

Clinical trial of a technique that could give everyone the best antibodies

This brings us to the technique being used here. In this case, the researchers placed the antibody genes in a circular loop of DNA called a plasmid. This is enough to ensure that the DNA doesn't get digested immediately and to get the antibody genes made into proteins. But it does nothing to help get the DNA inside of cells.

The research team, a mixture of people from a biotech company and academic labs, used a commercial injection setup that mixes the injection of the DNA with short pulses of electricity. The electricity disrupts the cell membrane, allowing the plasmid DNA to make it inside cells. Based on animal testing, doing this in muscle cells is enough to turn the muscles into factories producing lots of broadly neutralizing antibodies.

The new study was meant to test the safety of doing that in humans. The team recruited 44 participants, testing various doses of two antibody-producing plasmids and injection schedules. All but four of the subjects completed the study; three of those who dropped out had all been testing a routine with the electric pulses happening very quickly, which turned out to be unpleasant. Fortunately, it didn't seem to make any difference to the production of antibodies.

While there were a lot of adverse reactions, most of these were associated with the injection itself: muscle pain at the site, a scab forming afterward, and a reddening of the skin. The worst problem appeared to be a single case of moderate

muscle pain that persisted for a couple of days.

In all but one volunteer, the injection resulted in stable production of the two antibodies for at least 72 weeks following the injection; the single exception only made one of the two. That's "at least" 72 weeks because that's when they stopped testing—there was no indication that levels were dropping at this point. Injecting more DNA led to more variability in the amount of antibody produced, but that amount quickly maxed out. More total injections also boosted the level of antibody production. But even the minimal procedure—two injections of the lowest concentration tested—resulted in significant and stable antibodies.

<https://arstechnica.com/science/2025/10/dna-and-jolts-of-electricity-get-people-to-make-optimal-antibodies/>