

Call for Proposals 2023

Modalities: 1. Discovery Grants and 2. Exploratory Grants

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1. Background

At *Tecnológico de Monterrey* we have defined the Vision 2030 which aims to develop "leadership, innovation, and entrepreneurship for human flourishing." Through our activities and results, we will actively contribute to an ecosystem where national and international talent can work collaboratively, exploring different research venues and generating innovative and radical solutions for widespread challenges in different disciplines for high impact for industry and society. By promoting scientific research through this call, we will contribute directly to developing *Tecnológico de Monterrey's* vision for 2030: "Research, innovation, and entrepreneurial ecosystem¹". Furthermore, the impact, results, and outcomes of *Tecnológico de Monterrey's* research will become the main factors that will distinguish us as a leading world-class research university creating interdisciplinary solutions and technology-based enterprises to address societal challenges.

To achieve these goals, *Tec de Monterrey* has created an intramural competitive-fund to develop research and technological development through interdisciplinary research, led by extraordinary talent focused on creating solutions that positively impact the pressing challenges on which *Tecnológico de Monterrey* has decided to focus. This document will guide research teams to prepare a proposal for three-years research projects including its products, targeted outcomes, impacts, and the required budget to achieve them.

For this year, Challenge - Based Research Funding Program will have two calls aligned to the research modalities scope. This document is aligned to modalities 1. Discovery Grants and 2. Exploratory Grants. In the case of Innovation, there's an independent call.

2. Call objectives, modalities, and challenges

This financial program will support research projects to create solutions for specific challenges defined as a priority for *Tec de Monterrey*. Groups of researchers from *Tecnológico de Monterrey* can submit proposals to produce cutting-edge scientific innovations and create technological developments that will help to unravel solutions for selected challenges the research teams decide to address. The sum of the knowledge and experience of the team members must aim to strengthen the comprehensive process of research, innovation, and technological development, aimed at generating a verifiable impact and promoting technology-based entrepreneurship. Additionally, teams must link these efforts with key stakeholders in society. The development period of the projects will be from January 2024 to December 2026.

¹ For further details: <https://tec.mx/en/2030vision>

This document presents guidelines for preparing proposals and the bases for the evaluation process. Likewise, it contains the main guidelines for budgetary creation and operation. Researchers who submit proposals to this call commit themselves to comply with the operating guidelines expressed in this document and to achieve the results indicated in their proposal.

2.1 Modalities

This Call for Proposals includes two modalities to develop projects from January 2024 to December 2026:

1. **Discovery Grants: Disciplinary research** projects to investigate state-of-art topics to expand and develop knowledge in specific disciplines. The available funding is up to **1,000,000 MXN** per year (National Schools and Interdisciplinary Institutes). Special attention will be given to proposals submitted by **Early Career Researchers (ECRs)² as PI**. As main outcomes, it is expected Research Papers (specially Q1 / Q2) and Research Proposals.
2. **Exploratory Grants: Interdisciplinary research** projects to prove and demonstrate disruptive and multifaceted solutions to high-impact challenges—funding is up to **2,000,000 MXN** per year. Research groups should propose hypotheses to create disruptive solutions to the established challenges and promote Tec de Monterrey's leadership in researching related knowledge topics (National Schools and Interdisciplinary Institutes). As main outcomes, researchers must consider outcomes from Discovery Grants (Research Papers and Research Proposals) and, additionally, Research Contracts with stakeholders.

2.2 Challenges

This section presents the challenges defined by *Tec de Monterrey* along with topics that can be chosen to outline a proposal. National Schools defined challenges shown in Tables 1 to 5, and the challenges for Interdisciplinary Institutes are in Tables 6 to 12.

Researchers from the Interdisciplinary Institutes of Research and from the National Schools can integrate groups of professors in the models of research professor, postdoctoral fellows, and Ph. D. students to present proposals that unravel their respective challenges.

² Early Career Researchers are **professors** with less than 7 years after obtaining their PhD degree.

Researchers from National Schools must apply to the Challenges defined for them (Tables 1 to 5), and Researchers from Interdisciplinary Institutes must apply to Challenges in Tables 6 to 12. Collaborations between National Schools and Interdisciplinary Institutes can submit proposals through the special category Synergy Grants (Table 13).

These Challenges were defined for modalities 1. Discovery Grants and 2. Exploratory Grants.

Research Groups' Challenges and topics (National Schools)

Table 1. Challenge 1. Trigger Sustainability Actions to Respond to the Climate Emergency, reduce social gaps and economic lag			
Topic key	Topics	Topic key	Topics
A – T1	Regenerative Economy	A – T17	Climate Resilient Development
A – T2	Energy transition	A – T18	Management, Monitoring, Policy and Law for Sustainability
A – T3	Clean Technologies and Emerging Energy Sources	A – T19	Management, Monitoring, Policy and Law for Sustainability
A – T4	Zero-Net Technologies	A – T20	Geography, Planning and Development for Sustainability
A – T5	Energy and Water Security	A – T21	Philosophical Aspects of Sustainability
A – T6	Energy Storage	A – T22	Worldviews and alternative epistemologies
A – T7	Water-Energy-Food Nexus	A – T23	Ethics, equity, climate justice, and intersectionality
A – T8	Water Circularity	A – T24	Regenerative Design
A – T9	Emerging Pollutants	A – T25	Sustainable value chains
A – T10	Urban Resilience	A – T26	Education for Sustainable Development
A – T11	Circular Economy	A – T27	Gender studies around sustainability
A – T12	Circular Engineering	A – T28	Sustainable lifestyles
A – T13	Impactful entrepreneurship and innovation	A – T29	Culture's contributions to sustainable development
A – T14	Responsible/Sustainable production	A – T30	Big Data/Data Science for Sustainability
A – T15	Responsible/Sustainable consumption	A – T31	Communication strategies and Outreach

A – T16	Public Policy for Sustainability		
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Table 1. Research Groups' Challenges and topics, Challenge 1. Triggering Sustainability Actions to Respond to Climate Change

