GUIDE - TRANSMEDTECH EXCELLENCE SCHOLARSHIPS
FALL 2022 COMPETITION

APPLICATION DEADLINE:
TUESDAY SEPTEMBER 26TH, 2022, 16:00 PM (EDT)

It is important to review this document carefully before writing an application.
NEW: Application files are to be filled directly on our platform.

STATEMENT OF COMMITMENT TO EQUITY, DIVERSITY AND INCLUSION

Equity, diversity and inclusion are at the heart of the collaborative R&D, open innovation and interdisciplinary creativity that characterize the TransMedTech Institute. We believe that a diverse and inclusive environment is essential to the development of new technologies and medical interventions that meet societal needs.

In this spirit, the TransMedTech Institute is committed to:

- Foster an inclusive culture that supports and values all talents ;
- Pay particular attention to the impact and accessibility of the benefits of its work for the population as a whole;
- Promote an inclusive and intersectional approach in its practices, R&D and training activities, and in its service to the community.

The TransMedTech Institute encourages applications from women, visible and ethnic minorities, Aboriginal people and people with disabilities. People with non-linear or non-traditional backgrounds are also encouraged to apply.

1. OBJECTIVES OF THE PROGRAM AND EXCELLENCE SCHOLARSHIPS

The mission of the TransMedTech Institute is to support the development of innovative medical technologies[1] that meet the needs of users and the health care community in order to facilitate and catalyze their development and implementation in the health care system, as well as to train the next generation of highly qualified medical technology professionals and support the industry and the innovation community.

The cornerstone of the TransMedTech Institute is its *Living Lab*[2] approach, which follows a transdisciplinary and cross-sectoral open innovation process focused on the value and dynamics of the health system needs and involving all stakeholders. This approach collectively and jointly mobilizes the research and engineering communities, students, physicians, caregivers, industry members, government executives and patients to respond quickly and effectively to the needs of users and to ensure that the medical technology developed is integrated into their practices and uses. This environment fosters creativity and innovation as well as validation and implementation in the hospital setting.

The TransMedTech Institute's training program aims to train the next generation of researchers and professionals in an open innovation ecosystem that enables them to acquire valuable skills and understand issues related to the development of medical technologies from the idea to the use of the product in the health system. It is intended for graduate students and postdoctoral fellows who are interested in three types of careers: academic, industrial, entrepreneurial[3].

[1] *For more details, please refer to Appendix A*
[2] *See definition in Appendix A*
[3] *See definition in Appendix A*

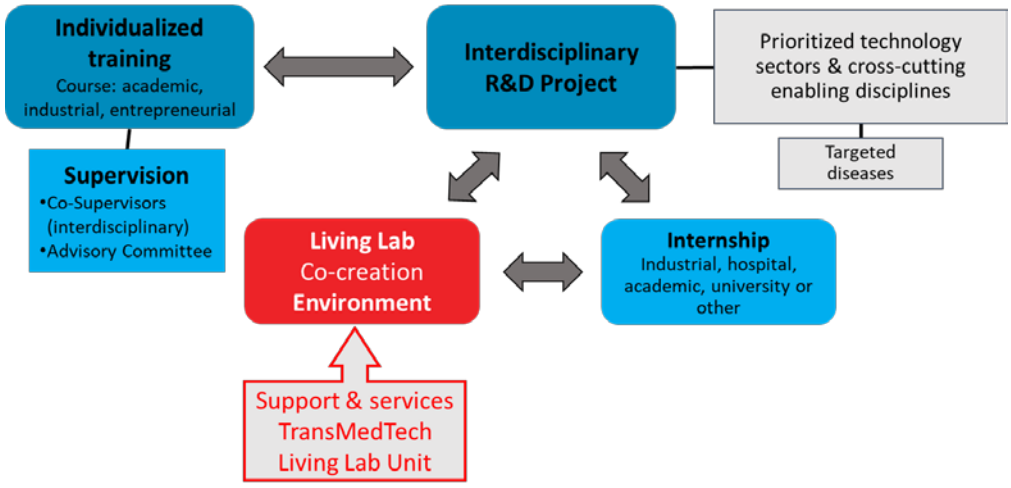
The TransMedTech Institute aims to attract and train the next generation of highly qualified medical technology professionals and support the industry and innovation community. The TransMedTech Institute also aims to provide the opportunity to discover the professional environment to which they aspire in order to develop the cross-cutting skills necessary for a successful career in this sector.

