

EVALUATION REPORT OF THE UNIT
DCAC/UMR S116

UNDER THE SUPERVISION OF THE
FOLLOWING ESTABLISHMENTS AND
ORGANISMS:

Université de Lorraine
Inserm

EVALUATION CAMPAIGN 2022–2023
GROUP C

Report published on March, 22 2023



In the name of the expert committee¹:

Thierry Pedrazzini, President of the evaluation 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:

Prof. Thierry Pedrazzini
Centre Hospitalier Universitaire Vaudois, Lausanne, Suisse

Mme Véronique Montcuquet, PAR ; Université Paris Cité
Prof. Jean-Sébastien Silvestre, CSS3 ; Université Paris Cité
Prof. Jean-Noël Trochu, CNU 51-02 ; Université de Nantes

HCÉRES REPRESENTATIVE

Dr. Sophie Ezine

CHARACTERISATION OF THE UNIT

- Name: Acute and Chronic Cardiovascular Deficiency
- Acronym: DCAC
- Label and number: UMR_S 1116
- Number of teams: 2
- Composition of the executive team: Director: Prof. Patrick Lacolley
Council incl. director, team leaders and six elected members representing permanent and non-permanent staff.

SCIENTIFIC PANELS OF THE UNIT

- Panel 1: SVE6 – Human Physiology and Physiopathology, Ageing
- Panel 2: SVE7 – Prevention, Diagnosis and Treatment of Human Diseases

THEMES OF THE UNIT

The Unit 1116 'Acute and chronic cardiovascular deficiency' from the University of Lorraine is structured in two teams, each of them combining basic research, translational and clinical programs. The unit research is mainly focused to better understand, prevent and treat accelerated vascular ageing, heart failure, atherothrombosis and acquired thrombophilia.

Team 1 develops three axes to identify the mechanisms of accelerated vascular ageing and atherothrombosis:

- (1) interaction between vascular cells and extracellular matrix,
- (2) molecular understanding of the role of vascular smooth muscle cells and their integrins in thrombin generation and,
- (3) elucidation of factors favouring the transition from acute to chronic inflammation and developing new therapeutic strategy.

Team 2 is dedicated to identify personalised profiles of heart failure and ageing, with a focus on biomarkers of fibrosis and inflammation (cardiotrophin, galectin...), on telomeres, and on functional and molecular biomarkers from cardiovascular imaging. Team 2 also develops and test bioprofile-guided therapies of heart failure and cardiovascular ageing.

HISTORIC AND GEOGRAPHICAL LOCATION OF THE UNIT

The unit was created in 2013 and renewed in 2018. DCAC is located at the Faculty of Medicine of the University of Lorraine in Vandoeuvre-les-Nancy, in a building dedicated to research.

RESEARCH ENVIRONMENT OF THE UNIT

DCAC is one of the nine units of the 'Biology, Medicine and Health' Department at the University of Lorraine at Nancy. It is also a partner of the Federation Hospital-University (FHU) CARTAGE aimed at investigating mechanisms of ageing in the cardiovascular system. Through this partnering activity, DCAC has been associated with the Fighting Heart Failure (FIGHT-HF) program. DCAC receives also supports from Lorraine University of Excellence (LUE), one of the I-SITE funded by the French Government. Finally, DCAC benefits from the stimulating environment of the University of Lorraine and beyond, in all fields of science, for its research activity and for exploiting its intellectual property.

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

Permanent personnel in active employment	
Professors and associate professors	25
Lecturer and associate lecturer	6
Senior scientist (Directeur de recherche, DR) and associate	2
Scientist (Chargé de recherche, CR) and associate	1
Research supporting personnel (PAR)	9
Subtotal permanent personnel in active employment	43
Non-permanent teacher-researchers, researchers and associates	1
Non-permanent research supporting personnel (PAR)	1
Post-docs	4
PhD Students	17
Sub-total non-permanent personnel	23
Total	66

DISTRIBUTION OF THE UNIT'S PERMANENTS BY EMPLOYER: Non-tutorship employers are grouped under the heading 'others'.

Employer	EC	C	PAR
Université de Lorraine	30	0	5
Inserm	0	3	3
CHRU Nancy	1	0	1
Total	31	3	9

UNIT BUDGET (K€)

Recurrent budget excluding wage bill allocated by parent institutions (total over 6 years)	924
Own resources obtained from regional calls for projects (total over 6 years of sums obtained from AAP idex, i-site, CPER, territorial authorities, etc.)	1175
Own resources obtained from national calls for projects (total over 6 years of sums obtained on AAP ONR, PIA, ANR, FRM, INCa, etc.)	1334
Own resources obtained from international call for projects (total over 6 years of sums obtained)	501
Own resources issued from the valorisation, transfer and industrial collaboration (total over 6 years of sums obtained through contracts, patents, service activities, services, etc.).	0
Total	3934

GLOBAL ASSESSMENT

The Acute and Chronic Cardiovascular Deficiency (DCAC; UMR S 1116) Unit is active in the field of cardiovascular disease, with expertise in vascular disorder including inflammation and thrombosis (Team 1) and in heart failure including ageing and personalised medicine (Team 2). Team 1 is mainly implicated in basic science studies whereas Team 2 is involved mostly in clinical studies, even if many projects in both teams include basic and clinical research. This organisation provides the opportunity to develop basic, translational and clinical research.

DCAC is one of the nine units of the 'Biology, Medicine and Health' Department at the University of Lorraine at Nancy. It is also a partner of the Federation Hospital-University (FHU) CARTAGE aimed at investigating mechanisms of ageing in the cardiovascular system. Through this partnering activity, DCAC has been associated with the Fighting Heart Failure (FIGHT-HF) program. DCAC receives also supports from Lorraine University of Excellence (LUE), one of the I-SITE funded by the French Government. DCAC benefits from the stimulating environment of the University of Lorraine and beyond, in all fields of science, for its research activity and for exploiting its intellectual property. In terms of funding, the budget, excluding salary of permanent scientists, has represented approximately about one million euros per year. From this, 85% of this amount came from external grants. This is quite substantial. However, the source of money came principally from two or three major European grants that will be difficult to renew in the future. This situation represents a risk for the years to come.

The scientific production of the Unit is excellent.

The Unit has a remarkable track record of publications. The total number of publications (1349) is impressive. Having said this, the number of original papers with members of the Unit occupying one of the two major positions on the authors' list is approx. 150, still a fair number for a research unit of this size. Publications are, however, mainly produced through collaborative work performed at the Clinical Investigation Centre 1433. The overall quality of the clinical papers remains excellent (NEJM, JAMA, Lancet,...).

The Unit received excellent recognition through its involvement in different research programs at the national and international levels. Principal investigators are implicated in collaborative works with laboratories in France and abroad. The Unit is able to recruit promising young scientists. The unit offers attractive student positions for PhD students and postdocs.

