

ACS GCIPR Key Research Areas Grant - Biocatalysis

**2026 ACS GCI Pharmaceutical Roundtable Research Grant for Increasing the  
Breadth and Utility of Enzymes in Pharma Manufacturing**

The ACS Green Chemistry Institute Pharmaceutical Roundtable (GCIPR) is a partnership between the ACS Green Chemistry Institute® and pharmaceutical-related corporations united by a shared commitment to integrate the principles of green chemistry and engineering into the business of drug discovery and production. Current members are Abbvie, Amgen, Astrazeneca, Bayer, Biogen, Biohaven, BMS, Boehringer Ingelheim, Ferring, Gilead, GSK, Ipsen, J&J, Lilly, Merck, Merck KGaA, Neurocrine, Novartis, Novonordisk, Pfizer, Roche-Genentech, Sanofi, Takeda, UCB, Vertex and the ACS Green Chemistry Institute. Associate members are Asymchem, Axplora, Bachem AG, ChemExpress, Codexis, Dr. Reddys, EuroAPI, Hongene Biotech, Hovione, InnoSyn, Nitto Avecia, Olon, PharmaBlock, Pharmaron, Polypeptide, Porton, Sai Life Sciences, Sk Pharmteco, ST Pharm, Syngene, Veranova, and Wuxi AppTec. Affiliate members are Corteva Agriscience, Aralez Bio, FMC, Phlow Corp, PHT, USP, and Zoetis.

**The ACS GCIPR is seeking a one-year R&D commitment to assist the Roundtable in its aim to further develop enzymes for scalable API manufacture. The focus of the proposal is “*Novel Biocatalysts for Sustainable API Manufacture*”, for which the ACS GCIPR would like to receive proposals that address:**

- a) Methodology for accelerated enzyme discovery and evolution**
- b) Development of biocatalysts for new to nature chemistry, or chemistry without a current, scalable biocatalytic alternative**

Proposals are invited from public and private institutions of higher education worldwide. This collaborative project is intended for a student within the selected Principal Investigator’s research group. One grant is planned to be awarded, and the total award is limited to \$80,000 for a grant period of 12 months. Interested PIs are required to provide a proposal describing the investigator’s capability to carry out the Roundtable’s proposed research. Deadline for receipt of proposals is **May 1, 2026, at 11:59 p.m. EDT**. All submissions must be made in our application portal: <https://gci.acs.org>. The Principal Investigator with the selected proposal will be notified by **October 1, 2026**. It is expected that research will commence in the principal investigator’s lab no later than **Q4 2026** and last 12 months.

**Requirements For Submission**

Proposals will only be accepted from public and private institutions of higher education. The grant is not limited to institutions in the United States. Proposals must be submitted through our application portal at <https://gci.acs.org>, and applicants must provide the contact information for the grant officer who will process the grant if selected. For institutions without a grant office or a comparable administrative office, applicants must upload a PDF letter signed by an appropriate university official acknowledging the terms of the grant and accepting the role of financial officer for the grant.

### **Detailed Project Description**

The exquisite enantio- and regio-selective nature of enzymes makes them extremely attractive catalysts for API synthesis. Additionally, enzymes can often be used in combinations, in cascade reactions allowing complex transformations in one pot. As sustainability imperatives shape modern synthesis, the favorable properties of enzymes: renewable origin, biodegradability, rapid evolvability, and activity in aqueous media, make them fundamental to green chemistry. However, in the hands of industrial chemists, current enzyme solutions can fall short: limited scope, difficulties in scaling, slow adaptation workflows, and incompatibility with standard manufacturing operations remain pressing challenges. This members of the GCIPR Biocatalysis Focus Team wish to address these bottlenecks head-on through the support of research in either of two broad areas, accelerating the discovery and evolution of industrial biocatalysts, and increasing the scope of biocatalytic methodology available to the industrial chemist.

The members of the GCIPR would be interested in receiving proposals that utilize both natural enzymes and those that incorporate noncanonical amino acids to facilitate more challenging non-traditional enzymatic reactions.

#### *Key*

#### *Considerations:*

- **Safety:** All reactions considered should have the appropriate safety considerations taken into account, especially those involving oxidation with air, oxygen or other oxidants
- **Co-factors:** For enzymes requiring co-factors that are depleted per turnover, recycling methods should be considered and presented.
- **Substrates and Reactions:** Heterocyclic compounds are abundant in the pharmaceutical industry. Substrates and/or reactions of study should be selected based on a pharmaceutically relevant profile to prioritize activity against these compounds.
- **Greenness:** To ensure that chemistry in water and flow chemistry continue to stay at the frontier of sustainability, applications should be reflective of the key research areas described by the GCIPR:

<https://doi.org/10.1039/C8GC01276H>

and of the principles of both green chemistry and green engineering:

<https://www.acs.org/green-chemistry-sustainability.html>

- **Processing:** Standard pharmaceutically relevant manufacturing operations such as liquid-liquid extractions, distillations, crystallizations, and membrane separations have limitations when operated in the presence of large quantities of protein. As such, the ability to engineer enzymes in the proposals to sufficient activity to be suitable for use in a manufacturing environment should be considered

### **Project Goal**

Promote innovation at the interface of chemistry and biochemistry/enzymology to accelerate biocatalyst discovery and evolution, and to use this methodology to discover biocatalysts that catalyse chemical reactions in a scalable fashion, taking into account enzyme activity, substrate tolerance and specificity, and performance in workup.

