

The GEM Challenge 2025 – Engineering Novel Solutions to Clinical Problems

The Institute of Engineering in Medicine (IEM) in the Jacobs School of Engineering and Health Sciences are pleased to announce the twelfth round of the **Galvanizing Engineering in Medicine (GEM)** competition to identify clinical challenges for which novel, early phase technology solutions can be developed and implemented by an interdisciplinary team of UC San Diego engineering and health science researchers. GEM has the overarching goal of building a collaborative ecosystem that leverages UC San Diego's outstanding strengths in clinical care and engineering to solve important healthcare problems. Awards will be made up to **\$40,000 for one year**. Upon successful completion of milestones, successful applicants will also be eligible for a **second-year follow-on award of up to \$15,000** for specific activities intended to generate additional funding for phase II research, technology transfer and/or commercialization.

From year to year, additional GEM awards in specific clinical and technology areas may be available. In 2025, we encourage applications related to cellular or medical biophotonics for the Michael Berns GEM Award.

We invite teams that include at least one **Clinically Active Faculty Member** and one **Engineering Faculty Member as PIs** to submit a proposal. Applicants need not be members of the IEM, but priority for support will be given to active members of the IEM and its research centers. Fellows and Project Scientists who would like to be PIs must contact **Dr. Deborah Spector (dspector@health.ucsd.edu)** or **Dr. Andrew McCulloch (amcculloch@ucsd.edu)** prior to submission.

Clinical Faculty who are looking for an Engineering Faculty partner or vice-versa should contact Dr. Deborah Spector or Dr. Andrew McCulloch after reviewing the center pages and membership listings on the [IEM website](https://iem.ucsd.edu/researchers/centers/index.html):

<https://iem.ucsd.edu/researchers/centers/index.html>.

The proposal must include two sections. **Section One** should describe a specific medical challenge or unmet need that presents an opportunity for innovation involving an engineering or technology solution to improve patient care and outcomes, including reducing healthcare costs. Healthcare improvement may be achieved through innovation in disease prevention, diagnosis, monitoring and/or treatment. In **Section Two**, the team should describe the engineering technology that will be developed to solve the problem and specific plans for the award period.

Priority will be given to investigators who did not receive a GEM award in the 2024 round of competition.

A description of GEM Challenge projects that have previously been selected for funding can be found on the IEM web site under the GEM Program.

<https://iem.ucsd.edu/programs/gem/past-gem-projects.html>

An expert panel of clinicians, engineers, entrepreneurs, and representatives from the Office of Innovation and Commercialization will evaluate proposals based on the following criteria:

Significance: To what extent does the problem or challenge impede or adversely affect patient care and what are the prospects that the proposed engineering technology solution will address and solve the specific challenge?

Investigators: How well qualified is the team of clinical and engineering investigators to solve the problem?

Innovation: To what extent does the problem focus on an unmet medical need? What new intellectual property is expected to arise from the project? How novel is the engineering approach, and does it take advantage of unique resources at UC San Diego – such as specialized expertise, infrastructure, and core facilities?

Feasibility: Can sufficient progress, such as development of a prototype, be made in 12 months with a budget of approximately \$40,000? Does the project leverage other resources that will prove the likelihood of success?

Milestones, and Future Funding: Are realistic milestones and deliverables clearly defined? What specific campus resources for accelerating translation and commercialization have or will be used, such as the Institute for the Global Entrepreneur, the Medtech Accelerator, the Rady School of Management, and the Office of Innovation and Commercialization? Is there a clear plan for next phase activities including specific plans for a \$15,000 year two, follow-on award? What continued funding strategies are anticipated (e.g., new grants, SBIR/STTR, industry partnership, licensing, startup)?

