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## **IRTSV - Institut de recherche en technologies et sciences pour le vivant**

Rapport Hcéres

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# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

HCERES report on  
federative structure:

Institut de Recherche en Technologies et Sciences  
pour le Vivant

iRTSV

Under the supervision of  
the following institutions  
and research bodies:

Université Joseph Fourier - Grenoble - UJF

Commissariat à l'Énergie Atomique et aux Énergies  
Alternatives - CEA

Centre National de la Recherche Scientifique - CNRS

# HCERES

High Council for the Evaluation of Research  
and Higher Education

Research units

*In the name of HCERES,<sup>1</sup>*

Didier HOUSSIN, president

*In the name of the experts committee,<sup>2</sup>*

Jean-Pierre JACQUOT, chairman of the  
committee

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Under the decree N°2014-1365 dated 14 november 2014,

<sup>1</sup> The president of HCERES "countersigns the evaluation reports set up by the experts committees and signed by their chairman." (Article 8, paragraph 5)

<sup>2</sup> The evaluation reports "are signed by the chairman of the expert committee". (Article 11, paragraph 2)

## Federation

|  |  |
|--|--|
| Federation name:                       | Institut de Recherche en Technologies et Sciences pour le Vivant |
| Federation acronym:                    | iRTSV  |
| Label requested:                       | Fédération de Recherche  |
| Present no.:                           | FR 3425  |
| Name of Director<br>(2014-2015):       | Mr Jérôme GARIN  |
| Name of Project Leader<br>(2016-2020): | Mr Jérôme GARIN  |

## Expert committee members

Chair: Mr Jean-Pierre JACQUOT, Université de Lorraine

Experts: Mr Pascal BARBRY, CNRS, Sophia-Antipolis

Ms Clotilde POLICAR, ENS, Paris

Ms Xuefen LE BOUHRIS, Université de Lille

Scientific delegate representing the HCERES:

Mr Steven BALL

## 1 • Introduction

### History and geographical location of the federative structure and its member research units and brief description of its activities

FR 3425 also known as iRTSV (Institut de Recherche en Technologies et Sciences pour le Vivant) is one of the eight CEA Institutes in the CEA's Life Sciences department. For the next contrat, the name will be changed into BioScience and Biotechnology Institute of Grenoble, with B<sub>2</sub>IG as an acronym. It is currently organized in four laboratories plus one research group in Neurosciences. iRTSV has been running for at least one contract under the supervision of Dr Jérôme Garin. The lab units participating to this Fédération de Recherches are all situated in Grenoble but scattered in several separate buildings. The four major contract operators are:

i) The CBM Lab (Chemistry and Biology of Metals, UMR 5249 CEA CNRS UJF). Its domain of expertise is to study metal in biology, with a special interest in the structure and spectroscopic properties of metalloproteins, regulation of biological systems using metal ions, bio-inspired chemistry involving metal systems, particularly in the fields of human health and energy.

ii) The PCV lab (Cellular and Plant Physiology, UMR 5168, CEA, CNRS, UJF). PCV studies plant cell functions with emphasis on chloroplast proteomics metabolism and regulation, flowering and actin networks.

iii) The BCI lab (Biology of Cancer and Infection, U 1036, CEA INSERM, UJF, CNRS). BCI studies the molecular mechanisms involved in cancer and infection with the aim to develop medically relevant applications for detection and treatment.

iv) The BGE lab (Large Scale Biology, U 1038, CEA, INSERM, UJF). BGE aims at producing large scale data using approaches in genomics, proteomics, imaging and medium throughput screening assays in order to feed system biology.

Together with the smaller research team GPC, overall iRTSV comprises a staff of more than 350 persons including 220 tenured jobs (100 of those at CEA). This Fédération de Recherche is housed in CEA facilities except the GPC team. Other institutional partners are CNRS, INSERM and UJF. iRTSV represents a strong entity in biology in Grenoble. Locally it interacts with two Labex structures (GRAL and ARCANE) and also with the major research structures present in Grenoble, namely IBS, INaC, CHU, IAB, etc. The activity of FR 3425 is facilitated by the existence of four large platforms, a computer center, mouse and plant facilities. These platforms are shared and operated by iRTSV.

### Management team

iRTSV has a director (Mr Jérôme GARIN) and a deputy director (Mr François PARCY). They are assisted by a team composed by the directors and deputy directors of the four participating laboratories. They convene twice a month and additionally hold a steering committee together with representatives of the funding bodies once a year.

### Specific workforce allocated to the federative structure

Twenty staff members are currently listed as employees of iRTSV. Five CNRS employees are affiliated to iRTSV but indeed work for BGE. Since this lab is not associated with CNRS, the administrative solution was to consider them as iRTSV staff. Although the director and deputy director are listed as "affectés en propre or primarily affiliated", they nevertheless also belonged to their respective research labs (as director and group leader) at least during the current contract. This leaves 13 staff members primarily affiliated to iRTSV. They are all CEA employees and all involved in management (Human Resources, Finances, European and International Connections, Scientific Communication, Working Security Conditions). Overall, a close scrutiny of this list indicates that CEA has chosen to organize administratively this sector of biology in Grenoble in the form of a Fédération de Recherches (it is actually listed on the front page of the report as Structure Fédérative which is a bit confusing). It does not seem that platform staff members are directly linked to iRTSV but rather to the individual partner labs.

