

EVALUATION REPORT OF THE UNIT
T2I - Transplantation immunologie et
inflammation

UNDER THE SUPERVISION OF THE
FOLLOWING ESTABLISHMENTS AND
ORGANISMS:
Université de Tours

EVALUATION CAMPAIGN 2022-2023
GROUP C

Rapport publié le 17/08/2023



In the name of the expert committee¹ :

Sebastien Lacroix-Desmazes , Chairman of the committee

For the Hcéres² :

Thierry Coulhon, President

Under the decree n° 2021-1536 of 29th November 2021:

¹ The evaluation reports "are signed by the chairperson of the expert committee". (Article 11, paragraph 2);

² The president of the Hcéres "countersigns the evaluation reports established by the expert committee and signed by their chairperson." (Article 8, paragraph 5).

This report is the result of the unit's evaluation by the expert committee, the composition of which is specified below. The appreciations it contains are the expression of the independent and collegial deliberation of this committee. The numbers in this report are the certified exact data extracted from the deposited files by the supervising body on behalf of the unit.

MEMBERS OF THE EXPERT COMMITTEE

Chairperson: Mr Sebastien Lacroix-Desmazes, Inserm, Paris

Experts : Ms Giuseppina Caligiuri, INSERM, Paris
Mr Niclas Setterblad, Sorbonne Paris Cité
Mr Fabien Van Coppenolle, Université Claude Bernard Lyon 1 - UCBL

HCÉRES REPRESENTATIVE

Ms Marie-Paule Roth

CHARACTERISATION OF THE UNIT

- Name: Transplantation immunologie et inflammation
- Acronym: T2I
- Label and number: EA4245
- Composition of the executive team: Sébastien ROGER

SCIENTIFIC PANELS OF THE UNIT

SVE Sciences du vivant et environnement

SVE4 Immunité, infection et immunothérapie

THEMES OF THE UNIT

The main research themes of the unit have evolved over the evaluated period (2016–2021). The initial project included research on various immune-inflammatory aspects of graft dysfunction, dendritic cell polarisation and ischaemia-reperfusion in the context of myocardial infarction or transplantation. It has since evolved with a strong focus on the molecular determinants of ischaemia-reperfusion injuries under different physiopathological contexts. The work of the unit particularly focuses on membrane receptors, transporters, and ion channels, by studying the role of purinergic receptors signalling in inflammatory responses to ischaemia-reperfusion, the role of ion channels and ion signalling in the cellular activation and differentiation triggered by ischaemia-reperfusion. The unit has also preserved a strong program for the development and improvement of therapeutic monoclonal antibodies.

HISTORIC AND GEOGRAPHICAL LOCATION OF THE UNIT

The EA4245 unit was created in 2012 on a project entitled 'Dendritic cells and organ graft'. It originates from a team created in 2004 directed by Pr Yvon Lebranchu dedicated to the study of the immunomodulation of dendritic cells. The unit has since experienced major restructuration and benefited from the arrival of different research groups. The group of Pr Denis Angoulvant working on ischaemia-reperfusion and associated deleterious inflammation joined the unit in 2012. The group of Dr Sébastien Roger who studies the role of ion channels and purinergic receptors in various physiopathological conditions joined in 2019. The group of Pr Gilles Paintaud who works on pharmacokinetics and pharmacodynamics of therapeutic monoclonal antibodies joined in 2020. In 2021, the unit was joined by the group of Pr Véronique Maupoil working on ion signalling and imaging in cardiac arrhythmia. The group of Dr Jérôme Rollin specialised in thrombosis, platelet physiology and role in immune regulation were planned to join the team in 2022. The EA4245 unit has been directed by Dr Sébastien Roger since September 2020.

The main quarters of the unit are located at the Faculty of Medicine of the University of Tours (Tours city centre), in close vicinity with the Bretonneau site of Tours University Hospital (CHRU Tours). The unit, however, also benefits from facilities located at the Faculty of Pharmacy (Grandmont campus), which is in close vicinity with the Trousseau site of the CHRU Tours.

RESEARCH ENVIRONMENT OF THE UNIT

The EA4245 unit is an active member of the Biomedical field of research developed at the University of Tours, in a close relationship with the University Hospital of Tours (CHRU Tours). Unit members bring in their expertise and technical skills, thus creating a scientific hub in the research environment. Members of the EA4245 unit are initial contributors to the Hospital and University Federation (FHU) entitled 'FHU SUPPORT, SURvival oPtimization in Organ Transplantation', created in 2014 and renewed until 2026. The EA4245 unit is one of the initial members of the Excellence laboratory, funded by the Future Investments Programme (PIA) on therapeutic antibodies, called LAbex 'MabImprove' from the Universities of Tours and Montpellier, created in 2011 and renewed until 2024. At the local and regional levels, the EA4245 unit has established strong collaborations with several Inserm-University units (UMR), and CNRS/INRAE-University UMR units. It is an essential actor of the program called Ambition Recherche Développement 2020 (created in 2013, renewed until 2026) and its associated projects 'Biomédicaments', which joints academics and pharmaceutical industries, and 'B Cell resources'. Some unit members are also involved in the GIRCI (Groupement interrégional pour la recherche clinique et l'innovation) Grand-Ouest from (North-West region) HUGO (University Hospitals of North-West) and in the MIAMIGO (Monitoring Immunopharmacologique des Anticorps Monoclonaux thérapeutiques) network. Some members have an active role on the monitoring therapeutic antibody platform cluster of CePiBac with The Center of Clinical Investigation (CIC Inserm 1415 Tours) and the Center of Biological Resources (CRB Touraine). The unit benefits from Tours university and university-hospital platforms provided by the Scientific and Technical Platform for Biological Systems Analyses as well as from the Pilot center for Therapeutic Antibodies Monitoring (CePiBac)

and the French Reference Medical Biology Laboratory (LBMR) for therapeutic drug monitoring of monoclonal antibodies (Tours University Hospital). Unit members have access to the PIXANIM platform (INRAE-University-CHRU-CNRS).

UNIT WORKFORCE: in physical persons at 31/12/2021

Permanent personnel in active employment	
Professors and associate professors	14
Lecturer and associate lecturer	12
Senior scientist (Directeur de recherche, DR) and associate	0
Scientist (Chargé de recherche, CR) and associate	0
Other scientists (Chercheurs des EPIC et autres organismes, fondations ou entreprises privées)	0
Research supporting personnel (PAR)	8
Subtotal permanent personnel in active employment	34
Non-permanent teacher-researchers, researchers and associates	0
Non-permanent research supporting personnel (PAR)	1
Post-docs	2
PhD Students	12
Subtotal non-permanent personnel	15
Total	49

DISTRIBUTION OF THE UNIT'S PERMANENTS BY EMPLOYER: NON-TUTORSHIP EMPLOYERS ARE GROUPED UNDER THE HEADING 'OTHERS'.