The Unit is facing a period of renewal in its upper management. Several leaders left the Unit in the recent years or will leave soon. The management is fully aware of the challenges ahead of them, and has taken appropriate steps. This includes hiring a renowned researcher, Magnus Bäck, who should take over the Unit director position in due time. The Unit has been also successful in attracting new researchers. The management has therefore initiated a very positive dynamic that receives full support from the supervisory institutions (INSERM, University of Lorraine).

Globally, the research activity, education programs and scientific production are excellent. The Unit provides therefore a fruitful environment for research, which is fully recognised by all employees.

DETAILED EVALUATION OF THE UNIT

A – CONSIDERATION OF THE RECOMMENDATIONS IN THE PREVIOUS REPORT

There were several recommendations that were addressed to the management in the previous report. There are summarised below:

1. The Unit should define better its research priorities
This is a crucial point that, unfortunately, has not been fully addressed in the present self-assessment document. The Unit can present an impressive track record of achievement, particularly in terms of publications. However, its research axes do not seem to be completely defined. Despite significant efforts, research developed in the two teams is quite heterogeneous with coordination between the basic and the clinical research activities that could be improved.
2. The Unit should attract full-time scientists to support its basic research programs
In this area, the Unit has been more successful, in particular by attracting one INSERM researcher (2020) and two associate professors at the University of Lorraine (2021). In addition, a full professor has been recruited on a 50% basis. This internationally recognised personality should take over one of the director positions in the future.
3. The Unit should attract foreign postdoctoral fellows and PhD students
This is a point that has been well taken but the Unit recognises having difficulties to attract the best students (postdocs and PhD students). This is in part due to difficulties to raise dedicated funding.
4. The Unit should reinforce its industrial partnership
Again, this is not fully achieved. There are a few ongoing partnerships initiated via the clinical research program, e.g. FIGHT-HF, COMMANDER, FRALSAFE. An industrial contract has been signed with Pfizer (2020–2023). However, it is not clear how these contribute to expand funding and intellectual property.
5. The Unit should recruit full-time technical staff for its core facilities
This is a recurrent problem, which has not been solved and which is particularly acute in the field of animal research. The Unit should make every effort to recruit staff technicians on permanent positions. This is crucial for maintaining the expertise in the Unit.
6. The Unit should work at achieving gender parity in the upper management
This recommendation has not been followed by appropriate steps towards this important objective. The gender imbalance is particularly evident at the level of staff scientists and clinicians.

In sum, further efforts need to be made in the future to fulfil all these objectives.

B – EVALUATION AREAS

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

Assessment on the unit's resources

The Unit provides an excellent, fruitful and friendly environment for research. The Unit is staffed with scientists, clinicians and technicians. In addition, a number of PhD students and postdocs complete their education or undergo periods of training in the laboratory. The number of personnel is adequate but some areas are understaffed (animal science). Funding, excluding salaries for permanent positions, comes from resources allocated by supervisory institutions (INSERM, University of Lorraine) and from grant money (approx. 85%), and has been sufficient in the past years. The Unit benefits from the activity of several core facilities such as the Mixed Service Unit, the Flow Cytometry platform, the Clinical Investigation Centre 1433 and other local structures. Overall, this contributes highly to create a stimulating environment for research.

Assessment on the scientific objectives of the unit

The main scientific objectives of the Unit are to identify the molecular mechanisms of ageing in the cardiovascular system and to develop innovative treatments, in particular for vascular dysfunction and heart failure. Having said this, from the self-assessment document, the specific aims seem not completely defined. Overall, there is a slight impression of heterogeneity in the research programs. This message needs to be modulated, however, considering the high number of scientists working at the Unit (>25).

The Unit has recruited an outstanding researcher with Prof. Magnus Bäck, who should eventually manage the Unit in the next years. However, how the arrival of this new director might impact significantly the Unit organisation and objectives is not clear at this point.

Teams 1 and 2 are very successful in their respective area of interest but active collaboration between the two teams could be improved. This gives sometime the impression the two units work in silos. Interactions are more based on scientific opportunities than hypothesis-driven.

Assessment on the functioning of the unit

The functioning of the Unit is excellent. It offers an appropriate and safe working environment. The Unit is aware of its duties regarding environmental protection, and takes appropriate steps whenever needed. All the members of the unit appreciate their working environment and the material and human conditions in which they evolve.

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

Strengths and possibilities linked to the context

The Unit operates in a network of academic institutions, university hospitals and biotech companies in Nancy. This provides ample opportunities for interactions. In this context, a partnership within the FHU CARTAGE favours collaborative efforts to initiate translational research, which is crucial for developing innovative treatments. The Unit contributes by offering its expertise in molecular and cellular biology of the cardiovascular system (Team 1) but also via its own translational research (Team 2). Thus, the Clinical Investigation Center 1433, one of the core facilities in which the Unit is involved, is pivotal in creating a smooth transfer of basic research into the clinics and vice versa.

The Unit is appropriately staffed with scientists, clinicians and technicians. A number of PhD students and postdocs also contribute to research. Excluding salaries of the permanent staff, the Unit has a total budget approaching one million euros a year, 85% coming from external grants. This has been comfortable.

Many staff scientists are PU-PH, and are employees of both the Unit and the Hospital. This emphasises again the importance of translational research for the Unit activities. This is also exemplified by the list of publications, which contains for a very large part clinical papers.

The Unit contributes to and benefits from core facilities. Besides the Clinical Investigation Center 1433, the Mixed Service Unit, the flow cytometry facility, and several others developed in collaboration with the 'Biology, Medicine and Health' Department at the University of Lorraine. This is crucial for basic and translational science.

Weaknesses and risks linked to the context

The research activities at the Unit are quite heterogeneous. The environment, while providing many opportunities for research, might also encourage individuals to take advantage of these opportunities regardless of the overall Unit objectives. The feeling is that, sometimes, there might be a gradual drift towards research that is technology-driven and perhaps a bit opportunistic. In this regard, the position of the Clinical Investigation Centre 1433 in the organisation is key. Its utility is not questioned. However, it should not develop at the expense of other research programs.

The Clinical Investigation Centre 1433 needs to be soon evaluated. The future of this facility might impact substantially research performed at the Unit in the next years.

The Unit also relies greatly on animal research. This expertise is unfortunately not organised via a core facility that would provide permanent positions for the technical staff involved. This is a major weakness.

In the same line, some key techniques rely on know-how by employees with limited-term contracts. This creates a risk of loss of competences in specific research areas.

Finally, the Unit is dependent on collaborations for its bioinformatic analyses. This is not ideal in an era where omics has become mandatory approaches in basic and translational research.

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

Strengths and possibilities linked to the context

The research programs and objectives cover topics related to vascular dysfunction and heart failure. There is some logic in investigating these two aspects as a continuum. One of the hypotheses being that vascular dysfunction predisposes to the development of heart failure in a context of ageing. Thus, the Unit positions itself in a competitive field, which should lead to the development of new treatments for heart failure, an unmet clinical need.

