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Press release

A molecule to regenerate insulin-producing cells in type 1 diabetic patients

Inserm researchers led by Patrick Collombat at Unit 1091, “Institute of Biology Valrose” (Inserm/CNRS/Nice Sophia Antipolis University), show that GABA, a neurotransmitter that is sometimes used as a dietary supplement, can induce the regeneration of insulin-producing cells. This discovery, confirmed in mice and partially validated in humans, gives new hope to patients with type 1 diabetes.

This research is published in the journal [Cell](#).

Type 1 diabetes is a disease characterised by the selective loss of cells that produce insulin, a hormone that lowers blood sugar levels upon sugar intake. These cells are called pancreatic beta cells. Discovering how to regenerate these cells is a major research challenge, as current treatments are not always sufficient in preventing (serious) complications.

Scientists have shown in [previous studies](#) that it is possible to regenerate pancreatic beta cells by genetically transforming cells that resemble them: the glucagon-secreting alpha cells. This approach involved the forced activation of the Pax4 gene in all alpha cells. The results also proved that these alpha cells were continuously regenerated and again converted into beta cells, leading to a massive increase in the number of beta cells. “*This advance is significant, but it is not possible to carry out this approach in humans,*” explains Patrick Collombat, Inserm Research Director. To eventually translate their findings to human, the scientists therefore initiated a search for compounds mimicking the effects of the Pax4 gene.

In this new study, the research team demonstrates that this effect can be induced with no genetic modification using GABA, a neurotransmitter that is naturally present in the body and also available as a dietary supplement.

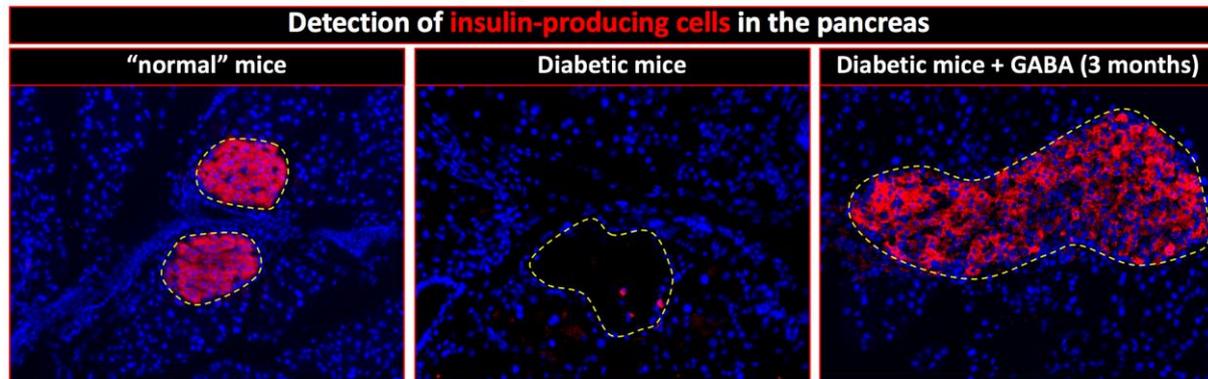
In mice, GABA induces the continuous, yet controlled, regeneration of pancreatic alpha cells and their transformation into insulin-producing beta cells. The regenerated cells are functional and can cure chemically-induced diabetes multiple times.

With regards to humans, researchers observe that in pancreatic islets (which contain both alpha- and beta-cells) treated with GABA, the number of glucagon-producing alpha-cells is decreased by 37% while a 24% increase in insulin-producing cell count is noted, suggestive of a conversion of alpha-cells into beta-cells.

Finally, by transplanting the equivalent of 500 human islets to mice, the same results are obtained after supplementing the animals for 1 month with GABA (daily). These results are truly encouraging for a putative application in humans. Accordingly, a pilot clinical trial will

soon be initiated to determine whether GABA may effectively help patients with type 1 diabetes.

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Sources

“Long-term GABA administration induces alpha-cell-mediated beta-like cell neogenesis”

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