Employer	EC	C	PAR
Université de Tours	26	0	4
CHRU Tours	0	0	4
Total	26	0	8

UNIT BUDGET

Recurrent budget excluding wage bill allocated by parent institutions (total over 6 years)	273.00
Own resources obtained from regional calls for projects (total over 6 years of sums obtained from AAP idex, i-site, CPER, territorial authorities, etc.)	1,397.00
Own resources obtained from national calls for projects (total over 6 years of sums obtained on AAP ONR, PIA, ANR, FRM, INCa, etc.)	725.00
Own resources obtained from international call for projects (total over 6 years of sums obtained)	469.00
Own resources issued from the valorisation, transfer, and industrial collaboration (total over 6 years of sums obtained through contracts, patents, service activities, services, etc.)	89.00
Total in k€	2,953.00

GLOBAL ASSESSMENT

The T2I monothematic unit has created an excellent dynamic in recruiting and attracting new members (8 physicians and 5 engineers and technical staff) in the last years. The director created a good complementarity between researchers towards a cross-disciplinary common project. The research of the team is sustained by:

- i) excellent external funding (3,703 k€ over the period), originating from the region (1,397.1 k€: 37.7%), from associations (750 k€: 20.3%) and from national calls (725 k€: 19.6%),
- ii) by adequate infrastructure and technological platforms (CePiBAC, BCR project), and by multiple cross-disciplinary scientific networks.

The attractiveness is exceptional as highlighted by:

- i) the impressive dynamic in recruiting new lab members and synergize different scientific expertise towards a single homogenous research project;
- ii) the excellent visibility of the unit in terms of participation in regional (LabEx MAbImprove), inter-regional (FHU SUPPORT, réseau MIAMIGO, ARD Biomédicaments), national (French Alliance for Cardiovascular Trials, Groupe de Réflexion en Recherche Cardiovasculaire de la Société Française de Cardiologie,...) and international (Consortium Le Studium with UK, Mex, USA, EU COST Actions IONCHAN-IMMUNRESPON (T2I coordinator) and EUroPeriSCope, Partenariats Hubert-Curien with Roumania, Marocco and China) networks and programs;
- iii) success as coordinators in regional (4), five national (1 INCa, 3 PHRC, 1 PRME) and twenty grants as PI from charities (5 Ligue régionale contre le Cancer and 5 FFC,...);
- iv) Thirteen PhD thesis were defended and four postdoctoral fellows hosted.

The scientific production is excellent and proportionate to the lab human resources, with 209 original scientific articles and 116 clinical articles, some of which are published in highly recognised journals, including Eur Heart J. Cardiovasc Imaging, J Heart Lung Transplant, Cell Mol Life Sci, J. Transl Med, J Thor Cardiovasc Surgery, Circulation, Stroke ... and some in more general journals (Nat Commun, several Sci Rep). Some lab members are co-authors of highly cited articles published in prestigious journals (J Am Coll Cardiol in 2017, N. Engl J. Med in 2019 and Lancet Public Health in 2020), which highlights the quality of their collaborations. The functioning of the unit is well organized with collegial decisions and open management. The budget is shared between lab members to favour the acquisition of new technologies or development of innovative and risky research projects.

Interactions with the society are very good with the filing of one patent, different types of partnerships with private companies (AstraZeneca, Medtronic), seven software released in open source, the participation in five clinical trials, multiple outreach initiatives towards non-scientific public and youngsters as well as participation in societal debates (fête de la science, conferences for the general public, hosting high-school students, program 'Déclics' for high-school students, radio shows, ...).

In conclusion, the committee estimated that the T2I unit is excellent and that the dynamic engaged in the recent years is very positive and should foster original research relevant for the society. This will be reinforced by persisting in the improvement in the publication level, raising funds from competitive European/international bodies and attracting additional permanent full-time scientists.

DETAILED EVALUATION OF THE UNIT

A – CONSIDERATION OF THE RECOMMENDATIONS IN THE PREVIOUS REPORT

1- Quality and scientific productions: Recommendation: 'Increase impact factors, even to the detriment of the total number of publications if necessary.'

The unit has set a series of criteria to improve the publication level which resulted in 478 peer-reviewed articles during the period 2016–2021 and a noticeable increase in the number of articles published in higher impact journals in the last two years.

2- Influence and academic attractiveness: Recommendation: 'increase international visibility'.

There was a clear implication of the unit at the national and international levels during 2016–2021 with notable participation to the LabEx MablImprove and to the FHU SUPPORT. Lab members also coordinated the European scientific network COST Action BM1406 IONCHAN-IMMUNRESPON and were involved in the COST Action CA15204 EURO-PERISCOPE. They also organised an international two-year consortium in 2018 and 2019 which attracted partners from Spain, Italy and China. Members of the lab participated to exchanges and to the mobility cooperative Hubert Curien Program with Morocco, Rumania, and China, and the unit hosted international scientists (China, Mexico). The unit has developed collaborations with several international universities in and outside Europe, and its members are actively involved in scientific societies, editorial activities, and reviewing of scientific projects for funding agencies and associations (ERC, national and regional).

3- Interactions with economic, social, cultural and sanitary environments: Recommendation: 'Develop politics for the valorisation of databases and biobanks of transplanted patients.'

The unit has promoted the creation of databases and biobanks and their use for its research. It has developed contracts with medical industries and pharmaceutical companies.

4- Internal organisation and life in the research unit: The recommended changes have been implemented

5- Involvement in the formation of research activities: Recommendation: 'increase management of students in the lab by researchers and technicians'. The recommended changes have been implemented.

6- Perspectives and five-year strategy. Recommendation: 'Increase the number of statutory research and technical members,' 'Obtain the certification for the BCR Platform'. Restructurations in the last years have resulted in the gain of two IR, one AI and two Tech. The unit decided to not make a platform of the BCR. Instead, the CePiBAC is associated with the Reference Medical Biology Laboratory (LBMR) of Tours University Hospital and has contributed to its certification.

B – EVALUATION AREAS

EVALUATION AREA 1: PROFILE, RESOURCES AND ORGANISATION OF THE UNIT

Assessment on the unit's resources

The unit developed an excellent dynamic in recruiting and attracting new members. Team members were excellent at raising funding from the region and at the national and international levels. They also showed admirable integration in local, regional, and national networks and adequate infrastructure and technological platforms.

Assessment on the scientific objectives of the unit

Team members produced seminal work on purinergic receptors. During the last mandate, they developed strong translational research on different heterogenous objectives. The director was able to synergize the efforts towards the delineation of a common project for the future mandate. The research of the team is sustained by excellent external funding.

Assessment on the functioning of the unit

The functioning of the unit is excellent with collegial decisions and open management. The budget is shared between lab members to favour the acquisition of new technologies or development of innovative and risky research projects. All the different categories of staff in the unit expressed enthusiasm and support towards the management. The recent arrival of a permanent full-time scientist will be an asset to coordinate bench work for all projects within each research axes. The unit has access to state-of-the-art equipment, mainly located on university platforms, which enhances its technical expertise and capacity to conduct cutting-edge research.