Table 2. Challenge 2. Promote the transformation of cities and communities to make them more sustainable, inclusive and prosperous	
Topic key	Topics
B – T1	Design for the vulnerable (gender, poverty, marginalized communities, access to technology, early childhood, etc.)
B – T2	Financial Inclusion
B – T3	Smart cities
B – T4	Urban Resilience: mobility, sustainable water management, air quality
B – T5	Public policy, Fiscal policy, and Legislation
B – T6	Foreign Direct Investment and its impact on the use of resources, mobility, and pollution in cities
B – T7	Affordable, renewable, and sustainable energies
B – T8	Healthy Cities
B – T9	Digital Agriculture and Precision Agriculture
B – T10	Biotechnology for health, food and environment
B – T11	Data Sciences, Artificial Intelligence & Quantum computing applications
B – T12	Nanotechnology for a better world
B – T13	Cities that attract talent and investment
B – T14	Cities migrating towards the knowledge economy

Table 2. Research Groups' Challenges and topics, Challenge 2. Changing the Cities' Paradigm towards Sustainable Communities with a Regenerative and Inclusive Culture

Table 3. Challenge 3. Transform and empower organizations towards digitalization the creation of shared value and responsible innovation	
Topic key	Topics
C – T1	New leadership models
C – T2	New company ownership models

C – T3	Managing relationships with stakeholders
C – T4	Social innovation and sustainability
C – T5	Business models innovation
C – T6	Strategy and Industry transformation
C – T7	Creative industries
C – T8	The future of work
C – T9	The future of talent
C – T8	The Gig Economy
C – T9	Family businesses
C – T10	Productivity and added value
C – T11	Digital transformation & smart factories
C – T12	Advanced manufacturing and intelligent logistics
C – T13	The future of value chain
C – T14	Models of sustainable organizations and circular economy: Responsible production, responsible consumption, innovative processes and co-design, transformation of new industries, zero-net circular economies: production and business
C – T15	Data analytics to understand the behavior of people's life and consumption patterns
C – T16	The impact of pandemics or generalized phenomena that promote social disruptions on youth unemployment

Table 3. Research Groups' Challenges and topics, Challenge 3. Transforming the Company towards responsible innovation and shared value creation

Table 4. Challenge 4. Promote environments for human flourishing	
Topic key	Topics
D – T1	Integral Wellness
D – T2	Diverse and Inclusive Communities
D – T3	Social and financial inclusion
D – T4	Arts as a platform for personal and social transformation
D – T5	Philanthropic culture and reciprocity

D – T6	A sustainable world as a foundation for human flourishing
D – T7	Spirituality
D – T8	Mental Health
D – T9	Financial health
D – T10	Purpose in life

Table 4. Research Groups' Challenges and topics, Challenge 4. Promoting Human-flourishing Environments

Table 5. Challenge 5. Construction of a new social contract	
Topic key	Topics
E – T1	Justice for all
E – T2	Socioeconomic equity
E – T3	Gender equity and equality
E – T4	Inclusive business
E – T5	Participation of women in leadership positions
E – T6	Fair trade
E – T7	Financial inclusion
E – T8	Public policy to promote equitable and access to quality education and services, and development opportunities
E – T9	Democracy, anti-corruption, and transparency
E – T10	Data analytics for the development of public policy
E – T11	Participation and active citizenship
E – T12	The Fourth Industrial Revolution impact in the future of work

Table 5. Research Groups' Challenges and topics, Challenge 5. The New Social Contract Construction

Table 6. Challenge 6. Development of new strategies to improve human health, through early diagnostic tools and innovative therapy	
Topic key	Topics
F – T1	Tolerance induction in allergic and autoimmune diseases
F – T2	Identification of biomarkers in cancer

F – T3	Protection of organ damage caused by ischemic and oxidative injury
F – T4	Identification of biomarkers in infectious diseases

Table 6. Research Groups' Challenges and topics, Challenge 6. Development of new strategies to improve human health, through early diagnostic tools and innovative therapy

Research Units' Challenges and topics (Interdisciplinary Institutes of Research)

Table 7. Challenge 1. Elevate learning outcomes by transforming teaching & learning to be engaging and motivating using active learning strategies and emerging technologies

Topic key	Topic
C1-T1	Evaluate educational models with an interdisciplinary and active learning approach to improve engagement and motivation in the teaching-learning process.
C1-T2	Explore evidence-based enriched technology-mediated learning environments for engagement, motivation, skills development, or evaluation.
C1-T3	Assess learning outcomes improvement through equitable and inclusive learning environments that promote awareness of individual differences, justice, impartiality, equity, and settings in which everyone feels welcome.

Table 7. Research Units' Challenges and topics, Challenge 1. Elevate learning outcomes by transforming teaching & learning to be engaging and motivating using active learning strategies and emerging technologies

Table 8. Challenge 2. Design effective competency-based education and lifelong learning systems to elevate learning outcomes

Topic key	Topic
C2-T1	Identify the characteristics for designing effective competency-based learning scenarios, addressing the requirements from international standards, accreditation organizations and the needs of the industry, business, and society.
C2-T2	Evaluate systems, policies, and strategies to scale skills development and lifelong learning opportunities for different population and workforce segments.
C2-T3	Explore the effectiveness of technological systems, using artificial intelligence and emulating real-world environments, to scale up techniques for skills development and competency assessment.

Table 8. Research Units' Challenges and topics, Challenge 2. Design effective competency-based education and lifelong learning systems to elevate learning outcomes

Table 9. Challenge 3. Design advanced materials for different applications to be net-zero emission and zero carbon footprint

Topic key	Topic
C3-T1	Smart materials for food packaging and bio-sensors with eco-friendly characteristics.
C3-T2	Lightweight materials for the transportation industry.
C3-T3	CO ² based materials for multiple applications
C3-T4	Biowaste products for industry and end-consumers (Circular Economy)
C3-T5	Technological platforms for rapid discovery and development of materials and manufacturing processes using artificial intelligence, data science, mathematical models, simulation and robotics.

Table 9. Research Units' Challenges and topics, Challenge 3. Design advanced materials for different applications to be net-zero emission and zero carbon footprint

Table 10. Challenge 4. Creation and development of high-tech manufacturing processes to accelerate and rapidly scale-up the production of advanced materials with minimum impact in the environment

Topic key	Topic
C4-T1	CO ² capture and mitigation to reduce emissions
C4-T2	Clean energy generation and management
C4-T3	Water recovery & reuse to ensure water resiliency
C4-T4	Creation of new manufacturing process to produce advanced materials with minimum energy consumption, waste, water usage, and greenhouse emissions.
C4-T5	Experimentation of synthetic techniques such as additive manufacturing and 3-D printing.
C4-T6	Transformation of Industry based on technological research and public policy initiatives to accelerate the advances of sustainable materials and manufacturing
C4-T7	Nearshoring for High-Tech Sustainable Manufacturing.

