

## The GEM Challenge 2023 – Solving Clinical Problems with Engineering Solutions

UC San Diego Altman Clinical and Translational Research Institute (ACTRI) and the Institute of Engineering in Medicine (IEM) in the Jacobs School of Engineering are pleased to announce the ninth round of the **Galvanizing Engineering in Medicine (GEM)** competition to identify clinical challenges for which engineering solutions can be developed and implemented. 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 in the range of **\$30,000 for one year** will be given. We especially encourage applications related to cellular or medical biophotonics for the Michael Berns GEM Award.

We invite teams that include at least one **Clinically Active UCSD Faculty Member** and one **Engineering Faculty Member as PIs** to submit a proposal. Postdoctoral Fellows and Project Scientists are not eligible to be PIs but may be members of the team.

**Clinical Faculty who are looking for an Engineering Faculty partner or vice-versa should contact Dr. Deborah Spector ([dspector@health.ucsd.edu](mailto:dspector@health.ucsd.edu)) or Dr. Andrew McCulloch ([amcculloch@eng.ucsd.edu](mailto:amcculloch@eng.ucsd.edu))**

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 solution to improve patient care. Healthcare improvement may be achieved through innovation in disease prevention, diagnosis, monitoring and/or treatment. In **Section Two**, the team should describe in detail the engineering technology that will be developed to solve the problem.

Faculty who received a GEM award in 2022 are ineligible for this 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>

A panel of Clinicians, Engineers, Business Experts, and Representatives from the Office of Research Affairs will judge these applications based on the following criteria:

**Significance:** To what extent does the problem or challenge impede or adversely affect patient care and how will the specific engineering solution address and solve the specific challenge?

**Innovation and "Coolness" Factor:** To what extent does the problem focus on an unmet medical need that is not being addressed elsewhere? How novel is the engineering approach, and does it bring to bear the unique resources available at UC San Diego – expertise, infrastructure, other types of support, particularly in combination? Will solving the problem be recognized as a landmark advance for healthcare?

**Feasibility:** Can the engineering solution be accomplished (at least to the development of a prototype) in a 12-month time frame with a budget of approximately \$30,000?

**Future Funding:** What continued funding strategies are anticipated (e.g., NIH R01/R21, NSF, SBIR/STTR, Industry)?

**Commercialization:** Can the engineering solution be commercialized and available to patients within a reasonable time period?

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

## 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 – does not include 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. (five pages maximum).
- Area of Technology – State which of the following IEM Centers your technology falls in.
  - Cellular Photonics and Biophotonics
  - Center for 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
- Utilization of Core Facilities - 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
  - UCSD Center for the Future of Surgery
  - UCSD Mechanical and Aerospace Engineering (MAE) Machine Center
  - Nano3 Nanofabrication Cleanroom Facility
- State whether you would be interested in participating in the Institute for the Global Entrepreneur (IGE) MedTech Accelerator Program or NSF I-Corps Program and how they would benefit your goals. Describe any plans to use other campus resources for

advancing innovation and commercialization such as OIC or the Rady School of Management.

- 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 \$30,000 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, publication expenses, or graduate student's tuition remissions or fees.

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 to an e-mail to **Justina Houston (IEM@eng.ucsd.edu)**.

Please contact **Dr. Deborah Spector (dspector@health.ucsd.edu)** or **Justina Houston (IEM@eng.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 26, 2023.**

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 26, 2023, 5:00 p.m. PT

**Notice of Awards:** August 1, 2023

**Funding Cycle:** September 1, 2023–August 31, 2024