INMG - Institut Neuromyogène

Rapport Hcéres

HCERES

High Council for the Evaluation of Research and Higher Education

Research units

HCERES report on research unit:

NeuroMyoGene Institute

INMG

Under the supervision of the following institutions and research bodies:

Université Claude Bernard Lyon 1 - UCB

Centre National de la Recherche Scientifique - CNRS

Institut National de la Santé et de la Recherche Médicale - INSERM

Evaluation Campaign 2014-2015 (Group A)

HCERES

High Council for the Evaluation of Research and Higher Education

Research units

In the name of HCERES,[1]

Didier HOUSSIN, president

In the name of the experts committee,[2]

Thomas BRAUN, chairman of the committee

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

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

[2] The evaluation reports "are signed by the chairman of the expert committee". (Article 11, paragraph 2)

Evaluation report

This report is the result of the evaluation by the experts committee, the composition of which is specified below.

The assessments contained herein are the expression of an independent and collegial deliberation of the committee.

Unit name:	NeuroMyoGene Institute
Unit acronym:	INMG
Label requested:	UMR_S, UMR
Present no.:	
Name of Director (2014-2015):	
Name of Project Leader (2016-2020):	Mr Laurent SCHAEFFER

Expert committee members

Chair:

Mr Thomas BRAUN, Max Planck Institute, Bad Nauheim, Germany

Experts:

Ms Carine BOSSENMEYER-POURIE, Université de Nancy (representing of the CNU)

Mr Mario DE BONO, University of Cambridge, UK

Ms Jamilé HAZAN, Université Pierre et Marie Curie, Paris (representing of the INSERM CSS6)

Ms Stéphanie LE BRAS, Université Rennes 1 (representing of the CoNRS)

Mr Bertrand LLORENTE, Université Aix-Marseille

Ms Athanassia SOTIROPOULOS, Université Paris-Descartes (representing INSERM CSS3)

Scientific delegate representing the HCERES:

Mr Jean ROSENBAUM

Representatives of the unit's supervising institutions and bodies:

Ms Emmanuelle CANET-SOULAS (representative of the Doctoral School « École Doctorale interdisciplinaire sciences-santé », EDISS, n°205)

Ms Bénédicte DURAND (representative of the Doctoral School « Biologie Moléculaire Intégrative et Cellulaire », BMIC, n° 340)

Mr Thierry GALLI, INSERM

Mr Rémi GERVAIS (representative of the Doctoral School « Neurosciences et cognition », ENESCO, n°476)

Mr Germain GILLET, Université Lyon 1

Mr Laurent KHODJABACHIAN, CNRS

1 • Introduction

History and geographical location of the unit

The NeuroMyoGene Institute, INMG, is a new institute, which will start its full operation in early 2016. Initially, research teams of the INMG will be at different sites on the Health-East Campus and the La Doua campus of the university of Lyon before moving to the Rockefeller Building of the Medical Faculty on the Health-East Campus after renovation is completed in 2017. The INMG will be eventually located at the R3 (5000 m^2 lab space) and the R4 levels (500 m^2 for microscopy platform) of the Rockefeller building. The INMG originates from a partial merger of the two molecular and cellular biology laboratories that existed in Lyon in 2007: the "Centre de Génétique et de Physiologie Moléculaire et Cellulaire" (CGPhiMC) on the scientific campus of the university of Lyon and the "Laboratoire de Biologie Moléculaire de la Cellule" (LBMC) at the ENS of Lyon. Creation of the INMG is part of a profound reorganization of life science research in Lyon, which already resulted in the formation of the Cancer Centre of Lyon (CRCL) and the Neurosciences Research Center of Lyon (CRNL).

Creation of the INMG was motivated by the idea to develop a strong fundamental research institute in cell biology, to provide state-of-the-art technological platforms for various research teams and to create a center of excellence for studying the nervous and muscular systems and translate basic research to the clinic.

The Health-East Campus provides a strong scientific and clinical environment with three large research centers, host hospitals and a large part of the medical faculty harboring about 10 thousand students. Hospitals at Health-East Campus include the neurology, cardiology, psychiatry, pediatric and obstetric hospitals and represent about 80% of the hospital beds in Lyon.