1/ The unit has resources that are suited to its activity profile and research environment.

Strengths and possibilities linked to the context

The activity profile of unit EA4245 is characterised by the following missions and objectives: to produce and promote biomedical research data, to supervise and train students, to participate in the administration and assessment of research, and to disseminate knowledge to wide audiences.

The unit has thus developed a strong implication in clinical and translational research and in clinical care, which is made possible by the integration in a local academic/technological network that includes the University of Tours, the Faculty of medicine, the Faculty of Pharmacy and Sciences, the University Hospital of Tours and different INSERM and CRNS units. From the accommodation point of view, the unit's premises have been located since May 2021 at the first and second floors of the Vialle building (approximately 700 m²). In addition, a laboratory space (75 m²) dedicated to plasmid production and amplification is also located to a nearby building. Facilities also includes office and laboratory space (approximately 340 m²). Then, altogether, the total working space of the unit is around 1115 square metres.

The unit members have also created and lead the MIAMIGO regional Network, which implicates seven clinical centres in Grand-Ouest (Tours, Angers, Rennes, Nantes, Brest, Orléans, Le Mans) and aims at supporting and developing clinical and translational projects within the region. The strong implication in clinical research is also favoured by the presence in the unit of seventeen hospital professors and assistant professors who hold a PhD.

The unit has put impressive efforts in human resources in the last years. It has gained of two IR, one AI and two Tech, which allows implementing novel technologies and methodologies on the long term. The unit was joined by one university professor (PU) and eight University Assistant Professors (MCU), the dynamic allowed to move from seventeen Unit members in 2018 to 49 Unit members in December 2021 (with 29.4 FTE).

The last term was marked by an increase in recurrent funding provided by the university from 21 k€ in 2018 to 68 k€ in 2022. The total budget of the last term was 3,703 k€, with most of the funding coming from the region (1,397.1 k€: 37.7%), from associations (750 k€: 20.3%) and from national calls (725 k€: 19.6%). Forty percent of the budget are shared and dedicated to undertaking risky innovative projects, based on a collegial decision that take place during monthly research unit committees.

Locally, the unit has initiated several platforms: CePiBAC, which is associated with the Reference Medical Biology Laboratory (LBMR) on therapeutic drug monitoring of monoclonal antibodies, and the BCR project.

Weaknesses and risks linked to the context

The average external budget per year was about 500 k€. In 2021, the total budget was 340 k€ of external budget and 42 k€ of recurring budget. This represents a total of 13.2 k€/FTE or 22.5 k€/HDR and is a low figure to allow developing original and innovative research.

The recurring budget, although increasing every year, remains marginal.

There is no national funding coming from ANR or major European funding (ERC, MSCA, ...).

2/ The unit has set itself scientific objectives, including the forward-looking aspect of its policy.

Strengths and possibilities linked to the context

The scientific objectives aim at deciphering molecular determinants of ischaemia-reperfusion injuries in different physiopathological contexts with a focus on membrane receptors, transporters, and ion channels. A specific axis is also aiming at elucidating the mechanisms involved in sterile deleterious inflammation and tissue remodelling. A strong research objective is linked to the study of therapeutic monoclonal antibodies. The specific projects thus pursue cutting-edge objectives and the research activities span from basic science to clinical trials. Unit members develop a bed to bench approach. They are initial contributors to the 'FHU SUPPORT', which led to the BioSUPPORT biocollection and to a DNA collection and are implicated in the prospective cohort CARIM and in the interventional cohort HIBISCUS-STEMI. Unit members also develop a bench to bed strategy notably by participating in the COVERT-MI study.

The link between basic and translational research is reinforced by the recent arrival of several researchers, most of whom are clinicians and are involved in active clinical practice. The double prism of basic science and medical research enriches each of the different research projects with a translatable perspective. Several young clinicians have been trained in the unit during their academic course, mainly in the field of transplantation practice (regional programme ARD Centre-Val de Loire, GIRCI–Groupe innovation et recherche Clinique Grand-Ouest). The unit is also a partner of the 'LabEx MabImprove'.

The unit has access to state-of-the-art equipment, mainly located on university platforms, which enhances its technical expertise and capacity to conduct cutting-edge research: it has initiated the CePiBac, which has obtained the label of Reference Medical Biology Laboratory and the BCR project. It also has a strong implication in the Future Investments Program (PIA).

Weaknesses and risks linked to the context

The research objectives appear somewhat pleiotropic, especially in view of the workforce and available budget. Hence, the coherence between the different axes of research developed in the unit is difficult to apprehend from the written document.

The importance of myocardial ischaemia as a major cause of morbi-mortality is put forward in the document, with a very high socio-economic impact. However, studying the consequences of myocardial ischaemia and stroke does not appear as a main research objective of the unit. Ischaemia eventually appears as one of the topics of the laboratory, but mainly linked to the transplantation field.

3/ The functioning of the unit complies with the regulations on human resources management, safety, the environment, and the protection of scientific assets.

Strengths and possibilities linked to the context

Research policies and exploitation of the findings are discussed during monthly research unit committees, and decisions are made following collegial discussions and unanimous agreement. A 'règlement intérieur', which is regularly updated, summarises the policy for scientific orientations, exploitation of findings, internal management of the budget, ordering of equipment, recruitment of staff, etc. The unit abides by the European HRS4R label (The Human Resources Strategy for Researchers. Recruitment independent from gender, age, ethnicity, religious or sexual orientation) and respects gender equality in recruitment, career development and training. Newcomers are trained through an internal formation on good lab practices.

The unit has recently moved to a renewed building that adheres to all new recommendations for saving energy (better isolated and better control the temperature, control of light with the movement, of water consumption with photoelectric cells,...). Dedicated waste bins have been settled (biological waste, chemical waste, paper...) and treatment circuits are in service and follow the regulation through services provided by the University.

The data management plan stipulates that scientific numeric data are saved on individual computers, on external hard drives and on the online, secured drive ('U filer drive') provided by the university.

From the accommodation point of view, the unit's premises have been located since May 2021 at the first and second floors of the Vialley building (approximately 700 m²). In addition, a laboratory space (75 m²) dedicated

to plasmid production and amplification is also located to a nearby building. Facilities also includes office and laboratory space (approximately 340 m²). Then, altogether, the total working space of the unit is around 1115 square metres. The sharing of the funds allows newcomers to develop innovative research.

Weaknesses and risks linked to the context

None of the scientists in the unit dedicates 100% of her/his time to research. There is also no permanent scientist from INSERM or CNRS.

Many scientists are medical doctors with clinical duties.

There seems to be a limited administrative support for the management/organisation of the research unit.

