Industrial Collaboration and Innovation Program

www.cbirc.iastate.edu

Bioresnewable chemicals for a sustainable future
CBiRC’s pioneering research and education programs are focused on developing technologies that enable the production of biorenewable chemicals. CBiRC will achieve this by harnessing the combined power of biotechnology and catalysis to deliver a broad platform of innovations that cost effectively convert renewable materials into chemical feedstocks. These biorenewable feedstocks will support the production of biorenewable chemicals within a sustainable chemical industry. To achieve these goals, CBiRC has organized into seven interconnected programs including: Biocatalysis Research, Microbial Engineering Research, Chemical Catalysis Research, Testbeds, Life Cycle Assessment, Industry Collaboration and Innovation, and a unique Education Program in biorenewable chemicals that covers both biological and chemical catalysis.

**Engineering Platform**

CBiRC is basing its engineering platform on three interconnected segments: (1) enzyme and microbial engineering, (2) chemical catalysis and catalyst engineering, and (3) testbeds and life cycle analysis. Biocatalysis efforts are focused on the fatty acid or polyketide biosynthetic pathways with a goal of enhancing microbial production through targeted engineering. Combining biocatalysis with chemical catalysis opens the door to developing an array of feedstock chemicals such as α-olefins, diols, dienes, branched and ring structures, and ethers and esters at the heart of CBiRC’s vision. These feedstock chemicals will form the basis for founding a biorenewable chemicals industry.

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**CBiRC research program leading to biorenewable chemicals**
Industrial Collaboration and Innovation Program

CBiRC aims to develop long-term membership relationships with chemical, biotechnological, energy, and agricultural companies, as well as other ventures that seek to leverage a broad network of respected expertise.

CBiRC’s Industrial Collaboration and Innovation Program provides a rich resource of knowledge and practical experience that will deliver fundamental scientific discovery and innovation to its members. The program seeks to facilitate technology transfer, guide the research, and accelerate commercial application with its three tiers of membership (detailed in the table on right). Membership highlights include:

- Collaboration with internationally recognized academic and private leaders;
- Access to faculty and students working in leading NSF-funded research programs;
- Early access to intellectual property, publications, and know-how in the biorenewable chemistry sector (Full and Sponsoring members only).

### Program Membership Benefits

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<tr>
<th><strong>Sponsor:</strong></th>
<th>Full members may individually sponsor dedicated research projects with CBiRC faculty members and jointly submit proposals to federal agencies. These projects require an individualized sponsoring agreement with CBiRC.</th>
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<tr>
<td><strong>Options:</strong></td>
<td>Full and Sponsoring members receive priority notification of CBiRC inventions and have an option to negotiate a royalty-bearing commercial license for such technology.</td>
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<td><strong>Research:</strong></td>
<td>All members receive CBiRC’s quarterly newsletters and gain early access to recent, not-yet-published research findings. All members have a royalty-free license for internal, noncommercial purposes. This provides an opportunity to assess new technologies developed in the center.</td>
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<td><strong>Network:</strong></td>
<td>All members participate in scientific exchange at CBiRC’s semi-annual meetings and are encouraged to suggest research directions and initiatives. These meetings also provide an opportunity to network with faculty, students, and other partnering biorenewable chemical companies as well as innovation venture capital partners.</td>
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<td><strong>Advisory Board:</strong></td>
<td>All members have exclusive membership rights to be a part of CBiRC’s Industry Advisory Board. Members recommend testbed design and target compounds and intermediates.</td>
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<td><strong>Internships:</strong></td>
<td>CBiRC has a significant mandate to educate new engineers in the multidisciplinary programs. All members have access to a talented pool of potential interns. CBiRC welcomes industry engineers and scientists as visiting scholars.</td>
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<td><strong>Recruit:</strong></td>
<td>All members have the inside track to hire CBiRC’s graduates into exciting new biorenewable opportunities in their organizations.</td>
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<td><strong>Promote:</strong></td>
<td>All members will be listed on CBiRC’s web site. Branding opportunities exist for members to promote their organization within CBiRC, Iowa State University, and the outside world. These include but are not limited to postdoctoral fellowships, seminars, and conferences.</td>
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### Annual Membership Fee

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<th><strong>Annual Membership Fee</strong></th>
<th><strong>INDUSTRY MEMBERS</strong></th>
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<td></td>
<td><strong>Strategic</strong></td>
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<tr>
<td>Large (a company with at least 500 employees)</td>
<td>$25,000</td>
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<tr>
<td>Medium (a company with less than 500 and more than 60 employees)</td>
<td>$12,500</td>
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<td>Small (a company that has less than 61 employees and more than 10)</td>
<td>$2,500</td>
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<tr>
<td>Start-up (a company that has not completed an IPO and has less than 11 employees)</td>
<td>$500</td>
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*To be negotiated on a case-by-case basis.*
Vision—CBiRC will transform the chemical industry by integrating biological and chemical catalysis to create a generalized framework for producing biorenewable chemicals.

Foundation—CBiRC, founded in 2008, has established an ambitious research and education program focused on developing cornerstone technologies to help form a viable biorenewable chemicals industry.

Research—CBiRC is focused on integrating biocatalysis, microbial engineering, and chemical catalysis with testbeds and a life cycle assessment of renewable chemical opportunities.

Education—CBiRC will provide educational programs that attract a diverse group of students into the engineering field and produce a new cadre of globally competitive college graduates capable of designing integrated chemical/biological processing systems.

Funding—The NSF Engineering Research Center for Biorenewable Chemicals is one of only 15 Engineering Research Centers currently funded by the National Science Foundation (NSF). Initial funding is more than $18.5 million over five years, with additional support from institutional matching and industry memberships.

Core Partner Institutions
Iowa State University (lead institution)
Rice University
University of California–Irvine
University of New Mexico
University of Virginia
University of Wisconsin–Madison

Institutions Contributing Affiliated Faculty
Salk Institute for Biological Studies
University of Michigan

CBiRC Management Team*

BRENT SHANKS ............................................. Director

BASIL NIKOLAU ............................................. Deputy Director

ROB ANEX ............................................. Life Cycle Analysis Leader

ABHAYA DATYE ............................................. International Education Program Director (University of New Mexico)

ROBERT DAVIS ............................................. Chemical Catalysis Leader (University of Virginia)

PETER KEELING ............................................. Industrial Collaboration and Innovation Director

ADAH LESHEM-ACKERMAN ........................................... Pre-College Education Program Director

LISA LORENZEN ............................................. Director of Industry Relations (Iowa State University)

TONIA MCCARLEY ............................................. Administrative Director

DAVID OLIVER ............................................. Biocatalysis Leader (University of Virginia)

RAJ RAMAN ............................................. University Education Program Director

DERRICK ROLLINS ............................................. Diversity Director

KA-YIU SAN ............................................. Microbial Engineering Leader (Rice University)

JACKIE SHANKS ............................................. Microbial Engineering Co-Leader

* From Iowa State University unless otherwise noted

For more information, contact:

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