NANOGEN

One dose to cure type 2 diabetes.

Problem

Type-2 diabetes affects more than 462 million people (7% of the world's population), results in **1.5 million deaths yearly**, and is currently incurable. Insulin resistance developed by cells of the pancreas leads to toxic high blood-sugar levels. The down-regulation of a key protein called **glucose transporter type 4 (GLUT4)** in those cells is central to the problem.

Our Solution

NanoGen uses MOF 16 **nanoparticles to deliver gene therapy via injection into the bloodstream**. Our solution targets the SLC2A4 gene promoter in adipocytes to **upregulate GLUT4** using a CRISPR activator. This increases glucose uptake, reverses insulin resistance, and cures type-2 diabetes with only one dose, impacting millions.

Our Approach

*Our cure to type-2 diabetes follows a three pronged approach, where we **connect the use of gene therapy, nanotechnology, and an injection method into the bloodstream** to deliver our solution to patients efficiently.*

CRISPR Activator Injection

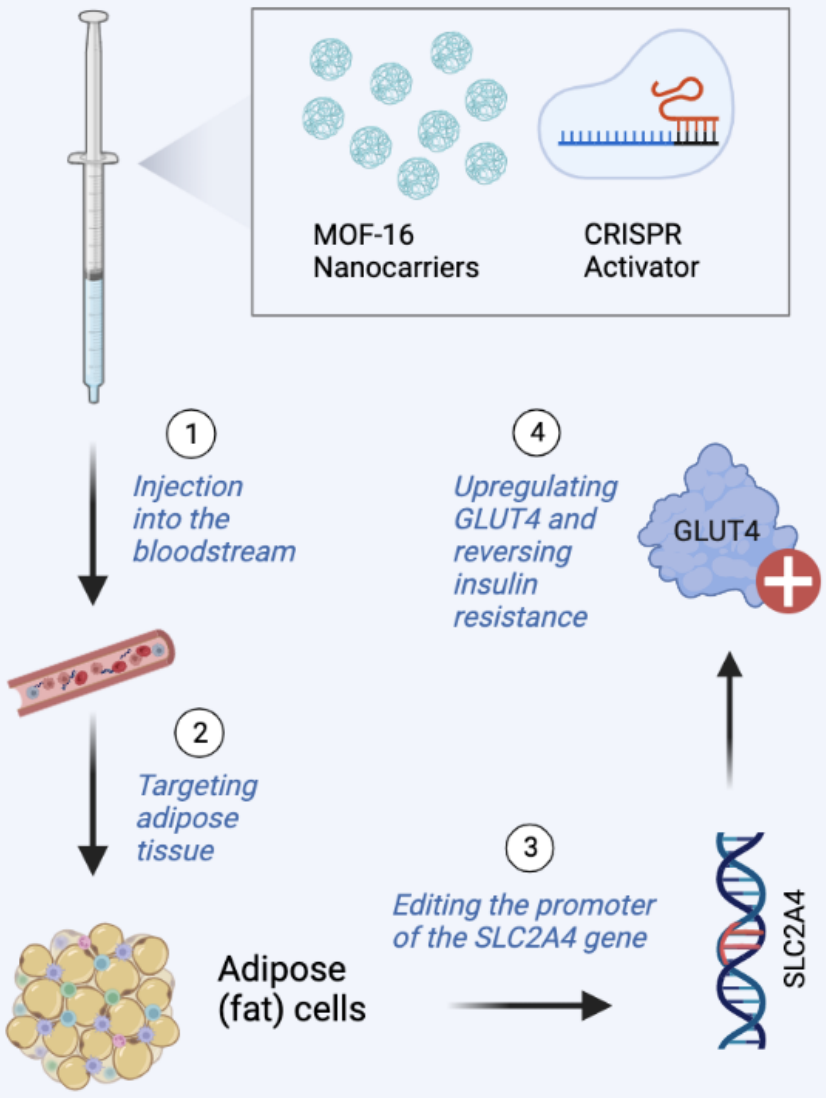
The patient will be injected with a CRISPR Activator, carried by MOF-16 nanoparticles, that will travel through the bloodstream to target and modify SLC2A4 genes, which reside in the body's adipocyte tissue.

MOF-16 Nanoparticle Delivery System

Using MOF-16, we can harness the large surface area and high programmability to our advantage to deliver the CRISPR activator to the SLC2A4 genes.

Targeting The SLC2A4 Gene Promoter

The SLC2A4 gene, which regulates the amount of GLUT4 in the body, will be modified by the CRISPR Activator to overproduce GLUT4. We are targeting the promoter of the gene so that the production of GLUT4 can be prompted by the activator, rather than other factors of the body.



Research Scientist,
AstraZeneca

*"**This proposal for a cure for type-2 diabetes is fantastic**, and utilizing CRISPR gene editing technology and nanotechnology drug delivery are cutting-edge pharmacological interventional strategies. Despite its possible challenges, **this proposal shows promise for future drug development to treat and cure T2D, and I'm excited to see its advancement.**"*