Over the years, the Unit has acquired national and international visibility and recognition in the field of cardiovascular research. Its expertise and leadership are well established. This is illustrated in particular by its participation to large European programs and its contribution to the FHU CARTAGE. The therapeutic cardiovascular axis associated with inflammation represents a strong point and place the unit in a leadership position in Europe.

The Unit is well integrated in the local network of academic and non-academic institutions, in particular in the 'Biology, Medicine and Health' Department at the University of Lorraine, and in the Lorraine University of Excellence (LUE), one of the I-SITE funded by the French Government. Both share common objectives in research.

The Unit is organised in a more basic-science team (Team 1) and more clinical-science team (Team 2). This organisation should favour translational research and promote the development of innovative treatments in the areas of interest. In this context, it has been instrumental in the identification of new pharmacological agents regulating vascular homeostasis and dysfunction, which provides opportunity for developing novel treatments.

The Unit is also active in the field of personalised medicine. This is certainly an area worth investigating, even if its real impact in therapies for heart failure is still difficult to appreciate.

The scientific objectives, as defined above, are in line with societal challenges such as the epidemic development of heart failure in the general population in a context of global ageing. The Unit collaborates therefore closely with clinicians to enable the transfer of novel therapies to the public.

The Unit organises its activity through internal discussions that are meant to discuss science, manage resources, provide adequate supervision for students, publish interesting papers and, at the end, favour meeting its objectives.

Weaknesses and risks linked to the context

There is an imbalance between scientific output of Team 2, which benefits clearly from its close relationships with the Clinical Investigation Center 1433, and the production of Team 1 that investigates basic mechanisms via more tedious approaches. This suggests Team 1 is somehow disconnected from Team 2 activities. This should be better worked out to favour translational research.

Basic science programs need to be substantially reinforced. In addition, the objectives of Team 1 and Team 2 should be in line with each other.

The European programs, which fund the Unit for a large part, are due to finish soon. The principal investigators in these programs will leave the Unit within the next year, and it is not clear at this point who will take over this responsibility.

The Unit is not associated with European programs in basic science.

The Clinical Investigation Center 1433 is about to be evaluated. How this reorganisation will impact directly or indirectly the Unit activities is presently unclear.

Internal and external communication should be reinforced through the development of a website, intranet, newsletter, social networks, etc.
The Unit should develop a seminar series and invite national and international speakers to present their research. An annual symposium in the field of interest would be welcome.

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

Globally, the Unit is doing a good job at offering an appropriate and safe working environment. Safety procedure is in place. It is the responsibility of the Director and the Prevention Officer to implement these procedures in the Unit. Risks are formally reevaluated every year. A yearly meeting is also organised for all employees to make sure everyone is on the same page. New employees are informed about the procedures upon arrival. Overall, this is adequate.

The Unit is aware of its duties regarding environmental protection, and takes appropriate steps whenever needed. The Unit has procedures for protecting its scientific assets. This includes making sure everyone keeps a record of its scientific activities. Computer data are also protected. Existing procedures also cover aspects of scientific misconduct.

Career development programs support staff members. They also include close supervision of PhD students and postdocs. The Unit has been working at recruiting permanent researchers and technicians.

Weaknesses and risks linked to the context

For more experienced researchers, it is not clear how the Unit works at promoting career advancement.

This is also the case for the technical staff that it is in need of better recognition.

Career progression for women should be reinforced substantially. The gender imbalance is particularly apparent in the upper management.

No dedicated procedures are in place to specifically prevent or report misbehaviour such as harassment and mobbing.

EVALUATION AREA 2: ATTRACTIVENESS

Assessment on the attractiveness of the unit

The Unit is highly recognised for its excellent expertise in vascular ageing and heart failure. Its track record of publications is impressive, particularly in clinical research. Then, even if the contribution of basic science to the reputation of the Unit is undisputed, basic science programs should be reinforced. The Unit provides ample opportunities to develop translational research. The presence of several core facilities covering various aspects of science contributes largely to its attractiveness. PhD (9) and postdoctoral (7) fellows from abroad are hosted by the Unit. Overall, the Unit offers a stimulating and excellent environment for developing innovative research.

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 Unit is recognised for its scientific activities, primarily via its publications (approx. 1350 in the last 5 years). A clearly impressive production, even if biased towards clinical research.

Members of the Unit are invited to give lectures in national and international scientific meetings (Annual meeting of the European society of hypertension, European society of cardiology, American Heart Association, Annual meeting of artery society ...), and at institutions in France and abroad.

Members participate in the organisation of scientific meetings in their area of expertise (Artery 20, Summer School, CardioVascular Clinical Trialists Forum ...).

Ten senior members are involved in editorial activities for peer-reviewed journals (European Heart journal, JACC; Heart failure, Cardiovascular research, ...). They also participate in various steering committees, review panels, etc. Finally, they are implicated in academic societies (Artery society ...), in particular as members of executive committees.

The Unit has been the recipient of several European grants (3 FEDER, 1 H2020), particularly related to its clinical research activities.

All the above demonstrate a clear integration of the Unit in European science.

Weaknesses and risks linked to the context

The major risk for the Unit in the years to come is the retirement of key members of the Unit that currently contribute to its reputation. In addition, other members might leave the Unit to continue their activity at other institutions. This might impact the capacity of the Unit to participate in European programs, and therefore to raise external funds. In brief, the Unit has excellent young researchers but, at the moment, lacks a few researchers at an intermediate career level, with enough experience to take over management responsibilities. The current management team is nevertheless aware of the situation and takes appropriate steps.

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

Strengths and possibilities linked to the context

The Unit is able to recruit 44 PhD students (9 from abroad) since 2016 and postdoctoral fellows (11 total and 7 from abroad). Twenty-seven students completed their PhD with at least one paper as the first author. The PhD duration is three years and four months. Fourteen students have obtained a contract after a competition organised by the doctoral school. Funding for postdoctoral fellows came from ANR, Nancy Hospital, industrial contracts ... Thus, the Unit is certainly attractive for students. Eleven HDR have been obtained during the current mandate, with a total of 33 HDR in the Unit.

The Unit has been able to recruit senior and junior researchers in the past years. These new members will participate in the development of novel lines of research, and possibly reinforce the basic science program. In particular, the Unit was fortunate enough to attract Magnus Bäck, a researcher of high reputation (Pr of Cardiology at the Karolinska Institute), who should be appointed Director in the next year.

The scientific integrity policy implemented at the Unit contributes to individual career development by providing appropriate recognition for its collaborators.

Weaknesses and risks linked to the context

The fact that many students and young researchers are supported by external money constitutes a risk in a context of transition for the Unit. How the Unit will be able to recruit these young scientists if the current senior staff is substantially reduced?

Another point that needs to be considered is the absence of clear strategy for recruiting researchers that would reinforce the existing research programs and not contribute to increasing heterogeneity. This is regardless of the quality of the science developed by the newcomers.