In addition, the GCIPR requests the following, if appropriate:

- Perform the necessary screening of enzymes for the proposed transformation
- Demonstration of robust screening and analysis methodology
- Evolution or engineering of enzymes for a specific reaction class
- Perform a substrate scope to better understand if there are significant limitations to the specific enzyme class
- Gram-scale demonstration of a select few transformations that show promise to show potential for scalability for the pharmaceutical industry.
- Application of sustainability metrics tools (<https://acsgcivr.org/tools/>) to laboratory scale up experiments to provide an initial assessment of reactions and potential for further development

### **Project Timeline**

It is expected that one year of research support will be sufficient to provide progress toward intended goals.

### **Proposal Format**

Please be prepared to provide the following information in the application portal:

1. Name and email of grant officer
2. Name, title, phone, email and address of the Principal Investigator
3. Project Title
4. Abstract (200 words)
5. Research Group website
6. PDF of Proposed Plan of Work (*2 pages, 12 pt font, 1-inch margins*)
  - Objectives: Briefly state the project objectives
  - Project Approach: Include specific aims and investigations planned
  - Proposed milestone deliveries with brief description of the manner in which the researcher intends to achieve them
  - Discussion of work's potential impact on sustainability
  - Brief description of the PI's research facilities and summary of the student's (undergraduate, graduate student and /or postdoc) capabilities to perform the proposed work
  - References (does not count toward your page limit)

Note: The PI should list any existing background intellectual property and/or collaborations they are aware of that might limit the freedom to operate any of the results arising from any research funded by ACS GCIPR. The priority of the Roundtable is to encourage research utilizing reaction conditions that are commercially viable with the freedom to use.

7. PDF of Detailed Estimated Budget: The total amount requested would include all direct costs, student assistantships, etc. The total award is limited to \$80,000 for a grant period of up to 12 months. (*2 pages, 12 pt font, 1-inch margins*)
  - Institutional overhead costs (indirect costs) should not be more than 10% of the total budget.
  - Post-doctoral associate salary and benefits are supported.
  - Student stipend and benefits are supported. Proposals for support of advanced graduate students are strongly encouraged.
  - PI salary supplements will not be supported.
  - Laboratory supplies and instrument use charges are supported.
  - No funds may be allocated for travel, equipment purchase or repair, or administrative support.

8. PDF of Curriculum Vitae of Project Team Members: Please submit a curriculum vitae of each project team member (up to two pages per team member, combined into the same PDF document as the project description). This does not count toward your page limit.

### **Report Requirements**

- Progress reports/research updates are due monthly or bi-monthly from initiation of research and will be discussed in arranged web-conferences. All reports/updates will be shared with the member companies of the Roundtable.
- Reports/updates should include research milestones/significant outcomes, summary of progress to date noting any deviations from the proposal, and research plans for upcoming months.
- A final comprehensive report is due one month after the end of the grant period. In addition, the content of the report should be targeted for publication in a peer-reviewed technical journal. The paper will be co-authored by the principal investigator and student(s) performing the work. Representatives of member companies who make intellectual contributions to the project should be recognized as authors.

### **Intellectual Property, Publication Acknowledgement, and Terms of the Grant**

- The primary purpose of this grant is the public dissemination of research through publication.
- Every patent, United States or foreign, that results from research funded (in part or in its entirety) by the ACS GCIPR Research Grant shall be immediately dedicated to the public, royalty free.
- Publication of results is expected within 6 months of work completion.
- Each publication prepared in connection with an ACS GCIPR Grant shall make acknowledgement in the following manner: “This manuscript was developed with the support of the ACS Green Chemistry Institute Pharmaceutical Roundtable (<https://www.acsgcivr.org>), under Grant No. XXXXX. The ACS GCI Pharmaceutical Roundtable’s mission is to catalyze green chemistry & engineering in the global pharmaceutical industry.”
- Acceptance of a Roundtable Grant will be conditional upon agreement by the grantee institution that in the event the Principal Investigator is unable for any reason to conduct the research proposed, the funds, if previously paid by the Roundtable, shall, upon demand,

be returned in full to the Roundtable, and further, that in the event the PI is unable for any reason to continue with the research after it has commenced, this grant shall be terminated forthwith and the unexpended and unencumbered balance of any funds theretofore advanced shall be returned to the Roundtable.

- The grantee institution, by acceptance of this grant, provides assurance that support normally provided by the institution for research of the faculty member will not be diminished.
- Applicants may have only one research grant with the ACS GCIPR at a time. In order to close a grant, the ACS GCIPR must receive and approve the required reports.

**For additional information:**

Website: [www.acsgcipr.org](http://www.acsgcipr.org)

Email: [gcipr@acs.org](mailto:gcipr@acs.org)