



the booster programs



- › Booster program led by the **Health technologies (ITS) theme-based institute of Inserm**
- › In partnership with the following hospitals:  
AP-HP, Brest University Hospital, Hospices Civils de Lyon, Lille University Hospital, Marie-Lannelongue Hospital, Rennes University Hospital

## Surgical and interventional procedures of the future

booster program

Deadline for  
electronic submission:

May 22<sup>nd</sup>, 2023

## GENERAL OVERVIEW OF THE SURGICAL AND INTERVENTIONAL PROCEDURES OF THE FUTURE BOOSTER PROGRAM

In the 21<sup>st</sup> century, surgical and interventional procedure sites must undergo transformation to become therapeutic dispensing locations requiring an interventional technical act, involving new technologies and approaches, such as robotics, multimodal sensors, imaging, biotherapies, nano-technologies, high-throughput biology, or artificial intelligence. These sites, occupied by multiple complementary disciplines, will have to manage patients with more complex pathologies and be able to perform more complex technical procedures while being less invasive and more efficient. The challenge is to reconfigure existing surgical and interventional sites by integrating innovative technologies capable of capturing essential data for the safety and quality of procedures, quickly transferring them to patients, optimizing the efficiency of procedures, maintaining vital functions of patients, while being accessible to as many people as possible.

The “future” of surgery must also address the challenges of “global health”. *The Lancet* Commission report on quantifying access to surgery globally, key indicators of the surgical system, and a projection of the future of surgery in 2030 shows that five billion people lack access to surgical and anesthesia care. *The Lancet* Commission calls for a focus on:

- Universal access to surgical and interventional procedures
- Gynecology/obstetrics, orthopedics, and laparotomy
- Cancer surgery, which will be a priority in 2028.

Therefore, research on the future of surgical and interventional procedures will have to confront **three challenges**:

1. Providing access to surgical or interventional care for every citizen in the world
  - Deploy a strategy to establish surgery/intervention services in the largest number of hospitals to meet 80% of needs
  - Explore ways to make interventional procedures accessible to as many patients as possible by leveraging new technologies (e.g. remote angioplasty performed by a physician with a nurse inserting the catheters)
  - Make these new technologies financially accessible to promote their wide adoption
2. Addressing the technological challenges of surgical/interventional procedures
  - Stimulate technological innovation of medical devices, digital solutions for decision-making support, and in connection with innovative therapies and medications
  - Propose innovative concepts for surgical or interventional organization and practice, integrating multiple technological innovations
  - Ensure intelligent and effective collaboration between multidisciplinary operating room professionals and technologies
  - Design technological and methodological innovations to accelerate and improve training
3. Fully integrating surgical/interventional procedures into patient care
  - Share the benefits/risks of technological advances with all professionals and work with them to develop multidisciplinary care algorithms
  - Evaluate the benefits of combining medications, surgical procedures, and other procedures
  - Involve patients/families/patient representatives in defining the most relevant goals in a consensus-based approach.

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## GOALS OF THE SURGICAL AND INTERVENTIONAL PROCEDURES OF THE FUTURE BOOSTER PROGRAM

### Overall goals

This program aims to support projects from Inserm translational research structures related to surgical and/or interventional procedures, with the goal of structuring this research as closely as possible to its application site. The new technological and methodological solutions developed should meet the requirements of precision, quality, and safety, while being easily transferable within medical structures and at the patient's bedside. Thus, the use of easily integrable and accessible technologies is a crucial point. The structuring of a collaborative network for surgical research will also be a key point in the success of these ambitious projects.

The booster program Surgical and interventional procedures of the future will be implemented in partnership with hospitals highly involved in this field: AP-HP, Hospices Civils de Lyon, Marie-Lannelongue Hospital, Lille University Hospital, Rennes University Hospital, and Brest University Hospital (hereinafter "Hospital partners").

### Specific goals

They are as follows:

- **WORK PACKAGE 1: STRUCTURE AND ORGANIZE CARE AND RESEARCH IN THE OPERATING ROOM**
- **WORK PACKAGE 2: DEVELOPMENT OF TECHNOLOGICAL SOLUTIONS FOR MINIMALLY-INVASIVE MEDICINE**
- **WORK PACKAGE 3: EVALUATION OF EFFICIENCY AND QUALITY OF SURGICAL CARE**

Each of these work packages requires training adapted to the new technologies and methodologies put in place. Improving the training processes is therefore an important complementary challenge, as it is a long, demanding, and fundamental process for integrating new technologies or innovative practices into a process of improving care. Expanding surgical and interventional practices to a wider population will be contingent on the training of the largest number of healthcare professionals.

