WHAT PURPOSE?

Fruits are a major source of vitamins and antioxidants and represent a market of 10 billion euros per year. Being able to anticipate environmental stresses and changing consumer demands with regard to taste and the nutritional value of different fruits would be a great aid to producers.

Contact: yves.gibon@bordeaux.inra.fr

Stimulating interdisciplinary research

Decompartamentalising research and federating skills; this is one of ANR's priorities. Interdisciplinarity fosters the emergence of new themes, poorly known disciplines and unexplored methods, thereby leading to paths of innovation.

Cross-disciplinary work is vital to develop innovative approaches that will provide effective answers to the major societal and global issues. Some 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. It facilitates research that aim to provide answers and solutions to the major societal issues, by bringing together scientific communities from various horizons to work on research projects.

WORTH KNOWING

The collaboration of this consortium has been extended in the European COSMOS project concerning the coordination of standards in metabolomics.



THE KEY FIGURE

20% of projects funded by the agency encompass several disciplines



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RESEARCH HIGHLIGHTS

How mathematics unravel the mysteries of rogue waves

The “MANUREVA” project, funded under the 2009 “Complex systems and mathematical modelling” programme, looks at analogies between ocean wave and optical wave physics to explore the specific properties of the notorious rogue waves observed at the surface of oceans, which is impossible to do in the ocean itself.

WITH WHOM?

Coordinated by Frédéric Dias of ENS Cachan, this project grouped the University of Bourgogne, Paris Diderot University and FEMTO-ST lab (University of Franche-Comté).

HOW?

An optical system can generate cases of extreme waves of very large amplitude which have similar properties to the rogue waves observed at the surface of oceans. The aim was to solve the mysteries of rogue waves by understanding similar extreme phenomena observed in nonlinear optics, combining mathematical, numerical and experimental studies on the extreme wave phenomena in hydrodynamics and optics. The numerical and theoretical work was validated experimentally in the study of extreme effects in the propagation of waves in optic fibres.

FOR WHAT PURPOSE?

The project has led to the development of new methodologies, and original mathematical and modelling methods, combining ideas from applied mathematics, statistical physics and thermodynamics. The transfer of the experimental findings obtained in optics to the scientific community working on rogue ocean waves and ocean hydrodynamics is a remarkable example of interdisciplinary work and cross fertilisation between the apparently remote disciplines of applied mathematics and nonlinear optics. The work conducted in MANUREVA has had considerable repercussions in the international scientific community and new partnerships have been formed with teams in Russia, Finland and Australia. Future developments of this research may one day enable to predict the conditions in which these rogue waves, so destructive for ships and oilrigs, occur.

Contact: frederic.dias@ucd.ie



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“The project funding has enabled us to conduct interdisciplinary research, which is one of the vocations of science. Covering several disciplines is a major advantage and contributes enormously to research. It is a real added value for the two scientific communities of mathematics and physics which have participated in the project. After MANUREVA, we obtained three ERC grants and built up a solid network between the two disciplines. This project has opened up a new field of research and new questions, says Frédéric Dias, coordinator of MANUREVA.”

Spotlight on cross-disciplinary research

Security serving freedom

"Global Security encompasses specific societal and economic issues that necessitate the involvement of extremely varied research disciplines"



3 QUESTIONS FOR XAVIER DRAMARD

Manager of the "Concepts, Systems and Tools for Global Security" (CSOSG) programme at ANR

What does your job as programme manager involve?

"My role is to help find innovative approaches in response to the security and freedom issues considered as priorities. I draw up the calls for proposals and I organise the selection of the best projects and the coordination of the research community through communication drives focusing on the calls and their results, in collaboration with the representatives of the scientific community and the users."

Research into security is not a scientific subject in itself; could you explain what research in this area involves?

"Global Security encompasses specific societal and economic issues that necessitate the involvement of extremely varied research disciplines, such as physical sciences, life sciences, engineering science, social sciences and humanities, etc. These disciplines must come together in order to obtain a coherent overall picture. These approaches cover technological maturities ranging from fundamental research to applied research and therefore require a funding method that fosters public-private partnerships."

The numerous projects funded by ANR under the CSOSG programme since 2006 combined with the success of the Interdisciplinary Workshop on Global Security (WISG) play a part in the national development of research and of the scientific community focusing on security-related issues. This success explains the increase in the number of publications which helps makes France a leading player at European and world level. Since 2009, this progress has been made in partnership with Germany (BMBF), which shares the concern to improve the security of citizens at national, bilateral and European level."



WORTH KNOWING

Each year since 2007, the Interdisciplinary Workshop on Global Security brings together the security research community (academic and industrial players and users).

What are your priorities for the years to come?

"Creating a societal challenge dedicated to the freedom and security of citizens under the ANR Work Programme will give greater visibility to these issues and develop the research Work in a manner that is coherent with the structuring of the industrial sector. The WISG will be maintained, as will the cooperation with Germany on priority subjects of common interest, as in 2014 with a call for proposals dedicated to the protection of critical infrastructures. The Franco-German cooperation will be facilitated by "MAPPS" (Mapping of Project, Players and capabilities in civil Security research), an on-line tool that will help the researchers in the two countries establish contacts with one another."



RESEARCH HIGHLIGHTS

An innovative miniature air vehicle for the protection of citizens and infrastructures

Funded under the 2009 edition of ANR's Concepts, Systems and Tools for Global Security programme, the "GLMAV DEMONSTRATOR" project proposes an innovative miniature air vehicle concept designed for all types of air surveillance and protection of persons and infrastructures.

WITH WHOM?

Coordinated by Patrick Gnemmi of the French-German Research Institute of Saint-Louis (ISL), the project brings together the Automation Research Centre of Nancy (CRAN), the Complex Systems Heuristics and Diagnostics Laboratory "Heudiasyc" (Compiègne University of Technology / CNRS), and the company SBG Systems SAS.

HOW?

The project has developed a dedicated portable tube which launches a projectile that reconfigures itself into a miniature air vehicle once it is above the observation site. This hybrid system called GLMAV, meaning Gun-Launched Micro Air Vehicle, is designed for all types of air surveillance and protection of persons and infrastructures, as it is equipped with an on-board vision system with real-time image transmission.

Weighing less than 10 kg, the ballistic launcher can launch the 1-kg GLMAV platform in projectile mode over a distance of 500 metres in 12 seconds, for an observation mission starting at a height of 100 metres. Once in miniature air vehicle configuration, the GLMAV platform is operational for observation in the horizontal and vertical directions. The system's originality lies in the use of an energy source external to the platform for the initial propulsion, in the speed of readiness of the observation capability, and the fact that the platform's components are acceleration-hardened.

FOR WHAT PURPOSE?

Among the many current projects relating to the use of unmanned air vehicles for observation purposes, this project proposes an innovative concept for carrying out discrete observations at low cost, based on the use of an external launcher (a "gun") enabling the micro air vehicle to be positioned rapidly above the observation site without reducing its autonomy in energy (the MAV remains passive) or affecting its functioning (acceleration hardening of the components) during the ballistic phase of flight.

In the context of the protection of citizens, vital infrastructures and networks, the project has aroused great interest from potential users (civil and military) and French and foreign companies.

Contact: patrick.gnemmi@isl.eu



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DID YOU KNOW?

Global security is defined as the capability to ensure, for a given community and its members, an adequate level of prevention and protection against risks and threats, whatever their type and impact and whatever their origin. This capability must be exercised under conditions that promote development without disrupting everyday living and collective and individual activities.



Competition to foster creativity: ANR launches “challenges”

In the context of the societal challenges, some subjects that are tightly focused on specific objectives justify putting different teams into competition with one another. ANR's "Challenge competition" funding instrument aims to encourage several teams to work on the same topic while enabling them to compare their respective approaches to a scientific application or question. ANR thus wishes to foster creativity through the notion of setting a challenge to different teams on a given topic.

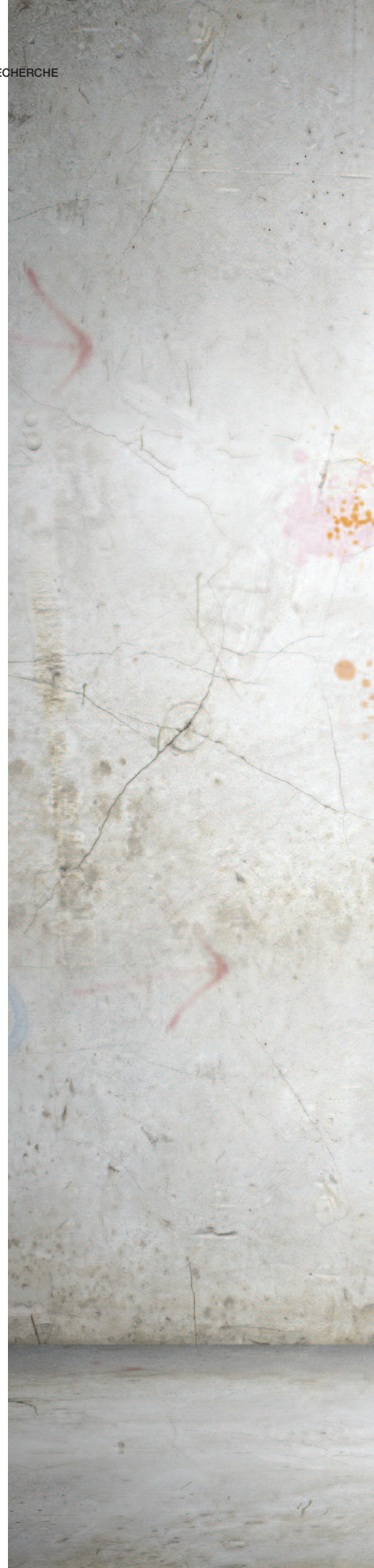
The ARGOS robotics challenge

Thought up and funded by the company Total and organised by ANR, the ARGOS challenge aims at promoting the development of advanced robots working in oil and gas environments. Total has thus entrusted ANR with the organisation of the call for proposals and the management of the team evaluation and selection process.

ARGOS promotes the emergence of a new generation of autonomous or remote-controlled surface robots capable of moving around on onshore or offshore production sites, in potentially explosive environments, and of feeding back information. This challenge is funded entirely by Total and calls upon ANR's expertise and know-how in the management of calls for proposals.

The evaluation process is based on both ad hoc peer reviews and the work of an evaluation panel; it focuses above all on criteria of scientific excellence. The selected teams will each receive the same minimum funding of €500 k from Total. Three competitions will be organised in succession with the teams to test the different modes of robot functioning.

"In our opinion ANR seemed the ideal partner to run the call for proposals for the challenge, underlines Xavier Faugeras, head of the ARGOS challenge at Total in 2013. It has experience and expertise in the setting up of calls for proposals and challenge competitions. It has a recognised and rigorous team evaluation and selection process. And its network of connections enables it to call upon diverse technical and international skills to support this process. It is an enriching experience."





IV • Preparing a new generation of talents



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



WORTH KNOWING

In 2013, ANR allocated 38.5 million euros to 181 young researchers' projects out of 1,183 proposal submissions

ANR encourages young researchers to submit projects. It wishes to promote their empowerment and capacity to innovate. ANR has thus set up a specific funding instrument for them. Baptised "Young Researchers", this programme gives the youngest researchers the means to develop and realise 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 who will be tomorrow's leaders of scientific research.

This programme 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 and with greater likelihood of success.

Anatole Lécuyer wins the "Young Researcher" prize

In October 2013, Anatole Lécuyer, a virtual reality specialist, was awarded the Inria-Académie des sciences Young Researcher prize for the boldness and the relevance of his work. ANR supported his research work on two occasions.

WITH WHOM?

A graduate engineer from the École Centrale of Lille (1996) with a Ph.D. from the Paris XI University (2001), Anatole Lécuyer has been working at the Inria Rennes research centre since November 2002. Alongside this, he has been research director at the Rennes 1 University since 2010 and the head of the Inria HYBRID team since 2013.

HOW?

As a specialist of virtual reality and brain-computer interfaces, his research work aims at federating and combining the different ways of interacting with virtual environments.

FOR WHAT PURPOSE?

Funded by ANR in 2005, Anatole Lécuyer's OpenVibe project explored brain-computer interfaces and the ability to move in a virtual world simply through cerebral activity. This project resulted in a software product distributed as open source which is still used in laboratories today. It has many applications, including assistance to disabled persons.



OpenVibe: season 2. Following on from the OpenVibe project, Anatole Lécuyer has launched the OpenVibe 2 project. This new research phase, which is also supported by ANR, aims at testing the software on a "model" community, namely that of video game players.



Post-Doctoral Return: 4-year assessment

WITH WHOM?

Intended for young researchers, whether French or foreign, having defended their thesis in France and carried out post-doctoral work abroad, the "Post-Doctoral Return" programme was set up by ANR in 2009. The scientists funded under this programme thus completed their project during the year 2013.

HOW?

This programme, which is open to all scientific disciplines and all types of research, aimed at giving the principal investigators of the selected projects appropriate means for carrying out an ambitious and innovating research project in France. The funding was allocated to them for a maximum period of three years. The challenge for the project PI was to succeed in setting up a team in order to achieve the scientific objectives defined in the proposal.

FOR WHAT PURPOSE?

The post-doctoral period that young French or foreign researchers who wrote their thesis in France can spend abroad represents a major asset in their scientific career. The return of these young researchers is essential for the development of excellence in research in our country. And that was precisely the aim of the "Post-Doctoral Return" programme: to facilitate their return to France and foster their future recruitment by a research organisation or company in the country.

WORKING TOWARDS A NEW FUNDING INSTRUMENT

After four years of existence, and spurred by the implementation of the Work Programme 2014, ANR has conducted a reflection on this programme and the way it interlinks with the Chairs of Excellence programme.

While maintaining the same objectives, ANR has created a new instrument: "Hosting High-Level Researchers" which offers a one-stop desk for all projects aiming to take on, in France, high-level researchers who have spent a significant part of their professional life abroad. The framework is greatly simplified, which enables the programme to focus on the scientific excellence of the candidates and their contributions to the organisations sponsoring the projects.



A career booster

Between 2009 and 2013, **150** 'Post-Doc Return' projects were supported by the ANR. Among the **26** scientists funded in 2009, **22** (84%) are now employed on a permanent basis.

Spotlight on an exemplary Post-Doc Return

Thibault Cantat, PI in the Theo-ExpCO₂ project funded in 2009 under ANR's Post-Doctoral Return programme, answers our questions

Researcher at the Molecular Chemistry and Energy Catalysis Laboratory at IRAMIS (Saclay Institute of Matter and Radiation), part of the Physical Sciences Division (DSM) of the CEA (Alternative Energies and Atomic Energy Commission).

What are you working on at present?

"I am trying to develop recycling routes for CO₂, a substance that is usually considered as waste. The idea is to use it as a raw material to synthesise high added-value substances, usually manufactured from hydrocarbons, such as fertilisers, solvents, polymers, etc. In short, a new and more sustainable chemical route."



What brings you to submit a project under the Post-Doc Return programme?

"After finishing my studies at the École Normale Supérieure of Paris and my thesis at Polytechnique, I spent two years in the United States at Los Alamos. In March 2009 when the call for proposals was launched, I was seeking to return to France. At that very time an opportunity arose at the CEA. It so happened that I was simultaneously selected to receive ANR funding and recruited by the CEA."