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 Unit has been successful in obtaining grant money from various sources for a total of approx. four million euros in the past years. This is an impressive amount, contributing for approx. 85% of the total budget, salaries not included

Funding were obtained from local grants (3 total, as coordinators), from national agencies (3 in total, all as PI, ANR, 1 ANR-FHU and 1 Inserm transfer), PIA BPI France as PI) and from foundations or charities (4 total, FRM, Fondation de France, 2 Fédération de cardiology).

Weaknesses and risks linked to the context

Analysing in more detail what is the source of external funding provides useful information. First, most of the money, i.e. almost 80%, comes from two European grants and the collaboration with the FHU CARTAGE. This is a fragile situation. Second, the principal investigators leading these efforts are senior scientists about to retire or leave the Unit. Then, in terms of numbers, the vast majority of the grants enable raising only small amounts of money.

It is also important to note that one grant was obtained from the French National Research Agency during the evaluation period. This is not sufficient. This type of grant is crucial, not only for the money they provide but also because these successes in competitive science contribute to forging scientific reputation. The current budget relies mainly on a couple of European grants that will have to be renewed.

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

Strengths and possibilities linked to the context

Members of the Unit have developed recognised expertise in their area of interest (vascular and heart physiology). Technical know-how for measuring various physiological parameters in the vasculature and the heart are available in the different laboratories.

Moreover, the Unit has been involved in the development and management of technical platforms. These core facilities are integrated in part in the Unit. They provide access to a number of technologies that are necessary for the daily research activities. These platforms offer therefore access to specific pieces of equipment and technical expertise (Mixed Service Unit; Flow cytometry; etc.). The Mixed Service Unit has been awarded the Research Support Structure label as part of a program by the Lorraine University of Excellence (LUE).

The Unit take advantage of the Clinical Investigation Center 1433 that is managed through a partnership between different institutions including the University Hospital. Several senior scientists and physicians affiliated to the unit work in the Clinical Investigation Center.

The Unit benefits also of privileged relationships with Nancyclotep, an experimental PET imaging platform, and with the School of surgery at the University of Lorraine.

Weaknesses and risks linked to the context

The Unit relies on experiments performed in animals for its research. Making sure this expertise is available over time has been a constant challenge. The main problem is the absence of dedicated positions for the technical staff in the Unit. The management is aware of the situation but has not been able to solve this problem.

The second potential problem is the access of state-of-the art bioinformatics. The Unit relies on collaborations for this kind of analyses. This might be a temporary solution but is not comfortable on the longer term. It would be wise to get organised for responding to future needs that will without doubt increase in the future.

Innovative approaches such as single-cell RNA sequencing, spatial transcriptomic, etc. should be developed to reinforce existing technologies and could foster more basic-science approaches.

EVALUATION AREA 3: SCIENTIFIC PRODUCTION

Assessment on the scientific production of the unit

The Unit produces very high-quality science. The scientific production of the Unit in terms of publications is beyond expectations: approx. 1350 papers have been published over the period. Original contributions from the Unit represent approx. 150 articles, of which 50 have been published in high-impact journals (Kidney int, Circulation, JACC, Nature Rev cardiology, NEJM, The Lancet...).

The vast majority of the papers are papers reporting results from clinical studies. These papers have been mostly the results of collaborative efforts via the Clinical Investigation Center 1433, and therefore do not necessarily result from research initiated by the Unit. Nevertheless, all these clinical studies address important clinical questions on topics related to the unit's work.

There were a number of successes in terms of novel discoveries. This is mainly the contribution of basic science to the identification of molecular mechanisms contributing to vascular inflammation and dysfunction. This new knowledge is significant and is being exploited for developing treatments.

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

Strengths and possibilities linked to the context

A number of significant discoveries have been made through the period:

Team 1 has been active at investigating mechanisms of vascular inflammation and dysfunction. Their research is reported in a number of articles published for a good part in high-profile journals. The discovery of the importance of coagulation in determining arterial stiffness is a major achievement. Another important discovery is the role of the TREM-1 pathway in inflammation, and its detrimental effect in cardiovascular disease. Importantly, these research efforts led to the filing of three patents, and constitute the seed for the development of innovative treatments.

Team 2 reported significant advancements in cardiac imaging. It also contributed to our understanding of the physiopathology of different cardiovascular disorders such as attrition, cardiogenic shock, septic shock, thrombosis, kidney disease, essential and pulmonary hypertension, etc.

Team 2 was also involved in assessing the efficacy of various treatments such as mineralo-receptor antagonists and gliflozins (EMPEROR trial).

A number of investigations by Team 2 are also reported in high-audience journals.

Weaknesses and risks linked to the context

Despite the high quality of science, the heterogeneity and the absence of a clear connection between Team 1 and Team 2 temper somehow this enthusiasm. A clear definition of the Unit main lines of research and the integration of the two teams in a common effort to meet the global objectives are missing to fully take advantage of the Unit potential.

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

Once again, the global scientific production of the Unit is remarkable. Clinical studies contribute more than basic science, but the production of basic science is substantial and excellent. From the numbers provided, there is good repartition between principal investigators.

Importantly, the Unit works at making sure every student will leave the Unit with at least one first-author paper.

Weaknesses and risks linked to the context

There is no real weakness in this respect.

Scientific production is sufficient to allow a fair distribution of recognition.

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

The Unit has established procedures to ensure research is performed with the expected integrity and ethics.

Protocols, raw data and conclusions are reported in paper or electronic laboratory notebooks. Experiments leading to new discoveries are independently repeated.

Animal experiments are approved by the Ministry of Education and local ethical committees. Clinical studies are also approved by appropriate ethical committees.

The Unit has defined rules for authorship and acknowledgements. The technical staff is normally included in the authors' list. Papers are usually published as Open Access papers to enable large distribution of science.

Overall, these policies comply with good practice in science.

Weaknesses and risks linked to the context

The large number of papers resulting from studies performed at the Clinical Investigation Center 1433 creates an imbalance between basic and clinical research.

EVALUATION AREA 4: CONTRIBUTION OF RESEARCH ACTIVITIES TO SOCIETY

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

The inclusion of the unit 'research in society is very good, and valorisation of intellectual property is considered whenever appropriate (8 patents, 2 start-up). Members of the Unit participate in establishing clinical guidelines. Efforts in the patient's care was recognised through an award granted by the Ministry of Solidarity for work to the benefit of transgender individuals. These examples demonstrate a good integration of the Unit in society.

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

Strengths and possibilities linked to the context

The Unit is aware of its missions towards society and valorises its intellectual properties. Several patents have been filed in the recent years (8). The activities of the Unit have led to the creation of two start-ups as laboratory spin-off companies. The importance of developing intellectual properties is therefore understood. One start-up develops products based on the discovery of the importance of the TREM-1 pathway in vessel inflammation, emphasising thereby successful transfer of basic research into potential therapy.

In this vein, several PhD students have benefited from 'CIFRE' contracts, allowing students to experience industrial imprinting, or contracts offered by the local political authorities.