EVALUATION AREA 2: ATTRACTIVENESS

Assessment on the attractiveness of the unit

The unit has shown outstanding attractiveness, as shown by the number of individuals who joined and active participation in European networks and hospital-university programs. It was successful in obtaining funding from competitive calls, highlighting its strong scientific capabilities. Recently, the unit underwent changes in research priorities, which should reinforce scientific attractiveness and increase international visibility.

1/ The unit has an attractive scientific reputation and contributes to the construction of the European research area.

Strengths and possibilities linked to the context

The evolution over time of the unit over the period evaluated indicates a rise in power. Members are involved in:

- i) international coordination of two Campus France PHC (ToubKal 2016 and XuGuang 2020)
- ii) and five EU contracts (4 COST programs and 1 PHC Brancusi).

PI are members of editorial boards of two Elsevier journals (Archives of cardiovascular diseases...) and five Frontiers journals (Frontiers in Pharmacology, Cancer...). They have directed a special issue in Frontiers in pharmacology (2021). They belong to scientific societies (International society for cancer metabolism, working group of the European society of hypertension...).

The unit organised two international meetings (COST on IONCHAN-IMMUNCELL...) and three members visited foreign laboratories (Romania, Belgium).

The Unit experimented a 37.5% success in raising funds from European calls.

The unit also displays ten National (MitoVasc, PhysCell, CarMeN, PhyMedExp, iBV, INEM, TAAM and IRMETIST), and sixteen International (China, USA, Italy, Denmark, UK, Spain, Germany, Romania, Canada, Mexico) academic collaborations, which opens possibilities to build interactions, establish biocollections and develop consortia (with specific collaborative funding).

One member belongs to the IUF (2015–2020) and another one was expert for ERC.

eleven prizes have honoured members of the Unit (Ruban Rose Avenir, Fondation de France...) and students (prix jeunes chercheurs, prix du meilleur poster, 3ème prix régional « ma thèse en 180 secondes »...)

Weaknesses and risks linked to the context

The visibility of the unit is for the moment mainly perceived at local and national level (thanks to the LabEx MablImprove).

2/ The unit is attractive for the quality of its staff hosting policy.

Strengths and possibilities linked to the context

The staff reception policy considers both the evolution of the unit's human resources and its accommodation policy. The recruitment of staff followed the evolution of the research project over the period 2018–2021. New collaborators joined the team. In January 2019, the unit hosted the group led by Sébastien Roger (1 MCU-HDR-IUF; 2 PU-PH, 1 postdoctoral student and 3 PhD students). Two more MCUs joined the team in 2020 and 2021 as well as a visiting professor (from the University of Münster). As a result, the unit increased from seventeen members with twelve full-time equivalents (FTEs) on January 1, 2017, to 46 members (for 29.4 FTEs) on December 31, 2021. This new staff has helped to strengthen the technical skills of the laboratory (cell physiology, cell signalling, electrophysiology). This is indicative of the attractiveness of this team and thus allows strengthening the interactions between basic research and clinical research.

The unit is strongly involved in training of students, which is witnessed by the presence in 2021 of nineteen members with accreditation to supervise research (HDR) and the training of ten to twenty students in Master (M1, M2), BTS and IUT every year. Thirteen PhDs have been defended and four postdocs hosted. Lab members are also implicated in the training of future clinicians and pharmacists at the Faculty of Medicine and faculty of Pharmacy, and in the formation of research scientists by taking part in the multi-university Master diploma 'Host/Graft relationship' and by teaching at the Faculty of Sciences and techniques.

Weaknesses and risks linked to the context

The rate of PhD students trained per HDR (19 HDR in 2021) is rather low.

3/ The unit is attractive because of the recognition gained through its success in competitive calls for projects.

Strengths and possibilities linked to the context

The first notable fact indicating the attractiveness of this team is its participation in the creation of the hospital-university federation (FHU) SUPPORT (SURvival and OPTimization in Organ Transplantation), initially created for the period 2014–2019. The FHU SUPPORT was subsequently renewed for the period 2022–2026.

The research unit is also behind the creation of the Excellence Laboratory on Therapeutic Antibodies (LabEx 'MabImprove' ANR-10-LABX-53-01) between the universities of Tours and Montpellier. The initial labelling covered the period from 2011 to 2020. The LabEx was renewed for five additional years (2020–2024).

Members obtained five national contracts as PI (3PHRC, IINCa PLBIO...), eleven grants from the Region (4 Region Centre-Val de Loire, 1 Cancéropole Grand Ouest...), including three PhD contracts.

Weaknesses and risks linked to the context

None, since the group's ongoing structuring will allow it to apply for more international and competitive project calls.

4/ The unit is attractive for the quality of its major equipment and technological skills.

Strengths and possibilities linked to the context

Some members of the unit oversee the Pilot Centre for Biological Monitoring of Antibody Treatments (CePiBAC). This hospital-university platform is involved in the study of therapeutic pharmacological antibodies in humans (Phase I to VI clinical trials). This platform has strong interactions with other local research platforms of the University Hospital of Tours. The CePiBAC platform is funded by Tours University Hospital and has received grants from the European Union (ERDF) and the LabEx MabImprove. The unit also benefits from university and university-hospital facilities. The unit also has access to a proteomic and lipidomic platform (PIXANIM, INRAE-University-CHRU-CNRS).

Weaknesses and risks linked to the context

Limited funding probably limits the capacity to develop original and innovative platforms/acquire modern technologies.

EVALUATION AREA 3: SCIENTIFIC PRODUCTION

Assessment on the scientific production of the unit

The scientific production is excellent (94 articles in major position) with a stable number of published articles and an increase in the number of high-impact publications in collaborative works. The scientific production is proportionate to the research potential and shared among staff members.

1/ The scientific production of the unit meets quality criteria.

Strengths and possibilities linked to the context

Publications of the unit on the evaluated period come to a total of 209 original scientific articles (with 94 in major position, Eur Heart J Cardiovasc Imaging, J Heart Lung Transplant, Sc Rep...), 72 reviews, and 116 clinical studies. Notably, three collaborative studies, based on clinical trials, were published in prestigious medical journals (J Am Coll Cardiol 2017, N Engl J Med 2019, Lancet Public Health 2020 and attracted numerous citations. The experimental results in each of the topics covered by the unit are regularly presented at National and International conferences, including the annual meeting of top speciality official associations (AHA, ACC, ESC...)

Weaknesses and risks linked to the context

The research topics cover a rather large span for a mono-team unit. A Clarivate representation of the original articles published by the unit members indicates that most subjects are in the cardiovascular area (64 papers). Within the 'cardiovascular' group, most papers deal with arrhythmia, rather than the proposed main scientific objective of the team, which is ischaemia-reperfusion injury. The articles dealing with non-cardiovascular topics cover a large and rather disperse panel of different topics, with inflammation and transplantation being less represented than expected.

2/ Scientific production is proportionate to the research potential of the unit and shared out between its personnel.