"But over and beyond the financial aspects, this funding also greatly enhanced my credibility in the eyes of the community"

What did the funding enable you to do?

"The subject on which I was working did not exist at CEA. I was recruited to develop that subject. This meant that I didn't have a team and was lacking certain specific items of equipment. The ANR funding couldn't have come at a better time. It enabled me to recruit two Ph.D. students, one with a grant from the ENS, and the other whom I was able to pay with the funds allocated by ANR. Alongside this I was able to buy all the equipment we needed. But over and beyond the financial aspects, this funding also greatly enhanced my credibility in the eyes of the community. The combined effects acted as a catalyst for my work."

And in terms of results?

"At the end of the project, we had filed five patents corresponding to new processes for synthesising molecules from CO₂. Immediately afterwards we applied for and obtained funding from the ERC and the Academy of Sciences, which enables us to continue to build on the initial ANR funding. Four and a half years after starting the project, my team now counts ten people: three permanent staff members, two post-doctoral researchers and five Ph.D. students."

**RESEARCH HIGHLIGHTS**

Water droplets, bubbles, sea spray: understanding deformation phenomena

A team of young scientists, financed by the “Young Researchers 2009” programme, carried out experiments aimed at gaining insight into the interface deformation phenomena that shape our everyday lives.

WITH WHOM?

The “Deformation” project was coordinated by Arnaud Antkowiak from Pierre and Marie Curie University.

HOW?

The project team, which was composed of young scientists from various disciplines, studied so-called interface deformation phenomena. To this end, they conducted experiments in a theoretical laboratory in order to study these phenomena, which pertain to various disciplines, including interface physics, fluid mechanics and elasticity. The study allowed for the following accomplishments: description of granular media as continuous media; realisation of an open-source code that allows for avalanche simulation; the discovery of micro-fabrication mechanisms for three-dimensional objects, using inkjet technology; the identification of the source of the liquid projections that are observed in glass or metallurgical ovens and that involve the spectacular distortion of viscous bubbles that occur in these substance flows.

WHY?

Major interface deformations occur in many different settings: the splash of a water droplet in a pool of water; the wispy projections of liquid formed by the bubbles of sparkling wine; rock avalanches; inkjet printing; the adhesion of soft contact lens on the eye. And although these phenomena shape our everyday lives and are observed in myriad technological or natural processes, scientists have yet to fully understand them or learn how to control them.

The project’s unique combination of disciplines and tools allowed for the realisation of various fundamental and significant advances. These advances in turn allowed for the development of innovative processes whose technological validation is currently ongoing.

Contact: arnaud.antkowiak@upmc.fr





V • Building bridges between the academic research and the private business sector



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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 for in academic research work. To meet these challenges, we have put in place specific instruments and activities.

Collaborative projects between public laboratories and companies

They are intended to improve innovation capacities, enhance the transfer of results and know-how arising from public research to the business world, and to take better account of industrial needs in academic research. By comparing the academic viewpoint with the industry viewpoint, these projects can address new research questions and issues from different angles.

Industrial chairs

Here, the aim is to develop lasting relations between public research establishments and companies by setting up a research and higher education chair within the establishment, financed in part by the company. The Chair is assigned to an outstanding researcher or professor. The mandate of the Industrial Chair is firstly to carry out fundamental and applied research, and secondly to disseminate the resulting knowledge through research-based training.

Carnot Institutes



The 34 Carnot Institutes are research structures that are committed to partnership research development. They have their own independent governance, an internal organisation, and encourage closer relations between public research entities and the industry. They receive a financial aid from ANR calculated according to the amount of revenue created by the partnership research contracts.

The Carnot label is assigned by the French Ministry of Higher Education and Research, further to a call for candidacies. Three calls were launched between 2006 and 2011 and were managed by ANR.

The Carnot label is assigned by the French Ministry of Higher Education and Research, further to a call for candidacies. Three calls were launched between 2006 and 2011 and were managed by ANR.

LabCom: when public research opens its doors to companies

In 2013, ANR put in place a simplified system to encourage public research entities to create partnerships with SMEs. The LabCom programme aims at developing the industrial partnership and transfer potential that exists within the academic research community. The key issue is to help academic research establish bilateral partnership with companies and with SMEs in particular because such links are crucial in the innovation chain.

HOW?

When a public research laboratory engages itself alongside an SME, the two parties sign a contract which involves common governance, a research and innovation road map, work resources that enable them to work jointly, and a strategy for the company to create value from the partnership.

As for project selection, it is simplified: the candidates are reviewed on a continuous flow basis, the peer selection process is based on a single committee, there is no requirement for a physical structure (a virtual



THE KEY FIGURES

The Carnot Institutes represent:

27,000 research professionals, including **7,500** Ph.D. students

A budget of **€2,000 M**
More than **19,000**

publications

€50 M of revenue per annum from the intellectual property

970 patents filed each year

KEY FIGURES AS AT 23/04/2014

123 LabCom projects reviewed out of the **197** projects submitted
34 projects funded
28% selection rate

laboratory can postulate) and the selected research teams receive a flat rate funding sum of €300 k. This makes for a less cumbersome organisation, faster setting-up of the funding and greater flexibility in the use of the grant.

ANR and the competitiveness clusters

Since their creation in 2005, ANR and the clusters have mutually enriched each other.

When ANR funds scientific projects labelled beforehand by the clusters (nearly 2,400 scientific projects labelled since 2005), the clusters and their ecosystem enable the selected ANR projects to have a greater impact, particularly with regard to value creation, technology transfer and the creation of companies.

ANR and clusters have three shared objectives: to reinforce the links between the public and private research players, to create value from the research, and to build scientific and technological communities that gain national and international recognition.

WORTH KNOWING

A competitiveness cluster brings together companies, research laboratories and higher education institutes in a given geographical location. These entities have committed themselves to a partnership approach that is intended to create synergies around innovative joint projects.



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KEY FIGURES FOR 2013

199 labelled projects funded,
110 of these being public-
private partnerships
837 partners, **203** being
private partners
€113 M funding, **€23.2 M** of
which went to companies
(**58%** to SMEs)
1,214 labels delivered by the
clusters
982 projects labelled (by at
least one cluster)

**RESEARCH HIGHLIGHTS**

A European consortium makes advances in plant defence studies

This European research project, funded under the “Plant KBBE” 2008 programme, has resulted in a new aid for studying the fungus responsible for grey mould in more than 200 host plants.

WITH WHOM?

Coordinated by Nathalie Poussereau from the Lyon 1 University, the BOTBANK project was conducted by a European consortium comprising teams from France (INRA, Bayer CropScience), Germany (University of Münster) and Spain (University of Córdoba), and notably included one industrial team.

HOW?

BOTBANK resulted in a new aid for studying the fungus *Botrytis cinerea*, consisting of a collection of mutants characterised by their capacity to infect plants and their morphological, physiological and biochemical criteria.

The creation of a bank of mutants makes it possible to select strains with altered infectivity and to identify the genes that play an important role in pathogenesis. The molecular analysis of the mutants allowed the identification of physiological and biochemical signatures characteristic of the early phases of infection. Several genes that are vital for the pathogenesis of the fungus were identified. Twenty-seven of them have been validated, and some are described for the first time. These new virulence genes led to the development of new lines of research linked to the parasitic development of the fungus and/or the plant's self-defence reactions.

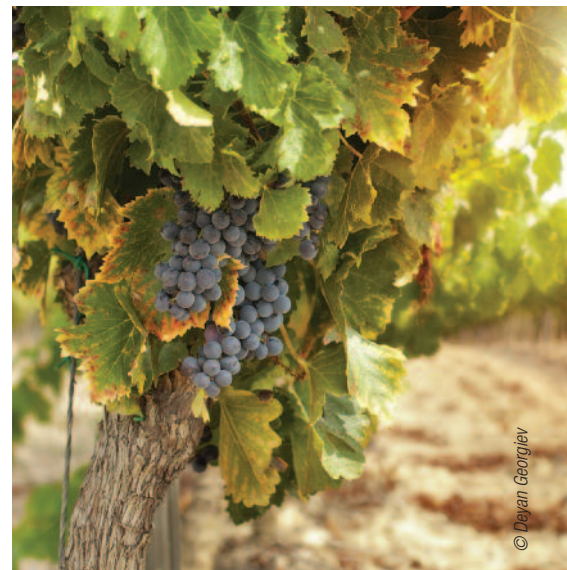
This collaborative project involving several European partners induced the sharing of know-how. It necessitated strong and lasting interaction between the academic partners and the private partner (Bayer CropScience, Lyon).

FOR WHAT PURPOSE?

The phytopathogenic fungus *Botrytis cinerea* is responsible for grey mould (also known as grey rot) in more than 200 host plants. This disease affects many cultivated plants, such as grape vines, market garden and horticultural crops. It causes financial losses estimated on the global scale at between 10 and 100 billion euros per year.

The project's collection is of interest for fundamental research and constitutes a useful aid in the search for strains with specific characteristics such as resistance to compounds or to diverse abiotic stresses. This project has already resulted in the emergence of new themes and the increase in interactions between academic and private research.

Contact: nathalie.poussereau@univ-lyon1.fr



**RESEARCH HIGHLIGHTS**

Modelling tools to serve biomass conversion

Funded under the 2009 “Chemistry and Processes for Sustainable Development” programme, the MeMoBloL project (“Molecular-scale modeling for Lignocellulosic biorefineries”) allowed for the development of key modelling tools for the chemical conversion of plant biomass.

WITH WHOM?

Coordinated by Rafael Lugo of IFP Energies nouvelles, the project involved six academic partners (ARMINES *Ecole des mines de Paris*, ENSTA Paristech *Ecole nationale supérieure des techniques avancées*, *Laboratoire d'ingénierie des matériaux et des hautes pressions CNRS*) and industrial partners (Materials Design and Prosim).

HOW?

Thanks to the collaboration of research labs with two SMEs, the project resulted in the elaboration of predictive models capable of reconstructing the thermodynamic behaviour of the molecules associated with the conversion of lignocellulosic biomass. The project also led to commercial development of a software tool. To this end, the project activities combined the development of mathematical models and molecular simulations, thus allowing for evaluation of the new models in the light of real conditions.

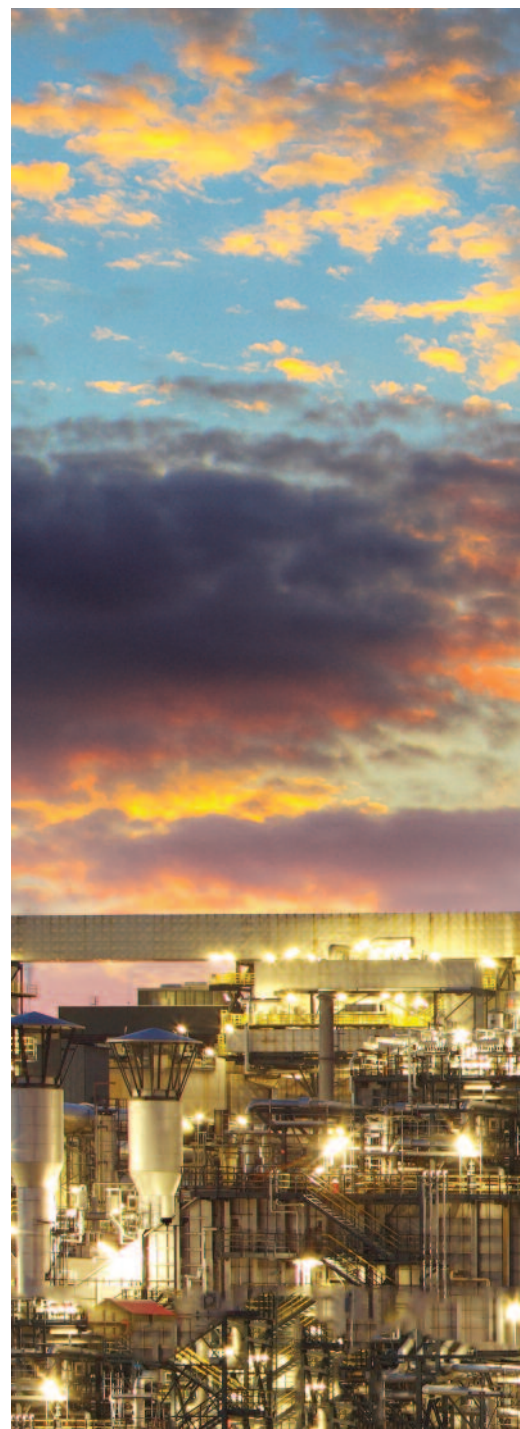
FOR WHAT PURPOSE?

Lignocellulosic biomass plays a pivotal role as a substitution material in the chemical industry. However, in order for new chemical products and manufacturing processes to be designed using this raw material, chemical engineers need tools capable of characterising of the molecules associated with the conversion of these bio-resources. In this context, the project aimed to develop new modelling and calculation technologies that allow for the reconstruction of the physicochemical behaviour of molecules derived from lignocellulosic biomass.

Unlike hydrocarbons, these molecules belong to various families of complex oxygen compounds that require specific modelling tools.

Contact: Rafael.lugo@ifpen.fr

Lignocellulosic biomass is a plant substance composed of lignocellulose, i.e. wood, straw, bark, grasses, leaves and so on.





VI • Fostering the emergence of innovative concepts



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Fostering knowledge production and scientific progress in all disciplines is one of the ANR's scientific priorities. We favor 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.

Blue-sky research: supporting curiosity-driven research, fostering excellence and risk taking in science

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 thus foreshadow striking scientific discoveries.

ANR' support to bottom-up initiatives acknowledges excellence and enhances the French potential for innovative research. Since its creation in 2005, we have given researchers a real opportunity to submit single or multipartner projects assessed on the sole criteria of originality and excellence. Until 2013, the bottom-up "Blanc" programme was open to all types of research projects, from the most fundamental to applied or partnership research.

ANR's Work programme 2014 has now supplanted the former programmes that were categorised as thematic and non-thematic programmes (blue-sky research). It targets major societal issues via a mix of programmatic and non-programmatic funding. The "At the frontiers of research" component is a completely non-programmatic element that grants researchers complete freedom to define their research themes and topics.



RESEARCH HIGHLIGHTS

Tracing back the history of plants in order to improve them

Funded by the "Young Researchers" 2009 programme, Paleocereale explores the genetic history of cultivated plants to enhance their development and their yield.

WITH WHOM?

The Paleocereale project is coordinated by Jérôme Salse of the French National Agricultural Research Institute (INRA) of Clermont-Ferrand.

HOW?

During the last decade, technological improvements in sequencing technologies led to the development of large sets of genomic resources allowing for the emergence of high-resolution comparative genomic studies between plant lineages. Based on paleogenomics, which aims at reconstructing the ancestral genomes of modern living species, the project has proposed a model in which modern plant genomes have evolved from a common ancestor with a basic number of five to seven chromosomes with thousand genes of founder biological functions. Modern plant species evolved from these ancestors through whole genome duplications (i.e. paleopolyploidization) followed by lineage-specific chromosomal fusions and translocations.

Paleopolyploidization events may have participated to species adaptation



through the acquisition of innovative functions gained from the extra-gene copies. Moreover, they may have occurred in response to the phase of major extinction of living species during the cretaceous-tertiary transition, a few tens of millions of years ago.

