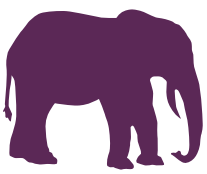
FNR

CORE

MULTI-ANNUAL THEMATIC RESEARCH PROGRAMME

FONDS NATIONAL DE LA RECHERCHE

Application guidelines



www.fnr.lu/core

Fonds National de la Recherche Luxembourg

APPLICATION GUIDELINES

CORE 2020 CALL

These guidelines provide practical information to potential applicants in preparing and submitting an application to the FNR's 'CORE Multi-Annual Thematic Research Programme'.

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Changes to the previous call:

- The CORE 2020 call is linked to the **revised National Research Priorities for Luxembourg** as retained by the Government on 20th December 2019.

- The **call deadlines of CORE and OPEN are both on 22nd April 2020**. The PI(s) and the host institution(s) are responsible in selecting the appropriate funding programme. Please contact FNR upfront in case of questions. If a same project is submitted in both programmes, it will not be reviewed and excluded from the selection process.

Note

Please carefully read the revised CORE call documents. They give indications about any call specific modifications, the submission and selection process. Please do not hesitate to contact the FNR staff for any further explanation.

1. Characteristics

1.1. Introduction

CORE is a **multi-annual thematic research programme** and is the central programme of the FNR. The prime objective of CORE is to strengthen the scientific quality of Luxembourg's **public research** in the National Research Priorities as retained by the Government as of 20th December 2019.

CORE research projects have a lifespan of two to three years and funding is allocated on a competitive basis. All projects are peer reviewed by international reviewers. CORE calls are launched on an annual basis.

The FNR allocates a maximum financial contribution of **21 Mio €** for the **CORE 2020 Call**.

Disciplinary, interdisciplinary, collaborative and cross-institutional projects will be fostered by the FNR. Researchers are encouraged to link methods, concepts and approaches from various disciplines to solve joint research questions that lead to new scientific insights and solutions that are beyond the scope of a single discipline.

CORE funding may cover research projects of PhD candidates who are involved in the project full-time and from the beginning.

Further details about the objectives and characteristics of the CORE Programme are presented in the CORE programme description.

1.2. Eligibility

1.2.1. Eligible Organisations

The following organisations[1] established within Luxembourg are eligible for financial support from the FNR under the CORE programme:

1. Public institutions performing research in Luxembourg;
2. Non-profit associations, societal impact companies (SIS)[2] and foundations[3] performing research in Luxembourg and that have obtained a special authorization from the Ministry for Higher Education and Research.

Each entity has to be registered at the FNR in order to be able to submit proposals through the online submission system.

More information on eligibility of institutions is available in the CORE application guidelines and on the FNR website.

For each proposal, project partners designate one 'Principal Investigator [4] (PI) per project, who is the project leader responsible for submitting the proposal on their behalf. The formal

[1] FNR's law dating May 31, 1999, art 3 (2).

[2] https://guichet.public.lu/en/entreprises/creation-developpement/forme-juridique/societe-capitaux/societe-impact-societal.html

[3] To be eligible for FNR support, non-profit associations and foundations must be accredited by the Ministry in charge of public sector research. To obtain an accreditation, associations or foundations have to introduce a formal request at the Ministry of Higher Education and Research.

[4] The PI is the researcher proposing the project idea and leading the project on a 'daily basis'. Check further information on the PI in section 1.3.1.

submission of the proposal to the FNR is done by an official representative of the coordinating institution hosting the PI. The PI must be employed at an eligible organisation at the time of the start of the project and for the full duration of the research project. The FNR has specific requirements for principal investigators and supervisors within FNR funded projects http://bit.ly/PIandSupervision.

'**Contracting Partners**' are institutions which are eligible for funding and which seek direct financial support from the FNR.

Among those, the PI's host institution is referred to as '**Coordinating Institution**'.

'**Non-contracting Partners**' are organisations or individuals from the public or private sector (within Luxembourg or abroad) participating in the project without direct financial support from the FNR.

'**Subcontractors**' are not considered as partners (contracting or non-contracting) in the project (see 1.8.4.5. Subcontracting).

1.2.2. Domain coverage

With CORE the FNR provides funding for high quality research projects within the revised National Research Priorities for public research and retained by the Government as of 20th December 2019.

Four interdisciplinary research priority areas to prepare Luxembourg for the future[5]

At the top-level, the national research and innovation strategy defines four research priority areas, which have emerged to be of particular importance for the societal, ecological and economic development of the country.

- **Industrial and Service Transformation**
- **Personalised Healthcare**
- **Sustainable and Responsible Development**
- **21st Century Education**

These areas are not considered as being distinct and independent from each other, but as areas that mutually influence each other, so that the subdisciplines that define each area can also have ramifications into other areas.

Please refer to the document **National Research Priorities** for a detailed description.

Area: Industrial and Service Transformation

Integrative materials science and technology

- Multiscale modelling in materials science and physics
- Materials discovery through machine reinforced learning
- Fundamental phenomena defining materials function and devices
- Interface-dominated materials
- Advanced manufacturing: multifunctional, multiclass, and multiscale materials, and their implementation
- Physics of active and living matter
- Materials life cycle

[5] Source: "National Research and Innovation Strategy for Luxembourg", published by the Ministère de l'Enseignement supérieur et de la Recherche, 12/2019

- Scientific instrumentation and characterization

Trusted data-driven economy and critical systems
- Security and cybersecurity, reliability and trust
- Cyber-physical systems

Future computer & communication systems

Autonomous and intelligent systems and robotics for earth and space

Space telecommunications, earth observation and space resources
- Resources in space
- Remote sensing and combination with multiscale data

Fintech/RegTech and transformative applications of distributed ledger technologies

Fundamental tools and data-driven modelling and simulation

Area: Personalised Healthcare

Complex biomedical systems – data and models
- Effective collection and deconvolution of complex biomedical data
- Multi-scale and mechanistic models

Precision medicine, including environmental, lifestyle and socio-economic factors
- Innovative molecular disease models
- Common mechanisms between diseases – mechanism-based stratification
- Environmental, lifestyle, and socio-economic impact on mechanisms of diseases

Understanding, preventing, and treating the health-disease transition
- Longitudinal dynamics of diseases
- Multifactorial intervention strategies
- Innovative clinical trials

Data-driven healthcare
- Trusted digital health systems
- Health informatics and implementation in the healthcare system

Area: Sustainable and Responsible Development

Climate change: energy efficiency and smart energy management; resilient eco- and agrosystems
- Resilient water systems
- Environmental monitoring
- Transition towards sustainability: energy efficiency
- Sustainable urban development and smart cities
- Smart energy systems

Economic: green sustainable finance / circular and shared economy
- From waste to product
- Sustainable behaviours

Social: migration and social cohesion / cultural identities, cultural heritage and nationhood
- Social cohesion and inequalities

- Societal transformation and labour market dynamics
- Household finance and risk management
- Migration and integration
- Cultural identities and nationhood
- Contemporary history, memories studies and public history
- Digital humanities

Responsible development: regulations and ethics for a data-driven society

- Regulation and supervision of markets
- Ethics and sustainability

Area: 21st Century Education

Innovative digitally enhanced learning and assessment environments

- Efficient learning environments
- Digital learning and human-machine interaction

Learning in a multilingual and diverse society

Equality of educational opportunity

Adult education, up/re-skilling and lifelong learning

1.3. Research Project Consortium and Human Resources

1.3.1. Principal Investigator (PI)

The PI is the researcher having the scientific lead of the research project, taking the responsibility for designing, managing and executing the project on a daily basis. He is responsible for controlling the implementation and scientific quality of the project, and for ensuring that the project is carried out in compliance with the terms, conditions, and policies of the FNR and those of the partner institutions. The PI is assumed to be the principal author of the proposal submitted to the FNR and is expected to be involved in the project in a significant manner

In oder to be eligible as PI, researchers must comply with the FNR requirements for principal investigators and supervisors http://bit.ly/PIandSupervision.

Notably the PI **has to satisfy the following conditions:**

- The PI must have a proper employment contract with the eligible beneficiary institution at the starting date of the project.
- The employment contract must last for the full duration of the research project.
- The PI must be an experienced researcher who holds a doctoral degree at the date of the submission deadline for the proposal. This counts for CORE and CORE Junior [6].

The coordinating institution is expected to provide documentation demonstrating the PIs research and project management experience. In any case, the internal rules of the coordinating institution need to be respected. The appropriateness of the PI to successfully lead the project is an essential element of the evaluation procedure. PIs are advised to submit proposals that are appropriate to their track record and experience. Even PIs with a

[6] For PIs not holding a doctoral degree, please consult http://bit.ly/PIandSupervision.

solid track record who enter a new research topic need to clearly demonstrate how they will use their expertise and knowledge to tackle a new field.

The FNR formally allows more than one PI on CORE project grants. This policy is intended to maximize the potential of collaborative science as well as to facilitate interdisciplinary research. To include a "Co-PI" is the decision of the applicant's institution and investigators, and must be based on the needs of the proposed research project.

The "PI" listed in the application form will be the corresponding PI for the FNR and is in charge of submitting the application and reports. The "PI" and "Co-PI" are key personnel with similar responsibilities in the research project. They have complementary expertise and must be from different research units (within the same or different eligible institutions). Both must fulfil the FNR requirements for PIs http://bit.ly/PIandSupervision, i.e. hold a doctorate and, in case of PhD supervision, a formal authorisation to supervise PhD candidates.

Applicants with a shorter research and project management track record are encouraged to submit their project application through the optional "CORE Junior Track" (see 1.3.2. CORE Junior Track). For CORE Junior track PIs wishing to train PhD candidates within their project, the FNR expects prior supervision experience/training by the PI.

1.3.2. CORE Junior Track

In view of providing non-established PIs with an adequate framework for first project applications, the FNR has developed a 'Junior Track' within CORE. The CORE Junior Track targets early career-stage researchers who have been awarded little or no own project funding as yet but who wish to establish their **independent research line**. The project should be initiated by the Junior PI and should be hosted within an existing research group.

The 'Junior Track' applications are processed and evaluated like standard CORE proposals, the same high peer-review standards apply. The reviewers will take into account however that these starting investigators do not have an extensive track record concerning project management and generally have little preliminary data related to the proposed project. They must however have enough literature review or preliminary studies to show that the project concept is feasible.

To off-set the inexperience of the PI, Junior Track projects are **restricted in magnitude** and foresee guidance through a **local scientific advisor and a mentor abroad**. The experienced local scientific advisor and the mentor fulfil a role of guidance and support but provide sufficient freedom to the Junior PI to pursue his/her own research ideas. The mentor is an established foreign researcher who will provide independent advice on the scientific orientation of the project and career development as well as help establish an international network.

