

Researchers find existing drug effective at preventing onset of type 1 diabetes

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A drug commonly used to control high blood pressure may also help prevent the onset of type 1 diabetes in up to 60 percent of those at risk

for the disease, according to researchers at the University of Colorado Anschutz Medical Campus and the University of Florida in Gainesville.

The study was published online this week in the *Journal of Clinical Investigation*.

"This is the first personalized treatment for type 1 [diabetes prevention](#)," said Aaron Michels, MD, a researcher at the Barbara Davis Center for Childhood Diabetes and associate professor of medicine at CU Anschutz. "We made this discovery using a supercomputer, on the lab bench, in mice and in humans."

The [drug](#), methyldopa, has been used for over 50 years to treat [high blood pressure](#) in pregnant women and children. It is on the World Health Organization's list of essential drugs.

But like many drugs used for one condition, Michels and his colleagues found it useful for something totally unrelated.

Some 60 percent of people at risk of getting type 1 diabetes possess the DQ8 molecule which significantly increases the chance of getting the disease. The researchers believed that if they could block specifically the DQ8 molecule they could also block the onset of the disease.

"All drugs have off-target effects. If you take too much acetaminophen you can hurt your liver," Michels said. "We took every FDA approved small molecule drug and analyzed HLA-DQ8 binding through a supercomputer. We searched a thousand orientations for each drug to identify those that would fit within the DQ8 molecule binding groove."

After running thousands of drugs through the supercomputer, they found that methyldopa not only blocked DQ8, but it didn't harm the immune function of other cells like many immunosuppressant drugs do.

The research spanned 10 years and its efficacy was shown in mice and in 20 type 1 diabetes patients who took part in a clinical trial at the Barbara Davis Center for Childhood Diabetes at the University of Colorado School of Medicine.

"We can now predict with almost 100 percent accuracy who is likely to get type 1 diabetes," Michels said. "The goal with this drug is to delay or prevent the onset of the disease among those at risk."

The drug is taken orally, three times a day.

Michels and fellow researcher David Ostrov, PhD, hope this same approach of blocking specific molecules can be used in other diseases.

"This study has significant implications for treatment of diabetes and also other autoimmune diseases," said Ostrov, associate professor at the University of Florida College of Medicine's Center for NeuroGenetics.

"This study suggests that the same approach may be adapted to prevent autoimmune diseases such as rheumatoid arthritis, coeliac disease, multiple sclerosis, [systemic lupus erythematosus](#) and others."

The next step will be a larger clinical trial sponsored by the National Institutes of Health in spring.

"With this drug, we can potentially prevent up to 60 percent of type 1 [diabetes](#) in those at risk for the disease," Michels said. "This is very significant development."

Provided by CU Anschutz Medical Campus

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