The established plant ancestral genomes, in terms of chromosome structure and gene content, offer the opportunity to perform high resolution translational research from models and species of agronomic interest. Efficient genomic transfer, based on accurate paleogenomics data, between rice (considered as a model grass species) and wheat allowed the improvement of agronomic traits, including the assimilation of nitrogen (which impact the yield) as well as fibre and carotenoid content of the grain (which impact the quality).

FOR WHAT PURPOSE?

These results make it possible to improve cultivated plants, to enhance their adaptation to ongoing and future climatic changes, in improving their development and their yields.

Contact: jerome.salse@clermont.inra.fr



WORTH KNOWING

The project has led to eleven publications and one European patent.



RESEARCH HIGHLIGHTS

Towards a new generation of safer and more autonomous batteries

Funded by the 2009 “Innovative Storage Energy” programme, this basic research project allowed for the development of a technology that improves the performance of lithium metal batteries, which are known for their high energy density, safety, and low operating cost.

WITH WHOM?

Coordinated by Renaud Bouchet from *Laboratoire d'Electrochimie et de Physicochimie des Matériaux et des interfaces* in Grenoble, the COPOLIBAT project was carried in collaboration with three university laboratories: the *Institut de Chimie Radicalaire* (Aix Marseille University), the *Laboratoire de Réactivité et Chimie des Solides* (Picardie University) and the *Laboratoire de Physique des solides* (Paris Sud University).

HOW?

The project aimed to improve the performance of polymer metal lithium batteries. To this end, it set out to avoid the major problem entailed by the use of classic polymers, by using block co-polymers in ordered nanometric domains. The most innovative aspect of the project was the design of single-ion nanotextured BAB tribloc co-polymers, whereby polymer block A brings the lithium ion conductivity, while polymer block B provides mechanical properties and thermal stability.

Thanks to their single-ion conductivity, the battery tests revealed exceptionally good power performance and cyclability at 60 °C (i.e. 20 °C lower than for current polymer technologies), which makes these new materials very promising for the next generation of batteries.

FOR WHAT PURPOSE?

In light of climate change and resource limitations, the challenge for the immediate future is to develop a safe, inexpensive and efficient battery technology that will endow electric vehicles with greater autonomy.

This basic-research project has laid the groundwork for a new generation of lithium metal batteries, which today are handicapped by their high operating temperatures and a lack of power attributable to their low permeability to used polymer ions.

Contact: renaud.bouchet@lepmi.grenoble-inp.fr

WORTH KNOWING

In 2013, the ANR financed the continuation of this project aimed at industrialising the technology developed in COPOLIBAT. The international prize “EDF Pulse Science and electricity” was awarded to Renaud Bouchet in 2014 on the basis of the research funded in COPOLIBAT.



**RESEARCH HIGHLIGHTS**

What are sexes, gender, mating types and sex chromosomes? Fungi provide some useful answers.

Financed by the “Blanc” 2009 programme, the Fungisex project centred around the study of the mating types and sex chromosomes found in fungi.

WITH WHOM?

Coordinated by Tatiana Giraud from Paris Sud University, the Fungisex project was carried out in collaboration with INRA Versailles.

HOW?

With the aim of gaining insight into the various mysteries associated with the existence of sexes, genders, mating types and sex chromosomes, the Fungisex project studied a specific type of organism – namely fungi. These organisms appear to have undergone a number of evolutionary transitions in terms of the number of mating types they exhibit, which range from zero to 2,000 or even more. Besides, some species of fungi exhibit sex chromosomes that are in a primitive or true state.

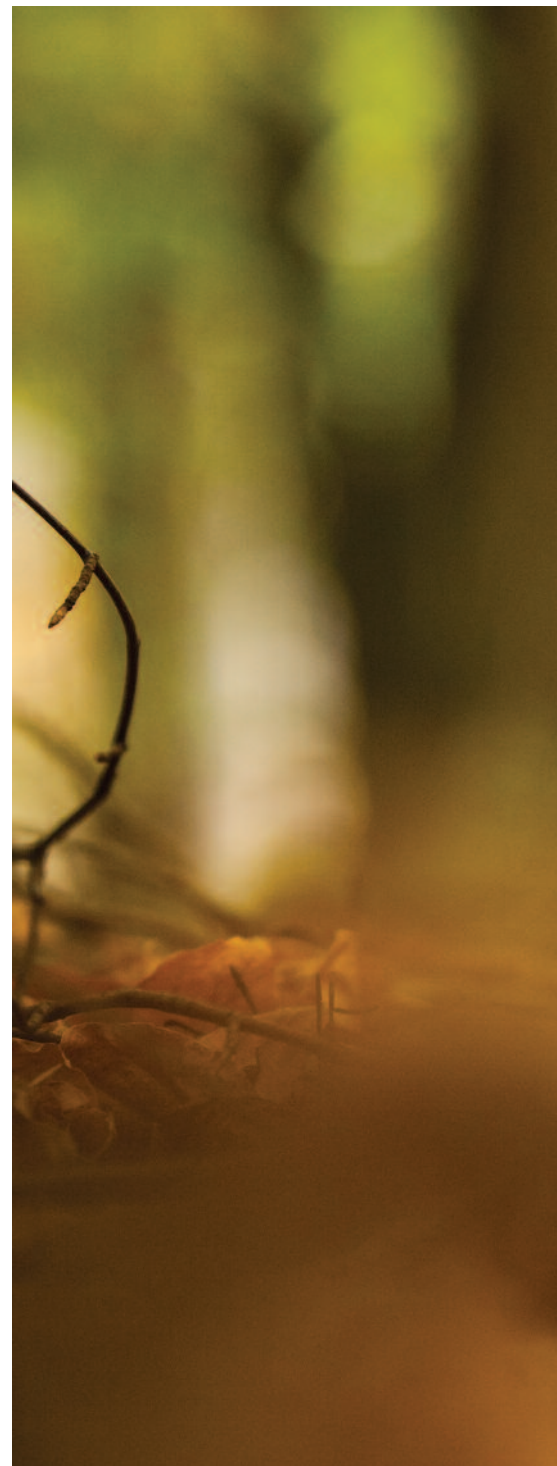
Having conducted a literature review, the project demonstrated that mating types in fungi have evolved so as to prevent identical clones from mating with each other. In addition, the absence of mating types in fungi has probably evolved for universal compatibility rather than for promoting inbreeding – a concept that runs counter to the conventional wisdom in this field and changes our way of thinking about mating types.

By using next generation sequencing on the *Microbotryum* genus, the Fungisex project also showed that sex chromosomes have evolved suppressed recombination over 90 percent of their length – which has induced degeneration, as occurred on the Y chromosome in humans.

FOR WHAT PURPOSE?

The Fungisex project provided responses of fundamental importance to the following questions: Why do most plant and animal species reproduce sexually, rather than through cloning? Why do some species clone themselves? How can we explain the very existence of mating types, which determine compatibility during sexual reproduction? How and why do sex chromosomes evolve?

Contact: Tatiana.giraud@u-psud.fr





VII • Promoting research that meets the major societal challenges



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Science and technology have a major impact on societies, transforming means of communication, transport and food 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. The ANR backs research projects aiming to meet essential societal needs such as health care or burning social issues and producing work on the major changes of our time.

**RESEARCH HIGHLIGHTS**

Moving towards major progress in lexical processing

Co-funded by ANR within the framework of the 2009 edition of the Franco-British call for proposals in social sciences, this project has enabled substantial progress to be made in knowledge of lexical processing and in particular with respect to the role of consonants and vowels in the identification of words.

WITH WHOM?

The RECONVO project is a fundamental research project coordinated by Thierry Nazzi (CNRS-Paris Descartes University) and Caroline Floccia (Plymouth University).

HOW?

The project compared the role of consonants and vowels in the identification of words in the French, English and Danish languages, at different stages of development of the human being. Based on a combined cross-linguistic and developmental approach, the project benefited from the international cooperation and a series of experiments carried out in parallel in Paris and in Plymouth.

FOR WHAT PURPOSE?

Initial studies had suggested that consonants play a bigger role than vowels in the identification of words. RECONVO has shown that this sensitivity does not appear in the French infant aged five months. French infants are more sensitive to a change of vowel affecting their first name than a change in consonant. In Danish, a language which - like English - uses a large number of vowels, a reverse bias towards vowels was evidenced as of the age of 20 months. The results therefore challenge the universality of the bias towards consonants and suggests that the grounds of the distinction between vowels and consonants should be reconsidered.

Contact: thierry.nazzi@parisdescartes.fr



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RESEARCH HIGHLIGHTS

A molecule that improves tolerance in transplantation

Funded under the aegis of the 2009 edition of the “Biotechnologies for health” programme, the TOLESTIM project developed a therapeutic strategy aimed at stimulating immunological tolerance for transplantation, with the aim of attenuating transplant rejection.

WITH WHOM?

TOLESTIM was a collaborative research project coordinated by Maryvonne Hiance from the biotech company Effimune. The project was carried out in partnership with Inserm (UMR 1064) and Nantes University Hospital.

HOW?

When performing organ transplants, surgeons aim for optimal compatibility between the organ donor and recipient so as to prevent the recipient’s immune system from rejecting the transplant. However, such rejection is an ever present risk, which needs to be managed via medication throughout the life of the organ recipient. In the interest of improving immunological tolerance to transplantation, the TOLESTIM project developed a substance known as FR104, an antibody fragment that has the capacity to selectively block the signals involved in stimulating the alloreactive T cells that are responsible for rejection, but without blocking the signals necessary for the regulatory activity of T cells, which in turn allow for tolerance.

FOR WHAT PURPOSE?

This new immunomodulating therapy will reduce transplant rejection, and may also be applicable to the treatment of various autoimmune disorders that share certain mechanisms with transplant rejection. The therapy is now ready for clinical trials.

Contact: mhiance@effimune.com



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9 major societal challenges

A large part of ANR’s new 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:

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

Intensive use of natural resources due to the development of 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 interacts closely with the issues of preserving the environment, from a development perspective, which comes from a virtuous circle in which all changes in societies follow the guidelines of reducing emissions of pollutants and greenhouse gases. The ANR promotes innovative research that finds solutions to these major issues for human societies.



RESEARCH HIGHLIGHTS

Pharmaceutical products, the new contaminants of the Mediterranean coastline

The demographic growth on the Mediterranean coastline over the last few decades has led to an increase in discharges resulting from human activities into the marine environment. The impact on the affected ecosystems is two-pronged, since it concerns both the environment and human health. Although industrial contaminants had already been identified, new ones have appeared, such as pharmaceuticals and personal care products. The Pepsea project funded by the “Contaminants, Ecosystems and Health” 2009 programme, has taken on the task of evidencing and analysing them.

WITH WHOM?

This project was coordinated by Elena Gomez of the Hydrosociences Montpellier Laboratory (CNRS/ Montpellier University) and involved the following partners: Environmental Analytical Chemistry Laboratory (Marseille University/CNRS), Environment and Resources Laboratory of Languedoc Roussillon (Ifremer) and Medical Pharmacology and Toxicology Laboratory (Lapeyronie University Hospital Centre/ Montpellier 1 University).

HOW?

The project examined the occurrence of the emerging contaminants such as pharmaceuticals and personal care products in sediments, water and organisms, and characterised their behaviour. It revealed the presence of this type of contamination at low concentrations on two marine sites with sea outfalls. It also provided proof of their bioaccumulation in the Mediterranean mussel. The dissemination of these emerging contaminants was studied using of 3D modelling. To better describe the contamination dynamics of the water masses at the outfall, an antiepileptic and its metabolites was used for modelling the release and dispersion, and then confirmed by in situ sampling. This work is the fruit of successful collaborations with the ARS (Regional Health Agency) of Languedoc-Roussillon within the framework of the Regional Health Environment Plan and the PNRM (National Plan for Residues of Medicines), and with the Algarve University (Portugal) and the Lebanese University.



FOR WHAT PURPOSE?

The project has evidenced the phototransformation of the contaminants into potentially toxic halogenated derivatives, and the role of sediment as a reservoir of some pharmaceutical products.

The hydrodynamic modelling employed allows improvements in practices for checking and monitoring discharges from outfalls at sea to be envisaged.

Contact: mgomezhe@univ-montp1.fr



RESEARCH HIGHLIGHTS

When vines produce energy

The BioViVe project (vineyard biomass for glass melting), funded by the Bioenergy 2009 programme, aimed to use biomass resources from vineyards, primarily prunings burned on site and uprooted vines, to produce some of the energy required to manufacture wine bottles.

WITH WHOM?

This project, coordinated by Laurent Pierrot, R&D manager at Verallia (Saint-Gobain), involved a partnership with French research centre CIRAD, Belgian company Xylowatt, GDF Suez and the Interprofessional Champagne Committee (CIVC).

HOW?

The BioViVe project consists in adapting a wood gasification method used in forestry to vineyard biomass resources. The syngas obtained is optimised for use in a glass-melting furnace. The project's partners facilitated the production of an industrial gasifier with a capacity of 1 MW, which was installed on the Verallia site in Oiry in the Champagne region, to prepare its connection to the glass furnace.

FOR WHAT PURPOSE?

This initiative has the dual purpose of making good use of a biomass currently burned on site (prunings, uprooted vines) and reducing the environmental impact of glass bottle production, which is particularly energy-intensive. The project has established that the annual biomass from vineyards in Champagne, estimated at 58,000 tonnes, will provide 50% of the energy for the furnace in Oiry. It has therefore raised awareness among winemakers, 15,000 wineries and 300 champagne houses in fact, on the benefits of recovering the by-products from their vines and promoted the use of different collection schemes by the operators. At the same time, the process is of interest to the service providers, who see it as a means of expanding and diversifying their business.

Contact: Laurent.Pierrot@saint-gobain.com



WORTH KNOWING

In the industrial phase, the project will save 10,000 tonnes of CO₂ per year, i.e. the equivalent to the emissions of around 5,000 vehicles.



Scientific and technological progress is key for modernisation and economic growth or for increased productivity. ANR funds research in key economic sectors with high potential for innovation (ecotechnologies and biotechnologies) and fosters the development of key enabling technologies feeding all sectors of the economy (information and communication technologies, nanotechnologies), with a true lever effect on industrial productivity, employment and company competitiveness and contributing to sustainable development in industry.



RESEARCH HIGHLIGHTS

To avoid exceeding the speed limit

WITH WHOM?

Armines (France), Valeo (France), Daimler (Germany) and Horschule Aalen (Germany). The SPEEDCAM project was funded under the 2009 edition of the "Land transport vehicles" programme.

HOW?

This Franco-German project lies within the framework of the development of driver assistance systems. It aims at automating reliable real-time identification of the maximum speed authorised on the road. In what way? By taking into account the speed limit set by the authorities and indicated to the drivers by the road signs. The approach is based on the merging of data produced by an image recognition and processing system and a geographical information system. Once the speed limit is known, the developed human-machine interfaces (HMI) generate an alert. The prototype incorporates a cruise control system: this enables drivers to set their speed according to the legal limit in force on the roads on which they are travelling.

FOR WHAT PURPOSE?

As well as having a direct impact in terms of road safety, the results obtained with the prototype displayed very good levels of detection/recognition. The final product is currently being put into commercial operation.

Contact: Fawzi.Nashashibi@minesparistech.fr

First edition of the "Digital Meetings"

On 17th and 18th April 2013, ANR held the first "Digital Meetings" in Paris. The purpose of this international seminar was to assess the situation of research funded by ANR in the digital field since 2008.

