

National Research Programme for Environmental and Occupational Health "Radiofrequencies and Health" 2022 Call for Projects

Deadline for submitting letters of intent: 18 January 2022

Deadline for submitting complete proposals: 17 May 2022

Please note that in the case of any discrepancy between the English and French versions of this document, the French version shall prevail.

I. OVERVIEW OF THE PROGRAMME

The French National Research Programme for Environmental and Occupational Health (PNR EST) is financed by ANSES with funds from the Ministries of the Environment, Agriculture and Labour, and also involves several co-funding partners, including ADEME and ITMO Cancer from the AVIESAN Alliance as part of the Cancer Plan.

The National Research Programme for Environmental and Occupational Health (PNR EST) promotes knowledge production in support of public policymaking for environmental and occupational health and safety, for the benefit of public health, and disseminates this knowledge to stakeholders. This gives the programme a leading role in fostering interactions within the scientific community, which helps ANSES mobilise researchers for its collective expert assessments of health risks.

This programme therefore organises calls for research projects. In this context, two calls are being issued in late 2021: the present call, dedicated to the theme "Radiofrequencies and health", and the second, which covers a wide area (excluding radiofrequencies).

II. OVERVIEW OF THE CALL FOR PROJECTS

This call for research projects (CRP) on "Radiofrequencies and health" was issued following the ANSES expert appraisals on the same subject published since October 2013¹. The CRP is aiming to create new knowledge, especially to fill gaps or remove doubts that have been highlighted in ANSES's expert appraisals and opinions. It also aims to expand the size of the research community involved in the field of

¹ <https://www.anses.fr/en/content/radiofrequency-radiation-mobile-telephones-and-wireless-technologies>

radiofrequencies and health. During the selection process, a strong emphasis will be placed on the quality of the projects' methodologies², insofar as they are intended to be used in future assessments. Particular interest is paid to research topics whose results can be used rapidly by public policymakers.

III. SCOPE OF THE CALL FOR PROJECTS

The call for projects deals mainly with the assessment and analysis of risks of radiofrequencies to human health, in the general population or in the workplace, and for ecosystems. The topics covered by this CRP are provided in Annex 1 as a list of research questions.

IV. PROPOSAL CHARACTERISTICS

Proposals shall be designed as research projects with a clearly identified goal. This excludes projects that may only appear as contributions to larger research programmes and projects without specific deliverables identified under the terms of the work.

These research projects may be conducted by a single team or a consortium involving several partners. Each team shall have a clearly identified scientific leader. The project shall be presented as a single proposal, with its leader being the scientist in charge of one of the teams. Funding is requested to complete the study or project. The rules are set out in Annex 2.

The research projects submitted must comply with the principles of scientific integrity and ethics of the French Charter of Ethics for Research Professions.

Two types of research projects are expected in 2022:

Feasibility studies:

Their purpose is to explore an innovative approach whose feasibility has not yet been established.

- Funding shall not exceed **€50,000**.
- The maximum duration for such a study is **two years**.

² *In the October 2013 report, page 341 mentions "ensure the methodological quality of the experimental protocols and the rigour of the analysis and interpretation of data from in vitro and in vivo studies by research teams both on the RF exposure part (exposure characterisation, signal shape, justification for the choice of the exposure type, etc.) and on the part relating to biological experimentation (blind experiment, appropriate positive and negative controls, allowing the interpretation of the amplitude of changes related to RF exposure, identification of false positives, repetition of experiments, sufficient statistical power, etc.)."*

Complete projects:

These are research projects which rely on an established methodological approach so that there is a reasonable level of assurance that the objectives will be met.

- Financial support will lie **between €40,000 and €200,000**. It can exceed these limits under exceptional circumstances if this is required by the project's nature, and provided the request is justified. This should be justified, for instance, with projects on radiofrequencies involving large consortia set up to tackle all issues from engineering to biology. In all cases the budget request may not exceed €300,000.
- The duration for a complete project will be between **two and three years**.