Management team

The INMG will be directed by a director (Mr. Laurent SCHAEFFER) and two deputy directors with distinct tasks. One will focus on scientific policy and scientific communication whereas the second will be committed to human resources and management of the administrative unit. The director's board will be assisted by an Administrative, Partnership and Communications manager (to be recruited). An Executive committee comprising the directors and the group leaders meets once a month and will be consulted for major scientific decisions regarding the selection and creation of new research teams as well as for the annual budget. A laboratory council that meets at least three times a year containing nominated and elected members of the INMG's staff as well as representatives of all the professional categories will serve a similar function. The director is assisted by an international scientific advisory board (SAB) of five scientists from France, Italy and Germany, which evaluates research teams every five years and provides advice for the recruitment of new research teams. The SAB has already evaluated and endorsed the concept of the INMG and approved the selection of research teams constituting the INMG. Finally, the INMG plans to establish User committees (laundry/autoclaves, store, microscopy, cell culture, animal facilities, etc.) to manage the daily life of the Institute and to guaranty efficient flow of information necessary for decision making.

The INMG does not propose to establish formal departments but relies on the strong connections between different research teams and the interdisciplinary structure, which does not seem to require further structuring of the INMG at the moment.

HCERES nomenclature

SVE1_LS3 Biologie cellulaire, biologie du développement animal

SVE1_LS5 Neurobiologie

SVE1_LS4 Physiologie, physiopathologie, biologie systémique médicale

SVE1_LS2 Génétique, génomique, bioinformatique

Unit workforce

Unit workforce	Number as at 30/06/2014	Number as at 01/01/2016
N1: Permanent professors and similar positions	34	28
N2: Permanent researchers from Institutions and similar positions	30	23
N3: Other permanent staff (without research duties)	34	35
N4: Other professors (Emeritus Professor, on-contract Professor, etc.)		
N5: Other researchers (Emeritus Research Director, Postdoctoral students, visitors, etc.)	12	13
N6: Other contractual staff (without research duties)	10	6
TOTAL N1 to N6	**120**	**105**

Unit workforce	Number as at 30/06/2014	Number as at 01/01/2016
Doctoral students	25	
Theses defended	50	
Postdoctoral students having spent at least 12 months in the unit	11	
Number of Research Supervisor Qualifications (HDR) taken	9	
Qualified research supervisors (with an HDR) or similar positions	29	29

2 • Overall assessment of the unit

Global assessment of the unit

The INMG is a newly created research unit that resulted from a partial merger of the CGPhiMC and the LBMC in Lyon, who have has a long-standing tradition in cell biology and neuromuscular research. So far the INMG consists of 14 research teams and is planned to eventually host 22-25 individual groups. The INMG has managed to attract a number of outstanding scientists from outside Lyon. Some of them are world-leaders in their respective fields. The successful gathering of strong research groups from Lyon and abroad clearly speaks for the attractiveness of the INMG and the appeal of the research concept.

The creation of the INMG makes a strong statement to explore basic processes in the neuronal and muscular system relevant for diseases processes in a complementary, multidisciplinary manner. Main research areas are devoted to: 1) Physiology of the Neuromuscular System. 2) Cellular and Molecular Neurobiology. 3) Nuclear Dynamics. Furthermore, the INMG aims to develop its links to clinical science for transfer of knowledge from bench to bedside. The translational aspect of the INMG is clearly visible by the appointment of 11 clinical researchers in the ranks of the professors and lectures, who will work at the institute and by the success of teams addressing disease-relevant issues. However, the impact of scientists at the INMG on clinical research has been limited so far compared to the success in the basic research arena. The number of patents, spin-off companies, and contracts with pharmaceutical and

biotechnology companies at present is not overwhelming. It will take major efforts to develop thriving translational projects based on available resources in Lyon that will do more than just supply potential therapy targets and/or provide a few biomarkers. Nevertheless, prospects are excellent and the committee felt that all means are in place and that the newly established INMG will become one of the leading places for basic and translational research relevant for neuromuscular disease processes.