The TransMedTech Institute's ecosystem will allow the trainee to grow professionally and acquire:

- An understanding of the health technology innovation cycle and its challenges (needs of the healthcare community, proof of concept, value of the innovation, regulatory aspects, approval and licensing processes, commercialization, evaluation by health agencies and hospitalization implementation units, social acceptability, etc.);
- Project development methodology based on a *Living Lab* open innovation approach;
- Project management methods specific to the medtech environment.

The TransMedTech Institute trainees will benefit from a variety of transdisciplinary training activities for the enrichment of their scientific, professional and personal skills. Trainees will also be invited to participate in major events in the field of medtechs, thus allowing them to develop their future network (e.g. Medteq Innovation Summit, Effervescence, etc.). Each trainee will also be supervised by a multidisciplinary and personalized Advisory Committee set up to meet their individual needs and by a member of the TransMedTech Institute, which will support him/her throughout their trajectory in order to promote his/her professional development according to the profile he/she has chosen (academic, industrial, entrepreneurial)[4].

Training in Biomedical Engineering and Medical Technologies in the TransMedTech Institute's Ecosystem



[4] *See definition in Appendix A*

Eligible applications

a) Student already admitted and enrolled full time in a research-based master's or doctoral program at a TransMedTech Institute's member institution[5]

   i. for 2 sessions or less for the master's degree (Summer 2022 or Fall 2022)

   ii. for 3 sessions or less for the doctorate (Winter 2022, Summer 2022 or Fall 2022)

   or

   Student expected to be admitted and enrolled no later than September 15, 2023 in a full-time master's or doctoral program at a TransMedTech Institute's member institution

   or

   Postdoctoral fellow already employed by a TransMedTech Institute's member institution (for a maximum of 12 months) or person to be hired as a postdoctoral fellow starting no later than September 15, 2023, and who respects the eligibility rules for postdoctoral fellows of Quebec universities (among which is the prescription that the postdoctoral fellowship must be completed within 5 years after the end of the doctorate) and the administrative rules of the home institution.

b) Permanent residents, Canadian students and international students are eligible for the competition.

PLEASE NOTE:
For this competition, the number of files in which a professor serves as director is limited to 2.
This also applies to the same tandem (Director/Co-Director) of professors.

Eligible research projects

a) The project must be part of one of the TransMedTech Institute's priority medical areas and sectors[6].

b) The supervisor must be a regular full-time professor or researcher at a member institution of the TransMedTech Institute. However, the co-supervisor may be from a non-member institution of the TransMedTech Institute.

c) To ensure the transdisciplinarity of the training program and the projects, the projects must be directed by a director and a co-director from **different and complementary disciplines**.

Examples of eligible co-directorships include:

1) Engineering professor + biology researcher
2) Engineering professor + clinical scientist (physician)
3) Imaging researcher (engineer or physicist) + radiologist physician)
4) Professor of kinesiology + researcher in software engineering

Examples of ineligible co-directors include:

1) Two engineering professors
2) Two rehabilitation professors

However, both of these cases could become eligible with the addition of a co-director from another discipline (e.g., physician, biologist, etc.).

[5] *Polytechnique Montréal, Université de Montréal, CHU Sainte-Justine, CHUM and Jewish General Hospital*
[6] *See details in Appendix A*

2. FUNDING PLAN AND TRANSMEDTECH INSTITUTE'S TRAINING PROGRAM EXCELLENCE SCHOLARSHIPS

The TransMedTech Institute's program aims to provide its trainees with first-rate financial support during their regular schooling, depending on their level of education. Each scholarship application must include a funding plan that complies with the parameters presented in the table below. Depending on the nature of the project and the opportunities, the funding plan may consist of, among other things, a "TransMedTech Institute's training scholarship" (which represents at most 50% of the funding), a scholarship from an external organization, a contribution from an industrial partner, MITACS, a Foundation, funds from the supervisor or co-supervisor, or others. A contribution from the research directors is strongly encouraged.

Appendix B presents hypothetical examples of funding plans.