Table 10. Research Units' Challenges and topics, Challenge 4. Creation and development of high-tech manufacturing processes to accelerate and rapidly scale-up the production of advanced materials with minimum impact in the environment

Table 11. Challenge 5. Develop novel drugs, foods, advanced therapies, strategies and policies for early detection, prevention, and reduction of prevalence of metabolic disease and obesity in children

Topic key	Topic
C5-T1	Sustainable food production.
C5-T2	Easy-to-use and cost-effective bioengineering platforms for early detection of metabolic diseases.
C5-T3	Analysis of Public Policy strategies to deal with childhood obesity.

Table 11. Research Units' Challenges and topics, Challenge 5. Develop novel drugs, foods, advanced therapies, strategies and policies for early detection, prevention, and reduction of prevalence of metabolic disease and obesity in children

Table 12. Challenge 6. Reduce the prevalence of excess weight and obesity in early childhood.

Topic key	Topic
C6-T1	Effects at the multi-omics level of the usual diet and new foods in Mexican and Latin American populations with a focus on pregnancy and early childhood.
C6-T2	Evaluate in vitro and preclinical models' new experimental drugs and advanced therapeutics.
C6-T3	Explore the causes and impact of excess weight and obesity in early childhood and the development of prevention measures for childhood obesity.

Table 12. Research Units' Challenges and topics, Challenge 6. Reduce the prevalence of excess weight and obesity in early childhood

Table 13. Challenge 7. Propose public policy and entrepreneurship to combat excess weight and obesity

Topic key	Topic
C7-T1	Accessibility and availability of nutrients and/or bioactive molecules.
C7-T2	Enhanced sensitivity of diagnosis for current platforms.
C7-T3	Generate clinical protocols and probe concepts for the use of novel therapeutics in a patient with metabolic diseases and obesity.
C7-T4	Special category - Synergy Grants. Interdisciplinary research projects between research groups associated with EIC and IOR to prove and demonstrate disruptive and multifaceted solutions to high-impact challenges tackling obesity.

Table 13. Research Units' Challenges and topics, Challenge 7. Propose public policy and entrepreneurship to combat excess weight and obesity

Table 14. Special category - Synergy Grants.

Topic key	Topic
SG-T1	Interdisciplinary research projects between research groups associated with EIC and IOR to prove and demonstrate disruptive and multifaceted solutions to high-impact challenges tackling obesity.

Table 14. Special category - Synergy Grants

2.3 Attributes of the proposals

Expected attributes of the research projects submitted are:

1. The project's objective, work plan, and outcomes must respond to one of the challenges stated in section 2.2 Challenges. **The selected challenge must be correlated to the Principal Investigator's adscription (National School or Interdisciplinary Institute).**
2. The proposal and all the submitted materials must be written in English.
3. Projects must be scientifically rigorous to address the selected challenge. In addition, the proposal must consider the technological and social megatrends when choosing its course of action, and an investigative intelligence study on the knowledge niche to verify opportunities to generate a relevant social or economic impact. The Office of Research Intelligence can produce and deliver intelligence studies on research niches and identify the top 10 universities in the world in the research niche. To get the corresponding Intelligence Report, please fill out the request form at the following URL before October 6th: <https://forms.gle/xpSStdEjNS3mdzjG6>
4. Each team member (full-time researchers, postdocs, doctoral students, foreign research partners, and experts supporting the development of specific products) should contribute significantly to the scientific outcomes of the project. Activities and outcomes will be documented in the *Product Summary Table (Application Form)*.
5. It is expected that teams establish strategic alliances with national and international research universities (up to two universities) to generate joint solutions; the collaboration should result in the production of joint scientific publications, talent development, and/or intellectual property.

6. For Modality 2. Exploratory Grant, teams should identify key stakeholders from the public and private sectors to amplify the project's impact by funding further research, transfer, implementation of findings, or dissemination/transfer of results. Support Letters are expected.
7. PIs submitting a proposal to this call (2023) AND leading a proposal for the Call (2022) should demonstrate they have submitted proposals externally during the last 12 months (external funding is expected).
8. Researchers' involvement in projects (2022) and new projects (2023) should have less than 100% of total dedication to research (work load)..

2.4 Products and Outcomes of the Proposal

Teams should consider the following section and **Annex 1. Reference cube for scientific productivity** as a guide to establishing the commitments of the team members that participate in the proposal. For additional information about the scientific assessment cube, please contact Laura Hervert, Director of Scientometrics (laura.hervert@tec.mx).

Modality 1. Discovery Grants and Modality 2. Exploratory Grants Proposals to create solutions for the challenges of the National Schools

Create solutions	Solution development with impact on society's relevant issues, according to the National Schools' challenges.
External funding attraction	It is expected at least one submitted proposal per year for each research model participant. Consider total funding attraction according to the goal of the National School per professor. For example, if the number of professors participating in the project is 3 and the goal of funding attraction from their school is an average of 0.3 million MXP per professor, the goal for year 1 is at least 0.9 million MXP in contracts for external funding, and so on. The number of proposals and amount of funding to submit to external organizations, including industry (no other sources of internal funding will be considered as part of this indicator).
Publications and Scopus citation	+ Publications in a TOP 50% (Q2/Q1) Journal according to the projects' discipline(s). + Congress participation / Book publication aligned with the discipline of the National Schools' strategy.

	Consider the Annex 1. Reference Cube for Scientific Productivity to establish this indicator.
Talent attraction and development	Although not compulsory, it is highly recommended to include early career researchers in the team of the project. Remember, for Discovery Grants, special attention will be given to proposals submitted by Early Career Researchers (ECRs) as PI. It may include Postdocs, Ph.D., and master's students. All members must demonstrate growth in R&D productivity.
National and International Collaboration	Productive collaboration with international and national universities / relevant partners and participation in national and international research networks.
Quantifiable impact	Comply with the project's main objective and prove/disprove the hypothesis.