## MAIN PERSPECTIVES OF THE SURGICAL AND INTERVENTIONAL PROCEDURES OF THE FUTURE BOOSTER PROGRAM

- Innovative technological solutions for surgical, interventional procedures, anesthesia, and resuscitation, and their physical and functional integration within the operating room
- The design of adaptive methods for scientific monitoring and routine evaluation of surgical innovations
- The implementation of evaluative decision support systems to ensure patient safety and care throughout their journey within and around the operating room
- The development of immersive educational strategies based on virtual and/or real-life scenarios for healthcare professionals, conducive to their formative evaluation and constructed by learning from the data collected from their practice
- The creation of virtual patients and digital twins useful for team training, based on available data reproducing the operating room environment and the surgical procedures to be performed

- › The emergence of prototypes rethinking the physical and functional architecture of the operating room with improved ergonomics and organization to optimize the performance and comfort of operators and the team
- › The physical integration of research within and around the operating room (technical control rooms, video control, anatomopathological and molecular investigations, data collection, etc.), combining translational approaches, cohort building, and work on existing data
- › Daily interaction within the operating room between healthcare professionals responsible for patients and researchers in collaboration with laboratories and industries to improve the organization of patient care and scientific outcomes
- › Continued efforts towards digitalization of the operating room to facilitate communication (within teams and externally with professionals involved in patient care) and organization through the creation of virtual operating rooms by scripting the environment based on available data
- › The creation of an integrative and systemic database on surgical and anesthetic care at the national level, from interoperable data warehouses, allowing for quality control and efficiency of patient care provided using relevant and valid indicators
- › The implementation of experiments for the exhaustive acquisition of continuous perioperative data flow (information systems, audio-video recordings, sensors, etc.) to monitor, analyze, and understand the multi-parametric complexity of surgery: from surgical procedures to teamwork, including physiological and psychological parameters of patients and professionals
- › The validation of metrics and interpretation methods for the systematic measurement of the procedure performed, its clinical outcome, and the experience of patients and healthcare professionals
- › The development of surgical solutions to optimize precision, safety, and quality of procedures while optimizing necessary resources (data, energy, materials, etc.)

## **WORK PACKAGE 1: STRUCTURE AND ORGANIZE CARE AND RESEARCH IN THE OPERATING ROOM**

The main objective of this work package is to optimize the performance of surgical and/or invasive medicine by opening up new perspectives with the integration of numerous technological developments such as in the fields of robotics, imaging, biotherapies, high-throughput biology, or artificial intelligence.

These perspectives will involve more rigorous management of necessary resources with the aim of achieving the required performance while optimizing these resources (data, consumption, waste, etc.) through the integration of more respectful algorithmic, robotic, biological solutions (frugal AI, etc.). The integration of these new technologies, focused on the patient within the complex and specific environment of the operating room, is a major challenge for the next decade.

This technological transformation will have significant repercussions on the conditions and organization of work within increasingly multi-professional teams.

Thus, human and organizational factors will play a major role in optimizing the evolution of surgical practices and interventional procedures but also in promoting exchanges and the emergence of innovative projects. In addition to its primary mission of care, the operating room must also be a conducive place for the training of healthcare professionals and the management of interdisciplinary research projects.



## Scientific questions and challenges

Eight conceptual, methodological, or technological challenges have been identified:

- A.** The physical and functional integration within the operating room of new technologies that can optimize the performance of surgical and/or invasive medicine (endoscopy, robotics, informatics, teleoperation)
- B.** Taking into account the intra- and interpersonal human factors in technological integration within the operating room to ensure acceptability, efficiency, safety, and quality of work life
- C.** Real-time access during the intervention to all the information useful for precision invasive medicine (images, physiological signals, big data, AI, etc.)
- D.** The production and collection during the intervention, even in perioperative, of data and/or samples intended for translational research
- E.** The production and release within the operating room of innovative therapy drugs prepared punctually (MTI-PP), during the same intervention, or of combined MTIs (under the auspices of a pharmaceutical establishment)
- F.** The organization and optimization of flows and management of interactions within the multidisciplinary teams (healthcare professionals, research personnel, engineers, etc.)
- G.** The facilitation within the operating room of training and dissemination of innovations in surgical, interventional procedures or anesthesia, both through real-life situations and the use of simulation
- H.** The control of energy consumption and equipment, and the reduction of waste production (in line with the evolution of health and environmental standards).