It is also understood that the PIs will work on their CORE Junior project for a large percentage of their time.

Characteristics of CORE Junior Track:

The PI and human resources:

- The PI should work at least 50% on the project.
- Human resources are limited to 2 FTE (including the PI's own contribution as well as FNR funded and not FNR funded staff). For a PhD candidate, 36 person months are counted (i.e. the additional up to 12 person months

for the 4th year's PhD extension don't have to be included).
The local scientific advisor and the mentor abroad are not counted to the 2FTE limit either.
Exceptions can be granted by the FNR on a case-by-case basis. Such exceptions must be requested prior to the submission deadline.

The mentor abroad:

- Besides the local scientific advisor, a mentor abroad is mandatory; the involvement of the mentor is expected from the drafting of the project onwards.
- The mentor must not be actively involved in the implementation of the research project (i.e. work package leader, external PhD supervisor).
- Extra funding is granted for mentoring (see 1.8.4.5. Subcontracting)

Additional budget for training may be requested (see 1.8.4.4. Travel Costs).

Maximum 1 national or international collaboration (in addition to the mentor).

1.3.3. Contracting Partners (only eligible institutions different from the Coordinating Institution)

A 'Contracting Partner' is an institution which is eligible for funding and which is seeking financial support from the FNR, e.g. the University of Luxembourg, the Luxembourg Public Research Institutions or other research organisations eligible at the FNR.

1.3.4. Non-contracting Partners / International Co-funding Partner (International Funding Agency)

A 'Non-contracting Partner' is an organisation or individual from the public or private sector (from Luxembourg or abroad) participating in the project without financial support from the FNR, e.g. company or foreign university.

An 'International Co-funding Partner' is a foreign institution applying for co-funding at the 'International Funding Agency' in its country; the FNR being the 'Lead Agency'.

1.4. International and National Co-Funding within CORE

Through a set of cooperation agreements with foreign funding agencies, the FNR intends to facilitate the **funding of bi-lateral projects** between Luxembourg researchers and their colleagues abroad. These agreements are based on the **Lead Agency** principle: both agencies base their funding decision on the results of one single evaluation procedure managed by one of the funding organisations (the so-called Lead Agency). In general, this is done by the country where the main research effort in terms of human resources is accomplished.

Applicants within the CORE programme may request funding of their foreign colleagues by the following funding agencies:

- Deutsche Forschungsgemeinschaft (DFG, Germany);
- Schweizerischer Nationalfonds (SNF, Switzerland);
- Fonds zur Förderung der wissenschaftlichen Forschung (FWF, Austria)
- European Molecular Biology Laboratory (EMBL);
- Fundação para a Ciência e a Tecnologia (FCT, Portugal)

- National Centre for Research and Development of Poland (NCBR, Poland);

DFG, SNF and FWF

Collaborative projects requesting funding from these three agencies may be submitted to any National Research Priority Area. Projects where the main research effort lies in Germany, Switzerland or Austria have to apply to the FNR INTER scheme (i.e. the joint project should be submitted to the respective funding agency abroad who will be the lead agency in the evaluation then)

EMBL and FCT

The cooperation with EMBL and FNR is open to all National Research Priority Areas, and the FNR will always be the evaluating agency i.e. the Lead Agency.

NCBR

In the cooperation with NCBR the FNR is always the lead agency, i.e. joint proposals have to be submitted to the FNR CORE programme. Only proposals fitting in the National Research Priority Area "Industrial and Service Transformation" and therein to the following subdomains eligible for funding:

- Trusted data-driven economy and critical systems
  - Security and cybersecurity, reliability and trust
  - Cyber-physical systems
- Future computer & communication systems
- Autonomous and intelligent systems and robotics for earth and space
- Fintech/RegTech and transformative applications of distributed ledger technologies
- Fundamental tools and data-driven modelling and simulation

Specific rules for researchers co-funded by the above agencies may apply. Applicants are advised to check with their respective agencies.

Further international co-funding with funding agencies other than the above can be applied for through the FNR INTER programme. Application and review processes will though differ from the CORE process.

Fondation Cancer Luxembourg

For CORE 2020, the FNR is continuing its co-funding collaboration with the Fondation Cancer. Applicants have to provide evidence that these cancer projects are in line with the topics of the Plan Cancer. All proposals subject to this collaboration will be evaluated within the normal CORE selection process, together with the other submitted proposals. The summary of the Plan Cancer topics are available on the CORE website.

1.5. Project Characteristics

1.5.1. Project Duration

The project must have a duration of **2 to 3 years**. In case funding for a PhD candidate is foreseen to be covered by the CORE project budget, the project duration must be 3 years.

In case PhD candidates are foreseen on the project, the FNR gives the possibility of an up to one-year extension period to finalize their thesis. The costs for this extension have already to be requested at submission stage. Later applications for extensions for PhD candidates funding will not be considered.

1.5.2. Number of Project Proposals per PI

Up to two project proposals may be submitted per PI (as PI or Co-PI or as a mix of both; the limit of up to two propsals remains). However, the experience of the previous CORE calls shows that PIs should concentrate their efforts on a single application.

Only **one application** is allowed for CORE Junior Track applicants. A CORE Junior PI cannot be a Co-PI on another project. No Co-PIs are allowed on CORE Junior projects (see section 1.3.1. for details on Co-PI).

1.5.3. Formal requirements

All application documents have to be written in **English**.

The Project Description Form is limited to a fixed number of characters. Refer to Section 6.1 Project Description for further instructions that have to be followed.

1.5.4. Resubmission and Follow-up

The FNR only allows **one resubmission** for each application. Projects which have been submitted to FNR in previous calls and have not been retained for funding may be resubmitted **once** and only after the project has undergone substantial revision. The proposals need special care in view of updating the current state of art as things change over the years. Furthermore, it is absolutely necessary to take the previous reviews and panel conclusion into consideration and to summarise the changes/modifications in comparison to the former application. The FNR reserves the right to exclude projects which have not undergone substantial changes in the resubmitted application. Please note that disguised resubmission can be rejected as well.

For **follow-up** projects, tangible outputs must be presented for the referenced ongoing project(s). If no tangible output is available, the new project should not be labelled as follow-up. In addition, the PI has to clearly state the innovation in the new proposal.

1.6. Consortium Agreement and Intellectual Property Rights (IPR) Management

Experience has shown that the signing of agreements governing intellectual property rights between all parties is a time consuming process. Therefore fully fledged agreements should only be signed when absolutely necessary. A Consortium Agreement and an Intellectual property rights agreement is mandatory in the following cases:

- If intellectual property goes beyond simple authorship rights and a protection via patenting of the project results is probable and/or there may be possible commercialisation of the project results;
- A company or private institution is part of the consortium;
- One of the parties involved explicitly requests such an agreement.

Consortium constellations that do not require fully fledged agreements:

- If intellectual property is limited to scientific publications (and data sets), the consortium (in this case the consortium is usually composed of universities and public research institutions in and outside of Luxembourg) should:

- At least indicate in the relevant section of the project description, how the authorship of the publications and the management and access to the data sets are settled amongst the project partners;
- Indicate any other statement agreed between the parties or;
- Sign a consortium agreement (only if it is specifically requested by the parties).

Consortium agreement (CA): Agreement governing the approach and rights and obligations among the members of the consortium including authorship rights of publications.

Intellectual property rights agreement (IPRA): All rights to technical solutions, methods, processes and procedures, regardless of whether or not these are or may be patented, as well as all copyrights and other rights to trademarks, authorship rights of publications, design, plant species, databases, integrated circuit layout designs, drawings, specifications, prototypes, company-internal secrets and the like.

In order to shorten the proposals, the applicants should refrain from adding complete template versions of CA or IPRA but state only the principles that govern these agreements.

If the applicants have further questions to this issue, they should contact the administration of their host institution and the FNR.

1.7. Principles for FNR-funded research activities

1.7.1. General principles

The research activities under the CORE programme should fulfil the following general principles:

- Research activities should respect fundamental **ethical principles**, including those which are reflected in the Charter of Fundamental Rights of the European Union. Where necessary, the approval of the Comité National d'Éthique de Recherche (CNER) and/or the Commission Nationale de la Protection des Données (CNPD) need to be sought prior to the launch of the project. In case the project gives rise to ethical issues, it is mandatory to join a plan explaining how these issues will be dealt within the proposal.
- **Research misconduct** e.g. provision of false information, plagiarism or falsification of data, may result in a rejection of the proposal. Applicants must comply with the 'FNR Research Integrity Guidelines' and the FNR reserves the right to pursue further steps in the event of research misconduct.
- The FNR attaches great importance to the **impact of research results** on science, industry, policy makers and the society in general. Therefore applicants are expected to list the value and impact of all research outputs (research publications reporting new knowledge, data, reagents, software, intellectual property, and training of skilled young scientists). The FNR expects results to be published in peer-reviewed open access publications [7]. Applicants should not use journal-based metrics, such as Journal Impact

[7] The FNR considers the following as peer-reviewed publications:
- A publication in a journal of the list of journals with impact factors published yearly by ISI Thompson,
- A publication in the journal index established by SCOPUS, or
- A monograph with a review board.

Factors[8], as a surrogate measure of the quality of individual research articles, but rather focus on the scientific content. The FNR also encourages the protection and the economic exploitation of research results when it is possible and applicable. Besides, the FNR also encourages the dissemination of research towards the general public and the media. Thus activities aimed at generating impact need to be foreseen from the initial project planning on under the National Research Priorities. As a signatory of DORA, the FNR encourages applicants to list a range of research outputs (including datasets and software, training of researchers, intellectual property).

- Financial support from FNR must be acknowledged in all publications and other forms of media communication, including media appearances, press releases and conferences.
- In the **implementation of the research activities**, adequate attention needs to be paid to gender mainstreaming, as well as to, inter alia, working conditions, transparency of recruitment processes, and career development as regards the researchers recruited on CORE projects. In this matter, the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers[9] offer a reference framework.

1.7.2. Open Access

The FNR attaches great importance to the impact of research outputs on science, industry, policy making and society in general. To maximise the possibilities for impact of research outputs, results from FNR-(co)funded research are expected to be disseminated via high-quality, peer-reviewed publications that are made freely available (FNR Policy on Open Access).

Costs for project related publications can be refunded through the FNR's "Open Access Fund". This does not apply to conference proceedings, PhD theses, book chapters and scientific monographs, although the FNR recommends Open Access publishing whenever possible. Please refer to the Open Access Fund guidelines for details.

1.7.3. National Quality Framework for Doctoral Training

FNR-funded PhDs are expected to be offered a research and training environment in accordance with the principles enounced in the National Quality Framework for Doctoral Training (QF).

The QF contains a set of requirements with respect to the management, quality and academic standards of PhD training, in particular:

- doctoral research environment and management,
- recruitment and admission into doctoral training,
- supervision,
- skills training and professional development,
- dissemination of research results,
- good practice in research and
- thesis assessment committee and procedures.