The Institute will be located in a very strong scientific environment and benefits from an outstanding set of technological platforms. Access to facilities will be shared with other research centers, which is an excellent opportunity to foster interactions and broaden the expertise. On the other hand, care has to be taken to manage joint facilities appropriately, serve different needs and guarantee the highest possible technical and scientific standard. Recruitment of outstanding scientists and technical personnel devoted to scientific service will be key for success of the shared facilities.

The director has a very solid international reputation in his field, and is surrounded by a number of outstanding scientists. The concept of the INMG leaves room for the recruitment of additional groups, which is a great chance to strengthen the center and sharpen the profile. The committee feels that the institute will most likely generate excellent science during the next 5 years and further increase its international visibility and attractiveness.

Strengths and opportunities in relation to the context

The INMG is composed of research teams with a long-standing history of excellent science, with excellent in house expertise covering most aspects of neuromuscular research. A great strength of the INMG is the availability of different models systems, each with its own distinct advantages as well as the focus on the interface between neuronal and muscular research, which is unique for a large research institute.

The scientific environment of the Institute is excellent offering numerous opportunities for collaborations and synergies in particular with the nearby Cancer Centre of Lyon (CRCL) and the Neurosciences Research Center of Lyon (CRNL), University campus, hospitals, and other sites of the University of Lyon.

The restructuring of biomedical research in Lyon is a great chance for establishing continuous success of the new institute. So far, the institute is in a “status nascendi” and will be able to attract several new groups, which offers the ability to further strengthen the focus but also to extend the research portfolio and establish an international research atmosphere. Several of the scientific and technical staff will retire during the next couple of years. Albeit this might result in the loss of certain expertise replacement of retiring staff members also offers the chance to rejuvenate the faculty and attract new talents.

The INMG will have access to an exceptional set of technological platforms and state of the art equipment. It greatly benefited from several programs allowing to acquire cutting-edge equipment for the characterization of cellular and animal models including high-definition echography, 3D x-ray scanner coupled to fluorescence detection, CyToF, ImageStream XL, etc. The renovation of the Rockefeller Building offers additional opportunities, in particular to set up a high-end microscopy facility with light sheet microscopes, high-resolution microscopy, etc. In addition to several in house facilities providing support for more basic but nevertheless vital infrastructure such as media preparation, sterilization, cell culture, histology, etc., the INMG will jointly run together with other institutes six different platforms (microscopy and imaging, rodent facility, zebrafish facility, animal physiology, neurochemistry and an integrated OMICs platform). It will be important to find competent and dedicated personal to run the platforms, provide sufficient support and guarantee transparent access for all teams. A privileged access to these technical platforms by teams of the INMG and the corresponding expertise will constitute an invaluable asset for the institute.

The INMG team members comprise 11 clinical researchers and some teams have a clear translational focus, which reflects the commitment of the INGM to narrow the gap between bench and bedside. However, the overall strategy to expedite translational research is not always clear making it difficult to identify a striking vision for the whole institute. With some exceptions most teams are primarily committed to basic research and did not made major efforts to capitalize on achieved results in terms of clinical applications. As a result, strong connections with pharmaceutical and biotech companies, and with clinical research teams are limited. Only a few patents were granted and a single spin-off is currently getting established. Nevertheless, the focus and established collaborations of the INMG provide an excellent basis for further development of translational research activities. The INMG has demonstrated its ability to attract financial support from governmental agencies and charities but funding from industry could be expanded.

The INMG has managed successfully to assemble a very strong group of team leaders and developed a convincing strategy for future research. At present, different teams are working at different locations until the new institute will move under a common roof. Relocation of the different INMG teams into the newly renovated

Rockefeller building is a great opportunity and will allow much better interactions. At the same time, availability of newly established scientific platforms will make new technologies available to each team, reduce costs and efforts that would have otherwise been required to establish technologies individually. The direct neighbourhood of two additional large institutes and the placement of the INMG on the health campus of the university with several hospitals is another major asset that can be exploited in the future. During the transition before moving into the new building major efforts will be necessary keep individually teams together and to build a joint spirit. The start of a new institute is a wonderful occasion to lay the ground for an enduring and stimulating companionship.

As a result of an efficient recruitment campaign, the INMG was able to recruit seven out of the 14 current research teams from outside Lyon including recruits from the US and Australia. Several of them are young scientists in the most productive part of their career. The new building still allows recruitment of new teams or the growth of existing ones. This is a unique opportunity to stimulate high risk/high gain programs.

