



Drug Function Testing Will Benefit from the Miniecosystems Designed by Chemists

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ABSTRACT

It is reported that scientists from Scripps Research have worked a way out to solve the a major problem in chemistry and drug development. They designed a miniecosystems to see if a molecule has the function of a potential therapeutic.

This research result has been reported on the journal—*Proceedings of the National Academy*, and it is learned that this technology allows researchers to save critical time and funding by simultaneously testing how drug candidates bind to their cellular targets and alter cell function.

Tianqing Zheng, Ph.D., postdoctoral associate on Scripps Research's California campus, said that this could save a lot of time in drug discovery by reducing the steps needed to assess drug candidates, and co-cultivation of mammalian and bacteria cells in miniecosystems makes it possible to select functional antibodies directly with [antibody phage display](#). What's more, he added that antibody [phage technology](#) has propelled the development of pharmaceuticals and the next step is to apply this method to select functional antibodies against many more targets of interest as of the success of this method.

This study shows that the miniecosystem is testing for affinity and function at the same time. The miniecosystems are held in droplets the size of a picoliter—or one-trillionth of a liter. In these cramped quarters, the researchers brought together a mammalian cell and E. coli bacteria. The mammalian cell in the droplet is engineered to express a fluorescent protein if properly targeted by an antibody. This symbolizes that researchers can detect antibody affinity and function more time- and cost-effectively.

In order to test their new system, the researchers quickly generated millions of miniecosystems with mammalian cells and bacteria that produce [magic phage](#)-tethered antibodies. They tested these antibodies against a real biological target: a receptor on brain cells, called TrkB, which revealed that antibodies are functioning as a therapeutic at targeting TrkB when attached to phage, rather than the antibody alone which they had proved in previous studies.

The miniecosystem should be a milestone in the drug function research field. Although scientists faced a bottleneck, they finally worked it out and proved that this study is successful in testing drug function.