Modality 1. Discovery and Modality 2. Exploratory Grants.

Proposals to create solutions for the challenges of the Interdisciplinary Institutes of Research

Create solutions	Solution development with impact on society's relevant issues, according to the Institutes' challenges.
External funding attraction	It is expected at least one submitted proposal per year for each research model participant. The total goal of external funding attraction depends of the number of professors participating in the project, an average of 0.5 million MXP/ Professor for year 1 and average of 0.6 million MXP/ Professor for year 2. For example, if the number of professors participating in the project is 6, the goal for year 1 is at least 3 million MXP and for year 2 is at least 3.6 million MXP in contracts for external funding. The number of proposals and amount of funding to submit to external organizations, including industry (no other sources of internal funding will be considered as part of this indicator).
Publications and Scopus citation	Above the group researchers' average productivity + One publication in a TOP 3% Journal. Consider the Annex 1. Reference Cube for Scientific Productivity to establish this indicator.

Talent attraction and development	All team members must demonstrate growth in R&D productivity.
National and International Collaboration	Productive collaboration with 2 international TOP 10 universities as well as participating in national and international research networks.
Quantifiable impact	Quantitative indicators regarding the obtained impact within the projects' main objectives.

In addition to these references, remember that expected outcomes for Discovery Grants are **Research Papers** and **Research Proposals**.

For modality 2. Exploratory Grants, beyond the expected outcomes for modality 1. Discovery Grants, it is expected also **Research Contracts** with external entities.

At the end of the project period, the teams should have achieved:

1. Carry out the work plan and budget as established in the proposal- complying with the commitments by December 2026.
2. Produce high-impact scientific publications. Individual productivity goals may differ among members based on their current production level, discipline, and primary role within the team. However, considering the almost three years of operation, all researchers must meet at least the minimum productivity levels according to their research time allocation and discipline (refer to Annex 1. Reference Cube for Scientific Productivity).
3. Attract and develop extraordinary talent which includes professors, post-doctoral associates, and doctoral students. Establish objectives for team members that contribute to their professional growth to position themselves as international leaders as a medium-term objective. All members of the team must comply with the commitments established in the proposal.
4. Attract external funding according to the project commitment. Also, demonstrate that proposals submitted for external funding (including industry). Teams from National Schools must verify the funding attraction goal with their Associate Dean of Research or Director of the Institute.

3. Who can apply for this call?

Research Model Professors from National Schools and Interdisciplinary Institutes can apply as **Principal Investigators** for this call.

As mentioned above, PIs submitting a proposal to this call (2023) AND leading a proposal for the call (2022) should demonstrate **they have submitted proposals externally** during the last 12 months (external funding is expected).

Team members may include:

- Full-time research professors (Research Models: 75%, 50%, 25%)
- Postdocs
- PhD students.
- Experts for specific tasks: Professors from *Tec (Vitalidad Intelectual)* and strategic universities.
- Research units from the Interdisciplinary Research Institutes can invite professors from school to develop specific tasks/products using their allocated time to do research.
- Research groups from the National Schools are allowed to invite professors from institutes to develop specific tasks/products using their allocated time to do research.
- Professor Researchers **involvement** in projects (2022) and new projects (2023) should be **less than 100%**

A key component of the evaluation is the composition of the team, it is highly recommended to include Early-Career Researchers and, furthermore, for Discovery Grants, special attention will be given to proposals submitted by **Early-Career Researchers (ECRs) as PI**.

4. Important dates

The following table outlines dates and activities all teams must be aware of. Applications (including the formats and additional documentation) must be submitted in their entirety from August 21th until October 20th at 23:59 p.m. No proposals will be accepted after this date.

Date	Activity
August 23 th , 2023	Call for proposals opens

October 6 th , 2023	Intelligence Report Requests deadline
October 20 th , 2023	Call for proposals' deadline
October 20 th , 2023 - January 7 th , 2024	Evaluation period
January 12 nd , 2024	Selected projects publication
January 15 th - 19 th , 2024	Funding for selected projects period

5. How to submit your proposal

Applications should be submitted online no-later than October 20th, 2023, at 23:59 p.m.:

1. To submit a proposal for this Call, teams (PI and participants) must create an account in **Science Connexion** platform: <https://scienceconnexion.com/>
2. Once logged in to the platform, identify the Challenge-Based Research Funding Program 2023 and select Apply to create your proposal registration. The Principal Investigator is responsible for the submission.
3. PI can add each team member through the Talent Tank (each member must create an account in Science Connexion previously). For more information, please check the following video:
4. The application must include all documents listed in section 6 Checklist of documents to include in the proposal. All formats must be duly filled out and named using the key described in the following paragraph (point 5). Incomplete proposals will **not** be considered for evaluation.
5. To facilitate management of the files for the evaluation committees, the files name's must follow a specific format, according to the nomenclature outlined below. **It is important to name the files as indicated below, otherwise, the proposal might not be deemed eligible.**

Before uploading each file, use the following key to name them:

**Name Key: Unit Key+ Challenge + File Name + Modality
and Topic (D: Discovery Grants)
Key (E: Exploratory Grants)**

Examples: **IFE001 - C1-T2 - Application Form-E.docx**
IFE001 - C1-T2 - Research Impact Planning Canvas-E.pptx
IFE001 - C1-T2 - Project Timeline and Milestones Template-E.xlsx
IFE001 - C1-T2 - Budget Template-E.xlsx

For “**Unit/Group Key**” see **Error! Reference source not found.** (For National School, select the Group Key by referring to the group of the leader of the proposal).

For “**Challenge Key**” see tables in section 2.2 Challenges of this document.

6. Science Connexion allows to work in the proposal development at different time points, when the proposal is ready you must submit it. Once submitted you won't be able to edit the proposal.

6. Checklist of documents to include in the proposal

1. Application Form
2. Research Impact Planning Canvas
3. Project Timeline and Milestones Template
4. Budget Template
5. Intelligence report. Universities TOP10 in the areas of the Institute use to propose strategic partners

7. Funding scope (building your budget)

The grants will not finance additional time for researchers, all professors in the research model have allocated time to do research. If one professor who is not in the research model is invited, she/he will participate in her/his intellectual vitality time.