Teams at the INMG were very successful in raising funds. Two ERC grants (1 consolidation, 1 starting) were awarded and 7 grants were obtained from the European FP6/FP7 programs. In addition, the INMG profited from large grants from the French Investment of Future plan (5.6 Mio €), which adds up to an impressive 18.4 Mio € in grant support in the period from 2009-2014.

The existence of a scientific advisory board, which is consulted for the monitoring of teams and in the context of major strategic decisions, such as the hiring of new groups and changes in institute organization, is very valuable. Its role should probably be increased further, as new rules regarding the distribution of recurrent funds will likely require an external advice.

The INMG has a clear vision and global strategy for future basic research and an excellent starting point to build a strong translation program. The director and its team are dynamically and efficiently pushing the teams towards better science and stronger interactions between them.

Weaknesses and threats related to the context

The committee was very pleased with the achieved results and the prospects of the institute and did not identify threats that cannot be handled. So far, the newly founded INMG did not have to withstood a baptism of fire but still has to prove its ability to cope with challenging situations. It is not difficult to foresee that transition time before moving into the newly renovated Rockefeller building will be a rather vulnerable period, which has to be managed carefully. Construction delays, difficulties in recruiting additional research teams or replacement of retiring staff and cuts in public funding represent considerable threats that might jeopardize success of the INMG and have an impact on its ambitious goals. So far, the INMG is a “virtual” institute with no common history, although several teams have collaborated extensively in the past. During the next period it will be crucial to integrate all teams, in particular those that have been newly recruited to Lyon, into a single unit and to forge a new institute with a strong “esprit de corps”. These threats were also identified by the director, although some of them are not really within the reach of the institute management.

The institute has received considerable support from the University of Lyon, CNRS, and INSERM over the last 5 years. The planned increase in the number of teams will require additional funding to cover expenses for additional scientists, technicians/engineers, and the opening of a new building. Operation of the new technology platforms will increase the percentage of resources allocated to infrastructure support, which might reduce the availability of funds for individual research teams to pursue research projects. As a consequence, research teams will depend more strongly on external grants in a context that is getting less favorable in France (decrease of ANR budget). Funding the infrastructure at an adequate level while maintaining flexible funds for research projects will therefore be a major challenge for the INMG.

The INMG seems to suffer from insufficient technical support, particularly for common infrastructure (animal facility among others). The creation of new platforms and the necessity to recruit highly qualified personnel will further increase these problems when no additional funding can be secured. A number of technicians and engineers will also reach the age of retirement within the next 5 years, which might exacerbate difficulties in running the infrastructure, if the retiring persons cannot be replaced. During the site visit university representatives offered support to alleviate these problems by assigning technicians from other units, which are going to be closed or reduced in size.

The technical platforms, which will be used jointly by different institutes, constitute one of the main assets of the INMG. It will be a permanent challenge to maintain and refinance the platforms allowing them to stay competitive and up to date. Failure to provide regular upgrading of existing equipment and acquisition of new instruments will be detrimental. Productivity of research teams might decline if too much time is devoted for managing platforms and

providing service. Instead, platforms should be run by dedicated scientists and technicians in close cooperation with different research teams to provide required services.

Despite the excellent environment and the international recognition of the INMG teams, the ability to recruit excellent post-doctoral fellows is hampered by administrative regulations, which restrict the duration of post-doctoral positions representing a major threat to maintain competitiveness. The percentage of foreign team leaders and postdocs at the INMG is limited, which is a shortcoming for an institute that wants to be recognized at an international level.

Despite its attractiveness, the number of PhD students recruited to the Institute seems relatively low and might be enlarged (75 PhD students in 5 years corresponding to roughly 1 PhD student per team per year). The number of foreign PhD students has reached 25%, which seems high for a French Institute but is not impressive compared to international standards. No specific program exists to attract international PhD students or postdocs.

The average age of staff (scientists and technicians) at the INMG is rather high (48 years) and several people are going to retire in the next 5 years (up to 11 people). It will be a critical issue to replace retiring staff. Furthermore, the INMG should try to establish new research teams headed by young promising scientists, who are about to establish themselves as independent scientists.