V. SELECTION PROCEDURE

The selection procedure relies on two committees:

- The research programme's scientific committee (CSPR). It is made up of renowned researchers, who will assess the scientific value of the submitted projects.
- The research programme's steering committee (COPR). It is made up of ministries involved in the scope covered by the call. The steering committee chooses the projects to be funded from the list drawn up by the scientific committee.

The selection process will be divided into two stages as defined below:

- an initial selection on the basis of letters of intent,
- a second selection based on complete applications, from among the shortlisted letters of intent.

The submission timetable and terms are described in Section IX.

Step 1: Selection from among the letters of intent

Letters of intent that do not meet the eligibility criteria defined in Section VI will not be evaluated. The scientific committee will assess the letters of intent, taking into account the selection criteria defined in Section VII. Members of the steering committee may also be consulted regarding criterion 3 and the alignment of the project with their priorities. Special attention should be paid to the quality of the letters of intent, which need to contain enough information, in a limited amount of space, to allow the scientific committee to evaluate the relevance of the proposal.

Only proposals whose letters of intent are shortlisted will be eligible to submit a complete application.

Step 2: Selection from among the complete applications

To be eligible, complete proposals must meet all of the eligibility criteria described in Section VI. Applications that do not meet all of these criteria will not be evaluated. Eligible projects will then go through the following selection process:

1. Collective scientific assessment of the projects by the scientific committee: on the basis of the opinions of at least two independent experts per project, according to the criteria described in Section VII. A list of projects will then be submitted to the steering committee.
2. Collective opinion of the steering committee on the projects shortlisted by the scientific committee, according to the criteria described in Section VII. This collective opinion also takes into account the available funds and priorities of funding bodies. The steering committee can also provide advice on the appropriateness of the requested funds with regard to the planned tasks. Under exceptional circumstances, it may recommend project modifications or even consolidation to incorporate several approaches or disciplines likely to improve the project's overall quality and relevance in relation to the programme's objectives.
3. The final decision to support a project is made by the funding bodies. The list of selected projects and the funding bodies' identities is published at the end of the selection process on the ANSES website.

VI. ELIGIBILITY CRITERIA

A project's eligibility will be examined at both selection stages, firstly through the letter of intent and secondly through the complete application, on the basis of the information that is available at each stage. Research projects must meet the same conditions at each stage:

Proposal characteristics

1. The projects must fall within the research domain covered by the call as defined in Section III.
2. The proposals' characteristics must be compatible with those listed in Section IV.

3. The projects must not contain actions that have already been funded under another call for projects. If there is any ambiguity, project managers should describe how any parts of the project interact with other sources of funding.

Conditions regarding the participating teams

1. The partnership must be clearly identified at the letter of intent stage.
2. This call for projects is open to all research teams, irrespective of the institution to which they belong³ (higher education and research establishments, research organisations, other public establishments with a research mission, technical centres, private establishments with R&D activity, etc.). Partners other than research teams are welcome insofar as their added value in the project has been clearly established.
3. The project must involve one French academic partner (higher education and research establishments, research organisations, other public establishments with a research mission, private healthcare establishments of collective interest, foundations and associations participating in research of interest and recognised as being of public utility or acting within the framework of public policymaking).
4. The call for research projects is open to foreign teams or to teams from international organisations. To facilitate foreign partnerships and assessment of projects, the CRP's text is available in English on the ANSES website.
5. A scientific committee member cannot hold any management role in a project (scientific leader of any team involved in the research project).

Administrative conditions

1. Letters of intent and complete applications **must** be submitted in accordance with the procedures listed in Section IX. They must contain all of the requested information and be submitted by the deadline.
2. The project must be authorised by the institutional leader of the coordinating research team and signed by the manager of each partner team.