The digital revolution has had a disruptive impact on our lives, transforming uses, ways of working, designing, creating and learning. But also and above all the way of seeing and thinking the world of the future. Improving our competitiveness by developing our knowledge, techniques, digital methods and instruments, such is the objective of project-based funding in the field of information and communication sciences and technologies (ICST). The challenge of the ICST programmes implemented by ANR in recent years is thus to mobilise interdisciplinary partnerships to bring the French stakeholders to be ever-more inventive in terms of concepts and uses in this naturally cross-cutting and enabling field.



Spotlight on F@CIL

The F@CIL project looks into the creation of smart cards with a difference. These cards allow high-data rate exchanges with the card-reader and function, with a very low energy level for the customer. "The F@CIL project had to be set up very rapidly to meet the needs that we in industry had identified", explains Jean-Paul Caruana. Winner of the "Value creation and transfer" prize, he adds that "thanks to the framework and funding provided by ANR, we were able to work with three different partners. Although it is very difficult to keep scientific research skills in industry, the funding of the F@CIL project enabled us to work jointly not only with research organisations such as CEA-LETI, but also with a highly responsive SME, and this was of great benefit for our project".



RESEARCH HIGHLIGHTS

Optical-fibre performance optimisation

The STRADE project, in the field of optical telecommunication, was funded by the "Future Networks and Services" 2009 programme, and allowed for major advances in the improvement of fibre optic capacities.

WITH WHOM?

Coordinated by Philippe Genevoux of Alcatel-Lucent Bell Labs France, this project was jointly carried out by Prysmian Group, Kylia, Lille 1 University, TELECOM & management SudParis, and INRIA, all of whose expertise complemented each other.

HOW?

STRADE aimed to develop a new data transmission technology based on the propagation of various forms of light in fibre, known as modes. Because the modes propagate independently from each other, total throughput in the fibres can be multiplied by a factor equal to the number of modes, relative to the single-mode transmission technology currently in use.

The project stakeholders worked concurrently on data transmission for a new type of fibre suitable for this technology, and on optical-signal amplification. They also investigated new receiving technologies that use coherent detection and digital signal processing in order to attenuate transmission problems such as non-linear effects.

FOR WHAT PURPOSE?

In view of the steady increase in Internet traffic, fibre-optic deployment is essential for realisation of an ultra-high-speed communication infrastructure. The development of new types of low-cost fibres that allow for increasingly high speed transport is essential in order to avoid the network saturation that is expected to occur by 2020. Thanks to a new optical-data transmission technology, STRADE demonstrated that considerably higher transmission rates are within reach.

Contact: philippe.genevoux@alcatel-lucent.com



FUTURPROD

What does research hold for tomorrow's industry?

On the initiative of the ANR and the foresight workshop FUTURPROD, 170 scientists and manufacturers met at the French conservatory of arts and crafts (CNAM) on February 12, 2013. Together they discussed the future for industrial production-related research.

WITH WHOM?

FUTURPROD, coordinated by the G-SCOP lab (Science for design, optimisation and production lab), brought together three national research networks (AIP-PRIMECA, SFGP and GDR Macs). In 2011, G-SCOP was invited to conduct foresight discussions on production systems of the future up to 2030, in order to identify a set of topic-based priorities.

HOW?

Foresight workshops serve to identify thematic research priorities. How? By using forward-looking methods, to be used for ANR calls for proposals. Consisting of 35 academic and industrial experts, to promote a multidisciplinary approach to the issues at stake, FUTURPROD met throughout 2012, in the form of bimonthly workshops. The experts then discussed their ideas at the conference and lastly, they submitted their findings and scenarios in a report.

FOR WHAT PURPOSE?

Countries such as the United States, the UK and Germany have already taken initiatives to respond to deindustrialisation. This is particularly what prompted the ANR to take action, at a time when it is important to review the French production systems model in light of present and future economic, environmental and social issues. These issues include an increase in the population, access to energy resources, access to employment, etc.

The 10 issues identified by FUTURPROD

- developing new intelligent technologies
- developing tools to design and organise production systems
- developing new occupational skills
- producing and distributing in supply chains closer to the market worldwide
- eco-efficient production
- production that ensures health and safety in the workplace
- designing functions rather than products
- inventing new collaborative systems
- improving corporate responsibility
- supporting participatory innovation

These ten issues were then broken down into 42 research areas.

WORTH KNOWING

How ANR's foresight workshops work

A foresight workshop (in French: ARP) seeks to stimulate forward thinking in research areas and topics that economic, social or scientific developments make necessary.

It gives rise to a forward-looking analysis of the area studied, through syntheses of French and foreign forward-thinking exercises. The aim is to identify the main factors behind developments in the issues, possible changes in the field, scientific challenges in the medium and long term, future research opportunities, analysing the resources necessary, and issuing recommendations and action plans relating to the potential launch of new research programmes. The method involves constructing different scenarios, which appeared to be the most relevant approach for devising and constructing a project.



VIII • An agency with a global outlook



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ANR is actively involved in the ongoing internationalisation of research, of its implications and issues, and of the major challenges of science and knowledge. Its activities aim at increasing the excellence, the competitiveness, the attractiveness, the impact and the outreach of French research in Europe and the world.

One of our major aims is to expand our activities internationally. Since 2006, we have found increasing ways to lend financial support to projects connected to the best foreign researchers. The growing number of partnerships has enabled us to meet different objectives, including:

- strengthening the competitiveness of French research,
- facilitating France's entry into European competition,
- and allowing national teams to collaborate with the best foreign teams.

As a young organisation in the field of national research and a representative of competitive project funding, we have strived from the very start to rapidly integrate European and global networks, facilitating France's international partnerships through project funding.

Research without borders: facilitating international collaborations

ANR supports the development of international collaborative research projects. To do so, we collaborate with the research funding agencies of other countries in order to remove obstacles to cooperation. We conclude agreements that serve to reduce the barriers and 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 generic call for proposals or through the launching of specific bilateral or multilateral calls for proposals.

Reinforcing the visibility of French research

We play an active part in European and international research policy, and make French research more visible by taking an active part in a variety of European and worldwide forums and governing bodies: Science Europe, the Global Research Council, the G8-HORCs, etc. ANR also participates in the global network of funding agencies: IRDiRC on rare diseases, Belmont Forum on global environmental changes, but also ORA in social sciences.

2013: Boosting ANR's international strategy

In a context of growing internationalisation of research, ANR focused in 2013 on reinforcing its European and international cooperation strategy by consolidating its role as a funder of project-based research in Europe and by becoming the coordinator of an increasing number of ERA-NETs, by participating in the reflections on European and transnational programmes, by anchoring a large part of its activity in the framework of Horizon 2020, by setting up the "lead agency" principle to facilitate collaborations between researchers, and by actively participating in the global dialogue.



2013 KEY FIGURES

1,304 international projects received eligible to funding
186 international projects co-funded with other funding agencies
€51 M of funding allocated to these projects
17% of all the projects supported by ANR are international co-funded projects



WORTH KNOWING

French research teams can also 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.





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**Our international policy:
prioritising actions, coordinating instruments, providing the community
with clear funding opportunities**

Prioritising actions

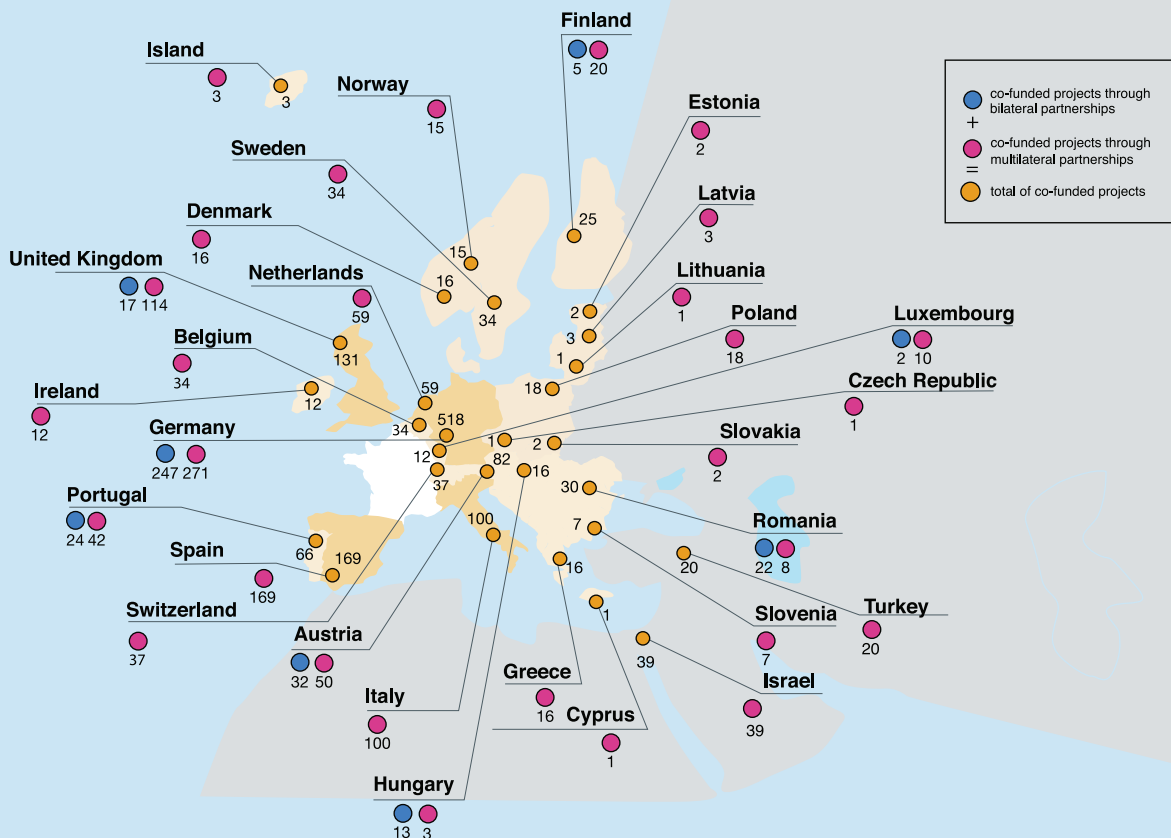
With a tight budget and ever-increasing requests for collaboration, ANR is forced to make choices and it is firmly committed to prioritising work that will have the greatest impact for the sector. "In selecting the ANR's international programming, different criteria are considered, measured and evaluated, says Pascale Briand, including: how to strengthen France's scientific position in relevant sectors, how to consolidate the strengths of the national community and move further towards excellence, how to meet science diplomacy objectives, etc."

Efficiency of public funding: coordinate, not duplicate

The ANR has threaded together much of its 2014 Work Programme with the funding programme Horizon 2020, and more broadly with the European policy agenda, while being careful that its funding does not duplicate EU funding. As Horizon 2020 covers a vast range of scientific topics, the concern is to offer competitive funding harmonising with European calls for proposals. In setting its priorities, the agency hopes to effectively coordinate national and European funding within the European Research Area. Moreover, the actual research areas may be transnational (e.g. climate change) and require a coordinated response from different countries.

Offering the community clear funding opportunities

Relying in particular on the work of the advisory board for European and International Actions (COMINT) (page 80), the ANR places great importance on giving researchers a clear picture of the funding available amongst the funding instruments offered by the agency and other French organisations, EU funding instruments and international instruments.



Building the European Research Area is a top priority

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, making the most of the European Commission's instruments: the ERA-NETs, the Joint Programming Initiatives (JPI), the articles 185, etc. ANR is involved in the forums and networks reflecting on strategy, scientific policy and the implementation of European agendas on specific subjects, and takes care to link its programme planning with European programme planning.



WORTH KNOWING

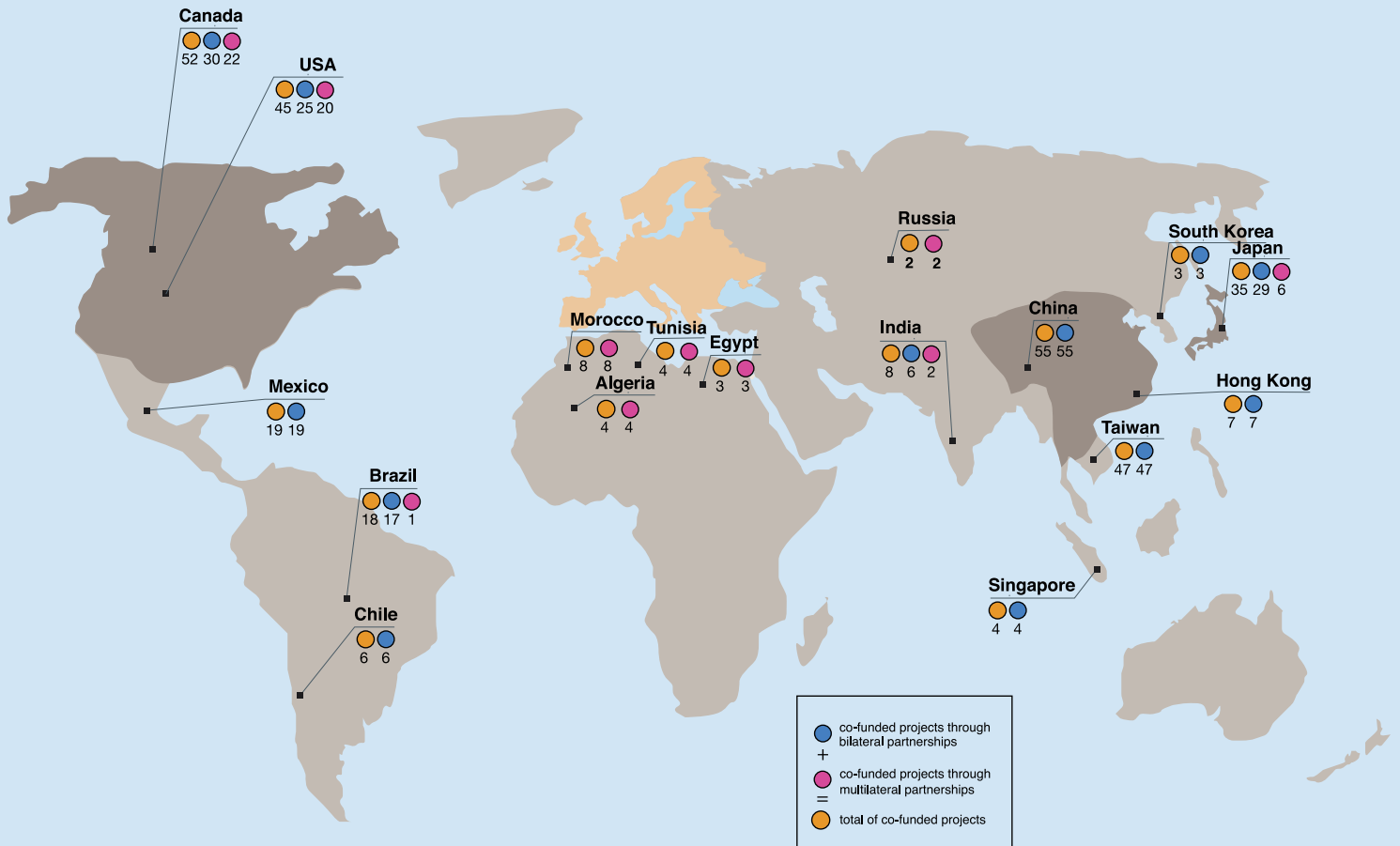
International projects may be carried out by academics from two or more countries, but also in public-private partnership.