Teams at the INMG were very successful in raising funds in the period from 2009-2014 and several of the grants will extend into the new contract period 2016-2020. It will be a challenge to maintain and extend this degree of funding in times of shrinking budgets. Teams at the INMG did receive substantial funding from patient organizations and charities but received rather low support from industry. However, in particular translational research requires intense interactions with pharmaceutical and medical companies including substantial financial support. Additional activities are required to convince the industry to participate in INMG projects.

Recommendations

The expert committee strongly supports the present director and his managing team, who did an admirable job to lay the foundation of a new institute and assembled an impressive group of outstanding scientists. It is now of utmost importance to keep the different teams located at different sites together before moving into the newly renovated joint building. The INMG should pursue its successful recruitment strategy to reach a critical mass of 22-25 research groups. Priority should be given to excellent young research team leaders, who are starting their scientific career although the unit would also benefit from recruitment of additional senior scientists complementing and extending the existing expertise. Yet, scientific excellence should always be given priority before strategic or thematic considerations. Significant efforts will be required to shape the new institute composed of a group of teams with different backgrounds and origins into a homogeneous structure that jointly acts together to achieve the mission of the INMG. Collaborations between different INMG teams, in particular those that have been newly recruited should also be encouraged decisively.

Most research teams are devoted to basic research although several clinicians are embedded into research teams and some teams are primarily committed to translational research. There is no need to force basic research teams to pursue translational research but a more comprehensive strategy is required to bridge the gap between bench and bedside if translation of basic research results into clinical practice instead of excellence in basic research emerges as the foremost priority of the institute. A dedicated rotation program with clinicians who are prepared to take a leave from clinical studies, joint seminar series and/or other activities in this direction as well as specific incentives to do translational research might help in this direction. Interactions with pharmaceutical companies and industry should be intensified.

Insufficient support by supervising bodies might hamper the growth of the institute, which needs adequate investments and a proportional increase in the budget to cope with the increase of the number of research teams.

Several central structures such as common platforms are about to be formed. Great care needs to be taken to shape these structures according to the needs of different teams and assure the quality of their performance. Service platforms should be organized independent of individual research teams wherever possible and made available for everyone. The management should make sure that research teams deeply involved in joint technical platforms do not suffer in terms of scientific productivity by spending too much time doing service. Recruitment of dedicated personnel would be potential way to cope with such challenges if the budget permits. Precise rules should be elaborated for replacement of group leaders who leave as well as for the promotion of inside researchers as group leaders.

Collaborations with other institutes at the campus, hospitals and university departments are vital for the success of the institute. The establishment of joint technical platforms represents an excellent way to promote

further interactions and foster intense scientific exchange. Joint scientific projects or common grants would also help.

The management should support activities to make the INMG more international. The ratio of foreign PhD students has raised up to 25%, which is a good sign but might be increased further, e.g. by establishing an international PhD program in the area. Such an initiative should be organized together with other research institutes on site and the local and regional bodies, who should offer more PhD fellowships in the area. In addition, it is recommended to increase the number of foreign team leaders and postdocs to establish the INMG as a hub of international research. The use of English as the common language for scientific activities at all levels is an essential step in this process and should be enforced. However, learning French is necessary for daily life. Hence, the INMG should offer support to foreign PhD students and post-docs to solve administrative issues both inside and outside the Institute and assist in organizing or finding language courses.

At present, the success in obtaining external grants is excellent. Administrative help for grant applications at the EU level, which are rather time consuming and tedious, seems very good, since scientists at the INMG are entitled to receive help and advice for EU grant applications by a dedicated CNRS office in Lyon.

The INMG should work on ways to offer good and productive post-docs a career track and to keep a position for periods longer than 3 to 4 years. Usually, it is not a priority for competitive scientists to obtain a permanent position early during the career as long as administrative rules do not interfere and sufficient independence can be granted.

The SAB already contributed to the selection of research teams for the new INMG, which is an excellent practice that needs to be continued. The SAB might counsel the management team in budget issues when it comes to the distribution of internal funds. Back up by the SAB might help the management to avoid internal tensions that will inevitably arise when overall funding of the institute becomes tight.