³ Regarding the eligibility of ANSES teams, refer to the recommendation of its Ethics Committee <https://www.anses.fr/fr/system/files/DEON-Ft-2013003.pdf>

VII. CRITERIA FOR THE SCIENTIFIC ASSESSMENT OF PROJECTS

A project will be examined at both selection stages, through a letter of intent and then a complete application, on the basis of the information that is available at each stage. The selection criteria are as follows:

Letter of intent stage

Letters of intent are reviewed according to the following criteria:

- 1) Scientific significance of the subject for the topic of radiofrequencies and health in the general population or at work. Impact on French public policies.
- 2) Scientific novelty: proposals shall be justified with regard to research undertaken at French, European and international levels. When the aim of the project is to reproduce a study, originality will be assessed on the method used to maximise the quality of the results of this second study.
- 3) Connection to the research questions. The considerations mentioned in the "Research questions" annex will play an important role in the prioritisation of projects, particularly by the steering committee.
- 4) Methodological quality and scientific feasibility: the approaches must be detailed and the methods described to enable the project's feasibility to be evaluated, particularly at the complete application stage.

Complete application stage

Projects are assessed based on the following criteria:

- 1) Scientific significance of the subject for the topic of radiofrequencies and health in the general population or at work. Impact on French public policies.
- 2) Scientific novelty: proposals shall be justified with regard to research undertaken at French, European and international levels. When the aim of the project is to reproduce a study, originality will be assessed on the method used to maximise the quality of the results of this second study.
- 3) Connection to the research questions. The considerations mentioned in the "Research questions" annex will play an important role in the prioritisation of projects, particularly by the steering committee.
- 4) Methodological quality and scientific feasibility, particularly the relevance of the choice of methods: the approaches must be detailed and the methods described to enable the project's feasibility to be evaluated, particularly at the complete application stage.
- 5) Organisational and partnership excellence (the project must include a provisional project timetable).

- 6) Consortium excellence. Scientific output of the applicants. Distribution of activities among teams: the skills necessary for the project must be clearly presented.
- 7) Appropriateness of the project length and allocated resources (financial request, human investments). Quality of the supervision of non-permanent staff.
- 8) For projects that could be a subject of scientific controversy, measures adopted to ensure the quality of the results (e.g. traceability of data, information that could be used to reproduce experiments or analyse data, inter-partner trials, multiple points of view held by partners, involvement of stakeholders in methodological design, participatory sciences, etc.).

VIII. AGREEMENT

The funding terms for the selected projects will be specified in the agreement between ANSES and a "coordinator" establishment. This establishment will in most cases be the one to which the project manager's team belongs. The main rules are listed in Annex 2. In exchange for financial support, the research teams shall:

- Commit to participate in actions to promote the results obtained during and/or at the end of the project (publications in peer-reviewed journals, presentations at conferences organised by ANSES, contribution to summary reports, etc.),
- For complete projects, supply a mid-term report and, in all cases, at the end of the project, a final report and a popular scientific summary that can be used by ANSES in its missions.
- Mention the support provided by the National Research Programme for Environmental and Occupational Health on appropriate occasions, in particular in publications.

As part of the implementation of the joint declaration by the network of French funding agencies to promote open science, the coordinator and partners undertake, if they receive funding, to:

- Deposit the scientific publications (full text) resulting from the project funded under this call in an open archive, either directly in HAL or through a local institutional archive, under the conditions of Article 30 of the Digital Republic Act (Article L533-4 of the French Research Code)⁴
- **Provide a Data Management Plan (DMP) within six months of the start of the project**, according to the conditions set out in the research agreement and then provide an updated version of the DMP when the work has been completed.

⁴ In accordance with Article 30 of the Digital Republic Act (Article L533-4 of the French Research Code), by submitting to ANSES the final version of their manuscript accepted for publication, the authors have exercised their right to make it available free of charge in an open format, by digital means.

In addition, ANSES recommends giving priority to publication in native open access journals or books⁵.

Considerable importance is attached to the rigour with which the project manager leads the project, which means that the contractual commitments for the timing of deliverables should be fully respected.

IX. PROJECT SUBMISSION TERMS

Letters of intent must be submitted online by the project managers no later than **18 January 2022 at noon (12:00)**, French time. Projects shall be submitted using the [Research and Scientific Watch \(Recherche et Veille\) platform](#) available via the ANSES website. The platform will be operational in **mid-November 2021**.

Important: The project manager should carefully read the eligibility rules listed in this call for projects, including at the letters of intent stage.