KEY FIGURES

774. This is the number of projects co-funded by ANR and its European partners since 2006. That is to say **70%** of the international projects co-funded by ANR, or **7%** of all the projects funded by the French agency.

Panorama of international collaborations



ANR forms solid partnerships with major players in world research and emerging scientific powers.

20 milestones of the international year

JANUARY 2013

1. Infect-ERA

Infectious diseases under Europe's microscope

The year 2013 was marked by the launching of the European initiative Infect-ERA and the coordination of a 4th ERA-NET placed under the responsibility of ANR. Funded by the European Commission, this instrument aims at developing and reinforcing the coordination of national research programmes. It also allows the pooling of resources by launching joint transnational calls for proposals on targeted themes.

WITH WHOM?

Alongside 14 European partners, ANR is launching calls for proposals with the aim of financing interdisciplinary and transnational research targeting fundamental aspects of the biology of human infectious diseases, whether caused by bacteria, fungi, viruses or protozoa.

HOW?

Here ANR plays the role of coordinator: it supervises the activities of the consortium of European partners and reports on these activities to the European Commission.

For the ERA-NET member agencies, the question is to avoid duplicating work, to share experience, know-how, data and equipment, and to identify and respond to any needs in terms of research. ANR participates in the calls launched by Infect-ERA and funds the research undertaken by the selected French teams. It is also involved in the governance of the calls and plays a key role in the choice of topics.

FOR WHAT PURPOSE?

European cooperation allows for mutual enrichment and increased efficiency. By putting competition aside, we create an incentive environment for synergies, shared vision and joint strategy. The European Commission has developed a series of instruments facilitating Pan-European collaborations: ERA-NETs, joint programming initiatives (JPIs), articles 185. In that context, funding agencies issue calls for transnational proposals that are clearly on the rise. These partnerships are also forums for discussions, joint analysis, networking and platforms to detect bottlenecks.

Why taking part in ERA-NETs?

ANR is a driving force in the ERA-NETs; through joint calls we promote the notion of excellence throughout Europe. We also meet with our European partners to define common priorities and coordinate our actions.

FLAG-ERA: that makes it 4!

FLAG-ERA rallies 22 European agencies, organisations and Ministries of Research around the European Commission's Flagship projects on "Future and Emerging Technologies", the FET Flagships. This is the 4th ERA-NET now coordinated by ANR, in addition to CHIST-ERA, EuroNanoMed 2 and Infect-ERA.



FLAG-ERA should more specifically contribute to the construction of two "FET Flagships": the Graphene project which aims at speeding up the development and commercialisation of applications using this carbon crystal, and the Human Brain Project (HBP), intended to develop a simulation of the human brain using a supercomputer.

The FLAG-ERA kick-off meeting was held from 12th to 14th November 2013 in Amsterdam.

Reminder

1 Since 2010, CHIST-ERA has brought together some fifteen partners around the long-term challenges in information and communication sciences and technologies.

2 EuroNanoMed 2 addresses the theme of nanomedicine, which is expected to have a major impact on the development of individual diagnoses, targeted therapies and better treatment monitoring. It involves 20 partners from 17 countries.

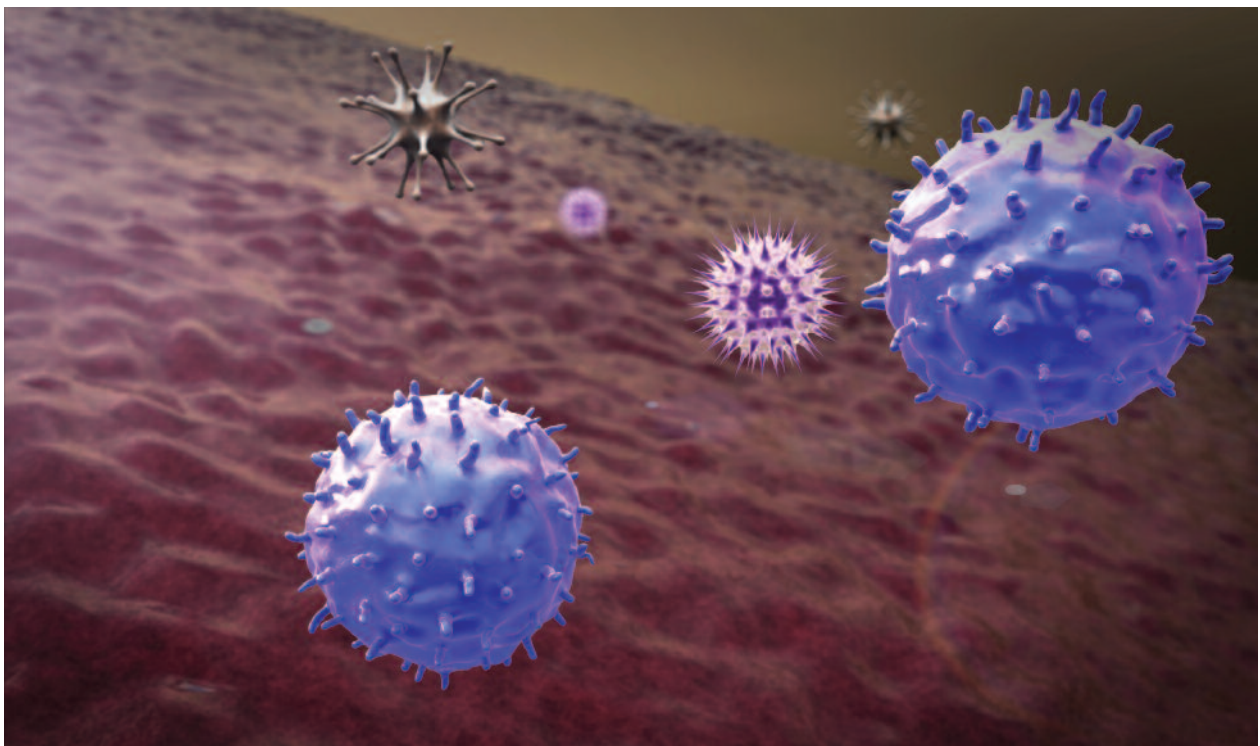


2013 KEY FIGURES

35: this is the number of ERA-NETs in which ANR has participated since 2006, in a multitude of fields, such as biology health, environment, information and communication sciences and technologies, ecotechnologies, nanosciences, materials and social sciences.

333: this is the number of collaborative research projects co-funded by ANR under the calls launched by the ERA-NET consortia between 2006 and 2013.

€96 M: this is the overall amount of funding attributed by ANR to the French teams in this context.



FEBRUARY 2013

2. ANR and the FNR in Luxembourg sign a cooperation agreement

ANR officialises the cooperation with the Luxembourg FNR (National Research Fund). A “lead agency” agreement was signed by Yves Elsen, Chairman of the Board of FNR, Pascale Briand, Director General of ANR, and Marc Schiltz, Secretary-General of FNR.

“It is a way of positioning ANR in a movement to harmonise the European research area, in which the key words are confidence, simplification and clarity”, emphasises Pascale Briand. According to Marc Schiltz, Secretary-General of FNR, the collaboration between FNR and ANR gives Luxembourgian researchers “easier access to one of the best research environments in the world”. It thereby helps make Luxembourgian researchers more competitive.”

3. ANR and TÜBİTAK move closer together

During the winter of 2013, Philippe Freyssinet, Deputy Director General of ANR, went to Turkey to forge links with TÜBİTAK – the Turkish Scientific and Technological Research Council – the principle research funding agency and operator in the country.

ANR has already worked with TÜBİTAK within the framework of its European programmes. It has co-financed no less than 18 projects with its Turkish partners since 2007, so this is not unknown ground for ANR. But the idea behind this visit was to see to what extent this partnership could be developed even further, at the bilateral level. The setting up of a Franco-Turkish collaboration more specifically confirms ANR's resolve to participate in the co-construction of a Euro-Mediterranean research area, but also to develop a new partnership with a rapidly growing country in the international scientific arena.



ANR-TÜBİTAK: Follow-up

On 27th January 2014, on the occasion of the State visit of the French President, François Hollande, to Turkey, Professor Yücel Altunbaşak, Chairman of Tübitak, and Pascale Briand, Director General of ANR, signed a memorandum of understanding. This MOU provides in particular for the funding of joint research projects.

6-7 MARCH 2013

4. "Great Tohoku earthquake"

The time has come to assess the Franco-Japanese research programme

On 6th and 7th March 2013, French and Japanese researchers met in Sendai to review the FLASH Japan 2011 programme. This call for proposals was launched following the earthquake and tsunami that hit Japan on 11th March 2011.

WITH WHOM?

In March 2011, ANR and the Japan Science and Technology agency (JST) launched a joint call for proposals called the FLASH Japan programme, further to the tsunami of 11th March. The final symposium concerning this call was held in Tohoku University in Sendai, a town directly affected by the earthquake.

HOW?

This final symposium provided the opportunity to assess the 9 Franco-Japanese projects selected under the call launched in 2011, and to present the work they involved and their results. These projects - which reached their term at the end of March 2013 - focus equally well on earth sciences as on the environmental and societal impact, engineering sciences, crisis management, interplay between natural and technological risks, the resilience of the environment and reconstruction.

FOR WHAT PURPOSE?

The aim of the FLASH Japan programme was to promote urgent research work relating to the earthquake and tsunami of 2011 in Japan, and to boost Franco-Japanese cooperation on this type of subject.

DID YOU KNOW?

The FLASH call is designed to support an urgent need for research whose scientific relevance is linked to an event or a natural disaster of exceptional scale. The aim is to finance the work necessary for the acquisition of rare information and data that are impossible to obtain in normal situations. Deployable at any time and dependent on the responsiveness of ANR and the local and French research teams, the FLASH instrument allows projects to be selected and funded in a short time frame without detracting from the fundamental principles of ANR for as much. To date it has been used twice, the first time in 2010 following the earthquake in Haiti and the second time in relation with the consequences of the earthquake and tsunami that hit Fukushima in Japan. The funding granted allows the necessary work to be started rapidly pending its takeover by a conventional research project.

WORTH KNOWING

In Japan the FLASH programme is called J-RAPID. It was open to international cooperation with other countries as well as France. The final project inventory counted 22 projects in collaboration with the United States, 9 with France, 2 with Thailand, 1 with Indonesia and 1 with the United Kingdom. These 35 projects were all presented at the final symposium.



MARCH 2013



RESEARCH HIGHLIGHTS

5. A closer look at earthquakes

Funded under the FLASH Japan programme, the DYNTOHOKU project is based on a large amount of data, collected mainly during the disaster, to model earthquakes. The project aimed to gain a better understanding of the mechanisms responsible for megathrust earthquakes in subduction zones and to create a sustainable partnership between French and Japanese teams.

WITH WHO?

France's CNRS (UMR8538 Geology Laboratory) and Bureau of Geological and Mining Research (BRGM), and Japan's National Research Institute for Earth science and Disaster prevention (NIED) and the University of Tokyo (Department of Earth and Planetary science).

HOW?

In the aftermath of the Tohoku earthquake, the second largest earthquake in the present century, French and Japanese scientists analysed and made use of a wide range of seismic and geodetic data to model this mega-earthquake as accurately as possible. For 18 months, these researchers strived, on the basis of seismic and geodetic observations, to develop a new model of the mechanism that causes very large fault slip at shallow depth in subduction zones.

FOR WHAT PURPOSE?

This project helped to understand the mechanisms responsible for great subduction earthquakes. It shows in particular that the interface area between the Pacific plate and the Japanese islands is much larger and better coupled than expected before this earthquake. This implies a different look at the rupture mechanism behind subduction earthquakes combining multidisciplinary observations with accurate numerical modelling. This project has resulted in a long-term partnership between French and Japanese seismologists.

Contact: madariag@geologie.ens.fr



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19-22 MARCH 2013

6. Global environmental changes: The G8/Belmont Forum initiative review panel meets in Washington

In the spring of 2013, an international panel of senior experts met in the United States to review the proposals submitted to the G8/Belmont Forum first call for proposals on environmental issues of global concern.

WITH WHOM?

The ANR participated in the Belmont Forum's first (and G8's third) call for proposals alongside agencies representing Australia, Brazil, Canada, Germany, India, Japan, Russia, South Africa, UK, and USA.

The evaluation panel set up to consider the proposals brought together some forty scientific experts in the two fields concerned from around the world.

HOW?

Research funding organisations pool resources in joint calls for proposals, the aim being to maximise scientific excellence, international collaboration and interdisciplinarity to find the best solutions to the environmental challenges we are all facing.

This international call concerned the vulnerability of coastal areas and the security of freshwater resources. 137 pre-proposals were submitted at the end of the first submission stage in 2012. The review panel met in London at the end of 2012 to select the pre-proposals, and then at the beginning of 2013 in Washington to examine the 52 projects invited to submit a full proposal. Following the panel's work, the agencies selected 13 projects with a total funding of €19 million. Of these, the ANR has financed six projects involving French research teams, to the amount of €2.5 million.

FOR WHAT PURPOSE?

Environmental changes, including climate change, require global responses, given that the problems are on a planetary scale. These collaborative efforts help to more effectively fund scientific excellence and involve experts from various fields in research areas of global concern through a multinational and interdisciplinary approach.

WORTH KNOWING

The International Group of Funding Agencies (IGFA) is a global forum concerned with research into the major challenges related to global environmental change. In this context, the Belmont Forum brings together senior representatives from the world's primary funding agencies. The ANR has been Vice-Chair of the Belmont Forum since 2012.

The G8-HORCs (Heads of Research Councils of G8 Countries) brings together the heads of the research funding organisations in the G8 countries. The members are particularly concerned with research strategy and policy, as well as with transverse and global problems. The G8 led a pilot programme launching three calls for transnational projects between 2010 and 2013 related to interdisciplinary and global issues, the most recent being the call issued with the Belmont Forum.



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APRIL 2013

7. Celebrating the “Franco-German year”

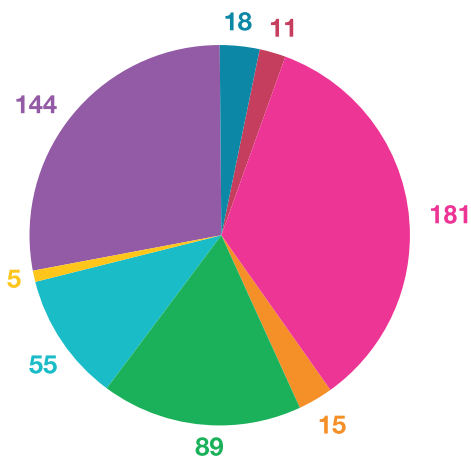
In honour of the 50th anniversary of the Élysée Treaty, German Federal Minister, Johanna Wanka, and her French counterpart, Geneviève Fioraso, Minister of Higher Education and Research, opened the Franco-German Science Week in Paris, on 15 April 2013.

Two German partners

The German Research Foundation, the DFG, is the self-governing organisation for science and research in Germany. It funds research projects in all fields of science and the humanities.