Finally, the Unit offers update course for general practitioners and medical students via the activity of the CUESIM ('Centre Universitaire d'Enseignement par Simulation').

The Unit enables interacting with the lay public. Members of the Unit participate in special events, for instance interviews that are broadcast in dedicated websites or in social networks. Another example is the publication of e-books.

Weaknesses and risks linked to the context

The main aspects in terms of valorisation of science are covered. Nevertheless, there was no recent achievements, and more efforts should be made in this area.

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

Strengths and possibilities linked to the context

The Unit values its know-how in different ways.

First, as mentioned above, the Unit valorises its intellectual properties. Second, members of the Unit contribute to establish medical guidelines. The latter being closely related to the involvement of the Unit in a number of clinical trials. Then, one of the members of the Unit was appointed by the Ministry of Health for evaluating the value of clinical trials and for developing standard practice in an epidemic context.

These are significant contributions.

Weaknesses and risks linked to the context

No real weaknesses.

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 participates in socio-economic events to advertise its activities. This is in particular the case via events organised for the lay public such as 'La Fête de la Science' and invitations for interviews. These educational activities represent opportunities to understand and experience science, then to debate societal issues with the general population.

One of the lines of research at the Unit addresses vascular dysfunction in transgender individuals. An e-book has been published to discuss various issues related to gender dysphoria, a condition associated with psychological distress and physiological disorders. The person leading this effort at the Unit received an important award by the Ministry of Solidarity.

Weaknesses and risks linked to the context

None really. The Unit is doing a rather well at communicating with the different actors of society. However, there is always a feeling that the Unit could do a bit more in favour of the lay public. Quality is assured, then one can work on quantity.

C – RECOMMENDATIONS TO THE UNIT

Recommendations regarding the Evaluation Area 1: Profile, Resources and Organisation of the Unit

The Unit is facing a period of transition in which the leaders of tomorrow need to be identified and given responsibility. The current structure at the upper management level is a kind of loose structure based on collaboration on decision-making. While being quite effective in the past, the increasing number of researchers at the Unit requires a clearer hierarchy, in particular at the intermediate level. The Committee recommends that internal procedures are implemented to evaluate and select the best and most suitable individuals that will be capable of maintaining the Unit at the level reached by their predecessors.

Along these lines, the apparent heterogeneity in the research program would also benefit of a reinforced hierarchy. This would indeed facilitate identification of research priorities and specific objectives. Merging some of the research programs might help achieve this goal.

Recommendations regarding the Evaluation Area 2: Attractiveness

The Unit would certainly benefit of a stronger postdoctoral program. Dedicated funding should allow proposing periods of postdoctoral training of reasonable length. In the Committee's opinion, a suitable period of training for postdoctoral fellows should be around three years and not shorter than two years.

Every researcher at the Unit should apply for peer-reviewed research grants. This is particularly true for grants by the French National Research Agency (ANR), which bring money and, importantly, scientific recognition.

The Unit should identify individuals capable of submitting grant proposals to the ERC program. This should be a constant preoccupation, already for early-career scientists but at all levels (starting, consolidated and advanced grants).

Overall, these different actions should reinforce the basic science program.

Recommendations regarding Evaluation Area 3: Scientific Production

The scientific production is excellent, particularly with regard to the number of publications. Nevertheless, as already mentioned, there is a relative imbalance between the production by Team 1 (more basic) and Team 2 (more clinical). The basic science program at the Unit is highly recognised for its cardiovascular phenotypic assessment at the organ and cellular levels. Physiological evaluation also represents a strong expertise. However, the Unit would certainly benefit from the introduction of the latest technologies in terms of analysis of the transcriptome and epigenome (transcriptomics, epitranscriptomics, single-cell analyses, etc.). The persons willing to carry out this effort must be quickly identified.

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

None

TEAM-BY-TEAM ASSESSMENT

Team 1: Vascular rigidity – inflammation – thrombosis

Name of the supervisor: Veronique REGNAULT

THEMES OF THE TEAM

Team 1, combines research on vascular stiffness, thrombin generation – vasculature coupling as well as acute and chronic vascular inflammation. A first aim is to delineate the mechano-transduction pathways by which intramural cells sense and regulate their interaction with the extracellular matrix. It also includes the role of mechano-sensing in vascular calcification, which accelerates age-induced arterial stiffening. The second aim is to provide a molecular understanding of the role of vascular smooth muscle cells and their integrin receptors in thrombin generation both in the blood compartment and in the vascular wall, in order to identify new mechanisms that can be targeted to prevent early vascular ageing. The third aim is to unravel factors favouring the transition from acute to chronic inflammation as targets to promote healing of non-resolving inflammation in cardiovascular therapeutic strategies.

CONSIDERATION OF THE RECOMMENDATIONS OF THE PREVIOUS REPORT

The recommendations made during the previous HCERES evaluation can be summarised as follows:

- i) Efforts are needed to better integrate the different research axes, taking into account the specificity of Team 1. Although the project is well-defined in three major axes, team members need to focus on their research objectives and on the topics for which they are leaders.
- ii) The links between the different research projects within Team 1, and between Team 1 and Team 2, maybe better emphasised.
- iii) There is a lack of young full-time researchers.
- iv) Members should promote internationalisation of the team by attracting young investigators/PhD students from abroad.
- v) The team should develop more interactions with industrial partners.

The team has attempted to address most of these recommendations. During the 2016–2021 period, Team 1 had an industrial contract with Pfizer (coagulation and vascular wall changes in inflammatory bowel diseases). The strong links of the Unit with the Clinical Investigation Center 1433 resulted in the team's involvement in various clinical trials in collaboration with industrial partners (FRILSAFE, COMMANDER, etc.). Several industrial partners are also involved in RHU FIGHT-HF (coordinated by a Team 2 member), in which Team 1 members participate in different work packages. Finally, Team 1 interacted closely with the two start-ups linked to the Unit (INOTREM and CARDIORENAL). Two young researchers (one at INSERM and one at the university) have been recruited to contribute to ongoing research.

Nevertheless, the multiplicity of experimental and conceptual approaches developed in Team 1 remains a concern. This did not lead to a better prioritisation of research axes within the team.