Strengths and possibilities linked to the context

All the senior PIs have published one or more works in journals that are well recognised within their speciality during the evaluation period. The most productive unit members in terms of original publications are the senior scientists actively exerting a training task, by supervising the research activity of PhD students. The latter consistently appear as co-authors of the related publications.

Weaknesses and risks linked to the context

A total of thirteen students defended their PhD thesis between 2017 and 2021 (out of a total of 25 registered PhD students). The number of PhD students/HDR is 1–2 for most of the twelve active HDR listed in the document. This implies that several unit members with HDR do not effectively exert the training as part of their activity. Only one PI has supervised or co-supervised >2 theses defended during the evaluated period, implying that those members with HDR who effectively exert a mentoring activity do not recruit PhD students on a regular basis.

3/ The scientific production of the unit complies with the principles of research integrity, ethics and open science.

Strengths and possibilities linked to the context

A substantial fraction of the published papers are 'open access' and several articles (at least 15, according to Clarivate) are 'Enriched Cited References'. Furthermore, several published papers result from clinical or translation studies implying that the unit complies with integrity and ethics (ethical standard are very strict for this type of publication).

Weaknesses and risks linked to the context

None

EVALUATION AREA 4: CONTRIBUTION OF RESEARCH ACTIVITIES TO SOCIETY

Assessment on the inclusion of the unit's research in society

The unit presents a very good involvement in nonacademic interactions as it has developed industrial partnerships with two industrial companies, filed a patent for a monoclonal antibody for diagnostic and therapeutic purposes and is participating/coordinating several technical and pedagogical tools. The implication of the unit members in outreach towards the general public is outstanding.

1/ The unit stands out by the quality of its non-academic interactions.

Strengths and possibilities linked to the context

The unit lists few collaborations with pharmaceutical companies (AstraZeneca, Medtronic) on projects related to the displayed scientific objectives, including heart-kidney syndromes and ischaemic injuries, myocardial inflammatory responses, human monoclonal antibodies for inflammatory pathologies diagnosis and targeting of purinergic receptors with small molecules.

Moreover, the unit obtained the financial support for the thesis of two PhD students from AURCIL, the regional association for the promotion of cardiovascular research. The unit also filed a patent for a monoclonal antibody to be used for diagnosis.

Weaknesses and risks linked to the context

Despite the several ongoing partnerships with industrial partners, the number of contracts developed with the industry is still very low and the unit is aware of its lack of involvement in projects leading to the development of non-academic actions such as start-up projects, due to the lack of manpower.

2/ The unit develops products for the socio-economic world.

Strengths and possibilities linked to the context

The unit filed a patent for the identification of new monoclonal antibodies for diagnostic and therapeutic purposes and is actively participating/coordinating several technical and pedagogical tools, such as articles in professional and technical reviews, book/articles for professionals. It also participates to the establishment of clinical recommendations. Additionally, the unit members are regularly solicited and implicated in educational assessments at both national and international levels.

Weaknesses and risks linked to the context

So far, the unit has not been able to create jobs due to a lack of opportunities.

3/ *The unit shares its knowledge with the general public and takes part in debates in society.*

Strengths and possibilities linked to the context

The unit is actively involved in the annual 'Fête de la Science', organising conferences and laboratory visits. The unit also contributes to the 'Village des Sciences', setting up a pedagogical demonstration stand to explain the research topics of the laboratory.

The unit received the Silver medal in 2021 for the '30 years of the Fête de la Science', acknowledging their investment in spreading information to the general public.

The unit members are regularly implicated in conferences given to high-school pupils (Lycée Balzac and Lycée Vaucanson in Tours, Lycée Saint-Denis in Loches), in conferences/scientific debates with the general public (Mairie de Tours and UTL and Centre Sciences & le Museum de Tours) as well as the French Federation of Cardiology (non-profit organisation).

The unit members are also regularly solicited by various media channels such as national and regional broadcasting media (TV, radio...).

Additionally, members of the unit were invited by the French ministry of Foreign Affairs to the 5th Franco-Chinese month of the Environment in 2018 in Beijing and in Changsha (Hunan province/academic and non-academic seminars).

Weaknesses and risks linked to the context

None

C - RECOMMENDATIONS TO THE UNIT

Recommendations regarding the Evaluation Area 1: Profile, resources, and organisation of the unit

To sustain a productive research environment and ensure effective student management across all three research objectives, we strongly recommend that the unit attracts a minimum of two full-time scientists. Additionally, we encourage all unit members to actively seek out and apply for European funding opportunities.

To improve the unit's visibility and maximise research impact, we suggest focusing all research objectives, including the dedicated work on therapeutic monoclonal antibodies, towards investigating purinergic receptors and ischaemia-reperfusion. This will help to establish the unit as a leader in this research area and increase the potential for impactful scientific discoveries.

Recommendations regarding the Evaluation Area 2: Attractiveness

To facilitate the involvement of all the clinicians belonging to the unit in research activities and mentoring of students, the unit director should obtain more free time off clinical duties for those clinicians with HDR.

The unit should highlight better the seminal work of its members in the discovery of purinergic receptors in order to potentiate the chances of funding from the European Union.

The unit is encouraged to develop more of its own techniques to gain independence from platforms in the future, even though this has not been a problem in terms of scientific publications and the success of calls of projects during the period evaluated.

The evolution of the research projects of the unit over the period 2018–2021 indicates a very strong dynamism which should allow a contribution of the structure to research at the international and European level in the future.

Recommendations regarding Evaluation Area 3: Scientific Production

The unit is encouraged to maintain the excellent dynamic in improving the quality and impact of its research, over quantity in terms of publication.

Recommendations regarding Evaluation Area 4: Contribution of Research Activities to Society

None

CONDUCT OF THE INTERVIEWS

Date(s)

Start: 10 février 2023 à 8 h 30

End : 10 février 2023 à 17 h 30

Interview conducted online

INTERVIEW SCHEDULE

Programme des entretiens entre l'Unité Transplantation, Immunologie et Inflammation (T2I) et le Comité d'évaluation Hcéres

