Taking the needle's sting out of diabetes

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This is Adi Mor from Tel Aviv University. Credit: AFTAU

Found in 30% of all human cancer tumors, the Ras protein literally "drives cells crazy," says Prof. Yoel Kloog, the dean of the Faculty of Life Sciences at Tel Aviv University. Prof. Kloog was the first in the world to develop an effective anti-Ras drug against pancreatic cancer, currently in clinical trials. Now, new research published in the June issue of the European Journal of Pharmacology shows that the drug might be able to slow the progression of diabetes as well.

Prof. Kloog's student Adi Mor of TAU's Department of Neuro-biochemistry and Sackler School of Medicine has modified Prof. Kloog's anti-Ras FTS compound to develop what could be the first tablet-based treatment for children and adults with Type 1 diabetes. Early

results show that FTS is effective in restoring insulin production in animal models — which could spell an end to the daily needle injections endured by diabetics.

"Our anti-Ras compound has shown very positive results in inhibiting diabetes," says Mor. And given the drug's history -- FTS has already passed toxicity studies for other diseases and disorders -- it has the potential to fast-track through FDA regulatory hurdles, skipping straight to Phase II clinical trials. A new drug for diabetes could be ready in as little as five years' time.

Helping the immune system do its job

Previous studies by Prof. Kloog's lab found that the FTS compound is effective against autoimmune diseases such as multiple sclerosis and lupus, "but the mechanism of its effects on immune cells was not well understood," says Mor. "I wanted to see if there was a connection between Ras and the regulation of the immune system, and if so if FTS could help regulate it to prevent or slow diabetes."

Through treating cells with the Tel Aviv University FTS compound, Mor was able to find and isolate an important immune system regulator protein called Foxp3. This protein keeps T cells in the immune system in check. T cells are the immune system's "soldiers" that fight off infection and disease. In her studies in the lab, when Mor blocked Ras using the FTS drug, she was able to increase the Foxp3 protein which gave a boost to the all-important T cells.

Slowing diabetes to a crawl

Mor then theorized that if the amount of regulatory T cells in the body was increased, the progression of diabetes would diminish. "My aim was

to slow down diabetes, which brings a suitcase of side-effects like circulatory problems that lead to blindness and amputations," she says.

In her recent study, Mor treated pre-diabetic mice for six months. One group was given FTS, another was given no drug at all. The outcome was dramatic. Only 16% of the treated group developed diabetes, while 82% of the untreated group became diabetic. Also, insulin production from beta cells in the treated group of mice increased in comparison to insulin production in the non-treated group, she reports.

"Diabetes is my main concern," Mor concludes. "So many children and adults continue to suffer from the disorder. Since the FTS molecule is very easily absorbed into the blood, it could be the first diabetes treatment in pill form to moderate insulin production in juvenile diabetes, slowing down the progression of the disease. It could help a lot of people."

Source: Tel Aviv University (news : web)