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Curing diabetes

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The demand for insulin fluctuates with blood glucose levels, presenting a special challenge for would-be gene therapists. In the 23 November Nature, Lee *et al*. present their solution, which causes remission of autoimmune diabetes in mice for at least 8 months (*Nature* 2000, **408:**483-488). A truncated insulin gene removes the need for proteolytic processing, a hepatocyte-specific, glucose-responsive promoter supplies the correct dosage, and an adeno-associated virus(AAV) delivers the necessary DNA to liver cells. Glucose challenge elicited the correct response of increased insulin production, although this response was robust 2 hours after challenge and continued for almost 6 hours, as compared to the 30 minute response time and 1 hour duration seen in healthy animals. This delay probably arises because the gene therapy is controlled at the level of transcription, whereas insulin production is normally controlled at the level of secretion. The sustained response caused mild hypoglycemia in the treated animals, but this treatment still presents a promising scenario for curing type I diabetes in humans.

References

1. Towards gene therapy of diabetes mellitus.

2. *Nature*, [http://www.nature.com/nature/]

3. Exploration of a liver-specific, glucose/insulin-responsive promoter in transgenic mice.

4. Use of adeno-associated virus as a general transduction vector for mammalian cells.