Vendredi 10 février 2023

- 8 h 30-8 h 45** Présentation des membres du Comité
- 8 h 45-9 h 25** Présentation du bilan par le directeur de l'Unité : Sébastien Roger (20 min de présentation, 20 min de questions)
- 9 h 25-9 h 40** **Pause-café**
- 9 h 40-10 h 10** Présentation scientifique des travaux représentatifs des différents axes : Sébastien Roger (15 min de présentation, 15 min de questions)
- 10 h 10-12 h** **Réunion à huis clos du comité**
- 12h-13h30** **Pause déjeuner**
- 13 h 30-14 h** Rencontre avec les personnels d'appui à la recherche : personnels administratifs et techniques
Porte-paroles : Carole Desplanches (carole.desplanches@univ-tours.fr) et Audrey Héraud-Meley (audrey.heraud@univ-tours.fr)
- 14h-14h30** Rencontre avec les doctorants et postdoctorants
Porte-paroles : Thomas Duret (thomas.duret@etu.univ-tours.fr) et Ana Valeria Vinhais Da Silva (anavaleria.vinhaisdasilva@etu.univ-tours.fr)
- 14 h 30-15 h** Rencontre avec les chercheurs et les enseignants-chercheurs
Porte-paroles : M. Fabrice Ivanès (fabrice.ivanès@univ-tours.fr) et Fabio Ferro (fabio.erro@univ-tours.fr)
- 15h-15h15** **Pause-café**
- 15 h 15-15 h 45** Réunion du Comité avec les représentants des tutelles
Université de Tours : Emmanuelle Huver (emmanuelle.huver@univ-tours.fr) et Catherine Beaumont (catherine.beaumont@univ-tours.fr), VPs recherche
Délégué Inserm : Frédéric Delaleu (frederic.delaleu@inserm.fr) et **ITMO PMN** : Raymond Bazin (raymond.bazin@inserm.fr) et Chantal Boulanger (chantal.boulanger@inserm.fr)
Vice-Présidente en charge de la Recherche au CHU de Tours : Hélène Blasco (helene.blasco@univ-tours.fr)
- 15 h 45-16 h** **Pause-café**
- 16h-16h30** **Réunion à huis clos du Comité**
- 16 h 30-17 h** Réunion du Comité avec le Directeur d'Unité
- 17h-17h30** **Réunion à huis clos du Comité**

PARTICULAR POINT TO BE MENTIONED

N/A

GENERAL OBSERVATIONS OF THE SUPERVISORS

Hc res
D partement d' valuation de la recherche

Tours, le 14 juin 2023

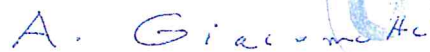

Objet : DER-PUR230023362 - T2I - Transplantation immunologie et inflammation.

Au nom de l'unit  de recherche T2I, j'adresse mes sinc res remerciements aux membres du comit  de visite HCERES pour leur rapport et leurs recommandations.

Nous transmettons ci-apr s les observations r dig es par l'unit  de recherche.

Je vous prie d'agr er l'expression de mes salutations distingu es.

Le Pr sident de l'universit  de Tours

Arnaud GIACOMETTI

Pr Sébastien ROGER,
Professeur de Physiologie, Université de Tours
Directeur de l'EA4245 Transplantation, Immunité, Inflammation
Responsable de Master Mention Biologie-Santé
Membre honoraire de l'Institut Universitaire de France (IUF)
Faculté de Médecine de Tours, 10 boulevard Tonnellé
37032 TOURS - FRANCE
Tél : 0033(0)2.47.36.61.30
Email : sebastien.roger@univ-tours.fr

Tours, 13th June 2023

Dear Madam, dear Sir, dear colleagues,

On behalf of all members of research unit EA4245 Transplantation, Immunology, Inflammation of the University of Tours, I would like to thank our HCERES delegate as well as all the expert members of the evaluation committee for the quality of our exchanges, this evaluation report and the recommendations to the unit.

The analysis that was made of our research unit is, from our point of view, completely correct, relevant and satisfying. There is no sensitive information in the report that we would like to hide in the public report.

Please find below some answers from comments indicated in the report.

Please accept, dear colleagues, our best regards.



Pr Sébastien Roger

P8 – “Evaluation AREA 1: 1/ The unit has resources that are suited to its activity profile and research environment”

Weaknesses and risks linked to the context:

The committee indicated:

« The average external budget per year was about 500 k€. In 2021, the total budget was 340 k€ of external budget and 42 k€ of recurring budget. This represents a total of 13.2 k€/FTE or 22.5 k€/HDR and is a low figure to allow developing original and innovative research.

The recurring budget, although increasing every year, remains marginal.

There is no national funding coming from ANR or major European funding (ERC, MSCA, ...). »

Answer:

We thank the committee for this comment. The evaluation committee is perfectly right when indicating that the recurring budget from the University is marginal (while in constant increase from 22 000€ in 2018 to 76 900€ in 2023) and that it is needed to attract more national and international funding to allow developing original and innovative research. However, it has to be considered that the unit has importantly evolved over these recent years in terms of both research thematic and human resources (important attractiveness).

As a result, there is a timeframe shift when comparing the actual number of members and the acquisition of external funding. Indeed, new members have recently reoriented their research project, obtained initial results and are applying to calls. They are now in the way of obtaining national and international funding. Therefore, we are rather confident for the next contract.

For example, multiple projects have been granted or are pre-selected since the assessment by the HCERES committee:

- **1 National INCa PLBIO** funding was obtained in **2021** (total amount 569 160€, including 293 760€ for the unit) and **1 INCa PLBIO in 2022** (total amount 579 204 €, including 218 160 € for the unit)
- **2 projects** submitted to the National call from the **Federation Française de Cardiologie (FFC)** have been pre-selected for second phase assessment: **DOTATIONS DE RECHERCHE 2023** (100 000€) and **IMPULSION** (30 000€)
- **1 National ANR AAPG2023** has been pre-selected for second phase assessment (total amount 572 000€)
- **1 European ERA4 Health Joint Transnational Call for Proposals 2023** has been pre-selected for second phase assessment (total amount 1 048 000€)
- Furthermore, **2 European COST networks**, involving members of the unit in the management committee, have started by the end of 2022:

COST Action CA21130 “P2X receptors as a therapeutic opportunity” (PRESTO) over the period 2022-2026, dedicated to study the role and target ATP-gated P2X ionotropic receptors in physiopathological conditions. The director of the unit is part of the management committee and is involved in the 5 working groups of the action.

COST Action CA21147 “European Network on Optimising Treatment with Therapeutic Antibodies in chronic inflammatory diseases” (ENOTTA) over the period 2022-2026, dedicated to facilitating the implementation of individualised (Therapeutic Drug Monitoring-guided) cost-effective dose optimisation of therapeutic antibodies in daily clinical practice for treatment of chronic inflammatory diseases. Two members of the unit are part of the management committee.

In addition to these national and international programs, the unit has been successful to the pre-selection of two Region Centre-Val de Loire Funding:

- **APR « Interêt Regional » 2023** (200 000 €) – associated to a European FEDER call (300 000€)

P9 – “Evaluation AREA 1: 2/ The unit has set itself scientific objectives, including the forward-looking aspect of its policy.”

Weaknesses and risks linked to the context:

The committee indicated:

“The research objectives appear somewhat pleiotropic, especially in view of the workforce and available budget. Hence, the coherence between the different axes of research developed in the unit is difficult to apprehend from the written document.

The importance of myocardial ischaemia as a major cause of morbi-mortality is put forward in the document, with a very high socio-economic impact. However, studying the consequences of myocardial ischaemia and stroke does not appear as a main research objective of the unit. Ischaemia eventually appears as one of the topics of the laboratory, but mainly linked to the transplantation field.”

