

We generate and harness big data to advance CHO cell-line engineering for drug development.

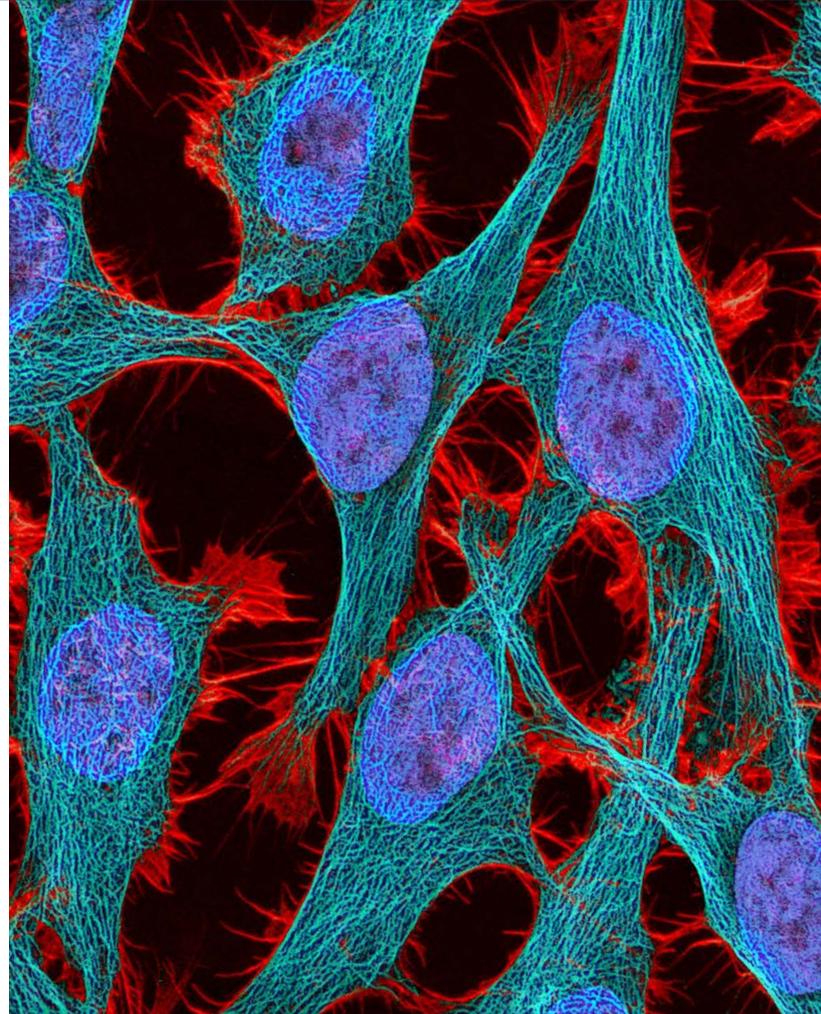
UC San Diego is a world leader in systems biology, genomics and CHO (Chinese hamster ovary) research. The biopharmaceutical industry now has the opportunity to build on this expertise to control, with precision, the critical quality attributes (CQAs) that determine safety, efficacy and cost of recombinant proteins secreted from CHO cells. The era of rational CHO cell-line engineering is here.

From Data to Knowledge

The CHO Systems Biology Center develops and deploys novel approaches to generate – and then manage, interpret, and integrate – massive biological data sets. We convert these mountains of data into biological knowledge needed to advance biopharmaceutical development and production.

Our innovations have introduced a new era of cell-line engineering, and we are partnering with industry to further develop and propagate our techniques and resources. We also train the talent that industry needs to translate these research advances to the marketplace.

Collaborate with us.



\$140 Billion Market

Cell lines serve as “factories” that churn out more than \$140 billion in biopharmaceuticals annually. CHO cell lines are the primary producers of these therapeutic recombinant proteins.