[8] Do not use journal-based metrics, such as Journal Impact Factors, as a surrogate measure of the quality of individual research articles. The scientific content of a paper is much more important than publication metrics or the identity of the journal in which it was published.

[9] The European Charter for Researchers and the Code of Conduct for their recruitment can be downloaded from http://bit.ly/EuropeanCharter

Host institutions of FNR-funded PhDs are expected to implement the QF requirements.

Following an external assessment in 2018 of the implementation of the principles of the QF in the main Luxembourg research institutions, a number of recommendations have been issued in view of advancing the implementation of the QF and further developing the quality of doctoral training in Luxembourg. More specifically, it is expected that:

- an **individual PhD plan** is drafted at the onset of each FNR-funded PhD project, outlining among others the objectives of the research project, the supervision set-up, rights and duties of all involved parties and expected outcomes in terms of reporting, publications, training activities, etc. The individual PhD plan serves as support to all involved parties and should be reviewed at regular intervals.
- the PhD supervisory committee (CET - comité d'encadrement de thèse) at the University of Luxembourg, includes **at least one member from a research institution abroad**. Travel/accommodation costs related to the CET participation of the external member can be covered by the CORE budget.

1.8. Financial Aspects

1.8.1. Funding

The overall funding budget of the CORE call is indicated in the CORE programme description. There are no funding maxima, except for the limitations of resources for CORE Junior Track proposals defined by the FNR, but the project plan should be cost-efficient (see selection criteria) in relation to the intended outcomes. The funding may not have the purpose or effect of producing a profit for the beneficiary. The funding may in no case result in a duplicate funding of operating costs, acquisition costs or staff costs. The costs listed must be essential for the implementation of the project.

1.8.2. Eligibility of Costs

To be considered eligible, costs must be real or based on lump sums. Certain types of costs may be indicated on a lump-sum basis (e.g. if they relate to operations routinely performed by the partner in question), provided the cost does not differ significantly from the actual cost and these operations are acceptable to the FNR. Where appropriate, calculations for lump sums need to be provided during negotiation. For future financial reporting the costs must be supported by evidence that they are real (recorded in the accounts of the beneficiary and supported by invoices for example), paid (supported by bank statements for example), and linked to the project.

The FNR distinguishes between direct costs and indirect costs.

1.8.3. Total Budget of a Project

Please also refer to the financial guidelines hereafter for specific rules concerning each budget heading.

The Total Budget of a project is defined as follows:

=	Total Budget of a project
+	FNR contribution
+	External financial contribution

+	Institution's (*) own financial contribution

* The FNR assumes that the difference between "*the total budget*" and "*the FNR contribution plus the external financial contribution"* is covered by the institution (Institution refers to the contracting partners).

The budget must be provided for each contracting partner, giving an estimate of the eligible costs required and the amount of funding expected from the FNR.

Additional justification and information have to be given in the respective field in section 5.3. of the 'Online Form'. The FNR may decide to limit its funding if no satisfactory justification of the budget is provided.

For CORE Junior Track proposals: The projects submitted under 'CORE Junior Track' will have to comply with special budgetary rules. If applicable, they are indicated in the "Règlement financier applicable aux instruments de financement du FNR".

1.8.4. Direct Cost

Direct costs are all those eligible costs which can be attributed directly to the project and are supported by an auditable record.

VAT is not an eligible cost in case the institute can recover VAT from the Luxembourg tax authorities in conformity with Luxembourg indirect tax regulation.

The defined FNR direct eligible costs categories are explained hereunder.

1.8.4.1. Personnel Costs

This budget line refers to the personnel allocated to the project. The payroll costs of all staff, full or part-time, who directly work on the project, and whose time can be supported by a full audit trail, may be included. The concerned staff must have a work contract with the institution. The need for such staff should be justified in the application form. The FNR will not cover costs of persons already funded by the State or by other funding sources. Furthermore, the FNR requirements for principal investigators and supervisors (http://bit.ly/PIandSupervision) within FNR funded projects apply.

The FNR will only finance the profiles of the personnel indicated in sections 3.3 and 3.4 Human Resources of the Online Form. For each position type requiring less than 3 person*months, please group the different staff (e.g. technicians, administrative staff, students) in one single item. Changes of profile (e.g. Post-doc to technician) have to be requested in writing in advance and receive formal approval by the FNR. An amendment of the contract will be prepared if necessary.

Lump sums for staff categories may be used provided these are based on a real-figure calculation.

The salary of PhDs and associated costs (travel, consumables, overhead) may be covered by CORE project funding provided that the PhD works 100% on the project during the whole project duration. Costs for PhD salary and related overhead costs, project related conferences in Luxembourg can be claimed for up to one year after the CORE project end.

The CORE project duration will remain the same as fixed in the CORE project contract.

Other sources of funding for PhDs and Postdocs can be own or third party funds.

In addition, the FNR encourages the involvement of (Bachelor or Master) students in the project in order to strengthen their interest in research.

The FNR expects project staff to use timesheets so that their actual time is recorded against a project to form the basis of the costs charged. Where a person is contracted to work 100% of their time on a single project (whether they are working full-time or part-time), timesheets are not necessary as their costs can only be charged to that activity. In all other cases, timesheets or project time records are required. This includes those who may be contracted to work on two or more projects, since it is essential when charging to have a means of recording and verifying the actual time applied to each activity.

> **For CORE Junior Track proposals:** The total working time to be covered by the CORE Junior PI and other staff cannot exceed 2 FTE (full time equivalent). This includes FNR funded and non-FNR funded working time. Exceptions to this rule is the 4th year of a PhD candidate, if applicable, as well as the local scientific advisor and the mentor abroad, which will not be counted to the above maximum.
>
> It is understood that the local scientific advisor and the mentor provide guidance to the CORE Junior PI and that their contribution as human resources does not have to be listed per se [10].

1.8.4.2. Equipment

This budget line is for new equipment dedicated to the project. This includes, but is not limited to, laboratory/workshop equipment (including computers and servers), software and installation costs.

Please indicate in section 5.3 (Financial Part, justification) of the 'Online Form':

- the precise nature of equipment with specific technical requirements;
- its unit cost and number of units;
- its relevance to the project;
- the necessity of the equipment taking into account the equipment currently available in the institution;
- its useful life according to the institutions' policy, the depreciation method (e.g. straight line);
- the portion of the equipment used on the project, the amount of use (percentage used and time) must be auditable;
- its use beyond the project with the indication of the residual value (if applicable);
- its use by other national or international research groups/institutions (if applicable).

Large equipment which is more expensive than € 25,000 will only be funded to the pro-rata of its use within the project, duly taking into account the depreciation rules within the research organisation.

For example:

- project duration: 3 years

10 The person*months of the local supervisor and the mentor don't have to be included in the 2 FTE working on the project;

- equipment acquisition costs: € 50,000 in the first year of the project
- useful life: 5 years, straight line method (€ 10,000 per year) assuming a residual value of € 0,00
- portion of the equipment used on the project: 75% of time used (3 years in present example)

➔ Eligible costs (pro-rata) amount to € 22,500
3 (remaining years) x € 10,000 (depreciation per year) x 75% (percentage use) = € 22,500

For equipment which is to be developed during the course of the project, or sub-equipment which may not be functional if used individually (for tests, upgrading and trials) and where the development costs exceed € 25,000 (total costs, not individual assembly parts) it is recommended to foresee own institutional co-funding and to indicate the co-funding source for all equipment.

The FNR may decide to limit its funding on a case by case basis.

For equipment costs over € 100,000 (FNR part and own funding combined), a business and/or utilisation plan is required at submission stage.

The FNR will only finance equipment listed in the original proposal. Additional equipment has to be requested in writing in advance and receive formal approval by the FNR. This modification will not result in an amendment to the contract.

1.8.4.3. Consumables

This budget line is for consumables necessary for the project realisation. Consumables are goods that can be consumed or spent. They are not individual parts of a prototype, upgrade, parts to extend existing equipment. The applicant needs to indicate the nature (chemicals, Glassware, etc.) of the consumables and justify the estimation of the total costs and requested budget in section 5.3 of the 'Online Form'. The total amount can be indicated as a lump sum in accordance with the institutions' rules.

1.8.4.4. Travel Cost

This budget line is for travel and related subsistence costs in relation to the project. The FNR will cover the real costs for travel, training, subsistence and conference participation fees. Expenditures should be in accordance with the institution's own regulations.

To avoid administrative burdening at submission and in order to give the applicant team (including the PhD candidate) the necessary flexibility, the budget for travel costs, training, subsistence and conference participation fees is calculated on a lump sum basis: € 2,000 per year and per 12 person*months (in relation to the total project effort). For PhD candidates a maximum of € 6,000 (3 years * € 2,000) can be allocated.

It is therefore essential to provide the total person*months effort of all the people working on the project. If the project team requires a higher budget for travel, the amount is to be justified in detail in section 5.3 of the 'Online Form'.

The FNR expects that all researchers involved in the project (in particular the PhD candidates) benefit from the travel and training lump sum provided by the FNR.

For CORE Junior Track proposals: The applicant is encouraged to apply for additional travel money to permit additional training sessions in research groups/labs abroad, attendance to specific training programmes and attendance at additional conferences. The total budget for travel is limited to € 25,000.

1.8.4.5. Subcontracting

This budget line is for costs related to services provided by subcontractors. Contracting partners may subcontract specific services (limited in time and scope) essential for the realisation of the project but not central to it, in case this work cannot be directly undertaken by one of the partners. It is understood that subcontracting cannot be provided by contracting or non-contracting partners of the project (see chapter 1.2.). This would be regarded as a direct scientific contribution to the project and should be budgeted for the partner in the appropriate budget line. Subcontracting to non-contracting partners is therefore explicitly not possible as it is considered a circumvention of the laws and regulations defining the direct beneficiaries of project funding by the FNR.

All subcontracting costs need to be duly justified. Please describe the service, indicate the price, the duration of the service and specify the reason why you revert to a third service in section 5.3 of the 'Online Form'.

The FNR limits the subcontracting costs to a maximum of 25% of the FNR requested funding (without indirect costs).

In addition:

1. The subcontractor (person and institution) has no IP rights;
2. The subcontractor has no publication rights on tangible project outputs;
3. Consultancy fees for scientific advisory boards set up by the PI are not eligible project costs.

For CORE Junior Track proposals: Costs associated with **mentoring** should be budgeted under this budget heading. The total budget for subcontracting is limited to **€ 25,000**. This includes travel costs for visits to Luxembourg only.
The above mentioned restrictions on IP and publication rights for subcontractors do not apply to the mentor.