Parameters of the TransMedTech Institute Scholarships

Program	Scholarship maximum duration	Maximum Contribution of the iTMT ($ CA)	Minimum Standard Amount ($ CA)	Maximum Cumulative Amount ($ CA)
Research Master	2 years	$ 11,000 / year	$ 22,000 / year	$ 30,000/ year
PhD	2 years[+]	$ 13,500 / year	$ 27,000 / year	$ 40,000 / year
Postdoc	2 years	$ 25,000 / year + corresponding benefits* + $ 10,000 start-up fund	$ 50,000 / year + benefits* + $ 10,000 start-up fund	$ 75,000 / year + benefits* + $ 10,000 start-up fund

[+] The duration of the doctoral scholarship is two years due to the end of the CFERF funding.
** According to the rules in force at the Institution where the postdoctoral fellow is doing his/her internship*

Throughout their training program, trainees will be asked to submit applications for other excellence scholarship competitions (at least one per year). In addition to the recognition of excellence, this will allow the trainees to increase the value of their financial support.

Applicants who already hold one or more scholarships (or who will be awarded) are encouraged to apply to the TransMedTech Institute's training program to take advantage of the enhanced training framework.

In all cases, the financial assistance offered by the TransMedTech Institute will be adjusted so that the total amount does not exceed the maximum cumulative amount. However, this does not apply to obtaining prizes (e.g. a lump sum, which is not considered a scholarship, awarded as a result of a performance or a specific achievement, such as a presentation in a conference, a writing contest, the *My Thesis in 180 seconds contest*, etc.) or travel stipends (to attend a conference or to complete an internship or training course).

An annual assessment of the trainees' performance, the progress of the project and the alignment of the project with the mission of the Institute will be carried out before allocating the funds for any subsequent year, up to the maximum duration of the TransMedTech Institute's scholarship.

Travel Stipend: Each candidate who receives a scholarship in this competition will be able to benefit from a maximum allowance of $3,000 CDN to participate in one or more activities that are part of his/her training, such as internships, conferences, workshops, training, etc. This allowance will be available for the duration of the scholarship (2 years or the end of the study program, whichever comes first).

3. COMPETITION PROCESS

STEP 1: Preparation of the application file

The application file must be prepared by the candidate with the help of his/her supervisor and co-supervisor. The applications will have to be completed on our dedicated platform.

The application file will include:

- ✓ A voluntary self-identification form
- ✓ An application form (some documents will have to be downloaded and/or uploaded)
- ✓ A funding plan form
- ✓ **For postdoctoral fellows only: two letters of reference of the applicant's choice** (uploaded by the references directly on the platform). N.B. At least one of the letters of reference must come from a different person than the (co)director of the candidate's PhD or Master's degree.

Applications will not be accepted by email and any incomplete file will not be evaluated.

STEP 2: External evaluation and selection

The files will be evaluated confidentially by a committee composed of external experts according to the criteria and weightings described in **Appendix C**. A ranking will be carried out and a threshold (level of excellence) will be established for each level (MSc, PhD, postdoctoral).

The files will be handled confidentially and a check for potential conflicts of interest will be done beforehand to ensure fair treatment for all.

The provisional selection of successful applications will be based on the available budget and the funding plans submitted.

The selected applications and the corresponding budget will be finally approved by the Board of Governors of the TransMedTech Institute.

STEP 3: Announcement of results

Applicants will receive an email announcing the evaluation committee's decision at the end of the evaluation process (December 2022). Successful applicants will have until **January 15, 2023** to complete the acceptance form on our dedicated platform.

STEP 4: Finalization of the file

The research director and co-director(s) will have to finalize confirmation of the funding plan, and a commitment from all stakeholders will be required before any disbursements can begin. A commitment from all stakeholders will be required before any disbursements begin. This will include a commitment to respect the TransMedTech Institute's mission and to work in the TransMedTech Institute's *Living Lab* environment.

For any research project involving humans and/or animals, the student or postdoctoral fellow and the research supervisor must obtain the approval of the appropriate ethics committees of each institution involved, prior to

the start of the project. Failure to comply with this requirement will result in suspension of the scholarship for the entire period of non-compliance.

OTHER TERMS

a) Start of the scholarship:

- Master's or doctoral student: January 2023 (winter semester), May 2023 (summer semester), September 2023 (fall semester)
- Postdoctoral fellow: between January and September 2023

The scholarship is not retroactive and will begin no earlier than January 1, 2023, depending on the start date of the program.

b) Terms of payment of the TransMedTech Institute's scholarship or the TransMedTech Institute's travel stipend:

All admitted students and postdoctoral fellows will receive their scholarship payments through their home institution. Annual renewal will be conditional on a summative evaluation (see section c) below).