All expenses and hirings must be aligned to the institutional policies established by “*Talento, TecServices Adquisiciones, Mis Viajes*”.

The following items are considered eligible expenses:

a. Talent

Item	Description
Postdoctoral position	<p>Postdoctoral positions are an eligible cost (up to one position per project, two years as maximum). It must be justified based on productivity and impact expected from the position.</p> <p>Postdoctoral positions already assigned does not add cost to the budget but should participate as a team member in the proposal with specific activities and outcomes in the work plan.</p> <p>Please consider the reference in Annex 3. Human Resources Costs.</p>
Doctoral position	<p>If any problem considering the CONAHCYT scholarships for doctoral students, then, special attention should be given to these positions.</p>
Technology Development Expert Services – External	<p>Services for specific tasks and products: Budget can be allocated to finance internal or external services to develop a solution to a tech-development problem.</p> <p>by The time frame to develop the specific task cannot exceed 12 months. Contract and payment must be aligned to the institutional policies established by “<i>TecServices Adquisiciones</i>”.</p>
Technology Development Expert by Fixed Time Contract	<p>Experts with a fixed time contract (as Tec de Monterrey collaborator):</p> <p>Teams can contract experts with “<i>Fixed-term contract</i>”, to develop specific tasks or products required to deliver the products and outputs of the project.</p> <p>The time frame to develop specific tasks cannot exceed 12 months, additionally they are <u>not subject</u> to renewal. The duration of the contract cannot exceed the duration of the grant operation period.</p> <p>Payment must be aligned to the institutional policies established by “<i>Talento</i>”.</p>

b. Research Stays

Item	Description
Short-term Research Stays	<p>It is considered a short-term research stay a travel to be hosted in other institution (strategic partner university/company) with the following features:</p> <ul style="list-style-type: none"> - Up to 60 days. - Professors and post-docs (the recipient must be a current employee at the moment of the stay).

	<p>It is necessary the approval of the Academic Department and Direct Leader along with complying with academic regulations and policies established by “<i>Talento, Mis Viajes</i>”.</p> <p>The short-term stay costs are covered as travel expenses through CONCUR platform. The expenses should always be in accordance with the institutional policies and rates. Additionally, the budget must include migratory processes and medical insurance with international coverage for accidents and illnesses.</p> <p>The research stay must contribute significantly to relevant project activities and/or outcomes declared in the Application Form.</p>
<p>Long-term Research Stays (Cost of living allowance)</p>	<p>It is considered a long-term research stay a travel to be hosted in other institution (strategic partner university/company) with the following features:</p> <ul style="list-style-type: none"> - Between 61 to 180 days. - Professors and post-docs (the recipient must be a current employee at the moment of the stay). <p>It is necessary the approval of the Academic Department and Direct Leader along with complying with academic regulations and policies established by “<i>Talento</i>”.</p> <p>Instead of travel expenses, the institution considers a long-term research stay as cost of living allowance. It includes plane tickets, accommodation, migratory processes, and medical insurance with international coverage for accidents and illnesses.</p> <p>Consider that research stays must comply with academic regulations. All compensation procedures must be reviewed prior to the trip, the compensation is defined by <i>Talento</i>.</p> <p>The stays aim must be the execution of specific activities and to generate joint scientific production or technology development products committed in the project proposal. A detailed description and a clear justification must be provided in the Application Form.</p> <p>Please consider the reference in Annex 4. Cost of Living Allowance</p>
<p>Research Stay Fellowship (only for students)</p>	<p>In the case of a student who will be the research stay recipient, the institution grants this support as a fellowship. To provide this fellowship, it is necessary to publish a call where the best candidate will be selected.</p> <p>Migratory processes are NOT an eligible cost and the contract of medical insurance with international coverage for accidents and illnesses is the responsibility of the student. The fellowship includes only the maintenance and accommodation costs.</p>

c. Materials and Experimentation

Item	Description
Internal and External Services, includes prototype development / Proof of Concept	<p>This item is meant for payment of expenses related to hiring services that are required to supply the specific needs of the project.</p> <ol style="list-style-type: none"> 1. Core Labs and internal laboratory-services: payment of the services offered by Core Labs and internal laboratories services. 2. External services: <ol style="list-style-type: none"> a. External Laboratory Services, including Laboratories at research centers and national or foreign universities. b. Data services and database generation, and software. c. Prototypes: Materials and external services required to produce prototypes. d. Proof of concept services: Materials and services to validate if a product or idea is feasible to take to the commercialization stage. e. Intellectual property: Expenses related to the registration of intellectual property TRL1 to TRL4. For further information on the Technology Transfer process contact: Technology Intelligence Associate Office (TTO): Nidya Solis (nidya.solis@tec.mx). IP management, regulatory issues, and Technological Observatory.
Prototype	<p>It is considered a prototype a permanent item either for use or display. For the budget, it is necessary to include a description of the prototype and its components in the Budget.</p>
Equipment	<p>Laboratory equipment: Acquisition of equipment needed for the project execution (costs must include maintenance, guarantee fees, import costs, transportation, delivery fees, etc.)</p> <p>In the case of Institutes, researchers must validate with the Director of the Institute to ensure no equipment duplicity.</p> <p>In the case of National Schools, researchers must validate with the Associate Dean for Research to ensure no equipment duplicity.</p> <p>At the end of the project, a specific analysis will be made to define if the equipment is part of the Core Labs.</p> <p>The acquisition of computational equipment, tablets, cellphones, etc. is not allowed. In case, the team considers this kind of equipment is crucial for the execution of the project, the requirements will be validated by the Director of Data CoreLab.</p>

	For equipment with a cost greater than \$150,000 MXN or that requires installation/maintenance, it is necessary the approval of Finance Department, CoreLabs Director and Associate Dean for Research (Schools)/Director of the Institute (Interdisciplinary Institutes).
Materials and supplies	Acquisition of tools and devices without inventory identification number, according to the project requirements and with sufficient justification, such as: consumable materials for experimental labor, live specimens, chemical reagents, gasses, diverse substances, agrochemicals, lab glassware and instruments, photographic and video liquids and consumables, software licenses, data/information portal services, books, amongst others.

