

On-demand biologics

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Many life-saving medicines, including insulin, antibodies and vaccines, are derived from living cells. These "biologics" can be difficult to obtain and store on the battlefield or in remote areas. That's why scientists are trying to develop portable systems that can quickly manufacture small batches of protein therapeutics on demand, according to an article in *Chemical & Engineering News (C&EN)*.

Pharmaceutical companies manufacture large batches of biologics by growing cells that are genetically engineered to produce a therapeutic [protein](#) in huge bioreactors. Growing the [cells](#) and then purifying the proteins takes several days, and switching a system from making one molecule to another can require months, writes Senior Correspondent Celia Henry Arnaud. Once produced, many biologics must be refrigerated to remain active, which is often impractical in [remote areas](#). To overcome these issues, the U.S. Defense Advanced Research Project Agency (DARPA) has challenged researchers to develop systems to manufacture biopharmaceuticals in less than 24 hours, so that the drugs can be produced onsite, as needed.

A team of DARPA-funded researchers at MIT has designed a benchtop [biologic](#) manufacturing system called Integrated Scalable Cyto-Technology, or InSCyT, that can be easily reconfigured to produce different biologics using yeast. Another DARPA-funded team at the University of Maryland, Baltimore County, has developed a system, called Biologically-derived Medicines on Demand (Bio-MOD), that fits inside a suitcase and uses freeze-dried cell extracts to make proteins. On-demand approaches like InSCyT and Bio-MOD could not only produce

much-needed medicines in remote locations, but they also could reduce the need for drug stockpiling and enable personalized medicines, experts say.

More information: The article, "Making biologics on demand," is freely available here: [cen.acs.org/biological-chemist ... logics-demand/96/i45](https://cen.acs.org/biological-chemist...logics-demand/96/i45)

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