1.8.4.6. Other Costs

This budget line is used for costs that cannot be listed within one of the previous budget headings. They include, but are not limited to:

- Organisation of scientific conferences and/or workshops held in Luxembourg;
- Scientific publications: conference proceedings, PhD theses, book chapters and scientific monographs related to the project. Please note:
  Open Access fees and other fees (e.g. page charges) related to scientific articles are no longer eligible for funding as part of FNR funded projects. Article processing charges (APCs) of Open Access publications (scientific articles or monographs) can only can be refunded through the FNR's "Open Access Fund", and if fulfilling the FNR requirements. See the Open Access webpage for more information. The FNR **requires** that all scientific articles related to FNR-(co)funded

projects are published in Open Access and that scientific monographs are published in Open Access whenever possible.

- Documentation (not expected in institutional libraries);
- Initial submission costs for the protection of a patent, license, trademark, etc.;
- Costs generated by the use of existing equipment within partner institutions. This may include rental/access charges for equipment or analysis costs. Please specify in the application form:
  - The type of equipment in question,
  - Justification of the costs,
  - Information on whether the existing equipment was purchased by the State,
  - Its residual useful life, and details of the calculation on which the budget estimate figure is based.
- Field work/fees;
- Recruitment and advertising costs for staff directly employed on the grant;
- Equipment-related items, such as relocation, maintenance (external contracts/ agreements).

Depreciation costs of equipment which has been completely funded by the FNR in other projects cannot be included here.
Equipment which is to be developed during the course of the project is not eligible under this heading (see 1.8.4.2. Equipment).

The nature of the costs and their relevance to the project has to be explained in detail in section 5.3. of the 'Online Form'.

1.8.5. Indirect Costs (Overhead)

The FNR applies the Full Cost with Flat rate model (FCF), where direct costs are reimbursed on the basis of the actual incurred (real) costs and overheads are reimbursed on the basis of a flat-rate (up to 25% of direct costs minus subcontracting). Overheads cannot be claimed by public administrations.

Indirect costs, also called overheads, are all the structural and support costs of an administrative, technical and logistical nature which are cross-cutting for the operation of the institution's various activities and cannot therefore be attributed in full to the project.

The nature of an indirect cost is such that it is not possible, or at least not feasible, to measure directly how much of the cost is attributable to a single cost objective.

Examples might be, but are not limited to, costs related to the general operation of the institution such as maintenance, insurance, petty office equipment, … and costs related to horizontal services such as administrative and financial management, human resources, legal advice, etc.

#	**FNR eligible costs**	**Basis**
1	Personnel costs	YES
2	Equipment	YES
3	Consumables	YES
4	Travel costs	YES
5	Subcontracting	NO
6	Other costs	YES
A = ∑(1to6)-5)	**TOTAL**	**Sum**
B = 25% x A	**Overheads**	**Up to 25% x Sum**

1.8.6. External Financial Contribution

Sources of funding outside of the CORE programme and the contracting institution should be indicated. Other FNR grants are considered an external source of funding for the project. Please indicate the total of the projected grant support in the appropriate section. Other external financial contribution could be a donation by a charitable organisation, revenues from licenses, etc.

Contributions by non-contracting partners (i.e. the partner's research effort in the frame of the project) are not considered as an external source of funding.
External financial contributions should be indicated in section 5.2 Overall costs of the project (FNR funding + other funding, including own contributions) for Coordinating Institution and Contracting Partners of the 'Online Form'.

1.8.7. Contribution by Non-contracting Partners

Please provide an estimation of the contributions of each of the '**Non-contracting Partners**' including **International Co-funding partner(s)** to the project in terms of person efforts and estimated budget in section 5.4. Budget Non-Contracting partners/International Co-funding partner of the 'Online Form'.

If you apply for 'International Co-funding' indicate the name of the International Funding Agency in the relevant section of the online form.

1.8.8. Budget Summary

An Excel sheet named 'CORE Budget Form' is available for guiding through the calculation of the project costs. An upload of that sheet is not required at application stage but a detailed justification of the costs is to be provided in section 5.3. of the 'Online Form'.

The worksheet 'Budget Summary' provides an overview of the budgetary and person*months efforts by each project partner.

Note that parts of the worksheet do not have to be completed manually but will be automatically populated with the data filled in the previous sheets.

2. The Selection Process

2.1. CORE Evaluation

The CORE Peer Review process guarantees an independent, state-of-the-art evaluation of the application which has the objective to select the research projects that reflect the highest **scientific quality**. The CORE review process consists of several stages:

- Proposals undergo an administrative eligibility check,
- Eligible proposals are peer-reviewed by independent, international researchers,
- Thematic expert panels rate the proposals and recommend funding,
- The FNR decision bodies select the projects to be funded based on the recommendation by the thematic expert panels,
- The funding decision is communicated to the applicants.

2.2. Administrative Eligibility Check

In order to be eligible, the proposals must fulfil all of the following criteria:

- Proposals must be submitted in electronic format to the online submission system before the deadline,
- Proposals must be complete (i.e. all of the requested components and forms must be included),
- Proposals must respect the maximum length and have to be written in English,
- Proposals must be submitted by an eligible FNR beneficiary organisation,
- All contracting partners must be in possession of an accreditation by the Ministry of Higher Education and Research and have registered at the FNR's online system,
- PI must fulfil the eligibility criteria (see 1.2. Eligibility),
- The proposed research topics must fit into the National Research Priorities for Luxembourg.

Applications not conforming to one of these elements are rejected at this stage without further evaluation. Ineligible applicants are informed **within 2 months after the submission deadline of the proposal**.

2.3. Peer-Review Process

Each eligible proposal is usually sent to at least **three reviewers** who are asked to complete a written evaluation according to the FNR selection criteria. A detailed description of the peer review process and the selection criteria is available in the **'Peer Review Guidelines'** available on the FNR webpage.The applicant has the possibility to send an email to the FNR with a list of **maximum 3 experts who should not be contacted as reviewers** for the specific project to submission@fnr.lu before the submission deadline. The email has to explain why this/these expert(s) should not be contacted. The FNR however reserves the right to make the final selection of the reviewers.

In a second step a **thematic expert panel** assesses the proposals based on the written evaluations, gives a funding recommendation and summarises the main arguments supporting the funding recommendation in a report (**Panel Conclusion**).

Proposals not fulfilling the minimal quality criteria (with low scorings by all reviewers) do not need to be discussed in the panel meeting but the justification of the low scoring will be checked by the panel.

In the last step, the **FNR decision bodies** select the proposals to be funded based on the recommendation of the expert panels.

After the funding decision, applicants receive **feedback from the FNR** together with the full anonymous written evaluations of their proposal and the 'Panel Conclusion'

2.4. Evaluation Criteria

The scientific merit of the proposal is assessed based on the following selection criteria. For CORE Junior track proposal, the assessment of the criteria has to take into account the specifics detailed in chapter 1.3.2.

1. Innovativeness of idea and scientific relevance

The FNR expects:

- High scientific quality, competitive at an international level,

- Research question(s) and the testable hypotheses are original, and are formulated clearly in the proposal,
- Project of high scientific relevance for the research field,
- Preliminary data related to the proposed project. PIs must have enough literature review or preliminary studies to show that the project concept is feasible,
- Projects to have the nature of a typical research project – funding of infrastructure or of data collection is not intended if this is not associated with the answering of a clear research question, and
- Direct contribution to advancements of the current state-of-the-art.

With the result of:

- Strengthening of the capacities of the research groups in their field of research,
- Increasing their international visibility within the research community.

2. Appropriateness of the approach

Methods proposed have to be:

- Sound,
- Rigorous,
- State-of-the-art, and
- Appropriate for the proposed investigation.

3. General feasibility of the project

- Project carried out and led by an experienced researcher with a proven track record in the field,
- Applicant team with the expertise and complementary knowledge required for the execution of the proposed project,
- Project plan needs to be efficient and ambitious, but feasible during the proposed timeframe,
- Allocated human resources and budget need to be appropriate (Reviewers should rather assess the cost effectiveness of the project in terms of person*months engaged on the project and the proposed costs of equipment and consumables; overstaffed projects are not recommended),
- Main infrastructure, necessary for the successful execution of the project, is available at the start of the project,
- PhD projects must be clearly described and feasible,
- Collaborations with partners from the public or private sector are encouraged but not explicitly requested. In any case, the added value of the collaborations needs to be justified

4. Expected output, outcome and impact of results

- Scientific publications,
- Patents (if applicable),
- Data, reagents, software (if applicable)
- Doctoral and other training: Supervisory skills and available learning environment for PhD or Post-doc training,
- Development of core competences of the research group in view of gaining international visibility and critical mass,
- Dissemination of the research results among the wider public,

- Planned strategies for generating impact during and after the project as well as the description of how potential users are to be involved in the project in view of exploitation of the results (i.e. exploitation of intellectual property generated, raising of scientific awareness, improvement of quality of life, etc. only if applicable),
- Value of intended economic, environmental and societal impacts.

5. In addition, for CORE Junior: Contribution to advancement of career

- CORE Junior PIs' track records are checked according to their career stage,
- Track record of the mentor and of the hosting group,
- Contribution of the mentor and of the hosting group to the advancement of the Junior PI's autonomous research career,
- Training and mentoring plan: contribution towards the development of the Junior PI's own research line and project management skills,
- Feasibility: ambition of the project matches the Junior PI's experience in research.

3. Applying for the CORE Call

3.1. Submission Deadline

Proposals must be submitted by the coordinating institutions' administrations (not by the PI) in electronic format to the online submission system (FNR Grant Management System) https://grants.fnr.lu no later than **14:00 (CET) on the 22 April 2020**.

3.2. FNR Grant Management System

All FNR Grants, including the CORE Calls are managed through an **online submission system** (FNR Grant Management System) accessible via https://grants.fnr.lu. This system provides applicants a web services interface for automated submission and further monitoring of completed grant applications and related services (acknowledgement emails, notifications and reminders).

The system guides the applicants through the different steps of the application procedure. All forms have to be filled in online and submitted in electronic format.

The character and pagelimitations indicated in the application forms have to be respected, otherwise the FNR will decide to not further process the application.

For technical questions regarding the 'FNR Grant Management System', the FNR can be contacted by email at tech-support@fnr.lu or call our Help Desk at +352 26 19 25 45.

3.3. How to Apply

The CORE Proposal Application consists of 2 different steps:

- **Step 1: Completing the Online Application Form**
- **Step 2: Submitting the Online Application Form**

3.3.1. Step 1 Completing the Online Application Form

The CORE Application consists of **different elements**:

- The '**Online Application Form**' is completed in the FNR's online 'Grant Management System' and contains the general administrative and budgetary details of the application.

