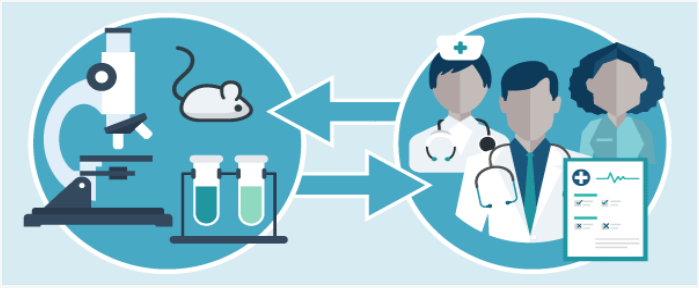
THE INNODIA PATIENT GROUP EXTRA NEWS

PAC - Patient Advisory Committee - was created to put the patients and their family at the center of the project, giving them a voice in the decisions that affect how they receive care. 8 patients and 2 family members meet on a monthly base to discuss ideas and suggestions and to give their input in the progression of the study.

Targeting protein changes to cure autoimmune diseases: how far are we from clinical translation?

Small changes are constantly made to proteins in order to finetune their function. One such change that is made to proteins is referred to as citrullination. While protein changes induced by citrullination are physiological events, taking place in healthy individuals, sometimes too much citrullination can occur. Excessive citrullination can result in harmful protein changes and research has shown that excessive citrullination plays a role in different autoimmune diseases. In type 1 diabetes, excessive citrullination results in harmful changes to proteins from the insulin-producing beta cell. It is believed that these changes make the beta cell visible for the immune system and direct the immune system towards attacking the beta cell. Preventing that these harmful changes are made could be an effective therapy to prevent the development of type 1 diabetes. As such, inhibiting citrullination has come forward as a potential therapy to cure type 1 diabetes.

In order to inhibit citrullination, researchers have designed drugs that block the protein changes caused by citrullination. These drugs have been tested in mouse models for type 1 diabetes, as well as in models for other autoimmune diseases in which excessive citrullination plays a role as well. The goal of this article was to evaluate the use of these drugs in the different models: What treatment was given? Were the drugs injected or given orally? How did the mice responded to the treatment? Was disease outcome improved? What effects had the drugs on the autoimmune response? And, what prospects give the answers to these questions on clinical translation?



Studies reporting on the use of drugs that target citrullination encompassed a period of 10 years, from 2011 to 2021. The drugs were typically injected on a daily base and treatment overall reduced the severity of the disease. In case of type 1 diabetes, daily treatment even prevented the development of the disease. Citrullination in the pancreas was reduced, indicating that the drugs do what they were designed to do, i.e. blocking citrullination. Moreover, the harmful changes to beta cell proteins caused by citrullination appeared to be reduced upon treatment. Similar results were obtained in mouse models of other autoimmune disease. While these results look promising in terms of clinical translation, there are major concerns that these drugs might cause severe side-effects in humans. The reason for this concern is that citrullination is an important physiological process, and that by blocking citrullination, also important, non-harmful protein changes can be blocked. This high-risk for unwanted side-effects hampers the clinical translation. Research is now focusing on the development and evaluation of drugs that would target more specific the harmful changes caused by excessive citrullination, and less the changes resulting from physiological citrullination. The outcomes of this research will enhance our prospects for future clinical translation.

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INNODIA is a unique and interdisciplinary network of 40 partners, including preeminent academic institutions from Europe, industrial partners, charitable foundations and small sized enterprises, bringing together their knowledge and experience to achieve one common goal: "To fight type 1 diabetes". Launched in January 2016, this European-based public private partnership (PPP) receives funding from the Innovative Medicines Initiative 2 Joint Undertaking (Grant Agreement Number: 115797) and is supported by the European Union's Horizon 2020 Research and Innovation program, European Federation of Pharmaceutical Industries and Associations (EFPIA), The Leona M. and Harry B. Helmsley Charitable Trust and JDRF.

INNODIA aims to improve the understanding of type 1 diabetes and pave the way for the development of novel therapies to prevent and cure it.

DO YOU WANT TO PARTICIPATE ?
Are you newly diagnosed with type 1 diabetes over the last 6 weeks ?
OR do you have a close relative with type 1 diabetes (parent, child, (half) sibling) ?

Find the nearest clinical center on www.innodia.eu