## WORK PACKAGE 2: DEVELOPMENT OF TECHNOLOGICAL SOLUTIONS FOR MINIMALLY-INVASIVE MEDICINE

In recent decades, the paradigm of therapeutic interventions has evolved significantly, moving from a linear approach (Decision-Action-Control) to a continuous process of decision optimization based on the steady acquisition and processing of multimodal information. The goal of medical data processing is to provide operating room actors with integrated models for medical decision support that can be optimized in real-time. Decision-making thus becomes a permanent feature at the center of the care process, before, during, and after the therapeutic intervention.

In the context of intervention therapies, the quality of the medical service rendered depends on the optimal nature of medical decisions and the ability of healthcare professionals to implement them within a constrained spatiotemporal precision context (within a few millimeters or seconds).

The next technological challenges aim to effectively integrate new tools arising from instrumentation development (imaging, implants, robotics, simulators), biological approaches (molecular analysis, cellular/biotherapies), as well as data processing approaches including artificial intelligence (digital twins, augmented reality, human-machine interaction, dosimetry). The introduction of these new tools will be associated with a more rigorous management of necessary resources, in order to minimize their impacts while bringing the required precision, safety, and quality.

## Scientific questions and challenges

Four conceptual, methodological or technological challenges have been identified:

- A. Digital twins.** In the context of decision support, one of the challenges is to implement the digital twin for the delivery of treatment and the optimization of intervention strategy. This implementation is based on the coupling between the real environment, with observable data at different treatment phases (pre-, per-, post-operative), and the patient-specific virtual environment equipped with predictive modeling functions and numerical simulation. The goal here is to consider a virtual treatment (for training, tele-expertise, or even remote interventions). This type of approach may pose integration difficulties in clinical decision support systems due to the calculation time, which can be addressed with AI approaches and model reduction methods.
- B. Multimodal intraoperative assistance systems (imaging, navigation, robotics, augmented reality).** Today, surgery has evolved significantly towards less invasive, robotic, endoscopic, laparoscopic, microscopic, and reconstructive procedures. Their integration will improve treatment efficiency with increased maintenance of postoperative patient function and quality of life. The development of the interventional environments of the future will involve: (i) innovative technologies based on virtual/mixed reality and their integration into the operating room to optimize surgical assistance with multimodal intraoperative visualization of the patient and the operating room (360° visualization, holography); (ii) precise, multimodal, multiparametric, and multi-scale interventional imaging; (iii) technologies for collecting and characterizing in vivo molecular data in real-time (e.g. spectroscopy, radiotracers, light or sound-based probes); (iv) new sensors/implants to optimize minimally invasive interventions and patient monitoring; (v) miniaturization of instruments and gain in both gesture precision (e.g. haptic systems, tool trajectory) and time (polyfunctional instruments) but also modules for fine control of injection parameters; and (vi) autonomous robotic systems for collecting data or performing minimally invasive and safe treatments for patients. All of these new tools must also respond to increasingly strong and binding societal developments, particularly regarding the optimal management of necessary resources (data, materials, etc.).
- C. New therapeutic approaches.** In order to integrate biotherapies (MTI-PP, combined MTIs, etc.) within a future operating room, it is essential to develop both the delivery pathways for biotherapeutic products in a biosafety-labeled operating room and innovative surgical devices for administration, personalized medical devices (e.g. tissue biofabrication), as well as new implantation techniques that allow for optimized monitoring.
- D. Securing the gesture.** The various instruments (imaging, navigation, etc.) in combination with data recording and their exploitation with AI approaches provide decision support but also generate an opaque space in which the professional needs to remain at the center of the action. It is essential to work at the interface between the machine and the team of professionals in the operating room. Making assistance systems “situationally aware” of the human environment in which they intervene and making this system understandable and controllable by the professional becomes essential to ensure secure gestures. The goal is to achieve intelligent collaboration between humans and machines, with learning and skills acquisition phases during surgical preparation, implementation, and evaluation stages. The integration of increasingly powerful simulators for professional training is also an essential element. Biophysical data coupled with the analysis of preclinical and clinical data (especially electrophysiological) can provide insights. For barrier D, emerging ultrasonic or time interference-based methods could provide solutions. For barrier E, the need is to do single cell transcriptomics to

define specific cellular promoters. For challenges **A, C, D and F**, the use of neuroimaging methods (structural MRI, functional MRI, diffusion MRI, NIRS, PET, multi-scale electrophysiology) is necessary.