- The '**Project Description Form**' contains more detailed information on the proposed research project, i.e. on its scientific content as well as the organisation of the tasks to be undertaken. The 'Project Description Form' is part of a web-based online application and cannot be submitted alone.
- The **Bibliography**
- The **Recent CV of the PI** (no template provided)
- The **Recent CV of the Main Researchers** in the Project (no template provided)
- The **Project Plan** contains the planning in time of the work packages and tasks.
- **If applicable, International Co-Funding**

  In the case that a co-funding of a German, Swiss, Austrian or Polish partner is required by the DFG, SNF, FWF, EMBL, FCT or NCBR, please download the additional and country specific documents which are necessary for the partner funding agency. Please complete all necessary forms, convert them to PDF and merge them into one single PDF file and upload them. More information on international confunding is available on the website.
- For **CORE Junior** projects: a **signed support letter** by the **mentor abroad** has to be attached (no template provided). A non-signed letter is subject to rejection of the application.

3.3.2. Step 2 Submitting the Online Application Form

The submission of the 'Online Application Form' consists of 2 stages:

- **Submission by the applicant**
- **Validation and submission by the Coordinating Institution**

After having generated the application in PDF format, please open the document and check if it is complete and correct. Especially ensure that the right uploads have been attached. When everything is correct, please make sure that the "To Do's" list is empty, then proceed to Step 2 on the same screen and click the button '**Submit for Institutional Check**'.

The application will now be accessible to the administration of the 'Coordinating Institution' in Luxembourg. The administration has the possibility to amend and validate your 'Online Application Form' and/or return it to you for changes.

Please note that the 'Coordinating Institution' has to respect the deadline for the final submission of the Proposal.

Incomplete applications, and/or late submissions will make the application non eligible and the application will be turned down without further evaluation!

If you need further advice and support, please contact your FNR Programme Assistant. Information on how to prepare the proposal is given in ANNEX 1 and 2 in *blue italic characters*.

ANNEX 1 Online Application Documents

Step 1 of the CORE Proposal Application consists of 3 different activities, which are presented as a 'To Do' list:

- **1: Online Application Form - CORE**
- **2: Download the Project Description Form from the FNR Website**
- **3: Generate PDF**

After completion of each activity, the button 'Done' validates the completion of the task and removes it from the 'To Do' list.

The first activity named '**Online Application Form - CORE**' is divided into 6 sections which can be accessed individually:

- **Section 1. Principal Investigator and Coordinating Institution**
- **Section 2. Research Project**
- **Section 3. Research Project Consortium and Human Resources**
- **Section 4. Legal and Ethical Requirements**
- **Section 5. Financial Part**
- **Section 6. Attachments**

The forms may be saved at any time and completed later. Before submitting the completed form, applicants need to make sure that all mandatory questions (marked with *) have been filled out. Explanations on how to complete the '**Online Application Form**' are provided in the sections below.

The second activity named '**Download the Project Description Form from the FNR Website**' requires to download a WORD document, named '**Project Description Form**'. This document should be saved to the desktop and completed off-line. A detailed description of the form is available in **Section 6 Attachments**.

1. Principal Investigator and Coordinating Institution

Section 1.1. Principal Investigator (PI)

- Application ID: *Generated automatically*
- Is there a Co-PI on the project: *in case of a Co-PI the same information has to be given as for the PI*
- First Name: * *May only be modified through your profile.*
- Family Name: * *May only be modified through your profile.*
- Gender: * *Select from list Male/Female*
- Title: * *e.g. Dr, Prof., etc.*
- Category of Position: * *e.g. Head of Unit, Head of Department, Assistant Professor, etc.*
- Current employment situation at the Coordinating Institution: *Select the status of your employment situation at the date of the submission deadline of the application.*
- Do you hold a Doctorate (PhD): * *Select Yes/No*
- Discipline of Doctorate (PhD): **If no doctoral title please write 'none'*
- University/Institution Issuing the Doctoral Certificate: * *If no doctoral title please write 'none'.*
- Date of the Doctoral Certificate:
- Email: * *May only be modified through your profile*

- Phone Number:
- Date of Birth: *
- Nationality: *
- Authorisation to supervise PhD candidates: *Every PI with one or more PhD candidate(s) on his/her project must have a formal authorisation to supervise PhD candidates, i.e. ADR from UniLu, equivalent academic authorization (HDR, Habilitation), other.*
    - ADR at UniLu available: *Select this only if the PI has the "autorisation à diriger des recherches" (ADR) from the University of Luxembourg at the time of submission.*
    - Other: *Briefly describe the form of formal authorisation to supervise PhD candidates (HDR, Habilitation, other) available at the time of submission.*
    - Not yet available: *Briefly describe through which external evaluation process the supervisor's research and mentoring track record is assessed and when this assessment is expected to be concluded.*

Section 1.2. Coordinating Institution

- Name of Coordinating Institution: * *Name of the Luxembourgish institution where the PI works (select from drop-down menu, if the institution is not yet on the list, it has to register at the FNR (see chapter 1.2 eligible organisations)*
- Department: * *Official name (and acronym) of the department and research group*
- Website of Group:

Section 1.3. Authorship of proposal

- Author and co-authors of proposal: * *Indicate who made contributions to preparing this research proposal and what these contributions consisted in.*

To validate this section and jump to the next one, click the button 'Save draft and continue to next section'!

2. Research Project

Section 2.1. Research Project

- Project Title: * *Should not be longer than 200 characters.*
- Project Acronym: * *The short title or acronym is used to identify the proposal efficiently. Should not be longer than 10 characters.*
- Project Start: * *Latest start of the project is 1 September of the year following the call deadline.*
- Project Duration (in months): * *Expected project duration. Projects should have a duration of 2-3 years. In case funding for a PhD candidate is foreseen to be covered by the CORE project budget, the project duration must be 3 years.*
- CORE Junior Track: * *Select Yes/No*
- Name of Mentor:
- Resubmission or Follow Up: * *Select Yes/No*
- If "yes", provide more details: * *Funding period and reference*
- Application to other funding bodies: * *Select Yes/No (If applicable, please indicate other funding instruments (also inside your institution) where this proposal, or a modified version of it, has been submitted. Applicants have to inform FNR about the status and outcome of the evaluation being carried out other than FNR*

- If “yes”, provide more details: * *(If applicable, please indicate other funding instruments (also inside your institution) where this proposal, or a modified version of it, has been submitted. Applicants have to inform FNR about the status and outcome of the evaluation being carried out other than FNR*

Section 2.2. Select Thematic Domain

Select one of these thematic domains in the drop-down list

BM – Life Sciences, Biology and Medicine
ID – Humanities and Social Sciences
IS – Information and Communication Technologies
LE – Law, Economics, Finance
MS – Materials, Physics and Engineering
MT – Mathematics
SR – Environmental and Earth Sciences

Section 2.3. National Research Priorities for Luxembourg in 2020 and beyond

One or more of the following research priorities must be selected from the list.

Area: Industrial and Service Transformation

Integrative materials science and technology
- Multiscale modelling in materials science and physics
- Materials discovery through machine reinforced learning
- Fundamental phenomena defining materials function and devices
- Interface-dominated materials
- Advanced manufacturing: multifunctional, multiclass, and multiscale materials, and their implementation
- Physics of active and living matter
- Materials life cycle
- Scientific instrumentation and characterization

Trusted data-driven economy and critical systems
- Security and cybersecurity, reliability and trust
- Cyber-physical systems

Future computer & communication systems

Autonomous and intelligent systems and robotics for earth and space

Space telecommunications, earth observation and space resources
- Resources in space
- Remote sensing and combination with multiscale data

Fintech/RegTech and transformative applications of distributed ledger technologies

Fundamental tools and data-driven modelling and simulation

Area: Personalised Healthcare

Complex biomedical systems – data and models
- Effective collection and deconvolution of complex biomedical data
- Multi-scale and mechanistic models

Precision medicine, including environmental, lifestyle and socio-economic factors
- Innovative molecular disease models
- Common mechanisms between diseases – mechanism-based stratification
- Environmental, lifestyle, and socio-economic impact on mechanisms of diseases

Understanding, preventing, and treating the health-disease transition
- Longitudinal dynamics of diseases
- Multifactorial intervention strategies
- Innovative clinical trials

Data-driven healthcare

- Trusted digital health systems
- Health informatics and implementation in the healthcare system

Area: Sustainable and Responsible Development

Climate change: energy efficiency and smart energy management; resilient eco- and agrosystems
- Resilient water systems
- Environmental monitoring
- Transition towards sustainability: energy efficiency
- Sustainable urban development and smart cities
- Smart energy systems

Economic: green sustainable finance / circular and shared economy
- From waste to product
- Sustainable behaviours

Social: migration and social cohesion / cultural identities, cultural heritage and nationhood
- Social cohesion and inequalities
- Societal transformation and labour market dynamics
- Household finance and risk management
- Migration and integration
- Cultural identities and nationhood
- Contemporary history, memories studies and public history
- Digital humanities

Responsible development: regulations and ethics for a data-driven society
- Regulation and supervision of markets
- Ethics and sustainability

Area: 21st Century Education

Innovative digitally enhanced learning and assessment environments
- Efficient learning environments
- Digital learning and human-machine interaction

Learning in a multilingual and diverse society

Equality of educational opportunity

Adult education, up/re-skilling and lifelong learning

Please justify, why your proposed research fits into theNational Research Priorities: *
Explain how your proposal fits into the context of the National Research Priorities. Proposals not clearly related to the National Research Priorities will not be considered for funding (max. 0,5 page).

For CORE Biomedical projects only, the Fondation Cancer has agreed to join funding. To be eligible for this co-funding the following section has to be completed.

Does your project fit the Plan Cancer topics?
This section does only appear if you choose one of the three BM domains above.

Explain how your proposal fits to the PLAN CANCER topics.

Tick Box: "The applicant and research institution are aware and acknowledge that the projects submitted in the CORE call and the associated evaluation results will be shared between FNR and the Fondation Cancer".
Tick the box to give your approval.