Image: NCMIR at UC San Diego

Unparalleled CHO Cell Line Resources

GENOME SEQUENCES
AND ANNOTATIONS

METABOLISM AND
GLYCOSYLATION MODELS

CHO SYSTEMS BIOLOGY
INSIDER INFORMATION

NEXT-GENERATION GENOME
EDITING TECHNIQUES

NEW SAFE HARBOR
INTEGRATION SITES

ENHANCED “CLEAN”
CELL LINES

BIG DATA ANALYTICS
FOR PRODUCT CONTROL

CLONES SECRETING
HUMAN PROTEINS

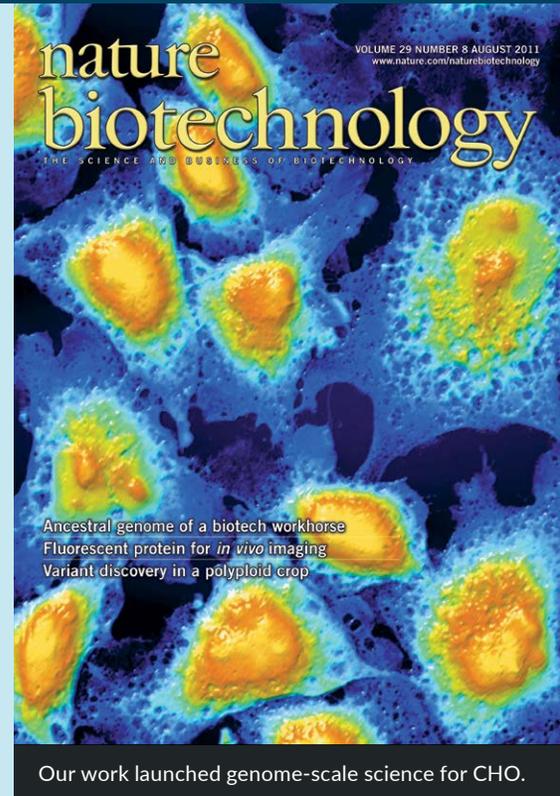
DEEP OMICS PROFILING OF
ENGINEERED CELL LINES

New Era for Systems Biology

“For three decades, CHO cells have been the biopharmaceutical industry workhorse. While the modus operandi for controlling drug quality included randomly screening cells, our research teams at UC San Diego are helping to open an era of rational CHO cell engineering, with the release of CHO genome sequences, systems biology models, and CRISPR tools. In the hands of innovative cell engineers trained in big data analytics and systems biology, these tools will enable the design of the next generation of CHO cells.

Because of research innovations at UC San Diego, we are uniquely positioned to train scientists in CHO cell design and expand the CHO cell engineering toolbox.”

— **Bernhard Palsson, Ph.D.**
CHO Systems Biology Center Director



UC SAN DIEGO BIOENGINEERING

Bernhard Palsson

Pioneer in systems biotechnology research and education.

Prashant Mali

Development of CRISPR/Cas9 genome engineering toolsets and tissue engineering methodologies for stem cell biology and regenerative medicine.

Christian Metallo

Metabolomics and flux analysis of mammalian cells applied to cancer, diabetes and cardiovascular disease. Experience with mammalian bioreactor engineering.

COMPUTER SCIENCE / BIOINFORMATICS

Vineet Bafna

Leader in proteogenomics, which involves the use of mass spectrometry data for the annotation of genomes.

UC SAN DIEGO HEALTH SCIENCES

Nathan Lewis

A leader of public CHO genome sequencing efforts. Expert in systems biology and genome editing technologies.

Jeff Esko

CHO genetics and glycan engineering, expertise in proteoglycans and glycosaminoglycans.

SANFORD | BURNHAM MEDICAL RESEARCH INSTITUTE

Randal Kaufman

Pioneer in the cell biology of protein folding and secretion and CHO cell engineering. Led development of clotting factors as Director at Genetics Institute.

CENTER MEMBERSHIP BENEFITS

- » Interact with leading scientists in mammalian biotechnology, genomics, and systems biology
- » Access the latest data from our large-scale projects
- » Engage top talent by interacting with our center
- » Fast-track collaborative agreements
- » Attend our semi-annual member meetings
- » Join our Advisory Board

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