APPLICATION GUIDELINES

Applications should be well-written, precise, and succinct and include the following:

- Title Page - Name, Department Affiliation(s), and email address of all PIs and Participating Investigators, Project Title
- Abstract and Specific Aims (**500-word maximum**)
- Research Design and Methods (**six pages maximum – excluding literature cited**)
 - **Section One** - Describe the specific medical challenge or unmet need that presents an opportunity for innovation involving an engineering solution. (one page maximum).
 - **Section Two** - Describe in detail the engineering technology that will be developed to solve the problem. The narrative should include the rationale for its potential effectiveness, preliminary data, feasibility (over 12-month time frame), existing intellectual property (disclosures and patents filed), parameters for evaluating success, and potential for commercialization. Also summarize competing technologies and explain why the proposed technology is superior. (four pages maximum).
 - **Section Three** - Describe milestones and deliverables for the first 12 months and how a \$15,000 phase II award will be used to transition the project to sustained funding (1 page maximum).
- Area of Technology – State which of the following IEM Centers your project is most closely related to.
 - Cellular Photonics and Biophotonics
 - Human Performance Research
 - Biomaterials and Tissue Engineering
 - Advanced Neurological Engineering
 - Cardiac Biomedical Science and Engineering
 - Engineering in Cancer
 - Engineering in Diabetes
 - Medical Device Engineering and Biomechanics
 - Mobile-Health Systems and Applications
 - Musculoskeletal Research
 - Nano-Medicine and Engineering
 - Cardiovascular Biomedical Imaging

- Infectious Disease Engineering Advances
 - Technologies for Healthy Aging
 - AI in Biomedicine
- Utilization of Core Facilities and Innovation Resources - State which of the following core facilities you have already used or plan to use for your project (Vouchers may be available for in-kind services).
- ACTRI Device Accelerator Center
 - ACTRI Biostatistics Core
 - ACTRI Clinical Facilities and Resources
 - Irwin and Joan Jacobs Center for Health Innovation
 - UCSD Center for the Future of Surgery
 - UCSD Mechanical and Aerospace Engineering (MAE) Machine Center
 - Nano3 Nanofabrication Cleanroom Facility
- State whether and how you plan to participate in innovation programs on campus including the Institute for the Global Entrepreneur (IGE), MedTech Accelerator Program, or NSF I-Corps Program, the Office of Innovation and Commercialization, or the Rady School of Management, and how they will benefit the project goals..
- Qualifications of the investigators (**one page maximum**)
- NIH-style biographical sketch including current and pending support (**four pages maximum per investigator**) for each member of the submitting team.
- Summary of outcomes and commercial status of prior GEM projects involving any member of the submitting team.
- Budget and Justification (total amount not to exceed \$40,000 for one year) – Funds may only be used for supplies, trainee or technician salary, core lab fees, statistical support for study design, and essential equipment for prototype development. A small amount of funds may be allocated for pilot clinical studies. **Note** - No funds may be used for faculty salary, travel, clerical help, office supplies, books and subscriptions, or publication expenses.

Applications should adhere to the following formatting specifications:

- 11-point Arial font
- Single-spaced
- 0.5 inch margins on all sides
- 8 ½" x 11" (i.e., standard size) paper
- Number all pages
- No appendices are allowed

HOW TO SUBMIT YOUR APPLICATION

All sections must be collated into a single document (docx or pdf) and submitted as an attachment. Please submit your proposal [here](#).

Please contact **Dr. Deborah Spector** (dspector@health.ucsd.edu) or **Philip Godfrey** (phgodfrey@ucsd.edu) with any questions about this RFA or the application process.

The deadline for the submission of entries is 5:00 pm on Monday, June 23, 2025.

A selected group of experts from the ACTRI, IEM, and Rady School of Management will work with the PIs of the winning proposals to help establish a team and budget to accomplish the goals of the project over a 12-month period.

Application Deadlines, Notices of Awards, and Funding Cycle

Application Deadline: Monday June 23, 2025, 5:00 p.m. PT

Notice of Awards: September 1, 2025

Funding Cycle: September 1, 2025–August 31, 2026