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OF MICE AND MAN-MADE LIVERS

All hail the lab mouse. Scientists routinely use the critters to test the safety and efficacy of treatments for humans, but unfortunately, because their liver cells act differently than ours, it's a challenge to use them for testing new drugs. Scientists have tried to work around the problem by injecting human liver cells into mice, but that's never really worked. So about 90 percent of drug trials fail because of liver toxicity in humans.

But all that began to change earlier this year, when MIT doctoral grad Alice Chen figured out how to put a human liver inside a mouse. The 2011 Lemelson Prize winner was trying to create artificial livers for transplant patients when she developed a hydrogel polymer in which human liver cells could thrive. The polymer (which looks like a soft contact lens) can be easily implanted into a healthy mouse, where the cells can then metabolize drugs just as they would in humans. The transplants have a 90 percent success rate, and can be formed and embedded in just two weeks.
— ANNE VICKMAN

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THE END OF THE COMMON COLD

IT'S THE HOLY GRAIL of medical breakthroughs, and it just may be at hand. We're talking about the cure for the common cold, and with it the end of influenza, stomach bugs, polio, hemorrhagic fevers, and quite possibly every other viral infection in the world. The miracle compound: double-stranded-RNA-activated caspase oligomerizer—or DRACO, which was announced this summer by Todd Rider and his team at MIT's Lincoln Labs in Lexington.

At heart, DRACO is shockingly simple— just three combined molecules that search the body to find and destroy any cell that dares host a virus. The first molecule helps the group slip in and out of cells; the second detects long strings of double-stranded RNA (the calling card of almost every virus); and the third causes the virus cell to self-destruct. If the drug clears the testing hurdles ahead, this could be it. Bigger than penicillin and, reportedly, with far less chance of resistance. — SHANNON FISCHER

ILLUSTRATION BY ADAM McCAULEY