- Master's students: Students will receive payments of their master's scholarship for a period of 2 years or until the end of their master's program, whichever comes first.
- Doctoral students: Students will receive payments of their doctoral scholarship for a period of 2 years or until the end of their doctoral program, whichever comes first.
- Postdoctoral fellows: Postdoctoral fellows will receive payments of their fellowship for a maximum period of 2 years (Due to the eligibility rules for postdoctoral fellows at Québec universities, which state that the postdoctoral fellowship must be completed within 5 years after the end of the doctoral program, the end date of the fellowship may vary).

The trainees must:

- Complete the information and self-identification form prescribed by the Canada First Research Excellence fund;
- Stay in the academic program;
- Meet with their Advisory Committee in the 1st quarter, and thereafter at least once a year (ideally twice);
- Have defined the location, dates and objectives of the internship during the first quarter following entry into the TransMedTech training program;
- Complete the 3 Gender and Sex-Based Analysis training modules offered on the CIHR website. A certificate of training will be required by the 6th month following entry into the TransMedTech training program;
- Participate in the activities of the TransMedTech training program;
- Continue the execution of the project in *Living Lab* mode;
- Progress satisfactorily in their training program, including the internship if necessary, in the follow-up with the Advisory Committee, and in their research project.

c) Advisory Committee and Periodic Assessment:

The Advisory Committee constructively supports the development of the trainees' transversal skills. It also works to evaluate and advise them for their career path. It is composed of 4 to 5 professionals with complementary

expertise, including the director and the co-director(s) of research, a member of the TransMedTech Institute and at least one additional member, ideally a health care provider or a representative of the medtech industry. The composition of the committee must reflect the candidate's career goals.

A formative periodic evaluation will be conducted in order to evaluate the trainees' progress, review the training plan and identify the strengths and weaknesses in terms of professional skills development and functional, social and emotional aspects of the training (knowledge, know-how and skills).

A summative evaluation (annual renewal and end of scholarship) will also be carried out using indicators such as the progress of the research project, meetings with the Advisory Committee, external scholarships requested and obtained, enriched training activities, publications, application at awards of excellence, professional development approaches and participation in conferences.

The Advisory Committee members will also guide the trainees through a self-assessment of their personal and professional evolution. The trainees will identify their scientific, technical, professional and personal strengths and weaknesses, as well as the solutions to be put in place to continue their development and overcome their difficulties.

d) Additional information

The administrative and academic rules in force at the university and/or the TransMedTech Institute's member institution where the trainee is registered apply at all times.

e) Living lab training experience (internship)

The trainees in the TransMedTech training program must plan an internship of 2 to 4 months (or more) during their training.

The choice of the training environment is free (biomedical industry, hospital, research center, etc.), but it must be justified in light of the career objectives and skills to be developed as part of the TransMedTech Institute's training.

- The internship can be done in several stages and is several places.
- The setting and the internship supervisor will be identified with the help of the Advisory Committee. **In all cases, the supervisor of the internship cannot be the trainee's director or co-director.**
- In the case of postdoctoral fellows, relevant research experience in an environment complementary to the main postdoctoral fellowship must be provided. For example, if the postdoctoral project takes place in a university laboratory, a *Living Lab* training experience could be planned in a hospital or industrial setting.

REQUEST FOR ADDITIONAL INFORMATION

Inquiries regarding the Fall 2022 TransMedTech Institute's Training and Excellence Scholarships must be addressed by e-mail at: bourses.transmedtech@polymtl.ca

APPENDIX A – DEFINITIONS AND ADDITIONAL INFORMATION

Medical technologies/Medical devices: Everyday, medical device advancements help save the lives of patients in Canada by improving the accuracy of diagnoses, enhancing treatments and cure of diseases, reducing long-term disabilities and helping to provide better medical care. Covering a wide range of products, medical device examples include pacemakers, artificial heart valves, hip implants, synthetic skin, scalpels, medical laboratory diagnostic instruments and test kits for diagnosis. Software, either stand-alone sold for the purposes given in the definition of a device (Patient Management Software) or used as a component to a device, is included in the term "medical device"[7].

We also invite you to consult the Government of Canada website about medical devices.

Living Lab approach[8]: this is an interdisciplinary and intersectoral open innovation process, collaborative, user-partner-driven and focused on the dynamics of needs (Push / Pull / Pool / Partnership), conducive to creativity and innovation, as well as their validation and implementation in the hospital environment. The innovation process is a set of steps and actions that enable new ideas to be found, imagined, defined, produced and tested to ensure better marketing. These steps will ensure that the project meets real needs and that it leads to concrete and satisfactory solutions.