d. Publications

Item	Description
Open Access journals and conferences	<p>Payment of scientific publications can be allocated in the budget, payment for open access in selected journals and registration fees for selected conferences.</p> <p>All publications expenses must comply with the guidelines of FAP (<i>Fondo de Apoyo a Publicaciones</i>), available at: https://tecmx.sharepoint.com/sites/ServicioInvestigadores/SitePages/Publish.aspx, the list of journals and conferences that are considered acceptable can be found here as well.</p>

e. Travel expenses

Item	Description
Research Travels	<p>It includes transportation costs, cost of lodgings, and food expenses for the project members, always in accordance with the institutional policies and rates, exclusively for expenses related to the project activities. This includes company visits and local transportation (such as cabs, highway stalls, and fuel, these costs; however, do not include meals).</p> <p>All financed travels should clearly contribute to the project outcomes.</p>
Travel expenses related to publish articles in conference	Expenses related to conference participation. This includes transportation costs, cost of lodgings, and food expenses for the project members, according with the institutional policies and rates, exclusively for expenses related to the project activities.

	It must comply with the guidelines of consult FAP (<i>Fondo de Apoyo a Publicaciones</i>) available at: https://tecmx.sharepoint.com/sites/ServicioInvestigadores/SitePages/Publicacion.aspx
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Not Eligible Expenses:

1. Payment of additional research time for professors, post-docs, students, and other Tec de Monterrey collaborators.
2. Payment of additional benefits for professors, staff, and students, such as, meals and tuition.
3. Expenses to attend conferences as a participant, not as a conference speaker.
4. Memberships in professional or scientific associations.
5. Hiring staff to manage projects or administrative activities.
6. Exchange of financial resources between institutions is not allowed, except for contracts for the development of experimentation in university's laboratories.

8. Evaluation process and selection criteria

8.1 Evaluation process

The Evaluation process will have **two stages**. The goal is to improve the quality of the proposals:

1. The first stage will analyze the format and possible interactions of the proposals, we will accept a re-submission.
 - the requested formats and documentation are complete. In case of incomplete proposals, the Evaluation Committee will contact PI to re-submission.
 - the team members have defined specific contributions and outcomes for the project,
 - the requested budget complies with the eligibility guidelines,
 - the productivity committed in funds, publications, and technological development is in accordance with the level of development of the professors.
 - With similar proposals, the Evaluation Committee will contact PIs to merge proposals if applies.
2. The second stage will be the external peer2peer evaluation.

These teams will be made up of at least three researchers who are experts in the topics of the challenges. The members of these committees will be researchers from outside Tec de Monterrey, and will evaluate the technical quality of the proposals and its results:

- The proposed objective represents an innovative, disruptive solution for the challenge posed.
- The work plan and the description of the methodology reflect scientific rigor to obtain the results of the project.
- The selected line of work has the potential to generate a relevant impact.
- The knowledge sought to be generated is relevant and differentiated from what other research groups outside the Tec are developing.
- The technology sought to be developed is innovative, the level of development committed is realistic to achieve in the specified time frame, and the concept has the potential to continue advancing to promote a scientific-technological based enterprise for a specific market.
- The impact of the project can be substantive due to its technological results, scientific products, and type of solutions.

8.2 Evaluation Criteria

The following aspects will be evaluated in the evaluation process:

1. Impact. The Problem definition and hypothesis will enhance the knowledge aligned to the Scope of the Challenge. This includes the Research Impact Planning Canvas Template to reflect the medium- and long-term scientific, societal, and economic impact of the project.
2. Objectives. A general and specific objective aligned to the problem's definition offers valuable solutions.
3. General research methodology. It considers a scientific approach and carefully designed plan to carry out the project's activities that will lead to the desired outcome reaching valid conclusions. The research methodology includes general and specific activities, such as experimentation, product definitions, team members' responsibilities, and the outcomes according to the modality of choice: journal papers, conference papers, intellectual property, innovative products, technology transfer activities, business development, and public policy proposals.
4. Products and outcomes. The proposed products and outcomes of the project will significantly contribute to the goals of the selected challenge and accordingly to the modality, both in quality and quantity, including exceptionally high-impact original generation of knowledge, external funding, technology transfer, and productive partnerships with industry or other stakeholders. The scientific

productivity goals, both as a team and as individuals, must be challenging and clearly stated.

5. Team configuration: The team reflects disciplinary complementarity to perform the different activities of the project. For modalities 2, proposals should involve an interdisciplinary team of researchers drawn from units of the institute, other institutes, research groups, or top universities to deliver societal and industry-related products and outcomes.
6. Talent development. The research plan considers the improvement of the research capabilities of all team members. Clear goals for individual and group research indicators must be established (including students, post-docs, etc.).
7. National and international research strategic partners. A clear definition of external national and international collaboration (centers, institutes, universities or researchers that strategically collaborate with the project and strengthen it). The definition of the professor(s) from the partner university as well as their role and expected contributions to the project.
8. Stakeholders. The proposal must declare potential stakeholders (partners, beneficiaries and users involved or interested in the project or its results) that will benefit from the project results and those who find the proposed results valuable or relevant.
9. Project Financial Sustainability. The proposal should state how to achieve external financial support beyond national funds and describe the team's strategy to attract funding. List the organizations, international funds, philanthropic organizations, companies, or others set as primary targets to contact and the amount of funding to request. It is highly recommended use Pivot-RP (<https://pivot.proquest.com/>) to identify funding opportunities.

8.3 Additional Elements to evaluate during project operation

During the project operation, research teams will have to:

1. Present a technical progress report and a financial statement progress report each July 15 and December 1.
2. Prepare an annual special report to communicate to the Board the progress and impact of the project when requested.
3. If necessary, get approval from Ethics Research Committee (More information: <https://comiteinstitucionaletica.tec.mx/es>)

4. The Project's financial operation must abide by internal rules and regulations, and it is subject to internal audits.
5. In case of delay in the budget exercise, it will be possible to request to transfer the unused budget, based on technical and financial justification. In case of need contact the Director of Research Management, Ana Lilia Benavides (abenavides@tec.mx), the budget carry-over will also require the Financial Officer's approval (Ma. Alejandra Venegas, mavenegas@tec.mx).
6. Any other issue not considered in this call will be analyzed by the VP of Research and any other expert appointed by the VP of Research.