### **WORK PACKAGE 3: EVALUATION OF EFFICIENCY AND QUALITY OF SURGICAL CARE**

Surgery is an activity that lends itself to efforts aimed at improving care to offer better quality and safer patient management. In industrialized countries, adverse events, which are a leading cause of mortality, represent a considerable cost to society. Preventing their occurrence, therefore, represents a significant health and economic challenge. To achieve this, the adoption of a systemic and integrative vision of surgery would limit the risks. This integrative vision requires exploring technical aspects, human and organizational factors related to the surgeon, the team, and the operating room environment, as well as effective management of postoperative care at the hospital and the patient's perioperative care trajectory in the city.

A scientific evaluation of the quality and efficiency of surgical care in real-time is essential to capture its complexity and improve results in an environment subject to intense transformations. Simultaneously, the development of anticipatory methods and the provision of real-time decision-making tools are necessary to secure the surgical procedure and better coordinate teamwork in the operating room. This involves improving collective training processes and individual (initial and ongoing) training through approaches combining simulation and experiential learning.

The main objectives pursued in this line of work are:

- › Catalyzing the implementation of systems for monitoring and continuous improvement of surgical outcomes
- › Identifying clinical, economic, and environmental performance indicators integrated into the perioperative care pathway, involving healthcare professionals and patients
- › Proposing a systemic approach to understanding and preparing for surgery to improve its execution and learning
- › Supporting the scientific evaluation of technological and organizational innovations in real or simulated settings.

#### **Scientific questions and challenges**

Four conceptual, methodological, or technological challenges have been identified:

- A.** The heterogeneity and quality of qualitative and quantitative data collected in the operating room and perioperatively, impacting the sharing and interoperability of databases and systems
- B.** The complexity of factors influencing surgical outcomes in the face of constant integration of innovations
- C.** The lack of methods and metrics for objectively evaluating changes implemented in routine practice (technological, organizational, human, environmental)
- D.** The absence of approaches allowing for optimal preparation of the surgical team for anticipated surgical procedures.



## PROGRAM OPERATION

### Governance and organization

**The booster program.** Inserm, by supporting collaborative projects that will profit on validated proofs of concept, funds research booster programs to accelerate the acquisition of knowledge, its transfer and value-creation. The booster programs of Inserm promote research of excellence and breakthroughs on priority areas, in European positioning, and in obtaining additional funding.

These programs are established by a scientific consortium and are organized around work packages. A scientific coordinator selected by Inserm (coordinating institution) and the director of the Health technologies theme-based institute of Inserm will lead the booster program, it will be guided by the heads of each work package (the head of the said work package is designated by and amongst the participants in each work package), and handled by a program manager. Each work package will involve a number of participants that may vary depending on the booster program.

**The scientific advisory board (SAB).** It is an international scientific expert committee responsible of: (a) selecting the participants based on the letters of intent (LOI), (b) producing recommendations for the direction of the booster program, (c) advising on the arrangement across the teams and work packages, (d) reviewing the final scientific program that will be submitted for approval by Inserm, (e) and evaluating the finalized booster program.

It is composed of four to six (4-6) international experts designated by the director of the Health technologies theme-based institute of Inserm, and the latter as an observer.

**The program scientific committee.** It is responsible for monitoring the progress of the scientific component of the program. It is composed of the consortium's scientific coordinator and the heads from each work package.

**The program steering committee.** It is responsible for managing the running of the program, including the budget, and approving proposals from the scientific committee for activities relating to the implementation of the overall program strategy. It is composed of the scientific coordinator, the director of the Inserm's theme-based institute Health technologies, one scientific representative for each Hospital partner member, and the director of the strategic program department of Inserm.

### Program implementation

**Preparation of the program.** Inserm's General Management identifies a scientific need or opportunity to launch a booster program on the proposal of Inserm's theme-based institutes. A scientific working group composed of national field experts<sup>1</sup> compiled a list of the relevant scientific issues to address, and to bring together complementary scientific and technical skills. Their discussions have culminated in the proposed booster program and work packages.

