

Boston



- NEWS
- RESTAURANTS
- A&E
- HEALTH
- REAL ESTATE
- STYLE
- HOME DESIGN
- WEDDINGS
- BEST OF BOSTON
- IN THE MAGAZINE

IN THIS SECTION: News | Fitness | Nutrition | Wellness | Hospitals

search

Boston Children's Hospital, Boston University, Harvard University

Boston Researchers Develop Stem Cell Roadmap

CellNet, a computer algorithm, will help ensure the quality of lab-engineered cells.

By Andrea Timpano | Hub Health | August 19, 2014 10:24 am

Recommend

4

Tweet

0

Tweet

0

4

4

|

|

Researchers at Boston Children’s Hospital, the Wyss Institute at Harvard University, and Boston University have developed CellNet, a computer algorithm which will serve as a “roadmap for cell and tissue engineering.” An asset to stem cell research and regenerative medicine, CellNet was created to help scientists confirm that lab-engineered cells match those found naturally in the human body.

“To date, there has been no systematic means of assessing the fidelity of cellular engineering—to determine how closely cells made in a petri dish approximate natural tissues in the body,” senior investigator and Boston Children’s physician George Q. Daley said in a statement. “CellNet was developed to assess the quality of engineered cells and to identify ways to improve their performance.”

The algorithm, published in the August 14 issue of *Cell*, compares an engineered cell’s network biology to that of a natural cell using public genome databases. This allows researchers to evaluate the quality of what are known as “induced pluripotent stem cells (iPS cells),” or cells which can be used to form body tissue, as well as specialized cells which are made from them. The results of these evaluations help researchers tweak the engineering process.

In testing CellNet and its applications, researchers identified four principles of stem cell science:

MOST POPULAR

- How Northeastern University Gamed the College Rankings »
- This Is Not a Test: The Best Schools in Greater Boston 2014 »
- MIT Students Create Small-Scale Roller Coaster for Campus Bash »
- Chef’s Guide: Eating Well at North End Restaurants »
- Photos: Boston Marathon Survivor Marries the Nurse He Met in Recovery »
- 10 Amazing Day Trips To Take Now »
- Warren Tolman Makes an ‘Unbecoming’ Comment »

DATA ANALYTICS
BUSINESS INTELLIGENCE
PART-TIME, EVENING & ONLINE GRADUATE PROGRAMS IN **Information Technology** at BU's Metropolitan College.
Classes start September 2.
REGISTER NOW!

BIOTECH
CLINICAL TRIALS
CELL CULTURE
cGMP

BOSTON UNIVERSITY

Part-time, evening programs in **Biotech** at BU's Metropolitan College.
Classes start September 2.
REGISTER NOW!

- 1) The Gene Regulatory Network [GRN] of iPS cells created by reprogramming a mature cell is nearly identical to that of stem cells made from embryos, confirming that iPS cells are a good raw material for creating specialized cells.
- 2) Once engineered cells are engrafted into laboratory mice, their GRN becomes even closer to that of the true target tissue, indicating that the body’s own tissues contribute signals to enhance the performance of transplanted cells.
- 3) Differentiating pluripotent stem cells into specific tissues is currently more effective than attempting to convert one specialized cell directly to another, creating cells whose GRNs are much like those of cells in the body.
- 4) Most specialized cells made from other specialized cells retain some “memory” of their cell of origin, making them less than ideal for certain uses but better for others.

CellNet will be available to all scientists as an internet resource. Researchers believe that the algorithm will help others use cells to model diseases and develop new treatments. “CellNet will also be a powerful tool to advance synthetic biology—to engineer cells for specific medical applications,” co-senior investigator James Collins said in a statement.

You Might Also Like:



Researchers Reverse Emotional Associations of Memories in Mice



Prenatal Antidepressant Use Doesn’t Increase Autism Risk, Study Says



Study Examines Link Between Aging and Sleep Disruption



Low Birth Weight, Higher Incidence of Type 2 Diabetes Link Found in African American Women

Be respectful of our online community and contribute to an engaging conversation. We reserve the right to remove impersonators or personal attacks, threats, profanity, or flat-out offensive comments. By posting here, you are permitting Boston magazine and Metro Corp. to edit and republish your comment in all media.

Chest Diseases

SPONSORED CONTENT



High-Tech, Video-Assisted Approach to Treat Lung Cancer



The Differences Between COPD & Asthma



Patient Story: Back to Normal After Chest Condition Diagnosis





... QUIZ ...

Quiz: Chest Diseases

.....

Connect With BIDMC

Request an Appointment

Find a Doctor

Follow us on Twitter

Like us on Facebook

VIDEO

Start the discussion...

Be the first to comment.

Video: Watch: Great White Shark Spotted Off Duxbury Coast

SUBSCRIBE



Subscribe Now

Give a Gift

Customer Service

Table of Contents