Section 2.4. Project Summary

- Key words characterising the Research Project: * *3-8 key words considered sufficient to characterise the scope of the proposal.*

- Publishable Project Abstract (max. 0,5 page): *
  Including research question, objectives, impact and outcome *
  Scientifically oriented executive summary. This abstract should provide a clear understanding of the research question, prime objectives, impact and outcome of the proposal and how they will be achieved. The Project Abstract should be concise, clear, informative, self-contained and may not include any confidential information as it may be used by FNR staff when contacting external scientific experts. The Project Abstract will not be published on the FNR website without prior approval by the applicant.
- Lay summary (max. 0,25 page): * *Non-scientific summary providing a clear understanding of the proposal for a general audience. The text should be easily readable, provide answers to the essential questions (e.g. Who, What, Where, When, Why, How), written in short and clear sentences while avoiding complex or meaningless wordings.*

Section 2.5. Primary and Secondary Domains of the Research Project

- Life Sciences (LS)
  - LS1 Molecular and Structural Biology and Biochemistry
  - LS2 Genetics, Genomics, Bioinformatics and Systems Biology
  - LS3 Cellular and Developmental Biology
  - LS4 Physiology, Pathophysiology and Endocrinology
  - LS5 Neurosciences and neural disorders
  - LS6 Immunity and infection
  - LS7 Diagnostic tools, therapies and public health
  - LS8 Evolutionary, population and environmental biology
  - LS9 Applied life sciences and biotechnology
- Mathematics, Physical Sciences, Information and Communication, Engineering, Universe and Earth Sciences (PE)
  - PE1 Mathematical foundations
  - PE2 Fundamental constituents of matter
  - PE3 Condensed matter physics
  - PE4 Physical and Analytical Chemical sciences
  - PE5 Materials and Synthesis
  - PE6 Computer science and informatics
  - PE7 Systems and communication engineering
  - PE8 Products and process engineering
  - PE9 Universe sciences
  - PE10 Earth system science
- Social Sciences and Humanities (SH)
  - SH1 Individuals, institutions and markets
  - SH2 Institutions, values, beliefs and behaviour
  - SH3 Environment and society
  - SH4 The Human Mind and its complexity
  - SH5 Cultures and cultural production
  - SH6 The study of the human past

A list with the descriptions of the Domains (Subdomains) is provided on the FNR website.
To validate this section and jump to the next one, click the button ‘Save draft and continue to next section’!

3. Research Project Consortium and Human Resources

Section 3.1. Contracting Partners (only institutions different from the Coordinating Institution)

A 'Contracting Partner' is an institution which is eligible for funding and which is seeking financial support from the FNR, e.g. public institutions performing research in Luxembourg or non-profit associations and foundations performing research in Luxembourg having obtained a special authorization from the Ministry for Higher education and Research. *Do not add the Coordinating Institution here as this information has already been communicated under 1.2.*

Mandatory information:

- Institution *Name of the Luxembourgish institution (select from drop-down menu; if the institution is not yet on the list, it has to register at the FNR prior to the deadline (see chapter 1.2 eligible organisations)*
- Department
- Researcher in Charge
- Web Address.

Click the 'Add' button to validate and/or add new partners.

Section 3.2. Non-contracting Partners / International Co-funding Partner (International Funding Agency)

A 'Non-contracting Partner' is an organisation or individual from the public or private sector (from Luxembourg or abroad) participating in the project without financial support from the FNR, e.g. company or foreign university

An 'International Co-funding Partner' is a foreign institution applying for co-funding at the 'International Funding Agency' in his country; the FNR being the 'Lead Agency'.

- Are you requesting funding by an International Funding Agency? **Select Yes/No*
- If yes, which is the International Funding Agency?
  None/DFG/SNF/FWF/EMBL/NCBR

Mandatory information:

- Institution (International Funding Agency): *'Name of the Non-contracting Partner'. If applicable add the 'International Co-funding Partner' followed by its 'International Funding Agency' in brackets e.g. Universität Trier (DFG)*
- Department
- Researcher in Charge
- Web Address
- Public or Private sector
- National or International

Click the 'Add' button to validate and/or add new partners.

Section 3.3. Lists of Main Researchers working on the Project

The table should show all the researchers working on the project, listed by importance for the project. The items in the table should be filled in for each researcher position (not including support staff). In case PhD candidates are foreseen, their funding for 48 months must already be requested at this stage. Later applications for extensions for PhD candidates funding will not be considered.

Institution(s)	Position type	Qualification level	Name(s) of researchers hired for this type position	Person* months	Person* months financed by FNR	Total estimated amount of the salary costs to be covered by FNR
Institution where the researchers will be working	*Group leader,*	*MSc, PhD, Professor, etc.*	*Name(s) of the researchers, N.N. if the name is not available yet*	*Person* months on project*		

Section 3.4. List of support staff working on the Project

The list should show the required support staff for the project (i.e. technicians, secretaries, researchers in charge of labs or instruments supporting the project but not directly involved in the research team etc.). The items in the table should be filled in for each human resource position. For each position type involving less than 3 person*months per project, the different persons have to be grouped into one single item (e.g. three technicians working each 1 person*month on the project should be grouped in one line).

Institution(s)	Position type	Qualification level	Name(s) of researchers hired for this type position	Person* months	Person* months financed by FNR	Total estimated amount of the salary costs to be covered by FNR
Institution where the researchers will be working	*Group leader, student, technician*	*MSc, PhD, Professor, etc.*	*Name(s) of the researchers, N.N. if the name is not available yet*	*Person* months on project*		

Section 3.5. PhD Candidates

For each PhD candidate, please fill in the following items:

- First Name of PhD Candidate *First name of the candidate, N.N. if the name is not available yet.*
- Last Name of PhD Candidate *Last name of the candidate, N.N. if the name is not available yet.*
- Title of Thesis *or draft title*
- Name of Academic Supervisor *Main supervisor at the host institution: the FNR expects that the project PI assumes the role of main PhD supervisor.*
  If other persons involved in the supervision, indicate name, affiliation, role in supervision.
- Institution issuing the PhD *Name and country of the institution. (needs to be known at submission) In case the degree awarding institution is a university abroad, the university rules for external supervisors, quality control and practical arrangements with the degree awarding institution need to be described in the project proposal.*

- Expected Start Date: *PhD candidates funded by the project should work 100 % on the project, and their thesis should start at the beginning of the project at the latest. Please note that their funding for 48 months must already be requested at this stage. Later applications for extensions for PhD candidates funding will not be considered.*
- Expected Award Date *Approximate date when candidate will be awarded his/her PhD.*

Click the 'Add' button to validate each candidate.

To validate this section and jump to the next one, click the button 'Save draft and continue to next section'!

4. Legal and Ethical Requirements

Section 4.1. Legal and Ethical Requirements

The **Ethical Issues Table** in the web-based online application of the proposal provides a guide to what are considered to be ethical issues. If the answer to any of the questions of the Ethical Issues Table is YES, the applicant must provide a brief description of the ethical issue involved and how it should be dealt with appropriately in section 1.5. of the Project Description.

The following special issues should be taken into account:

Informed consent: When describing issues relating to informed consent, it will be necessary to illustrate an appropriate level of ethical sensitivity, and consider issues of insurance, incidental findings and the consequences of leaving the study. Particular attention must be paid to properly inform study participants about the complex research procedures. If children are involved in a research activity it is necessary to obtain their assent and the permission of their parents.

Recruitment of patient cohorts: For the recruitment of patient cohorts equitable selection of patients should be ensured. The inclusion/exclusion criteria as well as the power calculations underpinning the recuritment targets will need to be described.

Collection and use of human derived material: The type and amount of biological materials to be taken from study participants and the manner in which biological materials will be taken including safety and invasiveness of the procedures for acquisition need to be specified. The measures employed to protect the privacy of and minimize risks to participants the length of time the biological materials will be kept, how they will be preserved, location of storage, and process for disposal, if applicable need to be described. Any anticipated linkage of biological materials with information about the participant, if applicable will need to be described. One should note that downstream research on human derived material (such as somatic cells for the generation of iPS cells and derivatives) could also raise ethical concerns (e.g. large-scale genome sequencing may evoke concerns about privacy and confidentiality). Appropriate confidentiality protections and consent for the downstream use of the material will need to be ensured.

Data protection issues: All FNR funded projects must comply with the EU's General Data Protection Regulation (GDPR) with regards to all data protection issues.

Use of animals: Where animals are used in research, the application of the 3Rs (Replace, Reduce, Refine) must be convincingly addressed. Numbers of animals should be specified. Describe what happens to the animals after the research experiments.

Human embryonic stem cells: Research proposals that will involve human embryonic stem cells (hESC) will have to address all the following specific points:

- the applicants should demonstrate that the project serves important research aims to advance scientific knowledge in basic research or to increase medical knowledge for the development of diagnostic, preventive or therapeutic methods to be applied to humans;
- the necessity to use hESC in order to achieve the scientific objectives set forth in the proposal. In particular, applicants must document that appropriate validated alternatives (in particular, stem cells from other sources or origins) are not suitable and/or available to achieve the expected goals of the proposal. This latter provision does not apply to research comparing hESC with other human stem cells;
- the applicants should take into account the legislation, regulations, ethical rules and/or codes of conduct in place in the country(ies) where the research using hESC is to take place, including the procedures for obtaining informed consent;
- the applicants should ensure that for all hESC lines to be used in the project were derived from embryos;
- the donor(s)' express, written and informed consent was provided freely, in accordance with national legislation prior to the procurement of the cells;
- that result from medically-assisted in vitro fertilisation designed to induce pregnancy, and were no longer to be used for that purpose;
- the measures to protect personal data and privacy of donor(s), including genetic data, are in place during the procurement and for any use thereafter. Researchers must accordingly present all data in such a way as to ensure donor anonymity;
- the conditions of donation are adequate, and namely that no pressure was put on the donor(s) at any stage, that no financial inducement was offered to donation for research at any stage and that the infertility treatment and research activities were kept appropriately separate.

Other ethical issues: Other ethical issues may pertain to research conducted with/in developing countries such as through the use of local resources (genetic, animal, plant, etc) as well as research which may have an impact on the local communities (e.g. capacity building, access to healthcare, education, etc).

Dual Use research having direct military use or the potential for terrorist abuse also gives rise to ethical issues.

In case of multi-national projects, identify the countries where research will be undertaken and which ethical committees and regulatory organisations will need to be approached during the life of the project.

The application should specify any already existing authorisation or permission for the proposed work and include copies (the copies do not count towards the page limit).

The PI is advised to contact the department in charge of ethical issues in its research institution for support.

5. Financial Part

For completing the sections below, please consult the Financial Aspects in chapter 1.8. describing the rules for eligibility of costs to be respected. In addition an Excel sheet named 'CORE Budget Form' is available for calculating the project costs. An upload of that sheet is not required at application stage **but a detailed justification of the costs is to provided in**

the appropriate section below. The feasibility of the project will be evaluated by reviewers based on that information.

Section 5.1. Funding requested from FNR (Coordinating Institution and Contracting Partners)

For the **Coordinating Institution and each Contracting Partner**, insert the amounts for the following items: *Provide an estimation for each cost category. Do not use points or commas as decimal separators. Make sure that the indicated numbers are correct and well justified since they form the basis for the evaluation and the possible later negotiation.*

Cost category	Coordinating Institution	Contracting Partner
Personnel		
Equipment		
Consumables		
Travel Costs		
Other Costs		
Total of direct costs	*Automatically filled in*	*Automatically filled in*
25% Overheads (indirect costs)	*Automatically filled in*	*Automatically filled in*
Total of direct costs plus overheads (not including subcontracting)	*Automatically filled in*	*Automatically filled in*
Subcontracting		
Total Costs	*Automatically filled in*	*Automatically filled in*

Requested Funds from FNR	*Automatically filled in (sum of the total costs of each contracting partner)*

Please note that overheads (indirect costs) cannot be claimed by public administrations. The amount for the overhead costs indicated for public administrations in the table above will be deducted from the total by FNR after submission.