User-partners: These are the parties involved in the innovation process and who will use or benefit from the developed technology. These stakeholders can be patients, their parents, caregivers, clinicians, physicians, health professionals, the community, health system managers, technical professionals, etc. The TransMedTech Institute's user-partners:

- Participate in the development or integration process by expressing their needs
- Test new products, develop inventions by participating in the design of new solutions
- Can play the role of entrepreneurs, ambassadors/campaigners, investors, etc.

Training program profiles:

- **Academic profile**: for students and postdoctoral fellows wishing to become future professors and researchers at universities or research centers
- **Industrial profile**: for students and postdoctoral fellows wishing to become future highly qualified employees working in a medtech company
- **Entrepreneurial profile**: for students and postdoctoral fellows wishing to become future entrepreneurs or leaders of medtech companies

Research project sectors and axes: The mission of the TransMedTech Institute is to support the development, validation and implementation of innovative medical technologies for diagnosis, prognosis, intervention and rehabilitation for cancer, cardiovascular and neuromusculoskeletal diseases. More specifically, the project must fall within one of the following subfields:

- **Diagnostics, prognostics and theranostic technologies**

This axis includes:

- Multimodal and interventional imaging
- Laser therapies, biophotonic probes
- Microfluidics, precision medicine

[7] *Taken from What is a medical device? (medtechcanada.org)*
[8] *For more information on the subject, please watch the following videos: What is a Living Lab? and What difference does a Living Lab Approach Make?*

- Sensors, biomarker measurement

This axis aims to develop, validate and implement screening and prognostic technologies dedicated to cardiovascular, neuro/musculoskeletal diseases and cancers including screening tests, minimally invasive biosensors and micro-devices or biophotonic technologies and transformative intervention therapies. Deliverables include the validation and implementation of screening tests, validated improved optical systems (endoscopes, biopsy needles, etc.) compatible with clinical realities, or advanced biosensors for faster, real-time, personalised analysis.

- **Therapeutic technologies**

This axis includes:

- Biomaterials, implants, surgical devices
- Nanotechnologies
- Simulation, navigation and surgical robotics
- Minimally invasive interventions

The goals of this axis is to develop and validate the technologies that will change the trajectory of treatment of cardiovascular, musculoskeletal or cancerous diseases through the development of new minimally invasive interventional devices that integrate new micro/nanosystems and nanomaterials for in vivo therapy, tissue engineering and surgical techniques or advanced and emerging technologies for minimally invasive interventional imaging, simulation-based planning, navigation/robotics-assisted interventions, and augmented reality for surgery. The deliverables are:

1) New classes of integrated technologies and nanotherapeutic tools enabling simultaneously deliver drugs, fluids and reagents to a tissue, stimulate cells
2) Validated surgical technologies, including the development of medical intervention and simulation-based protocols
3) Implementation in a new hospital intervention, and its clinical validation

- **Rehabilitation technologies**

This axis includes:

- Orthoses, prostheses
- Technical aids
- Mobility, posture, restoration of functions

This axis aims to rethink the way rehabilitation technologies and interventions for musculoskeletal diseases are designed, manufactured and used. This will be achieved by developing the next generations of orthotics, intelligent prostheses and assistive rehabilitation systems, based on biomechanical evaluation and movement analysis, computer simulations and innovative robotic devices, optimization of materials, topology, comfort and manufacturing processes, virtual reality, etc. Deliverables include innovative and higher performance treatments validated clinically, industrial transfers and products integrated into hospital facilities and/or transferred to end-users.

The project can also be part of one of the complementary transversal axes:

- Artificial Intelligence
- Data technologies
- Modeling / simulation

These transversal axes are not eligible alone and must be associated with one of the above-mentioned axes.

Equity: Equity refers to fair treatment, including the elimination of systemic barriers that disadvantage particular groups. Fair treatment is not necessarily the same for everyone, but takes into account different personal realities, both present and historical, to provide all individuals with access to the same opportunities for the promotion and support of research[9].

Diversity: Diversity refers to the presence, within the research ecosystem and society, of people from different groups, which promotes the expression of diverse perspectives, approaches and experiences, including those of underrepresented groups. The FRQ value the contribution of this diversity to research[7].

Inclusion: Inclusion refers to the establishment of practices that allow all members of the research community to be and to feel valued, supported and respected, paying particular attention to underrepresented groups within the research community and in research itself[7].

