

Synthetic gene networks stored, preserved on freeze-dried paper

Imagine pulling a small piece of paper out of your desk drawer, adding a drop of water, and within hours having a reconstituted biological system functioning on your benchtop. It turns out that such molecular magic might be possible, thanks to a new strategy to embed synthetic gene networks—built to detect the presence of glucose or a pathogen, say, or produce a protein of interest—on freeze-dried paper.

Boston University's [James Collins](#), an early leader in the [field of synthetic biology](#), and his colleagues added all the necessary ingredients—transcription and translation enzymes, along with DNA encoding genes that dictated a particular function—onto a bit of paper, then freeze-dried it. Up to a year later, the synthetic gene network could be rehydrated and kicked into gear.

“It turned out that this worked really well,” said Collins. “These samples would work as well as the fresh-from-frozen stock, and as well as inside a cell.”

“I honestly didn’t think it was going to work,” said [Keith Pardee](#), a postdoc in Collins’s Wyss Institute lab who led to work, which was published in *Cell*. “Our simplest system contains 35 proteins and the ribosomes, and I thought there’s just no way we’re going to be able to freeze-dry this and have each one of these proteins to come back at levels that are compatible enough to reconstitute transcription and translation. But I thought I just have to try because if it works it would be so cool. And it did.”

Read full original article: [Next Generation: Freeze-Dried Gene Networks](#)