Section 5.2. Overall costs of the project (FNR funding + other funding, including own contributions) for Coordinting Institution and Contracting Partners

For the **Coordinating Institution and each Contracting Partner**, insert the amounts for the following items: *Provide an estimation for each cost category. Do not use points or commas as decimal separators. Make sure that the indicated numbers are correct and well justified since they form the basis for the evaluation and the possible later negotiation.*

Cost category	Coordinating Institution	Contracting Partner
Personnel		
Equipment		

Consumables		
Travel Costs		
Other Costs		
Total of direct costs	*Automatically filled in*	*Automatically filled in*
Overheads		
Total of direct costs plus overheads (not including subcontracting)	*Automatically filled in*	*Automatically filled in*
Subcontracting		
Total Costs	*Automatically filled in*	*Automatically filled in*

Overall project costs (for all contracting partners)	*Automatically filled in (sum of the total costs of each contracting partner)*

Section 5.3. Justification for the requested funding

Common justification for the requested funding for personnel, equipment; consumables, travel, other costs and subcontracting. Please give a comprehensive explanation for all 6 budget headings: * ***Justify the project's costs in detail for the 6 budget categories.*** *The FNR may not fund all costs if the justification is not precisely given. Explain the distribution of costs amongst the partners and the different cost categories.*

Section 5.4. Budget Non-contracting Partners / International Co-funding Partner (International Funding Agency)

For each 'Non-contracting Partner' (if applicable also for the 'International Co-funding Partner') insert the following items:

Name of non-Contracting Partner	**Overall project costs for each non-contracting partner**	**Funding requested from International Funding Agency (if applicable)**
Personnel (total person*months)		
Total Costs		

Overall project costs (for all non-contracting partners)	*Automatically filled in (sum of the total costs of each non-contracting partner)*

Section 5.5. Overall Budget

- Requested Funds from FNR: * *The funds you intend to request from FNR. For control purposes, please check the amount and tick the box in this section.*
- Overall project costs (for all contracting partners): * *Total budget of the project for the contracting partners. For control purposes, please check the amount and tick the box in this section.*

- Overall project costs (including non-contracting partners): * *Total budget of the project for all partners, contracting and non-contracting. For control purposes, please check the amount and tick the box in this section.*
- Total Effort (Person Months) (All Partners) *'Person*months' is the metric for expressing the effort (amount of time) PIs and other personnel devote to a specific project. The effort is based on the presumption that each fulltime member of staff can work 12 person*months per calendar year. Please indicate the total person*months needed for the duration of the project.*
- Total Effort (Person Months) to be financed by FNR *person*months for which you intend to request FNR funding.*
- Total Effort PI (Person Months) *The total person*months you intend to work on the project as PI.*

To validate this section and jump to the next one, click the button 'Save draft and continue to next section'!

6 Attachments

Section 6.1. Project Description

The '**CORE Project Description Form**' is a Word document that can be downloaded on the CORE website. The document may be saved to the applicant's desktop and completed offline.

Character limits of the project description:

The project description **must include the exact headings of the form and is limited to a total number of 72.000 characters**.

Exceptions: Additional characters are allowed for the following headings if applicable:
Ethical considerations: 6.000 characters
PhD candidate supervision and research lines: 3.000 characters per PhD candidate
Comments on Resubmission: 3.000 characters
CORE Junior Track: advancement of the Junior PI's research career: 6.000 characters

As a recommendation, please use **font types such as Arial, Times New Roman or Helvetica with a font size** of minimum **11 points and adequate line spacing and margins.** Pictures and graphs may be included. Scanning of written text is not allowed.

FNR uses the tool Count Anything to check the number of characters. The **72.000 characters are counted including spaces** (indicated in Count Anything as Chars) and including the headings.

Proposals exceeding the indicated character limits will be rejected without further evaluation.

This '**Project Description Form**' is part of a web-based online application and cannot be submitted alone. After completion of the Word document, please convert it to PDF and upload it into the system **(no scanned PDF version)**. *Only PDF files can be uploaded!*

To replace a file already uploaded, the old file should be REMOVED before uploading the new file to the system.

Ideas and/or text belonging to others must be properly referenced, based on international standards. All applications are checked for plagiarism and any misconduct may result in the immediate disqualification of the application.

In case of a resubmission, modifications have to be integrated in section 6 of the 'Project Description Form'. Reviewers' comments shall be more specifically addressed in this section.

Please find hereafter the explanation of the different fields of the '**Project Description Form**':

1. Description of the Proposed Research Project

1.1 Introduction

Short introduction to intended research project.
In case of a follow-up project, please indicate the title and code of the project, specify the link between both projects and justify the need for a follow-up project. Tangible outputs must be presented for the referenced ongoing project(s). If no tangible output is available, the new project should not be labelled as follow-up. In addition, the PI has to clearly state the innovation in the new proposal.

1.2 Relevant state-of-the art and your own contribution to it

Based on a thorough and up-to-date literature survey, please describe the current scientific state-of-the-art and ongoing developments in fields relevant to your proposal including your own previous work. Provide an assessment of further research needs (what are the main ideas that led you to propose this work?).

1.3 Hypotheses, project objectives and contribution to knowledge development in the research field

Outline your project's contribution to the research needs identified above. State your (testable) hypotheses. Clearly define the objectives to be achieved by the project in a realistic and, as far as possible, measurable form.

1.4 Methods and approach

Describe the methods and procedures you will use in order to reach the objectives defined above. Summarise/analyse the underlying theory/theories.

1.5 Ethical considerations

If the project gives rise to ethical issues, please briefly indicate what they consist in and how they will be addressed. Outline the benefit and burden of such research, the effects it may have and how the ethical issues will be managed. Ethical issues need to be considered for the whole project and not only for the activities executed in Luxembourg. Ethical issues are not limited to issues handled by the 'Commission Nationale de la Protection des Données' and/or the 'Comité National d'Éthique de Recherche'

2. Project Plan

Present a detailed work plan, suitably broken down into an appropriate number of steps (work packages, milestones, scientific objectives or other) which would permit the monitoring of progress during the implementation of the project.
***Start with a brief description of the whole project plan** followed by a more detailed explanation for each step.*
***For each of the steps in the work plan**:*

- *Indicate timing for its completion,*
- *Provide a brief description of the work to be undertaken (including methods to be applied where appropriate) making reference to the previous sections wherever necessary to avoid redundancy within the text,*
- *Clearly identify the partners and personnel involved and specify their contributions,*
- *List, specify and quantify deliverables (e.g. prototype, survey results) and milestones (e.g. prototype tested, patient cohort established),*

- *Describe how you intend to assure the quality of your work (e.g. definition of milestones for measuring project progress, regular joint progress evaluation, cross-checking of intermediate reports or results, etc.) and how you will monitor and mitigate risks identified for the project.*

A suggestion on how you could structure your project is provided in Annex 2.1 (description of work packages). In any case, all the information has to be provided within this section, respecting the given page limit.

*Moreover, **a graphical representation** (e.g. Gantt Chart) of the structured work plan described here (including the personnel involved and timing) needs to be uploaded to section 6.4 of the Online Application Form.*

For a suggestion on how the work plan could be presented, please consult Annex 2.2 or the FNR website

3. Risk Management and Quality Assurance

Describe how you intend to ensure the quality of your work (e.g. definition of milestones for measuring project progress, regular joint progress evaluation, cross-checking of intermediate reports or results, etc.). Review the risks identified and describe how you will monitor and mitigate them. Mention any significant external factor (assumptions = positively phrased, risks = negatively phrased) that are not under the control of the project and may determine whether the intended project 1) may start as planned, 2) may be implemented as planned and/or 3) may achieve its intended objectives. (Example for an assumption: "Delayed equipment delivery").

The FNR strongly advises applicants to implement a scientific steering committee with internationally renowned experts for each project.

Please note: If serious risks exist (i.e. risks that could cause strong negative impacts and whose probability of occurrence is high), the project design should be reconsidered and/or a "plan B" should be elaborated.

In this section you should go beyond the description of how you want to tackle risks emerging in the project, e.g. regular consortium meetings.

4. Project Outputs

4.1 Impact of research results

Describe:

- *your **scientific dissemination strategy** (provide a realistic overview of the envisaged scientific peer-reviewed publications, international conference participations as well as other tangible outputs (e.g. prototypes, software development)). The list should address the type of publication category as well as the targeted level of publication – please note that if the intended outlet is much better than the average journal the applicant team has published in so far, the PI should explain why they think they can publish there now but have not done that before) Do NOT add the journal impact factor as a measure of scientific quality;*
- *how you will **involve potential stakeholders** from the national and/or international private and public sector (if applicable);*
- *the planned **strategy for exploitation** (economic or socio-economic) of your results, if applicable (e.g. What are the expected results? What will be the strategy of protection (patent, trademark, design, copyrights)? What will be the strategy of exploitation (licensing, start-up, etc.)? What is the project's potential to generate intellectual property and the possible exploitation of the IPR? (only applicable for research projects intending economic valorisation in the short- to medium term);*

- *the **outreach activities** foreseen in order to increase public awareness among the **general public** and the understanding of the research topic by a wider (lay) audience (e.g. publications, public conferences, interactions with pupils, and other activities).*
- *the contribution to the advancement of the development of the involved researchers and the partners' organisations.*

The above should be considered in short as well as in the medium to long term.

Please keep in mind that the outputs described in this chapter should be realistic in relation to the size of the project (funding and staff effort). Nevertheless the outputs should be ambitious (within the level of risk that is inherent to a challenging research project) and at an international level of standard in your scientific domain.

The intended outputs described will serve as measure to assess the ambition of the project during peer review and as a benchmark for evaluation in the final report.