All compulsory sections must be completed before the deadline. Incomplete applications will not be considered. Applicants are therefore advised to prepare in advance.

The letters of intent will then be evaluated and the project manager will be informed of the result ("authorised to submit a complete project or not").

For those whose letters of intent are shortlisted, complete applications must be submitted by the project managers. For the radiofrequencies topic, the text should preferably be written in English to allow evaluation on a broader scale. The application file should be transmitted:

- 1) Online, on the same platform, no later than **17 May 2022 at noon (12:00)**, French time. Acknowledgement of receipt of electronic applications will be automatically sent to the project manager.
- 2) Then through a certificate⁶ confirming receipt, which is issued by the platform after the application is submitted. This certificate should be returned by the project manager electronically, with all required signatures, no later than **16 June 2022 at midnight (00:00)**.

⁵ The DOAJ website (<https://doaj.org/>) lists scientific journals whose articles are peer-reviewed and open access. The DOAB site (<https://www.doabooks.org/>) does the same for monographs.

⁶ This certificate commits the partners to the fact that the establishments to which the project leader's team and the partner teams belong have been informed of submission of the project and have given their agreement.

Provisional key dates

November 2021	Opening of the call
Mid-November 2021	Opening of the platform for letters of intent
18 January 2022 at noon	Deadline for submitting letters of intent
March 2022	Project managers informed of the first selection results, based on the letters of intent
17 May 2022 at noon	Deadline for submitting complete applications
16 June 2022 at midnight	Deadline for returning certificates
September 2022	Project managers informed of the steering committee's results on final selection

X. CONFIDENTIALITY

Members of the research programme's scientific committee, as well as experts consulted for the scientific evaluation of projects, are subject to strict confidentiality regarding the content of the projects submitted to the call.

Funding bodies and state agencies serving on the programme steering committee are bound to strict confidentiality on the content of submitted projects. For mapping purposes or to manage multiple funding requests, however, they may share information on the laboratories or organisations active in the research topics covered by this call for projects.

For projects not selected for funding, the files will remain confidential.

For projects selected for funding, the research content will be kept confidential. However, ANSES will publish the summary of each project as submitted to this call for projects, along with the names of the partners. In addition, each funding organisation may use this work for its internal needs according to the terms defined in the agreement signed with the project manager. Finally, the scientific reports issued on completion of the work will be submitted to the reviewers, who will therefore have access to their content.

For all questions or requests for administrative or scientific information, please contact the CRP unit:

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ANNEX 1: Research questions

These questions are focused on the effects of radiofrequencies, defined in this call for projects as frequencies in the range from 8.3 kHz⁷ to 300 GHz. In the case of projects on electromagnetic hypersensitivity, considering a broader frequency range (extended to the lower frequencies) can be useful to understanding the phenomenon and is thus authorised. The effects of electromagnetic fields can be studied for these fields alone or in combination with a cofactor.

In addition to the signals corresponding to current exposure, project managers are invited to address new sources of exposure and the associated signals (such as connected objects), and the effect of various modulations used for mobile communication.

For these projects, the selection criterion "methodological quality and scientific feasibility" of Section VII includes: characterisation of the exposure of target populations, implemented exposure protocols (frequency, duration, presence of control groups for a possible thermal effect, etc.) or exposure situations for observational studies (e.g. operator data), in particular the electromagnetic sources, applicators or antennas used, the exposure environment (space, Faraday cage, etc.) and the means for measuring the exposure (sensor type, bandwidth, frequency, etc.).

Research on mechanisms of action of radiofrequencies at the cellular level

1. *In vitro*, *in vivo* or clinical studies on the mechanisms of action of radiofrequencies on living organisms at the cellular and molecular levels, taking into account changes in frequency use linked to new uses and new communication technologies. Studies on newly identified (e.g. for 5G) and little-studied (especially 3.5 GHz and 26 GHz and beyond) frequency bands are a priority.
2. Studies carried out under the same experimental conditions, at several frequencies, to assess the possibility of frequency-band-dependent effects.
3. Studies carried out under the same experimental conditions, using different types of temporal signal modulation.
4. In-depth studies with the aim of linking the mechanisms observed on artificial membranes to the observations made on cells.