## 2 • Overall assessment of the federative structure

### Global assessment of the federative structure

The labs involved in iRTSV have had an excellent scientific productivity in the last contract. It seems that in each lab the quality of scientific production has improved significantly compared to the earlier contract. They indicate that this is related to their capacity to equip, manage and renew scientific material of high quality in the platforms of the Structure Fédérative. This is essentially what is expected from a Federation de Recherches. More specifically, they have produced a large number of high quality papers in journals of high impact factor, but even more revealing with already a relatively large number of citations. The fields covered include first an integrated study of proteins in a large diversity of organisms (e.g. photosynthetic, human). This has relied very much on proteomics, metabolomics and also on cooperation with IBS for the structural part. Also cellular imaging and large scale genomics are extensively used together with modelling for getting into systems biology. This first part of the project intersects to a large extent with the two Labexes GRAL and ARCANE. A second part of the overall project is a large step into nanotechnologies in the framework of the innovation campus GIANT. Research performed in the labs of iRTSV has already generated some nanomaterials of interest in particular based on actin polymerization and also metal containing bio-inspired catalysts with possible applications in chemistry, energy (hydrogen generation) or photosynthesis. Accordingly, several patents have been deposited in the domain of biotechnology and a start-up NMR Bio (in collaboration between IBS and CBM) is foreseen in 2015. The Structure Fédérative iRTSV has had clearly the merit to bring together several important individual actors of the biological field in Grenoble but also chemists interested in bio-inspired materials. It has also favored the creation and maintenance of platforms of high scientific and technological standards particularly in proteomics and imaging and this has benefited to the whole community and beyond. Care was taken to maintain a good communication between iRTSV, the local Labexes and more generally with the Giant program. Examining the achievements of the partners of iRTSV leads to conclude that several of them have reached true international status with many invitations in international congresses but also notably ERC grants to a couple junior scientists and a series of valued international grants and prizes.

### Strengths and opportunities related to the context

Provided that iRTSV can maintain its funding (an achievement difficult to make in the present context, see below), the future of the Grenoble consortium might indeed be very bright. On the one hand they have been able so far to stabilize their permanent staff (29 departures for 29 arrivals in the contract), but also they have attracted high caliber scientists either locally or from other French Institutes or more rarely internationally. The present situation of the platforms is good, they possess in general recent equipments (sometimes maintenance is even still valid from the purchase contract). The training in iRTSV labs has been efficient with the presence of an average of 50 doctoral and 60 post-doctoral students. Several of those have eventually returned to Grenoble on permanent positions. In the last contract iRTSV has organized at least five scientific meetings, with at least one in association with the Labex GRAL. The research program proposed for the next contract is innovative and daring. Based on results obtained in the present contract they propose to develop new bio-inspired materials at the nanometer scale. In particular they want to construct *de novo* new metalloenzymes, to model the cytoskeleton, to use the capacity of 3D organoids to differentiate into tumour-like acini in order to study the tumoral process, just to name a few of these projects. Many of them also deal with the creation of new biomaterials. Large scale biology and systems biology will be extended to several of the topics studied previously in the partner labs. It seems that the researchers of iRTSV have demonstrated their capacity to move into this new frontier.

### Weaknesses and threats related to the context

In a French system which is forever changing its organization, it will be essential for iRTSV to maintain its status and originality. What about the relations with the Grenoble Labexes and GIANT? Will those structures slowly substitute to the Federations de Recherche? One worrying point which is underlined in the report is that the present funding of iRTSV is insufficient. This is due to the fact that iRTSV is a CEA operated structure and CEA is presently not in a financial shape which would allow it to support the Federation de Recherches at an adequate level. On the bright side, CEA probably needs to keep its 8 Structures Fédératives in order to manage the different labs that it hosts and probably the financial gain provided by concentrating the administrative staff is still of interest. It is also important to create a critical mass in biology, able to interact at a sufficient level with the other constituting bodies of the CEA center in Grenoble. Considering the huge recent development in physics, nanotechnologies, etc. it is absolutely

mandatory to put together the whole biology of this campus in such a Fédération, in order to keep it in a favorable position for the discipline.

### Recommendations

In the present difficult financial context it would be wise for iRTSV to diversify its funding and try to attract private funds in order to stabilize its financial status. The project based on the construction of new biomaterials at the nanoscale should very much help in this respect. Another aspect also mentioned in the report is the scattering of the labs of iRTSV and the existence of a building construction and renovation program. Given the age of some of the buildings housing the labs of iRTSV, this should also be a priority.