

Center Plan

Overview of Vision and Goals: Cellular Engineering

The Center for Cellular Construction is an NSF Science and Technology Center whose vision is to develop an engineering discipline that will allow us to design and build cells and tissue with specific three-dimensional structures. These structures will serve as living factories and building blocks for better and more sustainable products, materials, and devices to benefit humankind.

We are pursuing these goals through an integrative combination of research, education, diversity, and knowledge transfer. Three features characterize our approach as an engineering approach, distinct from traditional cell biology research: focus on a design-build-test cycle as opposed to the hypothesize-test-refine cycle that characterizes scientific research; use of rational and predictive models to drive design, which makes the design engineering as opposed to tinkering; and the fact that real-world applications are the driving force behind research activities. The focus on cellular structure is a distinctive feature of our research program that distinguishes our work from other efforts in synthetic biology, while our focus on engineering cells themselves, rather than on fabricating physical devices to interact with cells, sets us apart from traditional biomedical engineering.

Our educational activities are geared towards injecting an engineering mindset into biology education while at the same time training a new workforce with skills appropriate for engineering cells. Knowledge transfer activities are organized around the concept of learning from industry while moving our ideas into the real world through partnerships and startups. We are implementing concrete strategies for increasing diversity of participation in all three activity areas (research, education, and knowledge transfer).

Read more about individual center activities

Project 1 ^[1][Cellular Machine Shop](#)

Project 2 ^[2][CellCAD](#)

Project 3 ^[3][Cellular Legos](#)

Project 4 ^[4][The Living Bioreactor](#)

Project 5 [5]Cell-State Inference

Diversity and Broadening Participation [6]

Education

High School Education [7]

Undergraduate Education [8]

Graduate Education [9]

Knowledge Transfer [10]

Public Outreach [11]

Ethics and Responsible Innovation [12]

© 2016 The Regents of the University of California

Source URL: <https://ccc.ucsf.edu/center-plan>

Links

- [1] <https://ccc.ucsf.edu/project-1>
- [2] <https://ccc.ucsf.edu/project-2-cellcad>
- [3] <https://ccc.ucsf.edu/project-3>
- [4] <https://ccc.ucsf.edu/project-4>
- [5] <https://ccc.ucsf.edu/project-5>
- [6] <https://ccc.ucsf.edu/project-diversity>
- [7] <https://ccc.ucsf.edu/high-school-education>
- [8] <https://ccc.ucsf.edu/undergraduate-education>
- [9] <https://ccc.ucsf.edu/graduate-education>
- [10] <https://ccc.ucsf.edu/project-knowledge-transfer>
- [11] <https://ccc.ucsf.edu/public-outreach>
- [12] <https://ccc.ucsf.edu/project-ethics>