⁷ Lower limit of the "radiofrequency" range defined by the International Telecommunication Union.

Research on the physiological or health effects of radiofrequencies

This research will have to take into account the evolution of the electromagnetic environment: deployment of connected objects, 5G deployment (especially for the 3.5 GHz and 26 GHz frequency bands and beyond) and the associated technologies, changes in uses and therefore of exposure situations, etc.

1. *In vivo* or clinical studies on possible effects of exposure to radiofrequencies, in particular:
 - on circadian rhythms and sleep (relying for humans on objective criteria such as the ones defined by the American Academy of Sleep Medicine);
 - on the immune system;
 - on metabolism (metabolomics analysis);
 - on fertility, reproduction and development over several generations of animals;
 - on the autonomic nervous system;
 - on functional and brain development, according to age (*in utero*, juvenile, adult and elderly), by undertaking longitudinal studies in animals to identify possible sensitivity/vulnerability time windows;
 - on cognitive function (memory, reasoning, executive functions and attention) in animals and humans: by conducting challenge studies with adults and children at different ages of development, in situations with or without exposure to radiofrequencies, using properly calibrated psychometric instruments, brain imaging techniques and/or records of brain electrical activity (EEG) (including evoked potentials) in basal conditions or stimulation (cognitive tasks).
 - on skin flora, for frequencies above 10 GHz.
2. Epidemiological studies⁸ on possible effects of RF energy on health, including cancer, fertility disorders, neurodegenerative diseases, circadian rhythm disorders and long-term effects of physiological changes in sleep. In particular, studies involving populations that are more vulnerable to radiofrequencies

⁸ Particular care will be taken to consider confounding factors in particular connected with the use of radio equipment.

(epileptic patients, children, etc.) or less well documented (pregnant women, the elderly) or particularly subject to exposure (workers).

3. Study of the effects of co-exposure to radiofrequencies, approximating actual exposure situations and enabling analysis of the combined effects of RF and other environmental factors (physical or chemical) on the body.
4. Study of the effects of electromagnetic fields on living organisms in frequency bands that have not yet been widely studied, particularly above 2.5 GHz, associated in particular with the deployment of 5G technology and emerging uses concerning communicating objects.
5. Additional studies to assess the health and psychosocial impact of the use of mobile communication technologies by children, in particular addictive phenomena, sleep and learning disorders, etc.
6. Study of the effects of radiofrequencies on the environment (fauna), including animal behaviour.

Electromagnetic hypersensitivity⁹

1. Investigation of tools to characterise subjects declaring themselves "EHS", physiological markers, biological markers, specific genetic markers.
2. Investigation of mechanisms that could explain electromagnetic hypersensitivity (for instance production of neurotransmitters, study of cryptochromes, etc.).
3. Investigation of links between the characteristics of electromagnetic fields (frequency, strength, modulation, temporal shape of signals, etc.) and the symptoms experienced by persons declaring themselves "EHS" (challenge experiments that take into account, in particular, the diversity and evolution of the electromagnetic environment, continuous exposure measurements and collection of symptoms, etc.).
4. Investigations to explain the relationship between EHS and multiple chemical sensitivity, migraine, tinnitus, fibromyalgia, and medically unexplained syndromes more generally.
5. Investigation of vulnerability factors (for example comparative studies using control populations and populations with medically unexplained syndromes).
6. Research on the dynamics of the autonomic nervous system in EHS individuals

⁹ Or idiopathic environmental intolerance to electromagnetic fields.

(analysis of ortho/parasympathetic balance from heart-rate variability and other exploration techniques).

7. Research on the use, effectiveness and possible side effects of therapeutic measures (management of symptoms such as tinnitus, migraine) for subjects declaring themselves "EHS"; treatments used.
8. Investigation on metabolism and cerebral blood flow, the blood-brain barrier (using high-resolution imaging techniques) for people declaring themselves "EHS".
9. Research on the effects of an MRI test (tolerance) on individuals declaring themselves "EHS", compared with control subjects.
10. Sociological studies to understand the caregiver-patient relationship for people declaring themselves "EHS".
11. Sociological comparison of subjects declaring themselves "EHS" in different countries.