The German Federal ministry of education and research, the BMBF, is notably responsible for financing scientific research in Germany.

Special relations in many fields



- Information and Communication Sciences and Technology **18 projects**
- Global Security **11 projects**
- Biology Health **181 projects**
- Sustainable Energy **15 projects**
- Environment and Biological Resources **89 projects**
- Materials, Chemistry, Processes, Nanotechnology **55 projects**
- Mathematics, Physics **5 projects**
- Social Sciences and Humanities **144 projects**

Panorama of projects co-funded between 2006 and 2013

GERMANY, ANR'S LEADING PARTNER

Since 2006, more than 500 projects involving French and German partners have been co-funded by ANR, about 250 of which were bilateral Franco-German projects.



WORTH KNOWING

2013 marked the 50th anniversary of the Élysée Treaty. Also known as the Treaty of Friendship, it was established by Charles de Gaulle of France and Konrad Adenauer of Germany on January 22, 1963.



APRIL 2013



RESEARCH HIGHLIGHTS

8. Aesthetics through a Franco-German lens

WITH WHOM?

Funded under the 2009 edition of the ANR-DFG Franco-German call in social sciences and humanities, this project was coordinated by Elisabeth Décultot from the Marc Bloch centre in Berlin and Gerhard Lauer, from Göttingen University in Germany (Seminar für Deutsche Philologie).

HOW?

The purpose of the Aisthesis project was to critically examine the construction of aesthetics and the various related traditions, taking a close look at the reception of German aesthetics in France between 1750 and 1810 and the reception of France's art theories in Germany at the same time. The project is distinguished by its desire to circumvent the national segmentation omnipresent in studies on aesthetics since the 19th century. It has identified the cultural transfers between 'new' German science, described by Baumgarten as "aesthetic", and other traditions such as descriptive and practical theories of art and poetry developed in Europe in the first half of the 18th century. This research draws its strength from its multidisciplinary and international nature, bringing together researchers specialising in aesthetics, literature, philosophy and art history. The research also benefited from a partnership between the Marc Bloch centre and Göttingen University and a wealth of interaction with Wisconsin University and Montreal University.

FOR WHAT PURPOSE?

By analysing the exchanges connecting the two countries' aesthetics-related traditions, the research identified how the 18th century understood the functioning of sensitive perception and the role of art in the development of the human ability to perceive, and more generally, in the education of man. What is at stake is no less than how humans were represented in the Age of Enlightenment and the intellectual history in relation to this so far.

Contact: elisabeth.decultot@ens.fr

DID YOU KNOW?

Launched yearly since 2007, the Franco-German ANR-DFG programme in social sciences and humanities aims to support collaborative research projects conducted jointly by French and German teams. It plays a key role in collaborative research between the two countries. The programme contributes hugely to building the European Research Area in humanities and social sciences, in parallel and in addition to the multilateral social sciences programme ORA that it preceded by three years and which the ANR and DFG have spearheaded.



WORTH KNOWING

Three books have been published on this project and three others will be published by 2015. What's more, the French project coordinator, Elisabeth Décultot, was awarded a prestigious Alexander von Humboldt foundation professorship worth €3.5 million at Halle University in Germany.



© E. Décultot / G. Lauer

27-29 MAY 2013

9. World's research funders address the issues of Open Access and Research Integrity

ANR participated in the second summit of the Global Research Council in Berlin on May 27-29, 2013. Heads of 70 research funding organisations from around the world endorsed statements concerning two major issues in scientific research: Open Access and Research Integrity. The endorsement of an action plan on Open Access shows the consensus among the participants who agree that sharing research publications openly is a means to increase the quality of research communication and thus of research itself. The action plan mentions three fundamental principles: encouragement, awareness rising, and support for researchers that wish to provide their results in Open Access.

10-11 JUNE 2013

10. A Franco-Mexican forum boosts the bilateral scientific cooperation

A Franco-Mexican Forum for Research and Innovation was held on June 10-11th, 2013 in Mexico City, in order to enhance the bilateral cooperation. The event, jointly organised by the French Embassy in Mexico, the Mexican Agency for International Development Cooperation (AMEXCID) and the National Council for Science and Technology in Mexico (CONACYT), gathered more than 400 participants, including 60 representatives from French centres and institutes of research and innovation. ANR took part in the roundtable discussions on the funding opportunities for French and Mexican research teams, and on the synergies between the different schemes. The ANR also met its Mexican counterpart, the CONACYT.

ANR-CONACYT: Follow-up

The main aim of the forum was to boost France-Mexico bilateral cooperation. This has been done. During the French President's state visit to Mexico on April 10-11, 2014, several cooperation agreements were concluded between French and Mexican research organisations. ANR and CONACYT notably signed a new agreement to promote the funding of joint research projects carried out by teams from both countries.



© CEMICA



JULY 2013



RESEARCH HIGHLIGHTS

11. A Franco-Chinese team makes progress in 3D Modelling

Today, Computer-Aided Geometric Design has a dramatic impact on the way design engineers work. This Franco-Chinese project focused on new techniques of mathematical representation applied to Computer-Aided Design (CAD).

WITH WHOM?

The SHAN project was led by Jean-Claude Paul, Research Director, INRIA (French Institute for Research in Computer Science and Automation) and Jun-hai Yong, Professor, Tsinghua University (China).

HOW?

In CAD systems, the surfaces used to model forms are B-splines and more particularly NURBS (non-uniform rational B-splines). In the SHAN project, new mathematical representations have been studied. The idea was to apply these representations to solve essential problems in modelling, such as the calculations for the projection of points on curves and surfaces, the intersection and smoothing calculations, error control, etc. Working from the experience of both academic and industrial partners, new operators were tested on CAD and engineering applications (particularly in the field of aeronautics), and compared with the operators based on the conventional methods used today.

FOR WHAT PURPOSE?

3D geometric models play a key role in all industrial processes. However, constructing their subjacent mathematical representation remains difficult and they are still constructed manually to a large extent. This project proposes a new class of surfaces enabling the digital model of 3D objects to be represented with greater precision and robustness than current standard surfaces, digital simulations to be performed on these surfaces directly without prior meshing, and the *a priori* tolerances of numerical control machines to be verified.

Contact: paul@tsinghua.edu.cn



WORTH KNOWING

The SHAN project benefited from the excellence of the students and doctors seconded by Tsinghua University. It was the start of a very active collaboration between the two French and Chinese partners. Jean-Claude Paul received the "Advanced Professor Chair" distinction from Tsinghua University in 2011 and 2012.

Glossary

Computer-aided geometric design deals with the mathematical description of shape for use in computer graphics, numerical analysis...



AUGUST 2013

12. Hosting high-level researchers: A win-win initiative

In a global context of researcher mobility, ANR wishes to help reinforce the scientific positioning of France while at the same time offering a first-class welcome to foreign researchers. Consequently the agency proposes a new funding instrument dedicated to individuals baptised "Hosting high-level researchers" to enable scientists of any nationality to carry out a research project in a reputed institution in France. The ANR funding is designed to help French laboratories fulfil their role as host. The call for proposals is open to all scientific domains and targets two researcher profiles: leading world-class scientists whose career is widely recognised across the globe, and young researchers with high potential who can prove a record of excellence on the international scene.

AUGUST 2013

13. New collaborations with Germany, Austria and Switzerland

Within the framework of its Work Programme 2014, ANR has made agreements with its German, Austrian and Swiss counterparts to facilitate new bilateral collaborations.

WITH WHOM?

ANR has concluded agreements with the German Research Foundation (DFG), the Austrian Science Fund (FWF) and the Swiss National Science Foundation (SNSF).

HOW?

Establishing "lead agency" agreements enables DFG, FWF and SNSF to take the lead in 2014. This means that the projects must be submitted to these agencies only and in compliance with the conditions of submission in effect in these countries of these agencies.

These agreements concern all the themes funded by the agencies, other than social sciences and the humanities with Germany, which continue to form the subject of a specific programme.

FOR WHAT PURPOSE?

These partnerships aim at making scientific collaborations simpler and more fluid. Another objective is to create "borderless research" funding zones. Lastly, it is a way of contributing to the construction of the European Research Area.



WORTH KNOWING

DFG, FWF and SNSF alone evaluate each project. They then submit a list of projects to fund to ANR. The funding decision is then be taken jointly by ANR and its partner agency. Each agency funds the teams from its country. In 2015, ANR will take the lead.



WORTH KNOWING

In its Work Programme 2014, ANR decided to implement "lead agency" procedures with 5 countries. The "lead agency" principle is based on transparency and mutual confidence between two funding agencies. The lead agency takes charge of the reception, evaluation and selection of projects for the two countries. This is the case for ANR with Brazil (State of Sao Paulo) and Luxembourg.

SEPTEMBER 2013

14. Spotlight on the research challenges in the Mediterranean region

On 19th and 20th September 2013, ANR and Agropolis International organised a seminar in Montpellier on the trans-Mediterranean research challenges. This initiative was carried out within the framework of ANR's TRANSMED programme.

Debates, interactive discussions and dialogue marked the two days of this seminar. It brought together scientists, institutional representatives and decision-makers around the challenges and prospects of transdisciplinary research in the countries of the Mediterranean basin. It provided an opportunity to review the current issues associated with the agricultural, demographic and political challenges, among others, and also to draw up an initial assessment of the initiatives already supported by ANR related to this region of the world.

In addition, a presentation of the outlook for the development of the geostrategic context of the Mediterranean basin provided the occasion to express new needs and expectations. The discussions between participants thus underlined the relevance of fostering the emergence of research projects on the interactions between societies and their environments.

ANR and the Mediterranean

The Mediterranean basin is a region of the world that is culturally rich, complex and contrasted. In the course of its long history it has gone through and is still experiencing crises in many forms, whether ecological, economic, social, cultural and geopolitical. It is this finding that has motivated ANR, along with other like-minded organisations, to participate in the co-construction of a Euro-Mediterranean research area.

The Mediterranean is in effect the only region in the world for which ANR has introduced specific programme planning, characterised by a strong desire to encourage interdisciplinary research, systemic approaches and international partnerships.

In October 2013, ANR - alongside partners from both sides of the Mediterranean Sea - launched a Euro-Mediterranean programme dedicated specifically to the coordination of research efforts in the region: the ERA-NET MED multidisciplinary programme coordinated by Italy. ANR has been assigned responsibility for organising future calls for proposals.

WORTH KNOWING

In 2012, ANR launched a first TRANSMED call for multidisciplinary research proposals resulting in the selection of six targeted projects on the themes of "societies and regions", "sustainable management of resources" and "food security, nutrition, health".



30 OCTOBER 2013

15. Europe's research stakeholders meet in Paris

On 30th October, the representatives of Europe's funding agencies and principal research organisations met in Paris. An occasion for feeding back experience, comparing viewpoints and preparing the next annual summit of the Global Research Council (GRC), planned for May 2014 in Beijing.

WITH WHOM?

More than 80 representatives of European funding agencies, research organisations, the European Commission and experts from European and international associations participated in the regional European meeting of the GRC.

In addition: the co-organisers of the 2014 summit of the GRC, namely China and Canada, were represented by the Chinese Academy of Sciences and the Canadian Natural Sciences and Engineering Research Council (NSERC).

HOW?

Organised in Paris by ANR and Science Europe, the aim of the event was to raise the question of open access to publications and the funding of future research ("Funding the future"). The discussions led the funding agencies in particular to ask themselves how they can support future generations of researchers.

FOR WHAT PURPOSE?

This regional European meeting of the GRC enabled the participants to prepare the position of Europe for the next annual summit of the GRC to be held from 26th to 28th May 2014 in Beijing.

In focus: About GRC

The Global Research Council was created in May 2012 during a meeting organised by the NSF in the USA on the theme of scientific evaluation and merit review. An informal organisation of the heads of world's research agencies, the GRC brings together the main actors of international research funding. This global "forum" addresses issues of mutual interest and reaches agreements on principles and guidelines to encourage transnational collaboration.



OCTOBER 2013

16. Societies facing climate change: first JPI Climate call for European projects

Grouped under the joint programming initiative JPI Climate, the ANR and its European counterparts have launched their first call to fund collaborative research projects on a major societal issue.

WITH WHOM?

The following countries have participated in the first call: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, the Netherlands, Norway, Slovenia, Sweden and the UK.

HOW?

This call aims to facilitate research to inform and support societal transformations in the context of climate change in the European Research Area, while ensuring sustainable development. It is divided into two stages, with 77 pre-proposals submitted at the end of 2013 and 25 projects submitted in the spring of 2014. The projects are expected to be transnational and interdisciplinary, involving particularly teams of researchers in humanities and social sciences.



FOR WHAT PURPOSE?

Europe aspires to become a power whose competitive and dynamic economy is knowledge-based and capable of sustainable growth. Climate change alters the conditions under which these goals can be reached. This creates new challenges, especially in terms of social, political and technological innovations to avoid or stem the impacts, compensate or rehabilitate environments, and adjust to new constraints and opportunities. JPI Climate facilitates coordination, collaboration and the use of synergies while helping to prevent a fragmentation and duplication of research on these major European societal issues.

In focus: ANR and the JPIs

The Joint Programming Initiatives (JPI) seek to optimise national research in Europe, especially by harmonising research programmes, building pan-European strategic agendas and launching calls for international projects to respond as effectively as possible to major societal challenges. The ANR is a member of seven of Europe's ten current JPIs:

- JPND on neurodegenerative diseases is to date the largest global initiative addressing this major public health issue
 - FACCE brings together 21 countries committed to creating a European Research Area built to meet the challenges related to sustainable agriculture, food security and the impacts of climate change
 - HDHL seeks to address the societal challenge of promoting a healthy diet for all Europeans
 - AMR aims to build European research to fight against antimicrobial resistance
 - JPI Climate, involving 16 countries, promotes the coordination of knowledge development to understand and respond to climate change
 - JPI Oceans seeks to establish a comprehensive policy on the sustainable use of marine resources, while limiting the impact of climate change on marine life and coastal areas
 - MYBL serves to strengthen European cooperation on the challenges of demographic changes
-

21 NOVEMBER 2013

17. Pascale Briand joins the Governing Board of Science Europe

During the Annual General Meeting of Science Europe on 21st November 2013 in Brussels, the Director General of ANR was elected onto the board of directors of the association.

WITH WHOM?

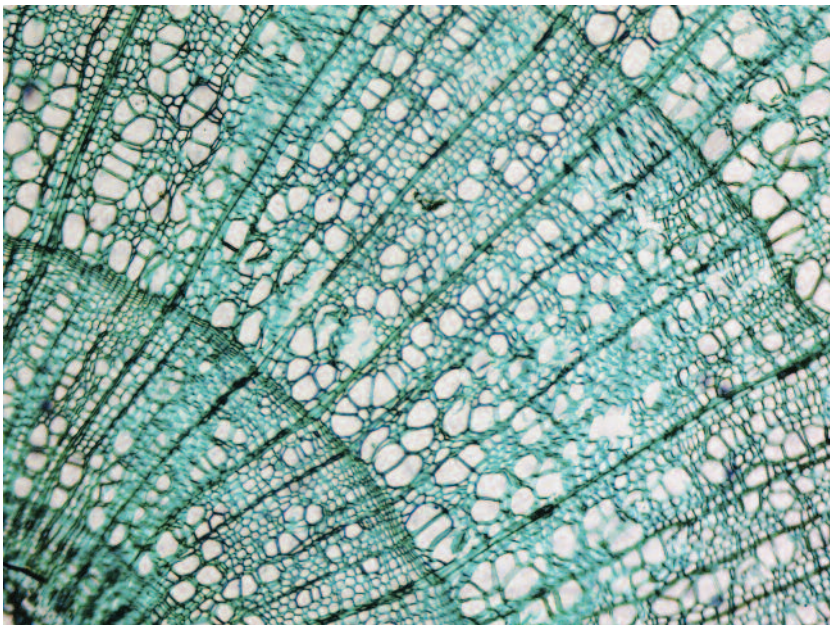
An association under Belgian law chaired by Paul Boyle until September 2014 and based in Brussels, Science Europe brings together the directors of the European funding agencies and research organisations.