Other references: NSERC - NSERC Guide to Addressing Equity, Diversity and Inclusion in Research (nserc-crsng.gc.ca)

[9] *Taken from Equity, diversity and inclusion | Fonds de recherche du Québec | FRQ (gouv.qc.ca)*

APPENDIX B – HYPOTHETICAL EXAMPLES OF FUNDING PLANS

The travel stipend and start-up fund (for the postdoctoral fellows) are automatically awarded to the trainees. They are not presented in the examples below but are added to the trainees' total funding.

Program	Financial arrangement (CAD)		Total scholarship amount (CAD)
Research Master	***Example A***		$52,000 ($26,000 / year)
	TransMedTech Institute Scholarship ($11,000 / year)	$22,000	
	MITACS Scholarship (4-months industrial internship)	$7,500	
	Industrial partner (4-months internship)	$7,500	
	Funds of supervisor	$15,000	
	Example B[10]		$65,000 ($32,500 / year)
	ABC External scholarship (several awards allowed)	$30,000	
	DEF External scholarship (several awards allowed)	$30,000	
	Funds of supervisor	$5,000	
PhD	***Example C***		$62,000 ($31,000 / year)
	FRQNT Scholarship ($21,000 / year)	$42,000	
	TransMedTech Institute Scholarship ($8,500 / year)	$16,000	
	Funds of supervisor (2,000 / year)	$4,000	
	Example D[11]		$57,000 ($28,500 / year)
	TransMedTech Institute Scholarship ($13,500 / year)	$27,000	
	Professor's funds ($15,000 / year)	$30,000	
Postdoc	**Example E**		$140,000 ($70,000 / year)
	NSERC Scholarship ($45,000 / year)	$90,000	
	TransMedTech Institute Scholarship ($15,000 / year)	$30,000	
	Funds of supervisor ($10,000 / year)	$20,000	
	Example F		$125,000 ($50,000/year + $12,500 benefits)
	TransMedTech Institute Scholarship ($25,000 / year + 25% benefits)	$62,500	
	Funds of supervisor ($25,000 / year + 25% benefits)	$62,500	

[10] The total amount ($32,500) is greater than the allowable maximum cumulative amount ($30,000) because no contribution is requested from the TransMedTech Institute. Trainees will still be eligible for a travel stipend and will have access to the same training and activities offered to trainees.

[11] The TransMedTech Institute provides a supplemental award to reach the minimum allowable standard amount ($21,000 + $6,000 = $27,000) and then provides $1 for every $1 offered by the professor. In this example, $2,000. The maximum cumulative amount must be respected at all times.

APPENDIX C – EVALUATION CRITERIA

Criteria	Master	PhD	Postdoc
Motivation and Career Plan (*Section 4*) Relevance, consistency and feasibility of the development and career plan. Enthusiasm for research.	10 %	15 %	15 %
Research project (*Sections 5, 6 & 7*) Quality and originality of the research proposal. Clarity and conciseness of the problematic, popularization, relevance of the methods and analyses, feasibility, impact and potential added value for the medtech industry or the health sector. Relevance of the partners and collaborations, transdisciplinarity of the team.	20 %	20 %	20 %
Research location, supervision and resources (*Sections 8 & 9*) Interdisciplinary, complementarity of direction and codirection. Suitability of the environment for the project. Necessary resources identified, accessible and available.	15 %	10 %	10 %
User-partners participation & EDI (*Sections 10 & 11*) Consideration of the needs of users and/or patients in the development of the project (e.g., their participation and contributions, their knowledge requirements, and their care pathways). Consideration of the principles of equity, diversity and inclusion in the project or approach. Responsible and ethical conduct of research.	10%	10%	10%
Link with the TransMedTech Institute (*Section 12*) Realization of the project with a *Living Lab* approach. Added value of the open innovation ecosystem (*Living Lab*). Link of the project with the TransMedTech Institute's mission.	15 %	15 %	15 %
Academic record, research skills and potential (*Sections 13-17 & transcripts*) Ability to undertake the proposed research. Relevant training, previous achievements, quality of research contributions, awards and honours, letters of reference* (*postdoctoral fellows only – section 18). General presentation of the application.	25 %	25 %	25 %
Leadership and relevant achievements within and outside of academia (*Section 19*) Initiative, participation in science and technology promotion activities, project or team management, community involvement, social and volunteer involvement, etc.	5 %	5 %	5 %
TOTAL	100 %	100 %	100 %