Answer:

We thank the committee for this relevant comment.

Indeed, the research project of the unit EA4245 Transplantation, Immunology, Inflammation has importantly evolved during the period 2018-2022. Initial objectives were to study immune mechanisms involved in graft rejection and organ dysfunction subsequently to ischemia-reperfusion, and to develop immunomodulation strategies using tolerogenic dendritic cells to prevent deleterious progression. These initial objectives included several sub-projects that could appear pleiotropic.

However, since September 2020, the new direction has operated on strong focus on the domains of expertise of the laboratory and hence to increase its visibility at both the national and international levels. The project is now dedicated to the elucidation of common molecular and cellular mechanisms involved in tissue remodelling leading to organ dysfunction, subsequent to ischemia-reperfusion in the physiopathological contexts of myocardial ischaemia, kidney transplantation and cardio-renal syndrome.

Most importantly, the research unit is now focused on a unique translational research project studying the involvement of the purinergic signalling in reperfusion injuries. The project is structured into 3 interconnected axes involving the different members of the unit, studying:

- 1) The role of inflammation and purinergic signalling in the development of ischemic lesions
- 2) The role of purinergic signalling in reperfusion injuries, tissue remodelling and organ loss of function
- 3) The involvement of purinergic signalling in the inter-individual variability of response to monoclonal antibodies used for the treatment of ischemic and inflammatory diseases.

Each axis is composed of several interconnected projects involving similar models and methodologies and multiple members of the unit. The goals of the research are to determine whether membrane receptors of the purinergic signalling (mostly P2Y and P2X receptors) could serve as:

- 1) Biomarkers of organ dysfunction in ischemic and inflammatory diseases
- 2) Factors responsible for the inter-individual variability in response to I/R
- 3) Targets for small molecules (newly developed or repurposed drugs) and therapeutic antibodies to reduce reperfusion injuries and prevent subsequent organ dysfunction

P10 – “Evaluation AREA 1: 3/The functioning of the unit complies with the regulations on human resources management, safety, the environment, and the protection of scientific assets”

Weaknesses and risks linked to the context:

The committee indicated:

“None of the scientists in the unit dedicates 100% of her/his time to research. There is also no permanent scientist from INSERM or CNRS.

Many scientists are medical doctors with clinical duties.

There seems to be a limited administrative support for the management/organisation of the research unit.”

Answer:

We thank the committee for this relevant comment.

Indeed, due to its status of research unit from the University (E.A., Equipe d’Accueil), the unit has no possibility to attract or recruit permanent scientists from INSERM or CNRS. This is one of the reasons why we are applying to the INSERM labelling for the 2024-2029 contract.

Nevertheless, since 2022, the unit has one permanent scientist dedicating 100% of his time to research: Dr Jérôme Rollin, who is employee of the University Hospital of Tours (CHU Tours) for conducting research projects in the unit. The University of Tours was also solicited to discharge the director of the unit from his teaching duties, at least for the time until the recruitment other permanent scientists.

Importantly, if the unit receives recognition by the INSERM, one permanent scientist from the CNRS is interested to join in 2024 (if authorized by CNRS), and two previous PhD students of the lab, currently post-doctoral researchers, would be interested in applying for the recruitment as INSERM researchers (CRCN).

Concerning our medical doctor colleagues, in discussion with the heads of their clinical services (several of them are also members of the unit), an internal organization is being set up in order to grant them more time for research. They strongly contribute to the translational aspect of our research and many supervise PhD students and apply to research project grants that contribute to our activities and funding.

Eventually, concerning the administrative support for the management/organisation of the research unit, it is very true that a supplementary support is needed. The director has several times alerted both the direction of the faculty of Medicine and the Presidency of the University.

Two actions are currently undertaken by the director:

1/ reduction the pedagogic duties of the secretary so she can dedicate more time for the research unit

2/ application to the recruitment campaign of the university for a 50% supplementary position for the research unit.

P10 – “Evaluation AREA 2: 1/ The unit has an attractive scientific reputation and contributes to the construction of the European research area”

Weaknesses and risks linked to the context:

The committee indicated:

“The visibility of the unit is for the moment mainly perceived at local and national level (thanks to the LabEx MablImprove)”.

Answer:

The committee is certainly true in this comment. Indeed, the unit receives local regional and national recognition thanks to its participation to the program Ambition Recherche Développement Biomedicament, the GIRCI Monitoring Immunopharmacologique des Anticorps Monoclonaux thérapeutiques prescrits dans l'Interrégion Grand-Ouest (MIAMIGO), the Fédération Hospital Universitaire SURvival oPtimization in ORgan Transplantation

(FHU SUPPORT), the LabEx MablImprove, the French Purine club, the French Alliance for Cardiovascular trials, the Société Française de Cardiologie (SFC), the Groupe Français d'études sur l'Hémostase et la Thrombose.

Furthermore, the unit is participating to 3 reference centres: 2 Reference Medical Biology Laboratory (LBMR) and 1 reference centre for rare diseases (Centre de référence maladies rares, CRMR) of the CHU Tours. This involvement also increases its national visibility:

- since 2021, the CePiBac platform is recognized as LBMR on therapeutic drug monitoring of monoclonal antibodies,
- since 2023, the clinical service of haemostasis is recognized as LBMR on Haemorrhages, Thrombotic Microangiopathies and heparin-induced thrombopenia
- since 2023, the clinical service of haemostasis is also CRMR on thrombotic microangiopathies

Also, since its precedent participation to the 2 COST Actions BM1406 "Ion Channels and Immune Response toward a global understanding of immune cell physiology and for new therapeutic approaches (IONCHAN-IMMUNRESPON, 2015-2019)", and CA15204 " European Platform for outcomes research into perioperative interventions during surgery for Cancer " (EUroPeriSCOpe, 2016-2021) and to the 2 recent COST actions CA21130 "P2X receptors as a therapeutic opportunity" (PRESTO,2022-2026) and CA21147 "European Network on Optimising Treatment with Therapeutic Antibodies in chronic inflammatory diseases" (ENOTTA, 2022-2026), we do believe that the unit is gaining international visibility.

P11 – "Evaluation AREA 2: 2/ The unit is attractive for the quality of its staff hosting policy"

Weaknesses and risks linked to the context:

The committee indicated:

"The rate of PhD students trained per HDR (19 HDR in 2021) is rather low".

Answer:

We do understand the comment from the assessment committee. However, this rate is partially due to a timeframe shift between the arrival of new HDR members in the unit and their acquisition of PhD grants, as well as to the specific functioning of the Doctoral School ED549 « Santé, Sciences Biologiques et Chimie du Vivant » (SSBCV) to which the research unit belongs. The attribution of PhD grants by the doctoral school SSBCV is quite specific and differs from that of most French doctoral schools.