It is important to note that since the letters of intent to participate in the program will be evaluated by an international SAB, there will not be a conflict of interest if any of the national field experts apply to be part of the program.

<sup>1</sup> Composition of the working group: Jean-François Aubry, François Berger, Delphine Beziau-Gasnier, Robert Calazzo, Benjamin Chousterman, Béatrice Cochener, Jean-Luc Coll, Vincent Degos, Antoine Duclos, Hélène Eltchaninoff, Evelyne Ferrary, Isabelle Fournier, Sébastien Froelich, Étienne Gayat, Pascal Haigron, Anatole Harrois, Arnaud Huulme, Matthieu Jabaudon, Pierre Jannin, Nadia Jessel, Carine Karachi, Cyril Lafon, Alexandre Loupy, Emmanuel Mandonnet, Alexandre Mebazaa, Philippe Menasché, Olaf Mercier, Paul-Michel Mertes, Guillaume Morel, Patrick Nataf, Yann Nguyen, Rémy Nizard, Stéphane Palfi, François Pattou, Mathieu Pernot, Hervé Petite, Serge Picard, Marc Pocard, Éric Stindel, Jean-Sébastien Silvestre, Olivier Soubrane, Jérôme Szewczyk, Juliette Therasse, Dimitris Visvikis

**Set-Up of the consortium.** The program is established by a scientific consortium involving the participants and is organized around work packages. The set-up of the consortium will occur in two stages: an initial selection of participants based on letters of intent by the international SAB, followed by the generation of the preliminary scientific program thanks to a phase of co-construction of the scientific program and working work packages.

**Electronic submission of the letter of intent.** The letter of intent will specify the program's work area in which the proposal fits and will describe how the participant's skills and know-how can be used to overcome one or more of the conceptual and/or technological obstacles identified as high-priority scientific components of the booster program.

The proposals can originate from the following participants:

- A single researcher
- A research team
- A mini-consortium involving at least one research team working in collaboration with one or several research teams, a natural person or a legal body (public or private legal body) in order to carry out a work packages.

**Co-construction of the work packages.** The international SAB will select the participants based on the letters of intent, and based on the evaluation criteria described below. Importantly, in the case of a proposal by a “mini-consortium”, the SAB may decide to retain only some components of the mini-consortium but not all of the components.

Following the selection of letters of intent (LOI), and based on the proposals and recommendations of the SAB, the director of the strategic program department of Inserm, the director of Inserm's Health technologies theme-based institute and the representatives of the Hospital partners will invite the selected participants to group themselves by work packages and participate in drafting the preliminary scientific program. This program will be presented to the the director of the Health technologies theme-based institute of Inserm, the strategic program department of Inserm and the SAB in the form of a collaborative symposium.

After the symposium, and following the recommendations that came from it, the scientific coordinator will submit a final scientific program to the program steering committee and to the executive management of Inserm. It will detail the contribution of each participant, the objectives and expected outcomes, as well as a detailed 3-years funding plan and identified external funding sources.

**Follow-up of the program.** The program steering committee will organize an annual scientific meeting that will bring together the international SAB, the participants involved in the consortium, and the program steering committee. During this meeting, the participants will present and discuss the progress of the booster program, the next stages to tackle, and, if necessary, propose new directions for research.

## ELIGIBILITY AND EVALUATION CRITERIA FOR LETTERS OF INTENT

### Eligibility criteria

To be considered eligible to participate in the consortium, the electronic letter of intent must meet the following conditions:

- Respond to the objectives of this call for proposals and address at least one of the work packages described

- › If the project emanates from a single participant, the participant must be a researcher or tenured teacher-researcher working within a scientific team labelled by Inserm<sup>2</sup>
- › If the project emanates from a mini-consortium:
  - a) The mini-consortium coordinator must be a researcher or tenured teacher-researcher working within a team labelled by Inserm, and/or be employed by Inserm and acting as coordinator of the mini-consortium
  - b) The mini-consortium coordinator shall, for the needs of the program, provide written evidence of agreement of the involment in the mini-consortium from each of the components of the said mini-consortium
  - c) When the component is a researcher, the said component must hold a permanent research position in France
  - d) The mini-consortium shall involve at least one component labelled by Inserm
- › Each participant must specify:
  - a) Their time commitment to the program
  - b) The resources, particularly in terms of staff or equipment, that they intend to use as part of the booster programs, in agreement with heads from the partner institutions
- › Participants that have already initiated a joint reflection before submitting the letter of intent will be favored
- › A participant shall can be included into only one application.

