



Chinese Scientists Create Four Synthetic Yeast Chromosomes

Chinese scientists have assembled four synthetic yeast chromosomes, so making China the second country after the United States capable of designing and building eukaryotic genomes.

The findings, published in the journal *Science*, constitute one step closer to building synthetic life.

Researchers from Tianjin University, Tsinghua University, and BGI-Shenzhen involved in the study have constructed the synthetic active eukaryotic chromosomes by first exactly matching the synthetic genome with the designed sequence.

"If genome sequencing is like reading the code of life, then genome synthesizing is writing the code of life. Moving from reading to writing is a breakthrough," said Yang Huanming, an academic with the Chinese Academy of Sciences.

In 2010, U.S. scientists succeeded in implanting a synthetic genome in a prokaryotic bacterium, so marking the first step in the chemical synthesis of live organisms.

"The latest study has addressed the fundamental problems of synthesizing unicellular eukaryotic organisms, so laying a foundation for the future design and building of cells for more complex multicellular organisms, including those of animals, plants and fungi," said Yuan Yingjin, a professor with Tianjin University.

The new effort is part of a larger project to redesign and reengineer yeast chromosomes called the Synthetic Yeast Genome Project. Several research institutes, in China and the United States, have participated.

Brewer's yeast has long served as an important research model, because although its cells share many features with human cells, they are simpler and easier to study.

"Synthetic yeast chromosomes will facilitate studies on chromosome abnormalities and repairs to the genome. This will provide models for research and treatment of present medical challenges, such as epilepsy, cancer, mental disorders, and aging," Yuan said.

Researchers believe that synthetic biology will provide solutions to global problems, including energy shortages and pollution.

For example, with the help of technological development, modified brewer's yeast made from synthetic chromosomes will one day, through fermentation, help to produce various kinds of food and energy at a lower cost, Yang said.