The doctoral school SSBCV receives 11 university PhD grants and 7 Region Centre Val de Loire PhD grants per year to be redistributed to affiliated research units based in Tours. Therefore, there are 18 institutional PhD grants for 16 research units, accounting for approximately 280 HDR.

Concerning the way to apply for an institutional PhD grant: research units are allowed to submit each year a maximum number of PhD projects depending on the total number of HDR members by team/unit. This ratio is one PhD project for 5 HDR. Therefore, our research unit was authorized to present a maximum of 4 PhD projects in 2022 (but 3 in 2021). In December of each year, PhD projects are presented by PIs (future PhD directors) to all HDR members of the thematic axis (approximately 70 HDR) of the doctoral school, through a short (8-10 minutes) presentation and a session of questions-answers. All HDR of the axis vote and all projects presented are ranked.

The doctoral school then attributes institutional PhD funding according to this ranking. Then, in May and July of following year (2 sessions), the doctoral school organizes auditions of PhD candidates. New PhD students start their project in October.

Therefore, from these data it can be understood how competitive it is to obtain PhD grants for all HDR in the research unit. Therefore, it is critical to have an efficient internal scientific strategy and to present to the doctoral school the PhD projects which are the most timely and important for the research unit. The unit usually does not present the maximum number of projects authorized and rather presents those showing high strategic impact, and generally proposes PhD projects co-directed by both a medical and a non-medical scientist to allow translational projects.

That being said, since the strategy has been established in 2019, the unit is rather successful to obtain PhD grants, including for recently arrived researchers.

Below are the number of PhD funding in the research unit and the recruitment of PhD students:

- **1 in 2020:** Thomas DURET, co-directed by Pr Sébastien ROGER (new member in 2019) and Pr Christophe BARON
- **2 in 2021:** Ana Valeria VINHAIS DA SILVA, co-directed by Pr Fabrice IVANES and Pr Thierry BOURGUIGNON (new member in 2020)
Louhane CLAUDEPIERRE directed by Pr Philippe GATAULT
- **3 in 2022:** Johanna AUGROS, co-directed by Pr Claire POUPLARD (new member in 2022) and Dr Caroline VAYNE (new member in 2022)
Oumnia BENOUNA, co-directed by Pr Jean-Michel HALIMI and Dr Côme PASQUALIN (new member in 2021)
Hasna DJERMOUNI, co-directed by Pr Mehdi OUAISSI (new member in 2019) and Pr Sébastien ROGER
- **2 in 2023:** Simon CHESSERON, directed by Dr Jérôme ROLLIN (new member in 2022)
Another PhD student to be recruited, co-directed by Pr Theodora ANGOULVANT (new member in 2020) and Pr Denis ANGOULVANT

Apart from this strategy to obtain institutional PhD grants, the unit is active to propose PhD projects to medical students, employed by the hospital. Also, efforts will be made to assess the possibility to apply for CIFRE PhD Grants.

P12 – “Evaluation AREA 3: 2/ Scientific production is proportionate to the research potential of the unit and shared out between its personnel”

Weaknesses and risks linked to the context:

The committee indicated:

“A total of thirteen students defended their PhD thesis between 2017 and 2021 (out of a total of 25 registered PhD students). The number of PhD students/HDR is 1–2 for most of the twelve active HDR listed in the document. This implies that several unit members with HDR do not effectively exert the training as part of their activity. Only one PI has supervised or co-supervised >2 theses defended during the evaluated period, implying that those members with HDR who effectively exert a mentoring activity do not recruit PhD students on a regular basis.”

Answer:

We acknowledge the HCERES committee for reading our previous answer.

The ratio “number of PhD / number of HDR” depends on the capacity of the unit to receive institutional PhD grants and is also due to the fact that most PhD projects are co-directed by 2 HDR to allow translational projects.

The Hcéres' evaluation reports are available online:
www.hceres.fr

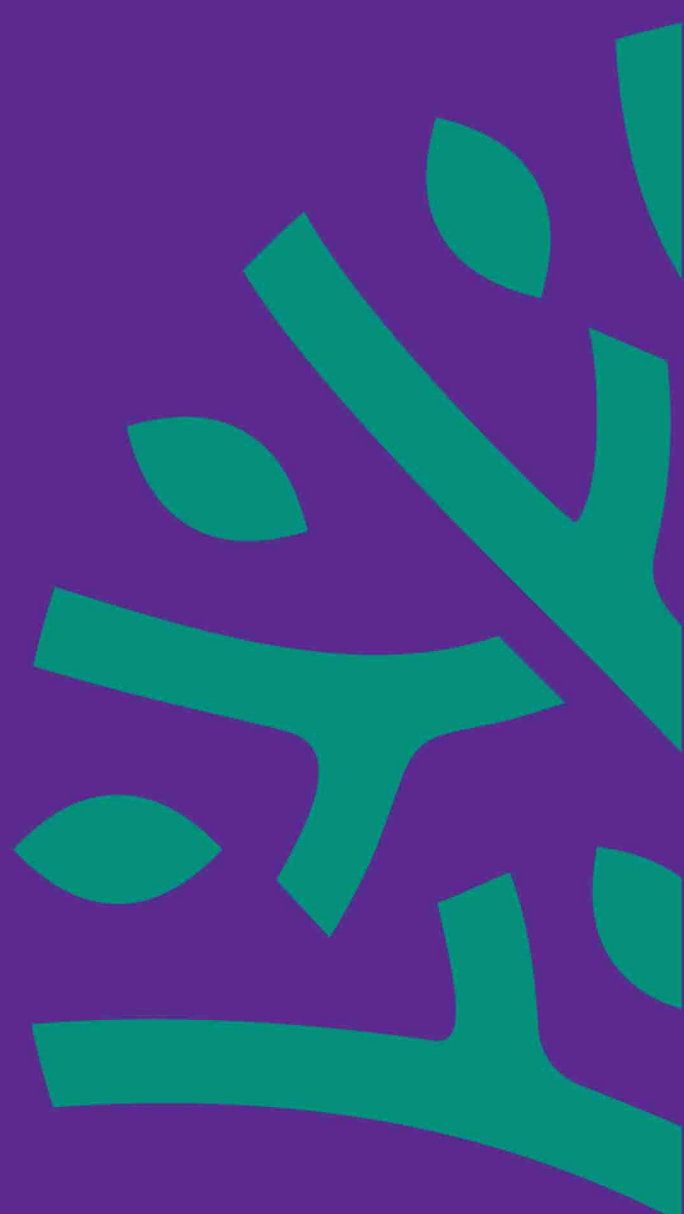
Evaluation of Universities and Schools

Evaluation of research units

Evaluation of the academic formations

Evaluation of the national research organisms

Evaluation and International accreditation



2 rue Albert Einstein
75013 Paris, France
T. 33 (0)1 55 55 60 10

hceres.com

[@Hceres_](https://twitter.com/Hceres_)

[Hcéres](https://www.youtube.com/Hceres)