4.2 PhD candidate supervision and research lines (only if applicable)

Provide a short description of the PhD project(s) by making reference to the project description and work plan.
Include the following information:

- *title of the PhD project;*
- *research question;*
- *methodology;*
- *envisaged outcome;*
- *number of publications foreseen (at least one 1st author publication expected);*
- *supervision set-up and degree awarding institution (including details about how the supervision and training of the candidate is organised);*
- *description of the profile of the candidate you wish to employ for this PhD position.*

4.3 In addition, for CORE Junior Track: Advancement of the Junior PI's research career

Summarise how the project will contribute to the advancement of the Junior PI's research career.
Describe:

- *The contribution of the project towards establishing an own autonomous research branch*
  - *How the CORE Junior project fits into the research line of the hosting group;*
  - *How the CORE Junior project differs from the research line of the hosting group and mentor and will contribute to establishing the own research line of the Junior PI.*
- *A training and mentoring plan that will help to develop the Junior PI's research career:*
  - *Training stays, mentoring sessions, networking activities, etc.;*
  - *The contribution of the mentoring to the development of her/her research and project management skills;*
  - *The contribution of the training planned within the frame of the project towards to the development of her/his research and project management skills.*
- *In case there is a PhD on the project, please describe any relevant supervision experience (incl. supervision training) of the CORE junior PI*

5. Project Participants and Management

5.1 Description of the consortium, communication and decision-making

For each participating research group in the proposed project, provide a brief description of the group, the responsibilities within the proposed project, as well as the previous experiences qualifying participants for the task at hand. Describe how the participants collectively constitute a consortium capable of achieving the project objectives, amongst others, by highlighting the complementarities between them. Explain how communication (channels, methods etc.) between all partners will be organised and how decisions will be taken (especially for projects with large consortiums). In addition, describe how the compatibility of data, and the accessibility of results for all members of the consortium will be ensured. (CVs of members of the consortium (main researchers only) are to be provided in the attachment of section 6.3 of the 'Online Form').
If new staff needs to be hired for the project, explain how you will make sure that these people are in place at the start of the project (or of their planned starting date). In addition, provide a short description of the profile of the staff to be hired.

5.2 Summaries (term sheets) of the Consortium agreement and/or the Intellectual Property Rights (IPR) agreement
It should summarise the essential terms of the required agreement (see chapter 1.8 'Consortium agreement and Intellectual Property Rights (IPR) management' for more details). Please indicate how the authorship of the publications and the management and access to the data sets are settled amongst the project partners. Note that each PhD within a CORE project is expected to publish at least one peer-reviewed paper. In projects with a potentially commercial orientation, the possibility of using the IPR through patenting or others should be envisaged. Applicants are advised to contact the administration of their institution and the FNR if they have further questions to this issue.

5.3 Track record of PI and applicant team (competence in the domain, publications, past fundings as PI)
Explain the competence of the PI and the applicant team in the proposed research domain by including supporting information regarding publications, past and running funding in Luxembourg or abroad

6. Comments on Resubmission

*The FNR only allows **one** resubmission for each application. Projects which have been submitted to FNR in previous calls and have not been retained for funding may be resubmitted **once** and only after the project has undergone substantial revision. It is absolutely necessary to take the previous reviews and panel conclusion into consideration and to summarise the changes/modifications in comparison to the former application. The FNR reserves the right to exclude projects which have not undergone substantial changes in the resubmitted application. Please note that disguised resubmissions can be rejected as well.*

Section 6.2. Bibliography (max. 3 pages)

Please indicate the relevant papers concerning your research question and methodology, as well as the main literature. Please highlight the most relevant 20 publications (by printing them in bold). Wherever appropriate, cite primary literature in which observations are first reported rather than reviews in order to give credit where credit is due.
Each reference must include the names of all authors (at least the first 3 authors), the article and journal title, book title, volume number, page numbers, and year of publication. If the document is available electronically, the website address should be mentioned, too.

Section 6.3. CV of the PI

Please upload a Recent Curriculum Vitae (in English) of the PI into the system *(max. 3 pages/CV in one PDF File). There is no template provided*.

The following information has to be included:

1. *The number and outcome of supervised doctoral dissertations as supervisor.*
2. *List of 10 most recent accepted publications or pre-prints (pre-prints must be freely available from a pre-print server and should be properly referenced via a link to the pre-print or DOI). Please do not use journal impact factors. Please indicate whether the papers are published Open Access or not.*
3. *List of 5 most important publications. Please do not use journal impact factors. Please indicate whether the papers are published Open Access or not.*
4. *List of other research outputs (e.g. sharing of data, reagents, software, contributions to consortia)*
5. *List of most relevant ongoing and completed projects as principal investigator (or main scientific contact) including funding source and amount.*
6. *List of own most relevant patents, if applicable.*

Section 6.4. CVs of other main researchers

Please upload a Recent Curriculum Vitae in English of the Main Researchers in the project into the system (as listed in table 3.3 of the online application form 'main researchers'; do not include CVs from support staff) *(max. 3 pages/CV in one PDF File). There is no template provided*.

The following information has to be included:

1. *The number and output of supervised doctoral dissertations as supervisor.*
2. *List of 10 most recent accepted publications or pre-prints of each of the main researchers (pre-prints must be freely available from a pre-print server and should be properly referenced via a link to the pre-print or DOI). Please do not use journal impact factors. Please indicate whether the papers are published Open Access or not.*
3. *List of other research outputs (e.g. sharing of data, reagents, software, contributions to consortia) of each of the main researchers.*
4. *List of most relevant ongoing and completed projects as principal investigator (or main scientific contact) including funding source of each of the main researchers.*
5. *List of own most relevant patents.*

If the name of the researchers is not known at the time of the submission, please include a short description of their profiles (max 1 page/profile).

Section 6.5. Project Plan (gantt chart)

Please upload the 'Project Plan' into the system.

The 'Project Plan' gives an overview of the project planning and presents graphically the different implementation steps described in section 2. Project Plan of the Project Description Form. The graphical representation has to be coherent with the text description of the workplan and permit monitoring of the progress during the implementation of the project.

The following elements have to be included in the graphical representation:

- *interdependencies between implementation steps;*
- *timing for the different steps;*
- *personnel involved in each step;*
- *deliverables for each step.*

For a suggestion on how the workplan could be presented, please consult Annex 2.2. and the FNR's webpage where you find a template for a Gantt chart representation.

Section 6.6. International Co-Funding (if applicable)

In the case that a co-funding of a German, Swiss, Austrian, Polish or Portuguese partner is required by the DFG, SNF, FWF, NCBR or FCT, please download the additional and country specific documents which are necessary for the partner funding agency.

Please complete all necessary forms, convert them to PDF and merge them into one single PDF file and upload them. For more information please consult the website on international cooperation.

Section 6.7. Signed Support Letter Mentor (if applicable)

For CORE Junior projects: a signed support letter by the mentor abroad has to be attached (no template provided). **A non-signed letter is subject to rejection of the application.**

Section 6.8. Declaration

Tick box 'We/I hereby declare that this proposal conforms to the call guidelines, especially the FNR requirements for PIs and Supervisors, and the 'FNR Research Integrity Guidelines'.

To validate this section and jump to the next one, click the button 'Save draft and continue to next section'!

If you have finished filling in the different sections of your 'Online Application Form', please click on the button named '**Form fully completed and ready for PDF generation**'. You may as well choose to modify the entered data by clicking on the button named 'Enter more details now'.

Ensure that you correctly filled all sections of the application form. The system partially warns you of mandatory sections but put a special attention on the completeness of documents that need to be uploaded.

The last task of Step 1 is to generate a PDF document which contains all the information of your 'Online Application Form'. Click on the hyperlink named '**Generate Full Proposal PDF**'. The PDF document will appear in the documents list on the right side of the screen. If the document named 'Generated PDF' does not appear in the list after a few minutes, please click on the refresh button of your browser.

ANNEX 2 Workplan and Work Packages

Annex 2.1 Description of Work Packages

One possibility of structuring a project is by defining different work packages, as in the example provided below. While the use of the work package structure below is not required, **having a good structure allowing monitoring of the project is mandatory** for all CORE applications.

A template of the work package structure below can be downloaded from the FNR's webpage.

Work Packages (WPs) and tasks (1 page/WP)			
Present the work packages (consistent with the Gantt chart in the 'Project Plan') in detail, using the table provided below. Use one table per work package (please copy the table as many times as you need it). The explanations included in the table have to be sufficient for justifying the proposed effort and allow for progress monitoring.			
WP number	**1**		
WP title			
WP leader	*Only 1 person*		
Start date		End date	
Objective			
Provide a general description of the work to be undertaken (including methods to be applied where appropriate), identify the partners involved and specify their contributions.			
Tasks			
Break the work package down into major tasks. Explain the sequence of tasks and explain interdependencies between tasks where necessary.			
Interdependence with other work packages			
Provide a narrative description or/and a graphical presentation of interdependencies between the present work package with other work packages.			
Deliverables and milestones			
A deliverable represents a verifiable output of the work package. Normally, each work package will produce one or more deliverables during its lifetime. *List, specify and quantify deliverables (e.g. prototype, survey results). State the project month of delivery (measured in months from the first month the project started).* *Milestones represent a scheduled event signifying the completion of a major deliverable or a set of related deliverables (e.g. prototype tested, patient cohort established). State the project month of delivery (measured in months from the first month the project started).*			
Human resources			
Name of researcher	Partner	Qualification level	Person*months
		PhD, Professor etc.	

Annex 2.2 Graphical Overview of the Project Plan (Gantt chart)

The 'Gantt Chart' gives an overview of the project planning and presents graphically the different implementation steps described in section 2 (Project Plan) of the 'Project Description Form'. The graphical representation has to be coherent with the text description of the workplan description as it will be used for monitoring the progress of the project (if this is accepted for funding by the FNR).

This is a suggestion on how a workplan could be structured. Please note that it is possible to structure the workplan differently as long as it is suited for allowing the proper monitoring of the project. The Excel workbook named 'CORE Project Plan (Gantt Chart)' containing one single worksheet can be downloaded from the FNR's webpage if this structure is to be used.

The suggested form is self-explaining and contains several examples. The Excel workbook is write-protected and only white cells can be filled in.

The first part of the form contains the following mandatory fields:

- Project Acronym
- PI Name
- Coordinating Institution
- Start Date
- End Date
- Reference Date (As Of) *Insert the date of your submission*
- Instance (Phase) *Select Submission*

The second part of the form lists the Work Packages (WPs) and planned outputs and presents them in time. It contains the following fields:

- Work Package *WP number*
- Related tasks *Task number*
- Name of Work Packages and related tasks *Should be short enough to enter the available space. Extensive descriptions of the WPs and tasks are already in the 'Full Proposal Form'.*
- Planned start and end date *For each WP and task enter the relevant dates in the format 'dd/mm/yy' or 'dd.mm.dd'. The Excel input and output formats depend on your system and MS office regional settings.*
- Actual start and end date *Used later for annual and final reports*
- Gantt Chart *Will be displayed when you insert the dates.*
- Deliverables *Just list them without description*
- Milestones *Just list them without description*
- Status *Select 'Not started' in the drop down list*
- WP or Task Leader *One single name per WP and task*

The worksheet must contain all work packages and tasks you describe in the Project Description Form. In any case, mention for any output the number(s) of the work packages leading to its completion.

If necessary, you may add additional tasks and work packages. Please refer to the procedure for adding additional WP2 described under the help flag in row 96.