8. 4 Additional considerations

1. Proposals will be ranked according to Compliance and Experts Evaluations, to ensure the approval of the best proposals. All proposals will receive feedback with technical recommendations.
2. There is a limited budget to support National Schools and Interdisciplinary Institutes' proposals. Therefore, the number of projects to finance will depend on budget availability, and the impact, generation of new knowledge, and scientific productivity of the proposal.
3. It is expected that all professors can propose disciplinary or interdisciplinary solutions to the defined challenges. According to the financial plan, a new call for proposals to create solutions for new challenges will open next year.

9. Contact information

Any questions about this call and its annexes, please contact:
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Annex 1. Reference cube for scientific productivity

The *reference cube for scientific productivity* defines high performance standards for researchers in the following dimensions: Discipline, scientific production, and researcher career stage. The *main goal* is to provide a comprehensive research productivity guide that serves as a tool to define performance strategies for researchers.

<p>RESEARCH TIME CATEGORY</p>	<ul style="list-style-type: none"> • 25% - 50% (National Schools) 75% (Interdisciplinary Institutes) • The methodology to define these goals considers Tec de Monterrey professors' publication performance from 2016 to 2020 and the top researcher ranking from Stanford-Elsevier.
<p>RESEARCH SUBJECT / DISCIPLINE</p>	<ul style="list-style-type: none"> • 11 Clusters of disciplines linked to schools • The clusters were formed with QS-disciplines of similar theme and historical performance • Metrics are defined for each discipline according to the research workload
<p>RESEARCHER CAREER STAGE*</p>	<p>These criteria represent a minimum basis and apply to all professors regardless of their career level:</p> <ul style="list-style-type: none"> • EARLY RESEARCHER • ESTABLISHED RESEARCHER • SENIOR/ LEADING RESEARCHER

Guide for professors in National Schools

a. Model researchers

School	Subjects	50% Research Model(Annual reference)		
		Scopus	Q1Q2	FWCI
EAAD	Architecture/Performing Arts	1.2	0.8	1
ECSG	Communication & Media Studies/Sociology/TEC - Ciencias Sociales/Law/Library & Information Management/Politics & International Studies/Social Policy & Administration/Sports-related Subjects	1.2	0.8	1.2
EHE-1	Education & Training	1.5	1	1
EHE-2	Anthropology/Archaeology/English Language & Literature/History/Linguistics/Philosophy/TEC - Artes y Humanidades/Theology, Divinity & Religious Studies	1	1	1.1
EN-1	Accounting & Finance/Development Studies/Hospitality & Leisure Management	1	0.8	1
EN-2	Business & Management Studies/Economics & Econometrics	2	1	1.4

School	Subjects	50% Research Model(Annual reference)		
		Scopus	Q1Q2	FWCI
EIC-1	Chemistry/Engineering - Chemical/Engineering - Electrical & Electronic/Engineering - Mechanical, Aeronautical & Manufacturing/Environmental Sciences/Materials Science/Mathematics/Physics & Astronomy/TEC - Ingenierías	4	2	1.3
EIC-2	Agriculture & Forestry/Computer Science & Information Systems/Engineering - Petroleum	5	3	1.1
EIC-3	Earth & Marine Sciences/Engineering - Civil & Structural/Engineering - Mineral & Mining/Geography/Geology/Geophysics/Statistics & Operational Research	2	1	1.2
EM-1	Anatomy & Physiology/Nursing/Pharmacy & Pharmacology/Psychology/TEC - Medicine/Veterinary Science	2	1	1.5
EM-2	Biological Sciences/Medicine	5	3	1.1

b. Non-model researchers

School	Subjects	Non-research model ($\leq 25\%$)		
		Scopus	Q1Q2	FWCI
EAAD	Architecture/Performing Arts	0.5	0.5	0.75
ECSG	Communication & Media Studies/Sociology/TEC - Ciencias Sociales/Law/Library & Information Management/Politics & International Studies/Social Policy & Administration/Sports-related Subjects	0.5	0.5	0.9
EHE-1	Education & Training	1	0.5	0.75
EHE-2	Anthropology/Archaeology/English Language & Literature/History/Linguistics/Philosophy/TEC - Artes y Humanidades/Theology, Divinity & Religious Studies	0.5	0.5	0.9
EN-1	Accounting & Finance/Development Studies/Hospitality & Leisure Management	0.5	0.5	0.75
EN-2	Business & Management Studies/Economics & Econometrics	1	0.5	1.1

School	Subjects	Non-research model ($\leq 25\%$)		
		Scopus	Q1Q2	FWCI
EIC-1	Chemistry/Engineering - Chemical/Engineering - Electrical & Electronic/Engineering - Mechanical, Aeronautical & Manufacturing/Environmental Sciences/Materials Science/Mathematics/Physics & Astronomy/TEC - Ingenierías / Agriculture & Forestry/Computer Science & Information Systems/Engineering - Petroleum	2	1	0.8
EIC-2	Earth & Marine Sciences/Engineering - Civil & Structural/Engineering - Mineral & Mining/Geography/Geology/Geophysics/Statistics & Operational Research	1	0.5	0.9
EM-1	Anatomy & Physiology/Nursing/Pharmacy & Pharmacology/Psychology/TEC - Medicine/Veterinary Science	1	0.5	1.2
EM-2	Biological Sciences/Medicine	2	1.5	0.8

Guide for professors in Interdisciplinary Institutes of Research

a. Institute of Future Education

		Research model 75% (Annual reference)		
Group	Subject	Scopus	Q1Q2	FWCI
1	Computer Science & Information Systems	5	3	2.2
2	Education & Training	3	1	2

b. Institute of Obesity Research

		Research model 75% (Annual reference)		
Group	Subject	Scopus	Q1Q2	FWCI
1	Agriculture & Forestry Biological Sciences	5	2	2
2	Medicine	6	3	1.5
3	Nursing Social Policy & Administration	2	1	1.2

c. Institute of Advanced Materials for Sustainable Manufacturing

		Research model 75% (Annual reference)		
Group	Subject	Scopus	Q1Q2	FWCI
1	Social Policy & Administration	2	1	1
2	Economics & Econometrics Mathematics Statistics & Operational Research	3	2	1.5
3	Chemistry Engineering - Mechanical, Aeronautical & Manufacturing	4	2	1.5
4	Computer Science & Information Systems Engineering - Chemical Materials Science	5	3	1.5

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This tables shows the reference for the Research Units, Interdisciplinary Research Groups (IRG), and Research Groups from National Schools, see column “CVE-ITI” to include the key in the name of the templates.