WORKFORCE OF THE TEAM

Permanent personnel in active employment	
Professors and associate professors	7
Lecturer and associate lecturer	3
Senior scientist (Directeur de recherche, DR) and associate	2
Scientist (Chargé de recherche, CR) and associate	1
Other scientists (Chercheurs des EPIC et autres organismes, fondations ou entreprises privées)	0
Research supporting personnel (PAR)	0
Subtotal permanent personnel in active employment	13
Non-permanent teacher-researchers, researchers and associates	0
Non-permanent research supporting personnel (PAR)	1
Post-docs	2
PhD Students	9
Subtotal non-permanent personnel	12
Total	25

EVALUATION

Overall assessment of the team

Overall, team 1 is very good to excellent. The total number of publications over the evaluation period is 280 including 55 original articles (27 basic science and 28 clinical), as first and last authors. Team 1 has made seminal works such as the first demonstration of a relationship between coagulation and arterial stiffness at the basic and clinical levels (Kidney Int. 2021, Cardiovasc. Res. 2022), the role of neutrophil-derived leukotriene B4 in atherosclerotic plaque rupture (Cardiovasc. Res. 2018) and neutrophil extracellular traps in the hypercoagulable state of antiphospholipid syndrome patients (Rheumatology 2021). The team also has an internationally recognised expertise on TREM1 (J. Am. Coll. Cardiol. 2016) and overall on venous and arterial thrombotic events in different pathological states (Nat. Rev. Gastroenterol. Hepatol. 2021). Finally, the team owns an unquestionable international reputation on the physiopathology of vascular smooth muscle cells (Physiol Rev, 2017).

The team has a particularly effective training activity for doctoral students and postdoctoral fellows since ten doctoral students have defended their theses and the team has welcomed seven postdoctoral fellows of four different nationalities between 2016 and 2021.

Team 1 has reinforced the translational research by recruiting a young researcher at INSERM and one young associate professor with expertise in biochemical/biophysical cellular microenvironment.

Strengths and possibilities linked to the context

The scientific production of the team is excellent. Due to their research themes and the nature of the activities of the different members, the team develops coherent basic, translational and clinical research approaches. In some specific areas, the team is clearly an international leader (i.e. TREM1, vascular smooth muscle cells, inflammation resolution).

The involvement in articles/grant/institutional activities demonstrate a high level of expertise (e.g. Editor-in-Chief of the European Heart Journal Open, editorial board members of Cardiovascular Research, Scientific Delegate of the Evaluation Agency for Research and High Education, members of the executive committee of the Artery Society, European Society of Cardiology).

The number of invitations to international/national congresses (e.g. annual meeting of the European Society of Hypertension, annual meeting of Artery Society, European Forum on Hypertension, International Workshops on Structure and function of the vascular system, European Society of Cardiology, European Association of Cardiovascular Imaging, annual meeting of Artery Society, Gordon Research Seminar) and contributions to the organisation of symposia (e.g. working groups on atherosclerosis and vascular biology of the European Society of Cardiology, annual meeting of artery society) are excellent.

The team obtained a Pfizer grant and four students benefited from CIFRE fellowships.
 Three patents have been filled with international extension
 The team has contributed to the writing of several guidelines for clinicians.
 Members are involved in six clinical trials and in charge of five patient cohorts.

Weaknesses and risks linked to the context

The team is currently organised into seven axes: Vascular stiffness and coagulation; TREM1; Heart failure and myocardial infarction; Inflammation in cardiovascular ageing; Semicarbazide-Sensitive Amine Oxidase; Vascular smooth muscle cells; Coagulation; Antiphospholipid syndrome; Vascular surgery; macromolecular crowding (MMC) of ascites and plasma. This is quite heterogeneous.

Over the period 2016–2021, even if the total amount of money raised is substantial, these funds come for 50% of a grant on the COVID-19 and, the rest of the 50% depends, for the most part, on grants obtained from less than €50,000 and from local initiatives. No ANR grant has been obtained.

The capacity of the team members to publish their work in high-ranking journals, particularly as first/last author, should be reinforced.

RECOMMENDATIONS TO THE TEAM

Team 1 should give greater priority to certain themes/lines of research, in order to better take advantage of their translational approach and develop mechanistic aspects in more detail. Such mechanistic aspects could be further developed using state-of-the-art technologies and experimental approaches.

Team 1 must continue its efforts to increase recognition of its work and that of the various staff members at both national and international levels.

The team is strongly advised not to multiply more than necessary for its different axes of research. The team should refocus on some distinct strategic objectives and reinforce current lines of research via developing state-of-the-art approaches.

The team should initiate a policy for identifying leadership. This should be in particular the case for younger members in order to foster the emergence of a new generation of leaders.

Reorganisation of research activities could be accompanied by a structural reorganisation of team 1 and acquisition of specific expertise.

Considering the level of funding and the innovative themes studied in Team 1, team members should consider every possibility to publish articles in high-impact journals.

TEAM-BY-TEAM ASSESSMENT

Team 2: Personalised medicine in cardiovascular ageing and heart failure
 Name of the supervisor: Pierre-Yves MARIE

THEMES OF THE TEAM 2

Team 2 is composed of six groups: Imaging; Heart failure; Mineralocorticoid receptor antagonists; Fibrosis; Vascular ageing; Sepsis; Shock and VA-ECMO; Transgender health and metabolism and pulmonary hypertension.

The main research themes include a) Magnetic resonance imaging (MRI) of inflammation, b) Fibrosis and arrhythmia, c) Integration of remodelling markers and multi-parametric cardiovascular risk stratification, d) New concepts for cardio-renal syndrome, e) Clinical trials leading to changes in international guidelines for the treatment of heart failure, f) Accelerated attrition during the early childhood as a major explanation for shorter telomere length in patients with atheromatous disease, g) Cardiovascular and metabolic effects of hormonal therapy in transgender patients, and h) Thrombosis lesions in the pulmonary arteries in pulmonary hypertension.

CONSIDERATION OF THE RECOMMENDATIONS OF THE PREVIOUS REPORT

- i) Team 2 should increase the mechanistic aspects of its studies in order to publish in basic science journals with high impact factor.
- ii) The team should increase its industrial partnerships.
- iii) The policy for attracting foreign postdocs should be improved.
- iv) Given its dynamism and international connections, the team should attract more PhD students and postdocs.

The number of publications is outstanding, mainly dominated by clinical and translational papers (1021). However, the number of basic sciences publications is still rather low (5), including 21 articles published in journals with IF <4, 12 with 4 <IF <10, one with 10 <IF <20 and one with a FI > 20, and four review papers.

No industrial contracts were signed during the evaluation period with the Unit but important collaborations took place with the industry through participation in clinical trials with the Clinical Investigation Centre 1433. There are also important interactions with industrial partners in the framework of the RHU Fighting HF and the CARDIORENAL start-up. Two PhD grants were funded by the industry and CIFRE.

Eleven postdoctoral researchers have been recruited in the Unit during the evaluation period, seven from abroad (USA, Portugal, Luxembourg, the Netherlands, Sweden). Among those, four were recruited in Team 2 and two of them are from abroad.

A young researcher should be recruited. One was recruited in 2021 (expertise in translational research in ageing and in particular in telomere biology). Team 2 has recruited seven young medical researchers appointed in several clinical disciplines (2 in intensive care and emergency medicine, one in therapeutics, two in cardiology, one in neurology and one in vascular surgery).