HOW?

Science Europe aims at promoting collective funding and research interests of its European members by addressing scientific policy questions of interest for the countries. The association also works to reinforce the European Research Area.

FOR WHAT PURPOSE?

The appointment of Pascale Briand should consolidate ANR's position among the main funding agencies in Europe. It reinforces the agency in its efforts to contribute actively to the construction of the European Research Area and to foster European research.



© Claudiu Vizita



NOVEMBER 2013

18. ANR reinforces its international policy

In November 2013, ANR created the "COMINT", an advisory board for European and International Actions. The purpose of this new strategic entity is to accompany the development of a coherent and structured international policy.

WITH WHOM?

Chaired by Pascale Briand, Director General of ANR, the COMINT comprises high representatives from national thematic alliances, the CNRS, the Ministries of Research and Foreign Affairs, as well as prominent figures from the public and private research spheres, higher education and experts in international strategy.

HOW?

The COMINT meets twice a year in a plenary session. Sub-groups can also work in parallel on targeted issues.

In practice, the board places a consultancy role for ANR in the implementation of a coherent international partnership strategy. It analyses the operations conducted by ANR outside France. It recommends geographical and thematic directions for ANR. It helps to ensure better coordination of the funding instruments at national, European and international level. Lastly, it proposes future avenues concerning its conditions of action and advice with regard to its annual Work Programme.

FOR WHAT PURPOSE?

The objective is to obtain a detailed analysis of the complementarity of the funding instruments proposed by ANR, with respect to the existing national and European funding systems. It also provides an opportunity to assess the effectiveness of these public funding instruments as a whole.

WORTH KNOWING

The COMINT held its first meeting on 6th November 2013, and the second on 27th March 2014.



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19. Franco-Swiss ties get closer

On 29th November 2013, the University of Bern hosted a seminar devoted to university and scientific cooperation between France and Switzerland. An opportunity to discuss ways of reinforcing Franco-Swiss relations in the areas of research and higher education.

WITH WHOM?

Organised on the initiative of the French Embassy and the Campus France Agency¹, this seminar enabled Farid Ouabdesselam, Advisor to the Director General of ANR, to address the audience, alongside Béatrice Ferrari, Scientific Advisor to the Swiss Secretary of State for Training, Research and Innovation.

HOW?

On the debate agenda: the latest changes in national higher education policies, with particular focus on the research sector in the context of internationalisation of the French and Swiss systems.

FOR WHAT PURPOSE?

In summer 2013, as part of the international opening of its generic call for projects, ANR concluded a lead agency agreement with the Swiss National Science Foundation, the SNSF. This partnership bears witness the true complicity and relation of confidence between the two structures.

¹ The Campus France Agency is tasked with promoting higher education, hosting and managing international mobility of students, researchers, experts and guests.



WORTH KNOWING

When it comes to research, Switzerland is a determined country with a strong international focus. The proof: nearly 70% of its partnership projects are carried out with teams from foreign countries. In this respect, France is a key partner for the Swiss Confederation, holding 3rd place among the countries with which Switzerland collaborates.



20. Kick-off of the new European programme for research and innovation

The Minister of Higher Education and Research, Geneviève Fioraso, launches Horizon 2020 in France. This research and innovation programme of the European Union for the period 2014-2020 realigns the funding on three priorities, namely scientific excellence, industrial primacy and societal challenges. ANR has made a large part of its Work Programme 2014 consistent with this programme.

WITH WHOM?

This is the European Union's framework research and innovation programme. It must be emphasised that Europe is a priority for ANR: part of the Agency's remit is to reinforce scientific cooperation at European level and contribute to the construction of the European Research Area by interlinking its programme planning to the European initiatives.

HOW?

ANR's Work Programme hinges around 9 major societal challenges, identified in the national strategic agenda "France Europe 2020", which is consistent with the Horizon 2020 programme. ANR is careful that its funding does not duplicate EU funding. As Horizon 2020 covers a vast range of scientific topics, the concern is to offer competitive funding harmonising with European calls for proposals. Lastly, the new network of national contact points (NCP) comprising experts in the European programmes is tasked with assisting the French scientists in responding to the Horizon 2020 calls for proposals. ANR has thus been assigned responsibility for coordinating the "FET NCP" concerning future and emerging technologies.

FOR WHAT PURPOSE?

With a budget of 79 billion euros covering the period from 2014 to 2020, Horizon 2020 came into effect on 1st January 2014. It brings together all the European Union funding instruments for research and innovation and hinges around three major priorities, namely scientific excellence, industrial primacy and societal challenges. It aims at reinforcing the competitiveness and the position of the European Union on the international scene in the fields of research, innovation and technologies, and to take into consideration the concerns of the public in the face of the major societal challenges.

 **WORTH KNOWING**

"Horizon 2020" has a dedicated website in France: <http://www.horizon2020.gouv.fr>. Intended for future French PIs of European projects (researchers, professors, industrial partners, etc.), this website highlights current information on the calls for proposals. It also provides practical information to facilitate the participation of French scientists and industry in the Horizon 2020 calls for proposals.



IX • Behind the scenes at ANR



Revamping the processes and structure of ANR



3 QUESTIONS FOR

MICHAEL MATLOSZ

ANR Deputy Scientific Director General

During 2013, ANR reconsidered many of its internal processes in order to adapt them to the Work Programme 2014 and to the two-stage selection process. Michael Matlosz reviews the situation.

What are the ultimate goals of the simplification process implemented by ANR?

"We want to alleviate, facilitate and simplify the administrative steps that we ask of the researchers. Ultimately we want to be more user-oriented, to assist the research performing organisations in project management, and to measure the progress and advances that the projects bring in their fields over several years."

What is the situation for the teams who still depend on the former calls for proposals selection process?

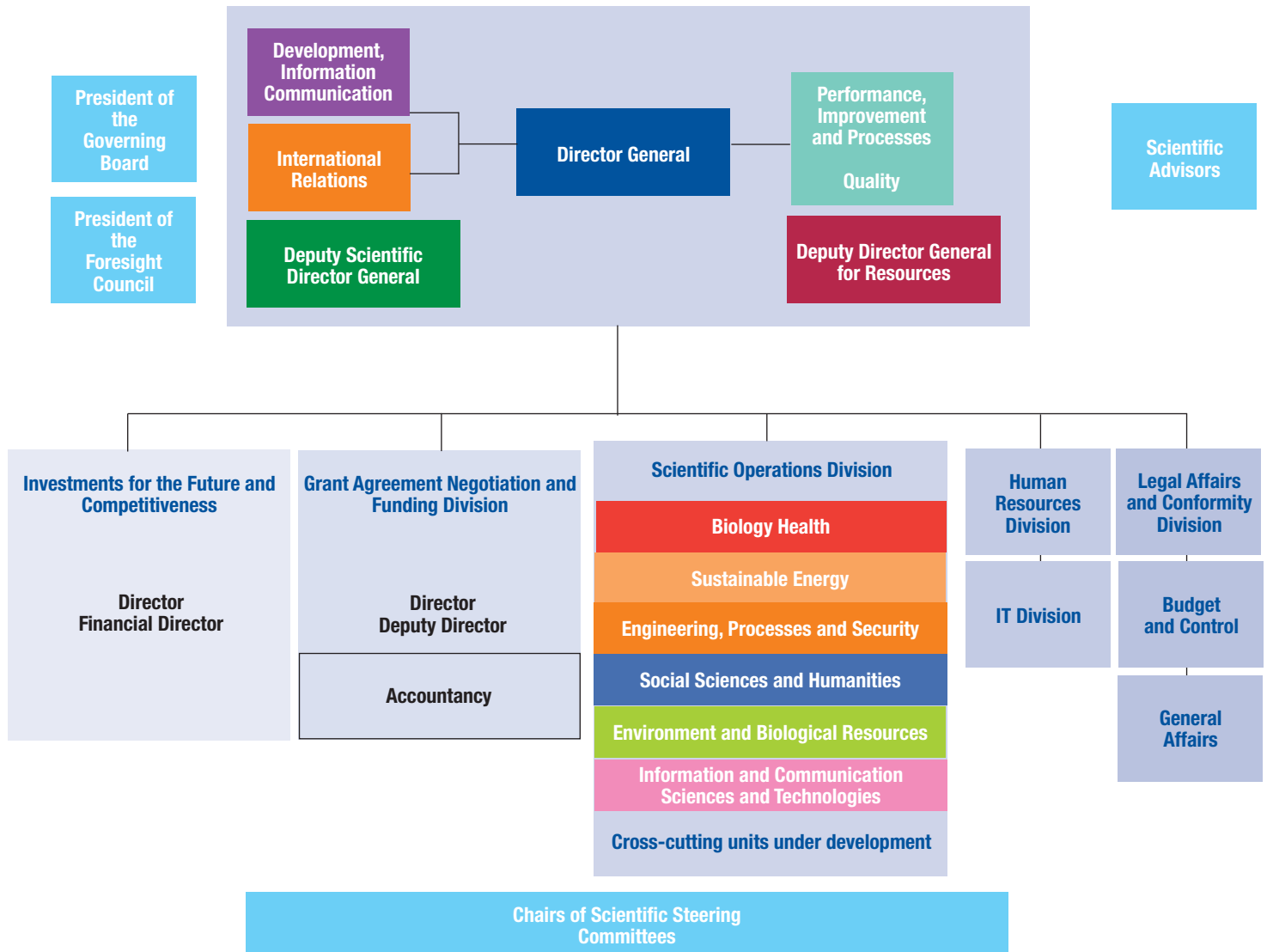
"The administrative processing of the projects received will gradually become more fluid, which will enable the ANR funding that preceded implementation of the two-stage process to be encompassed in the new broader system."

ANR has undertaken and is pursuing an internal reorganisation as a complement to these changes in the work process. Could you tell us more about this?

"Alongside our thoughts on how to adapt to the changes induced by the Work Programme and the two-stage selection process, we also examined everything relating to the negotiation of the grant agreement and the grants awarded to the projects. The aim is to rethink our processes and consequently our structure, as the two go hand in hand. This will enable the respective roles to be clarified and facilitate ANR's exchanges with project principal investigators. In terms of internal organisation, this will result in two major changes. All the scientific functions will be grouped together in a single division, the DOS (Scientific Operations Division) which will be responsible for all aspects requiring scientific skills: implementation of work programmes (selection, monitoring), performance of syntheses and analyses (reviews, reports, impact analyses), thereby providing a more cross-cutting vision of the activities. In parallel with this, the accounting and grant management teams have been grouped together since June 2014 in a new division, the DCF (Grant Agreement Negotiation and Funding Division)."



Organisation chart



A young agency

In 2013 the total headcount at ANR was **245** full time equivalents worked (FTE), compared with **239** FTE in 2012. This increase results from the development of ANR's international activities, which requires the mobilising of additional forces financed from ANR's own resources for the management of the ERA-NETs in particular (9 FTE). Another observation: ANR's staff comprises **59%** women and **41%** men. The average age of ANR personnel is **40.7** years.

Human resources: stabilising the skills

The reorganisation of ANR - which began in 2012 - and the implementation of the Work Programme 2014 were accompanied by a specific human resources policy. Henceforth everything is done to motivate the staff and propose career developments, particularly through vocational training.

The Executive Master with Paris Dauphine proves its worth

Out of concern to motivate, involve and maintain the loyalty of its staff, ANR has set up an Executive Master's degree in "Research Management" in partnership with the Paris Dauphine University. The first class of this Master's degree graduated in June 2013, with 22 graduate students, all of them scientific managers at ANR. A second class began in September 2013. Its particularity is that it is open to professionals from other organisations and now includes people from administrative activities. This Master's degree is an ideal opportunity to train for a new activity characterised by a dual competency in scientific research and project management.



ANR makes commitments

Whether considering disability in the workplace or gender parity, ANR is particularly tuned in to these subjects.

With regard to disability, the outsourcing of administrative work to the ESAT (*Etablissement et Service d'Aide par le Travail*) network of assistance and service centres that help disabled people into employment, is maintained: this represents almost half of ANR's obligation to employ disabled workers. Furthermore, ANR now takes part in forums dedicated to the meeting of employers and disabled persons seeking employment in order to increase recruiters' awareness of the question of "employment and disability".

With regard to the commitment regarding gender parity, progress has been made over the last three years. In effect, during that period the percentage of women represented within the call for proposals evaluation panels has increased from 19 to 29%, and this trend should continue in the years to come.



QUESTIONS FOR

PHILIPPE TERRAL

ANR Human Resources Director



Generally speaking, what types of profile catch your attention when recruiting staff?

"For the administrative functions, this depends on the job and the activity. Nevertheless, we try to identify a certain ability to adapt in the candidates, because ANR has been evolving constantly since it was created. A person who has already worked in both the public and the private sector, in a very small enterprise and a large enterprise, or in different sectors of activity, has a profile that could interest us. This openness proves an ease of adaptation to different environments. Alongside this, for the scientific posts, we tend to recruit people with a Ph.D. and a first professional experience. Someone whose professional profile already includes experience in research support functions is a real bonus."

What are your priorities for 2014?

"Since the beginning of the year we are continuing not only to assist with the development of ANR's missions but also its ongoing reorganisation which fosters the emergence of cross-cutting functions. This assistance notably involves changing our functions and skills baseline, developing internal training and mobility with a view to enhancing the professionalisation of research support as a specific activity."



How is the ANR budget managed?

Like any State operator, ANR has a single budget: the expenses and revenues entered in its statement of operations correspond both to the project funding budget - essentially dedicated to the calls for proposals - and the management budget which serves to ensure the smooth running of the agency and the payment of its personnel.

Its main revenue comes from the subsidy awarded by the Ministry of Research which is divided into commitment appropriations and payment appropriations. The commitment appropriations for the project funding budget correspond to several-year commitments made at the signing of an agreement allocating a grant to the project partners for a duration of about 42 months. These commitments give rise to expenses and outlays throughout the duration of the agreement.

€588.6 M of new commitments made in 2013

ANR's resources in commitment appropriations determine its capacity to fund new research projects.

In 2013, as in the preceding years, ANR committed the totality of its dedicated project funding resources, that is to say €588.6 M of commitment appropriations, of which €566.8 M correspond to the subsidy awarded by the Ministry of Research (down by 17% with respect to 2012) and €21.8 M were provided by the co-funders.

