Long-term glycemic control using polymer-encapsulated human stem cell–derived beta cells in immune-competent mice – Vegas et al.,

* Pancreatic transplantation / cadaver islet infusion clinically implemented but need immunosuppression
* SC-beta (glucose responsive mature beta cells derived from human embryonic stem cells)
* Host immune response to implanted materials is a clinical issue if we use immunoisolation with porous biomaterials
* Encapsulation with **alginate derivatives** mitigates foreign-body responses in vivo

b-cell–mimetic designer cells provide closed-loop glycemic control

* Beta mimetic designer cells established by minimal engineering of human cells achieves glucose response coupling glycolysis-medium calcium entry to excitation-transcription system
* Implanted circuit-carrying cells corrected insulin deficiency and self-sufficiently abolished persistent hyperglycemia in T1D mice
* Glucose- inducible glucagon-like peptide 1 transcription improved endogenous glucose-stimulated insulin release and glucose tolerance in T2D mice

1. Stem cells
2. Conversion of alpha into beta cells (GABA mediated)
3. Fibroblast to beta cells
4. Reprogram gastric endocrine into making insulin