WORKFORCE AND RESSOURCES OF THE TEAM:

Permanent personnel in active employment	
Professors and associate professors	18
Lecturer and associate lecturer	3
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 –	1
Subtotal permanent personnel in active employment	22
Non-permanent teacher-researchers, researchers and associates	0
Non-permanent research supporting personnel – PAR –	0
Post-docs	2
PhD Students	8
Subtotal non-permanent personnel	10
Total	32

EVALUATION

Overall assessment of the team

Team 2 is excellent according to an outstanding expertise in translational research in the cardiovascular field, an outstanding level of publications during 2016–2021: 1056 publications, as seven articles in The Lancet, eight in the New England Journal of Medicine, three in the JAMA Cardiology – 2 as last author –, 6 in Circulation research 4 as 1st author), 21 in Circulation (7 as 1st or last authors, including 4 reviews), 25 articles in The Journal of American College of Cardiology (10 as a first author including 4 original studies), fifteen articles as 1st or last author in the European Heart Journal (5 original studies).

Team 2 is excellent regarding its expertise in cohorts and biocollections (4/10 in the team 2, 1 biocollection of human tissue), supporting translational research in conjunction with the CIC1433 and medical teams in a supportive environment of its supervisors (University, Inserm) and its partner at the University Hospital of Nancy.

These outstanding scientific papers lead to new international guidelines for medical therapy (anti aldosterone, SGLT2 inhibitors in heart failure, anticoagulation, etc.) and also proposed a new concept, the 'blood-muscle model', according to which telomere attrition in leukocytes occurs very early in life before atherosclerosis.

The team 2 is excellent regarding its regional, national and international recognition allowing to be part of international collaborations as a member (Network For Research In Vascular Ageing COST Action, Network on Structure and function of the vascular system – ARTERY society, European Association of Cardiovascular Imaging, working groups on the ageing topic – or coordination – European Forum on Antiphospholipid Antibodies, Working Group on Atherosclerosis and Vascular Biology, Global Cardio Vascular Clinical Trialists (CVCT) forum –, scientific committees.

The team is excellent regarding the level of funding obtained in a competitive environment – 2 European grants – coordination FP7: FIBRO-TARGETS, HOMMAGE, another one has recently been obtained by Magnus, one European grants – partnership: FrailSafe H2020, one National grant from PIA – coordination FIGHT-HF (Fighting heart failure), one FHU: CARTAGE PROFILES, one National grant from PIA – partnership IMPACT GEENAGE.

Strengths and possibilities linked to the context

Team 2 brings together six complementary themes with the shared objective of developing innovative personalised strategies for cardiovascular diseases ageing to improve the management of age-related cardiovascular diseases (acute and chronic heart failure). More specifically, Team 2 wishes to 1 – identify personalised bio-profiles of heart failure and cardiovascular ageing using systemic biomarkers of fibrosis and inflammation, telomere length and cross-phenotyping with functional and molecular biomarkers from cardiovascular imaging, and 2) to develop and test bio-profile-guided therapies for heart failure, cardiovascular ageing and frailty, at the multi-organ level.

The analysis of its publications shows that these objectives have been met and that the scientific output of Team 2 is consistent with these objectives. The publications of this team are outstanding in terms of both the number and quality of publications: 1056 publications of which 33 are in large audience: seven articles in *The Lancet* (among them: two original articles as 2nd, 1st author, 3 reviews as 1st or last author), eight in the *New England Journal of Medicine* (among them: 3 as 1st, last or before last author, 1 letter), three in the *JAMA Cardiology* (2 as last author), six in *Circulation research* 4 as 1st author), 21 in *Circulation* (7 as 1st or last authors, including 4 reviews), 25 articles in *The Journal of American College of Cardiology* (10 as a first author including 4 original studies), fifteen articles as 1st or last author in the *European Heart Journal* (5 original studies).

The scientific production is based on an important culture of translational research and a strong involvement of clinicians in translational and clinical research, carried out with the Clinical Investigation Centre 1433. The scientific production testifies to a very high level of international recognition. This does not undermine the quality of the production of the basic science. Team 2 registered five patents between 2016 and 2021.

Regional, national and international recognition support the team's ability to raise important funds in a competitive environment, while at the same time strengthen the visibility of its leaders. Recognition is illustrated by implication of Team 2 in the I-SITE Lorraine University of Excellence, the FHU CARTAGE and renewed CARTAGE-PROFILES, and the RHU FIGHT HF, the integration and collaborations within the UMS 2008/US40, the Biology-Medicine-Health cluster of the University of Lorraine, the Clinical Investigation Center 1433, the Nancycloptep platform, the school of surgery, teams in charge of massive data, and by funding obtained via the EU FP7 programs. The close collaboration and support by the RHU Fight-HF and the GEENAGE program of the ISITE lead to a win-win strategy that also contributes to the continuation of I-SITE for the period 2021–2027.

Members of the unit are outstanding scientific international personalities are regularly invited for lectures in national and international scientific meetings (ESC congresses, AHA scientific meetings ...), participate in the organisation of international meetings (Global CardioVascular Clinical Trialists – CVCT – Forum and Workshops ...), and are members of executive committees or directors of national and international working groups and scientific societies.

This recognition as physicians, mastering translational research within a high-level research unit has made it possible to obtain biocollections from high-level international clinical trials and to lay the scientific foundations for new clinical trials. This is an important characteristic and strength of team 2 which reinforce its numerous collaborations in national and international scientific networks.

The multidisciplinary nature of the clinical themes (Anaesthesia – Intensive care; Cardio Medical Surgical; Ageing Diseases – Gerontology – Palliative Care; Imaging; Laboratories; Head and Neck Neuro; Medical Specialities; Emergency Medical Care) is also a positive point as it favours interactions between clinical and basic research. In addition, it is a possible response to the departure of the clinical leaders currently in charge.

It should also be noted that Team 2 is able to conduct research in small (murine pulmonary hypertension model) and large animals (pig ischaemic cardiogenic shock).

Weaknesses and risks linked to the context

Team 2 does not have a senior full-time scientist and the organisation of the team is based on the strong involvement of clinicians (18 professors or associate professors) who are working part-time (0.3 FTE) and three lecturers or associate lecturers. Outstanding personalities who were involved in the majority of the translational research retired or will leave the Unit. Team 2 has recruited younger university doctors in several clinical disciplines, but the multidisciplinary and diversity of the research fields may lead to a risk of dispersion in case of insufficient coordination.

Given the difficulties in recruiting technical staff, sharing of technical expertise between the two teams has been a determining factor in maintaining the research activity. However, this has constraints and can limit the

emergence of research themes. The absence of a high-level technician for the small animal exploration platform is a threat to both the scientific production and the attractiveness of the unit in the near future.

Team 2 chose to develop collaborative programs with external teams focused on complex biology and bioinformatics approaches in cardiovascular diseases. This may represent a fragility for the future given the current research orientations integrating multimodal and multiparametric approaches, including AI, particularly in the context of the themes of research developed by Team 2 (imaging, heart failure, risk scores, identification of new care pathways, telemonitoring, valvular heart diseases, metabolism, etc.). However, it should be noted that one member has expertise in biomathematics.