### Evaluation criteria

After verifying eligibility, the letters of intent will be submitted for evaluation by the international SAB. Letters of intent not meeting the eligibility criteria will not be evaluated.

The evaluation criteria are as follows:

- › **Quality and originality of the proposed research**
  - Clarity of research objectives and hypotheses
  - Innovative and progress compared to the state of the art
- › **Know-how/skills**
  - Relevance of skills in relation to the objectives of the program
  - Ability to associate skills in a wide network
- › **Excellence of one or more teams**
  - International recognition
  - Skills of team leaders in their discipline
- › **Quality of the research environment**
  - Human resources mobilized in the program
  - Infrastructure available to carry out the program
- › **Innovation**
  - Innovative nature of the project in relation to the advancements in the field of research
- › **Expected outcomes**
  - Impact of the outcomes in terms of knowledge and solving technological challenges
  - Role of the project in enabling the consortium to participate in international networks

<sup>2</sup> A labelled team is a team approved by Inserm in accordance with its own process of evaluation.

## ELIGIBILITY CRITERIA FOR THE FINALIZED PROGRAM

To be considered eligible, the final scientific program project must meet the following conditions:

- The project must meet the goals of the booster program
- Each work package must associate at least two participants with complementary skills, at least one of the participants involved in the work package must be a team labelled by Inserm or be employed by Inserm
- The scientific coordinator must be significantly involved in the program.

## SURGICAL AND INTERVENTIONAL PROCEDURES OF THE FUTURE BOOSTER PROGRAM'S CALENDAR

Publication of the call for proposals	April 17 <sup>th</sup> 2023
Opening of the project submission website	April 17 <sup>th</sup> , 2023
Deadline for electronic submission of the letter of intent	May 22 <sup>nd</sup> , 2023
Meeting of the international SAB: selection of the letters of intent (in person or video conference)	June 22 <sup>nd</sup> , 2023
Discussion with institutional partners	June 22 <sup>nd</sup> , 2023
Seminar and presentation of the work packages	June 29 <sup>th</sup> , 2023
Co-construction of the program and work packages	June 29 <sup>th</sup> to September 29 <sup>th</sup> , 2023
Deadline for submission of the finalized project to the coordinating establishment	October 27 <sup>th</sup> , 2023
Discussions with all partners	November 27 <sup>th</sup> , 2023
Kick-off meeting	December 2023

## OPERATING CONDITIONS OF THE CONSORTIUM

### Coordination of the consortium

The coordinating institution of the consortium is Inserm.

### Duration of the program

Three (3) years.

## Scientific reports

The scientific coordinator of the consortium will provide scientific reports to the coordinating institution according to the charter of good practices of Inserm ([inserm.fr/en/our-research/good-practices-at-inserm](https://inserm.fr/en/our-research/good-practices-at-inserm)) in the following schedule:

<b>A brief progress report 6 months after the beginning of the project</b>
<b>A halfway through the booster program</b>
<b>A final report no later than 2 months after the end of the program</b>

The reports may lead Inserm to request additional information, suspend the program, or end financial support or request reimbursements notably if the program is not being run properly or funding is not being used properly.

## Responsibility of the scientific coordinator

The scientific coordinator must inform Inserm and its partners, if necessary, via the program steering committee of any substantial modification of the research program or difficulties hindering the program completion. The scientific coordinator must also participate actively in the program monitoring procedures organized by Inserm (presentation seminars, colloquia, etc.).

## Publications and communication

It is requested that for all communications and publications, including presentations at conferences, interviews or other events, proper acknowledgement is given to the booster program.

Without prejudice of any other statement, the publication or communication must include the following funding statement:

**“Financial support from Inserm to the booster program  
Surgical and interventional procedures of the future”**  
or **“Avec le soutien financier de l’Inserm dans le cadre du programme d’impulsion  
Procédures chirurgicales et interventionnelles du futur”**

These publications will be sent to Inserm for reference as soon as possible and at the latest five (5) days following publication, which enables the preparation of a possible institutional communication.