A moderate and balanced management budget

Management expenses (personnel + operation) totalled €33.1 M in 2013, of which €14.1 M (42%) represented personnel costs and €19 M (58%) operating costs. Among the main expense lines in the operating envelope we can mention:

- the rentals and expense charges for premises, which represent 21% of the operating expenditure, hence the importance of the decision taken in 2012 to relocate to a single site enabling significant financial savings to be made,
- the expenses associated with the panels and boards (travel, assignments) which amount to €3 M and represent 15% of the expenditure in 2013,
- the payment of foreign peer reviewers called upon for the external reviews carried out in the project selection phase, which represent 30% of the expenditure.



WORTH KNOWING

State operators are organisations separate from the State, with public or private legal status, which are tasked with a public service mission for the State. Placed under direct State control, the majority of their funding comes from the State and they contribute to the performance of the programmes in which they participate.



Funds to serve the community

Cash position down due to the speeding up of payments

If the management budget and the project funding budget are summed, the overall result for the financial year 2013 totals €-89.5 M. ANR's self-financing capacity and the variation in its working capital are negative, resulting in a reduction in its cash position, which is down from €620 M at the end of 2012 to €352 M at the end of 2013.

This change is the result of the efforts made to speed up payments to the beneficiaries (€783 M of disbursements from the project funding budget excluding Investments for the Future) and a reduction in the subsidy awarded by the ministry.

Investments for the Future, a specific mission, including from the budgetary aspect

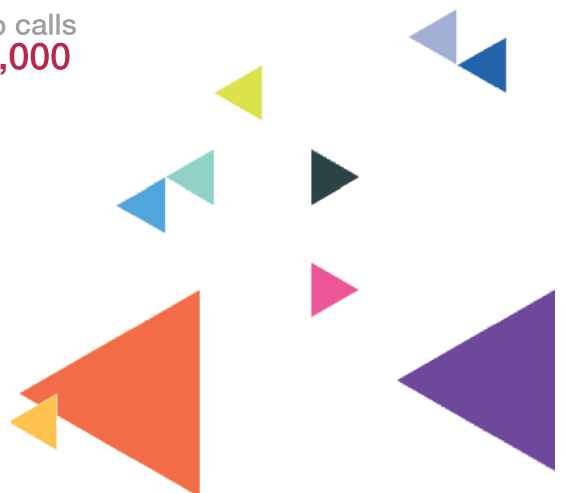
ANR is the main operator tasked with the management of the appropriations for the Investments for the Future programme: of the €35 billion appropriated by the supplementary budget act of 9th March 2010, €22.56 billion transit by ANR (€18.73 billion of non-expendable endowment funds and €3.83 billion of expendable funds).

In 2013, the "Investments for the Future" programme gave rise to:

- the signing of 682 agreements representing a total of €6,606.2 M of multiyear commitments. To date, the grant agreements have been settled for 99% of the wave 1 projects and 88% of the wave 2 projects.
- the disbursement of €1,235.5 M, i.e. a total sum of €3,481.8 M
- the collection of €626.3 M of interest generated by the non-expendable endowment funds.

The expenses associated with the Investments for the Future do not affect the ANR statement of operations (except for the operating expenses linked to their management).

Since 2005, **5.2 billion** euros have been committed to calls for proposals and allowed the funding of more than **12,000** research projects





3 QUESTIONS FOR

PIERRE COLLIOT

ANR Accounting Officer

Where do ANR's financial resources come from?

"The subsidy awarded by the Ministry of Research represents ANR's main financial resource. In 2013 it amounted to 596 million euros for the commitment appropriations and 513 million euros for the payment appropriations. It is supplemented by 4% (€21.8 M euros of commitment appropriations) through co-funding."

What route does the money follow before it reaches a research team?

"The contract signed between the Agency and the legal representative of the public or private establishment hosting the principal investigator's laboratory sets a maximum sum for the grant, which will be paid following a payment schedule. The schedule is divided into three annual terms (four as from 2013), and a final balance which is paid subject to the submission and evaluation of a final scientific and financial report on completion of the project."

How do you respond to people who point out delays in the payment of the grants to researchers?

"These delays are due to the fact that ANR has been somewhat the victim of its own success. In a very short space of time, the Agency's headcount increased five-fold, rising from 50 to 250 employees, while the number of project files managed increased by a factor of ten, from 3,000 to 30,000. We therefore had to rethink our method of functioning. One illustration of the result of this reorganisation is the bringing together of ANR's authorising and accounting services not only within the same division but, as of summer 2014, in the same building (50 avenue Daumesnil, in Paris). This bringing together of services, which has now been achieved in part, has enabled the number of files paid in 2013 to be increased and, more generally, has accelerated the payment process."





3 QUESTIONS FOR

LAURENT GODART

Head of the ANR Grant Management Division

The prime role of ANR is to fund research. Concretely, what sum did this represent in 2013?

"The payments made by ANR in 2013 for the research teams of French organisations and enterprises totalled 2 billion euros, including the Investments for the Future programme."

What does ANR do if a research project is not carried through to its term?

"In extremely rare cases, ANR may be brought to ask a structure that does not honour its commitments to reimburse awarded sums. We are currently honing our watch over private companies that receive ANR funding in order to anticipate risks of them going into receivership or compulsory liquidation, for example. As of 2015, we are going to devise and implement a per-organisation auditing system."

How do you see the bringing together of authorisation service and the accounting service within ANR? What will the creation of the DCF (Grant Agreement Negotiation and Funding Division) allow?

"We are going to have an overall view of the budget within a single structure, from the decision to fund a project through to the final payment of the grant awarded to the research team. Setting up this division will enable ANR to have strong interactions with the establishments supporting the project principal investigators with which ANR establishes the grant agreements. This new organisation will, among other things, give us the capacity to act more quickly and more efficiently: essentially this will mean faster preparation of grant agreements, disbursements and closing of completed programme editions. It goes without saying that the enhanced "fluidity" will also be more comfortable for the ANR teams."



Disseminating information to the scientific communities

For almost ten years now ANR has endeavoured to adapt to the needs of the scientific community and the research landscape. It is gradually acquiring the tools necessary for project monitoring and measuring the impact of the funding instruments it proposes. Risk taking, new ideas, leaps in knowledge, multidisciplinary projects, international collaborations, public-private partnerships, etc. the virtues of this mode of funding are of great value for the researchers, for innovation and for the competitiveness of our country.

ANR's communication division tries to develop information aids dedicated to the stakeholders of the sector, whether they are the users of project-based funding - French, European or international - ANR itself for its activities, and of course the higher education and research institutions. We also want to share news of the projects we fund: noteworthy advances and peer successes in particular.

In 2013 we created a Development, Information and Communication division, which produces and disseminates information to our target audiences. The effort devoted to launching an activity via the social networks LinkedIn and Twitter seems to suit the community, judging by the rapid increase in our subscriber numbers.

All our publications – the "cahiers de l'ANR", the newsheets in "the ANR and..." collection, our annual reports, etc. – can be downloaded from the website which, for its part, has already greatly evolved and will be undergoing further changes.

In 2013 we also enhanced our international visibility to accompany the policy conducted by the Director General in this respect. The English version of the website has been enriched with current topics of interest for foreign cybernauts.

WORTH KNOWING

- **Launching of a new collection "ANR and ..." (10 newsheets to date)**
- **Increase of unique users to ANR's website: + 12.8% between 2012 and 2013**
- **Follow us on Twitter and LinkedIn**





Appendices

2013 CALLS FOR PROPOSALS

Programme	Eligible proposals
EXPLORATORY AND EMERGING RESEARCH (BOTTOM-UP PROGRAMMES)	
Blanc	2536
Young Researchers	1174
Post-Doctoral Return	149
SOCIAL SCIENCES AND HUMANITIES	
Learning	69
Changing societies: "Emergence and evolution of cultures and cultural phenomena"	43
Franco-German call for proposals in social sciences and humanities	72
Innovative societies - Innovation, economy, living	42
Open Research Area (ORA) for the social sciences in Europe	78
BIOLOGY AND HEALTH	
Translational research programme in health	258
Mental health and addictions (SAMENTA), including ERA-NET NEURON 2	117
Contaminants and environment: health, adaptability, behaviour and uses	103
Biomedical innovation in public-private research partnership	78
Technologies for health and autonomy	76
ERA-NET EuroNanoMed 2: Nanomedicine	16
ERA-NET Infect-ERA: Infectious diseases	66
ERA-NET ANIHWA: Animal health and welfare	44
ERA-NET E-RARE 2: Rare diseases	116
JPND: Neurodegenerative diseases	32
SIINN: Nanotoxicology	14
AAL 185: Ambient Assisted Living	5
Bilateral Franco-German call for proposals on Epigenomics of Common and Age-related Diseases	32
Call for French-US Projects in Computational Neuroscience	30
ENVIRONMENT AND BIOLOGICAL RESOURCES	
Viability and adaptation of productive ecosystems, territories and resources to global changes - AGROBIOSPHERE, including ERA-NET RURAGRI	89
Adapting: from genes to populations. Genetics and biology of adapting to global changes - BIOADAPT	101
Facing Societal, Climate and Environmental Changes	43
Sustainable food systems	32
EcoTechnologies and EcoServices	56
ERA-NET Biodiversa 2: Biodiversity	60
Multilateral programme Plant KBBE	39
Belmont Forum / G8-HORCs: Coastal Vulnerability and Freshwater Security	18
JPI FACCE: Agricultural Greenhouse Gas Research	14
SUSTAINABLE ENERGY	
Biomaterials and energies	31
Sustainable electricity production and management	54
Efficient de-carbonised energy systems	38
Sustainable transports and mobility	28
Sustainable buildings and cities	37

Projects funded	Success Rate	Total ANR funding (€M)	Average funding per project (€k)
416	16.40%	152.12	370
181	15.42 %	38.51	210
32	21.48%	10.85	340
12	17.39 %	4.75	400
8	18.60%	2.15	270
17	23.61%	3.74	220
8	19.05%	2.48	310
5	6.41 %	1.02	200
21	8.14 %	5.45	260
18	15.38%	6.87	380
20	19.42%	8.1	410
12	15.38%	8.19	680
14	18.42%	9.34	670
5	31.25%	1.36	270
6	9.09%	2.43	410
7	15.91%	0.98	140
9	7.76%	1.95	220
7	21.88%	2.52	360
3	15%	0.81	270
0	0	0	0
4	12.50%	2	500
6	20.00%	1.44	240
10	11.24%	6.69	670
16	15.84%	6.52	410
7	16.28%	5.25	750
6	17.65%	4.18	700
10	17.86%	7.12	710
8	13.33%	1.99	250
6	15.38%	1.70	280
6	33.33%	2.54	420
6	42.86%	0.64	110
7	22.58%	5.39	770
13	24.07%	9.52	730
9	23.68%	6.73	750
7	25.00%	6.43	920
8	21.62%	6.61	830

2013 CALLS FOR PROPOSALS

2013 CALLS FOR PROPOSALS	Eligible proposals
ENGINEERING, PROCESSES AND SECURITY	
Specific support for research works and innovation defence - ASTRID	140
Sustainable chemistry - industries - Innovation	49
Concepts, systems and tools for global security - CSOSG	21
Materials and processes for high performance products	83
Nanotechnologies and nanosystems	46
ERA-NET M-ERA.NET: Materials	32
G8-HORCs: Materials	32
INFORMATION AND COMMUNICATION SCIENCES AND TECHNOLOGIES	
ERA-NET CHIST-ERA: Long-term challenges in ICST	23
Digital contents and interactions	104
Hardware and software infrastructures for the digital society	68
Digital engineering and security	33
Digital Models	71
PARTNERSHIPS AND COMPETITIVENESS	
Industrial chairs	19
LabCom	170

Projects funded	Success Rate	Total ANR funding (€M)	Average funding per project (€k)
40	28.57%	11.38	280
10	20.41%	6.01	600
7	33.33%	5.96	850
15	18.07%	13.42	890
11	23.91%	8.28	750
2	/	0.64	320
3	/	0.86	287
4	17.39%	0.86	220
21	20.19%	15.32	730
14	20.59%	11.32	810
7	21.21%	4.6	660
14	19.72%	9.8	700
5	26.32%	4.44	890
/	27.00%	/	300

CALLS FOR PROPOSALS

BILATERAL PARTNERSHIPS

ANR-DFG Franco-German call for proposals
 ANR-BMBF Franco-German call for proposals
 ANR-NSF call for French-US projects
 Opening of the TECSAN programme to Taiwan (NSC)
 Opening of the SOC&ENV programme to Brazil (FAPESP-FACEPE)
 Opening of the MATETPRO programme to Germany (BMBF)
 Opening of the Digital models programme to China (NSFC)

BILATERAL COLLABORATIONS UNDER THE BLANC PROGRAMME

Germany (DFG)
 Austria (FWF)
 Brazil (FAPESP)

Brazil (FAPESP-FACEPE)

China (NSFC)
 USA (NSF)
 USA (NSF)
 Hong Kong (RGC)
 India (DST)
 Luxembourg (FNR)
 Portugal (FCT)
 Romania (ANCS)
 Taiwan (NSC)

MULTILATERAL PARTNERSHIPS

ERA-NET NEURON 2
 ERA-NET E-RARE 2
 ERA-NET ANIHWA
 ERA-NET EuroNanoMed 2
 ERA-NET Infect-ERA
 JPND
 ERA-NET SIINN
 AAL 185
 ORA Plus with Germany (DFG), USA (NSF), the Netherlands (NWO) and the UK (ESRC)
 ERA-NET M-ERA.NET
 G8-HORCs
 ERA-NET CHIST-ERA 2
 ERA-NET Biodiversa 2
 PLANT KBBE with Germany (BMBF), Spain (MINECO) and Portugal (FCT)
 Belmont Forum / G8-HORCs
 JPI FACCE
 ERA-NET RURAGRI

Themes	Eligible projects submitted to ANR	Projects co-funded by ANR	ANR funding (€M)
Social sciences and humanities	72	17	3.74
Epigenomics of Common and Age-related Diseases	32	4	2
Computational neuroscience	30	6	1.44
Technologies for health	2	2	1.14
Environmental changes	5	1	0.35
Materials	7	2	1.95
Green ICT	8	1	0.4
All themes	109	21	5.76
All themes	47	7	1.42
Global environmental change / Earth science, Microbiology, Immunology, Infectiology	13	3	1.47
Global environmental change / Earth science, Microbiology, Immunology, Infectiology	2	0	0
Infectious diseases	12	1	0.19
Materials	23	3	0.75
Chemistry	11	1	0.4
All themes	23	3	0.78
Engineering science, Infectious diseases	45	4	0.71
All themes	26	2	0.53
Life sciences, Social sciences and humanities	60	10	1.89
All themes	90	9	2.36
All themes	33	5	0.88
Mental diseases	48	5	1.07
Rare diseases	116	9	1.95
Animal health and welfare	44	7	0.98
Nanomedicine	16	5	1.36
Infectious diseases	66	6	2.43
Neurodegenerative diseases	32	7	2.52
Nanotoxicology	14	3	0.81
Ambient Assisted Living	5	0	0
Social sciences	78	5	1.02
Materials	32	2	0.64
Materials	32	3	0.86
Information and communication sciences and technologies	23	4	0.86
Biodiversity	60	8	1.99
Plant genomics	39	6	1.7
Coastal Vulnerability and Freshwater Security	18	6	2.54
Agricultural Greenhouse Gas Research	14	6	0.64
Sustainable agriculture	17	2	1.18
TOTAL	1,304	186	51

AGENCE NATIONALE DE LA RECHERCHE
ANR

Development, Information and Communication Division

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