Despite the creation of one start-up company and the numerous collaborations with industry in the framework of the Clinical Investigation Centre 1433 and the RHU FIGHT HF, there is a lack of interaction with biotechnology companies for more fundamental approaches.

RECOMMENDATIONS TO THE TEAM

As discussed, Team 2 has an important involvement in translational research. However, the national context shows a decrease in the involvement of clinicians in basic science research and a lack of attractiveness of university position. Recruitment of a PUPH, having a full-time position in the unit may help to implement concrete measures to work for making basic and clinical research more appealing for clinicians and the opportunity for clinical discussions and facilitated interactions with basic researchers. This is a fundamental issue for the years to come in the context of the departure of outstanding physicians.

The loss of expertise and the absence of a high-level technician for the small animal exploration platform) is a threat to both the scientific production and the attractiveness of the unit in the near future and must be a priority within the framework of a clear and defined scientific policy in order to avoid the heterogeneity of research themes.

CONDUCT OF THE INTERVIEWS

DATE: SEPTEMBER 13, 2022

Start: September 13, 2022; 8 a.m.

End: September 13, 2022; 6 p.m.

Interview conducted: online

INTERVIEW SCHEDULE

- 8:30 a.m. Presentation of the committee
- 8:45 a.m.-9:20 a.m. Highlights of the Unit by the Director
Patrick Lacolley and Magnus Bäck
- 9:30 a.m.-10 a.m. Team1: Vascular stiffness – inflammation – thrombosis/Rigidité vasculaire —
inflammation — thrombose. Veronique Regnault
- 10 h-10 h 30 Team2: Personalised medicine of heart failure and cardiovascular ageing/Médecine
personnalisée de l'insuffisance cardiaque et du vieillissement cardiovasculaire Athanase
Benetos and Pierre-Yves Marie
- Coffee break
- 10 h 45-12 h 00 Committee debriefing
- 12H00-13H00 LUNCH
- 1:15 p.m.-1:45 p.m. Meeting with technicians and administrative staff (closed doors)
- 1:45 p.m.-2:15 p.m. Meeting with PhDs and postdocs (closed doors)
- 2:15 p.m.-2:45 p.m. Meeting with researchers not team leaders
- Coffee break
- 3 p.m. – 3:30 p.m. Meeting with the representatives of the local institutions (closed doors)
- Université de Lorraine : Jean-Luc Blin, Didier Mainard (directeur du pôle BMS) et Clotilde Diné de
la Direction de la Recherche et de la Valorisation.
- Inserm delegate : Eric Simon (eric.simon@inserm.fr)
- Coffee break: 15 mn
- 4 p.m.-4:30 p.m. Closed-door meeting of the committee
- 4:30 p.m.-5 p.m. Meeting with the Directors (Patrick Lacolley and Magnus Bäck)
- 5 p.m.-6:30 p.m. Committee meeting (closed doors)

GENERAL OBSERVATIONS OF THE SUPERVISORS

Direction de la Recherche et de
la Valorisation

91 avenue de la Libération
BP454
54001 NANCY Cedex

Alain HEHN
vp-recherche@univ-lorraine.fr

Hélène BOULANGER
presidente@univ-lorraine.fr

HCERES
2 rue Albert Einstein
75013 Paris



Objet : Observations de portée générale sur le rapport d'évaluation - DER-
PUR230023074 – DCAC (Défaillance Cardiovasculaire Aigüe et Chronique).

Madame, Monsieur,

Je vous remercie pour le rapport d'évaluation réalisé pour le laboratoire DCAC (Défaillance Cardiovasculaire Aigüe et Chronique), que vous nous avez transmis le 21 février 2023. Je tiens également à remercier très sincèrement les évaluateurs pour la qualité des échanges et pour l'analyse de cette unité de recherche.

L'unité DCAC n'a pas de remarque particulière à formuler sur le rapport d'évaluation transmis.

Vous remerciant à nouveau pour cette évaluation qui permettra à l'unité mixte de recherche DCAC de poursuivre sa réflexion sur la base des recommandations émises, je vous prie d'agréer, Madame, Monsieur, l'expression de mes respectueuses salutations.

Le Vice-président du Conseil Scientifique,

Alain HEHN


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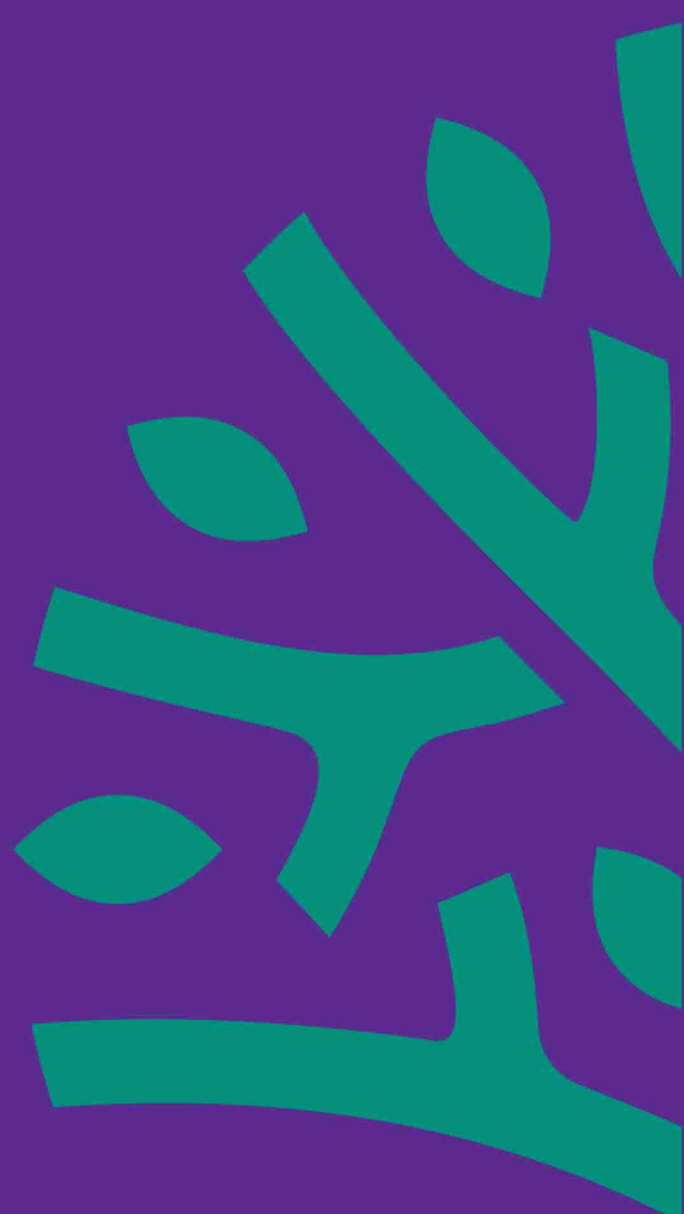
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2 rue Albert Einstein
75013 Paris, France
T. 33 (0)1 55 55 60 10

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