

# Enterovirus vaccine prevents virus-induced diabetes in a T1D experimental model

November 21 2017

---

Scientists at the University of Tampere (Finland) and the Karolinska Institutet (Sweden) have demonstrated that an enterovirus vaccine can protect against virus-induced diabetes in a mouse model for type 1 diabetes.

Type 1 diabetes is rising worldwide, and to date, the exact causes of the [disease](#) are not known. Enteroviruses (the most common virus affecting humans) are an environmental factor touted as a potential cause of the disease. However, no firm evidence exists proving their role. In this study, Stone et al. have taken an initial step to determine the involvement of these viruses through testing the efficacy of a novel prototype vaccine in preventing experimental type 1 diabetes after enterovirus infection. Vaccination of at risk-individuals with such a vaccine and the subsequent monitoring of disease onset could reveal a role for these viruses in type 1 diabetes. Furthermore, if enteroviruses were involved, vaccination with an enterovirus vaccine would provide a viable preventative treatment for virus-induced type 1 diabetes.

Type 1 diabetes is the most common, chronic, life-threatening disease in children. Finland and Sweden have the highest incidence of type 1 diabetes in the world with more than one in 200 suffering from the disease in Sweden. The disease is caused by the destruction of the cells in the pancreas that produce insulin, the hormone responsible for regulating blood sugar levels. There are currently no preventative treatments and this disease requires life-long insulin injections for survival. Type 1 diabetes is also associated with severe and life-

shortening complications including cardiovascular disease, loss of eyesight and a risk of lower limb amputations, and as such, it puts a heavy burden on both the affected individual and the health care system at large.

Currently, there are no commercially available vaccines available for human use that target the enteroviruses that are associated with type 1 diabetes in humans. For the first time, this study by Stone et al. reports that the vaccine prevents diabetes induced by enteroviruses in a clinically relevant model for type 1 diabetes. Furthermore, it also protected against other signs of infection that were seen in control animals and it had no adverse effects on vaccinated animals.

"These exciting results showing that the vaccine completely protects against virus-induced diabetes indicate the potential that such a vaccine has for elucidating the role of enteroviruses in human type 1 diabetes" says Prof. Malin Flodström-Tullberg at the Karolinska Institutet whose group were responsible for the pre-clinical studies.

The researchers are keen to continue pursuing these studies as confirmed by Dr Vesa Hytönen, who produced the prototype vaccine: "The model described in this paper provides an excellent platform to test further enterovirus vaccines containing a greater number of potential diabetogenic viruses. Through these proof-of-concept studies, we hope to develop and experimentally validate an enterovirus vaccine similar to the commonly used poliovirus vaccine, which has the potential to establish whether enteroviruses play a role in type 1 diabetes."

Work is currently ongoing at the University of Tampere to develop a vaccine that targets a greater number of viruses than the single [virus](#) vaccine described in this study, and all of the proposed viruses have been implicated in type 1 [diabetes](#). This experimental model provides an exciting opportunity for further proof-of-concept studies before progress

to a clinical set-up in humans.

"The experiments here are important steps towards the clinical use of novel enterovirus vaccines. Such a [vaccine](#) is under further development by Vactech Ltd. and its collaborator Provention Bio for testing in a clinical setting," says professor Heikki Hyöty, University of Tampere, an author in this study and one of the pioneers in this research field.

**More information:** Virginia M. Stone et al, A Coxsackievirus B vaccine protects against virus-induced diabetes in an experimental mouse model of type 1 diabetes, *Diabetologia* (2017). [DOI: 10.1007/s00125-017-4492-z](#)

Provided by University of Tampere

Citation: Enterovirus vaccine prevents virus-induced diabetes in a T1D experimental model (2017, November 21) retrieved 23 April 2024 from <https://medicalxpress.com/news/2017-11-enterovirus-vaccine-virus-induced-diabetes-t1d.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--