Institute	CVE-ITI	Unit
Institute for the Future of Education	IFE001	IRG – Scaling complex thinking for everyone (R4C)
	IFE002	IRG – Socially Oriented Interdisciplinary STEM Education Research Group (SOI-STEM)
	IFE003	Competency Based Education
	IFE004	Educational Technology
	IFE005	Effective and engaging learning models
Institute of Advanced Materials for Sustainable Manufacturing	IAMSM001	Competitive Intelligence and Public Policies for Sustainable Manufacturing (MTY, Mixcoac)
	IAMSM002	Accelerated Materials Development MTY (Lightweight materials and smart materials)
	IAMSM003	Accelerated Materials Development EDMX (Advanced polymers and smart materials)
	IAMSM004	Manufacturing processes for advanced materials CDMX (High performance manufacturing)
	IAMSM005	Manufacturing processes for advanced materials MTY (Processes and technologies for CO ₂ capture, use and reduction in manufacturing, Bioproduction systems in manufacturing processes)
	IAMSM006	Enabling technologies for the development of advanced materials GLA (AI/ML/KBES)
	IAMSM007	Enabling technologies for the development of advanced materials CDMX. (AI / DataScience/ Digital Technologies)
Institute for Obesity Research	IOR001	Healthy foods
	IOR002	Bioengineering and medical devices
	IOR003	Integrative biology
	IOR004	Experimental medicine and advanced therapies
	IOR005	Public health policy

School	Clave-GI	Group Name
EIC	EIC-GI01	Molecular and systems bioengineering
EIC	EIC-GI02	Emerging food technologies and nutraceuticals
EIC	EIC-GI03	Advanced manufacturing
EIC	EIC-GI04	Nanosensors and devices
EIC	EIC-GI05	Photonics and quantum systems
EIC	EIC-GI06	Advanced artificial intelligence
EIC	EIC-GI07	Smart supply chain and logistics
EIC	EIC-GI08	Innovation in smart digital technologies and infrastructure
EIC	EIC-GI09	Cyber physical systems
EIC	EIC-GI10	Water science and technology
EIC	EIC-GI11	Energy conversion, storage and management
EIC	EIC-GI12	Descarbonization, Climate Change and Circular Economy
EMCS	EMCS-GI01	Diagnostic and therapeutic innovation in chronic degeneration diseases
EMCS	EMCS-GI02	Advanced therapies in visual sciences
EMCS	EMCS-GI03	Global health and emerging diseases
EMCS	EMCS-GI04	Research in breast cancer
EMCS	EMCS-GI05	Developmental biology and comprehensive well-being in childhood
EMCS	EMCS-GI06	Neurological sciences and neurorestoration
EN	EN-GI01	Leadership and effective organizations
EN	EN-GI02	Development of conscious businesses
EN	EN-GI03	Impactful entrepreneurship and innovation
EN	EN-GI04	Organizational strategy and industries transformation
ECSG	ECSG-GI01	Legal systems innovation
ECSG	ECSG-GI02	Economies of the future
ECSG	ECSG-GI03	Democracy and global affairs
ECSG	ECSG-GI04	Government and public entrepreneurship
EAAD	EAAD-GI01	Sustainable Territorial Development
EAAD	EAAD-GI02	Advanced Design Processes for Sustainable Transformation
EHE	EHE-GI01	Educational innovation
EHE	EHE-GI02	Digital humanities
EHE	EHE-GI03	Humanities for sustainable development

Annex 3. Human Resources Costs

Position	Candidate	Salary	Fringe Benefits	Total Cost per Month
Project Specialist	Master student (without CONAHCYT support)	\$14,192.00	\$6,032.75	\$20,224.75
Project Specialist	Doctoral student (without CONAHCYT support)	\$18,922.00	\$8,943.07	\$27,865.07
Project Specialist	Bachelor's degree	\$20,000.00	\$9,960.00	\$29,960.00
Project Specialist	Bachelor's degree with experience	\$25,000.00	\$12,450.00	\$37,450.00
Project Specialist	Master's degree	\$30,000.00	\$14,940.00	\$44,940.00
Project Specialist	Master's degree with experience	\$35,000.00	\$17,430.00	\$52,430.00
Postdoctoral position	Doctoral degree	\$40,000.00	\$19,920.00	\$59,920.00

Annex 4. Cost of Living Allowance

Country	City	Cost of Living Allowance (MXN)			Furnished apartment (USD)	
		Salary A ¹	Salary B ²	Salary C ³	Rent per Month 1 Bedroom	Rent per Month 2 Bedrooms
Spain	Madrid	9,480.25	16,727.75	23,027.75	2,996	5,800
USA	Seattle	13,588.42	23,976.50	33,006.42	3,500	4,200
USA	Los Angeles	16,432.50	28,994.83	39,914.75	4,300	4,387
USA	Chicago	16,432.50	28,994.83	39,914.75	3,300	4,387
England	London	16,432.50	28,994.83	39,914.75	3,210	4,387
Italy	Milan	12,008.33	21,188.50	29,168.50	3,210	3,570
France	Paris	12,008.33	21,188.50	29,168.50	3,210	5,846
Canada	Toronto	7,900.25	13,939.83	19,189.75	2,752	5,846
China	Shanghai	18,960.58	33,455.58	46,055.50	4,677	5,846
Korea	Seul	18,960.58	33,455.58	46,055.50	4,677	1,459
Japan	Tokio	18,960.58	33,455.58	46,055.50	4,677	5,800
Colombia	Bogota	Adjustment not required			938	4,200

¹ Salary per month 60,000 MXN, Salary per year 720,000 MXN, includes 50% for Fringe Benefits.

² Salary per month 120,000 MXN, Salary per year 1,440,000 MXN, includes 50% for Fringe Benefits.

³ Salary per month 180,000 MXN, Salary per year 2,160,000 MXN, includes 50% for Fringe Benefits.