Characterisation of exposure

1. Research on exposure measurement protocols for the 3.5 GHz and 26 GHz frequency bands in particular, and for related technologies (5G, active antennas, small cells, etc.) and in realistic use situations.
2. Research on the specific nature of actual exposure of children and pregnant women to radiofrequencies when using radio devices (tablets, telephones, etc.).
3. Research on the characterisation of human exposure in the context of cumulative exposure: PLC, new communication technologies, connected objects, autonomous and connected transport, etc.

ANNEX 2: Chargeable expenses

I. ELIGIBLE EXPENSES

Chargeable expenses should correspond to actual expenditure and be strictly linked to the project's execution, exclusive of any profit margin. In particular, only expenses incurred between the start and the end of the project, as stipulated in the agreement, will be taken into account. It should be possible at any time to prove the genuine nature of the expenses incurred. Receipts and all documents justifying the expenditure incurred under the project shall be kept by the beneficiaries (coordinator or participating team) for four years and submitted to ANSES on requested.

Personnel expenses

The only expenses accepted are: wages of fixed-term contract personnel and professional fees, including social contributions and taxes on wages.

With the exception of public industrial and commercial entities, the personnel expenses taken into account in the amount of the financial contribution made by ANSES cannot, under any circumstances, involve the permanent personnel of public entities.

Overhead expenses and small-equipment expenses

The following expenses are accepted, including non-recoverable VAT:

- laboratory costs (procurement of products or consumables),
- office supplies,
- purchase of patents or licences,
- publication costs,
- travel expenses of permanent or temporary personnel assigned to the project, particularly for participation in ANSES communication and dissemination events,
- conference registration fees related to the project,
- outsourced work (photos, computing, etc.),
- maintenance of equipment purchased for the project,
- procurement of small equipment whose unit cost is less than €1,600 excl. tax,
- allowances for trainees.

Equipment expenses

Equipment expenses are regarded as expenses incurred for equipment whose unit value is greater than €1,600 excl. tax. ANSES will take into account:

- all or part of the cost of purchasing this equipment, if it is not reusable after the project's completion (which should generally be the case);
- the share of depreciation calculated pro rata to the period of use if the equipment is reusable after the project's completion, unless an exception is made by ANSES.

General management fees

Part of the general administrative fees linked to the project can count as expenses. These fees are limited to 4% of total expenses, unless an exception is made by ANSES on the express request of the recipient (coordinator or participating team), with justification.

Service provision

Regardless of their legal status, beneficiaries (coordinator or participating team) can contract work to or lease equipment from entities outside of the project. The cost of this work shall remain marginal in relation to the programme's total cost (less than 30% of this total cost), unless an exception is made by ANSES on the express request of the beneficiary, with justification. The costs of these services shall appear individually as overhead expenses.

ANSES does not enter into commitments with service providers, who therefore have no grounds upon which to make any claim to ANSES if the recipient (coordinator or participating team) of a grant fails to comply with its obligations. Services are provided exclusively for and under the supervision of the grant's recipient (coordinator or participating team). In accordance with the rules in force, the recipient (coordinator or participating team) must pay for services as they are delivered, irrespective of the date of the payment expected from ANSES.

Internal invoicing case:

These expenses must be related to services traceable in accounting, carried out by another entity (department) of the grant recipient (coordinator or participating team). The costs of these services must be identified analytically.

In addition, these services must be proportionate to their actual use for the purposes of the project and must not have been taken into account in the structural costs and/or management fees. They must be invoiced exclusive of any profit margin.

These expenses must comply with the eligibility rules described in this Annex.

II. NON-ELIGIBLE EXPENSES

The following expenses cannot be paid by ANSES:

- Financial fixed assets and routine expenses to replace equipment;
- Expenses related to marketing, sales and distribution fees;
- Expenses related to land and buildings.