## Intellectual property

Subject to prior agreement regulating this topic, the rules of ownership, use and exploitation of the results of the program will be defined in an agreement concluded by and between the legal body involved in the consortium.

## Consortium agreement

The drafting of a consortium agreement is strongly recommended, in particular to manage the aspects of governance of the program, sharing data, the production of the program deliverables including the production of scientific reports, the organization of progress meetings, intellectual property, use and exploitation of results from the program. It becomes mandatory as soon as a legal body regulated by the French private law (or equivalent for a foreign legal body) is involved in the program.



## RULES FOR SUBMISSION

### Submission of the letter of intent

The submission of a proposal through the Eva3 Inserm website involves:

- › Registration on the Eva3 Inserm website providing the candidate's information (surname, first name and email); enabling the reception of a user code and password giving access to a secure Eva3 personal space
- › Online submission of the letter of intent on the Eva3 website.

### Electronic submission deadline

Deadline	May 22 <sup>nd</sup> , 2023
<p><b>It is strongly recommended not to wait until the closing deadline of the call to submit the letter of intent.</b></p>	

## PUBLICATION OF RESULTS

The list of participants selected from the letters of intent will be published on the Eva3 Inserm website. In addition, all the candidates will receive a notification of the result of their application.

## COMMITMENTS OF THE PARTICIPANTS

Each participant shall provide evidence or shall warrant that:

- › Its commitment within the program shall be consistent and compatible with its others commitments outside of the program prior and after the beginning of the program
- › Nothing prevents its involvement in the program (therefore, prior to the beginning of the program, each participant shall notably obtain the prior approval, when requested, of its employer and during the program each participant shall inform Inserm without delay of any situation that could prevent the participant from participating in the program).

When a participant shall not meet anymore one of the criteria described in this document, Inserm shall be entitled to exclude the said participant (excluding participant) of the program and, as the case may be, claim reimbursement of all or part of the fund provided by Inserm.

A participant may withdraw from the consortium for legitimate reasons, subject to giving three (3) months notice to Inserm by a registered letter with acknowledgment of receipt.

The excluding or departing participant undertakes to communicate to the other participants, at no charge and without delay, all the records and information needed to enable them to continue the program.

Similarly, the excluding or departing party undertakes not to impose its intellectual property rights to prevent or preclude the continuation of the program and, subject to third-party rights, undertakes to grant a license to use its background knowledge and possibly its proprietary results.●



## PARTNERS

AP-HP, Brest University Hospital, Hospices Civils de Lyon, Lille University Hospital, Marie-Lannelongue Hospital and Rennes University Hospital.



## CONTACT

In case of questions, you can contact:

- › For scientific and technical aspects:  
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April 2023

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Cover illustration: 3D digital illustration of a futuristic  
medical robot used to perform remote surgery on patients.  
Medical concept art featuring the future of health care devices  
used for remote procedures by AI.  
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Inserm is the only public research organization in France entirely dedicated to health. Our objective: to promote the health of all by advancing knowledge on living organisms and their diseases, and by developing innovation.

## Inserm's booster programs

At Inserm, our missions are to accelerate progress in knowledge, support integrated and multidisciplinary research, and ensure a continuum between fundamental and clinical research. With the knowledge that challenges and issues in health and biology are constantly changing, creating and opening new directions for innovation, Inserm has established scientific programs focused on high-priority research areas: booster programs. These programs aim to create a new dynamic in innovative fields by developing complementary skills to explore research niches that remain underinvestigated. They are focused on scientific questions at the frontier of biological knowledge and new technological opportunities, with a potential added benefit in terms of societal value. The collaborative funded booster programs are divided into multiple work areas, whose implementation involves a consortium of teams.

The objectives of these programs are:

- To build scientific communities in specific and high-priority fields by developing national interdisciplinary consortia founded on the skills and expertise of Inserm teams
- To make French biomedical research a leading player in these fields by accelerating the acquisition, transfer, and valorization of knowledge, potentially involving industry partners at the conception of the programs.

Through its research programs, Inserm aims to facilitate and accelerate discoveries and their transformation into tangible progress for patients and society. It does so by developing a research environment that is conducive to interactions between basic, translational, and clinical research.

The Surgical and interventional procedures of the future booster program will be implemented in partnership with hospitals highly involved in this field: AP-HP, Brest University Hospital, Hospices Civils de Lyon, Lille University Hospital, Marie-Lannelongue Hospital and Rennes University Hospital.