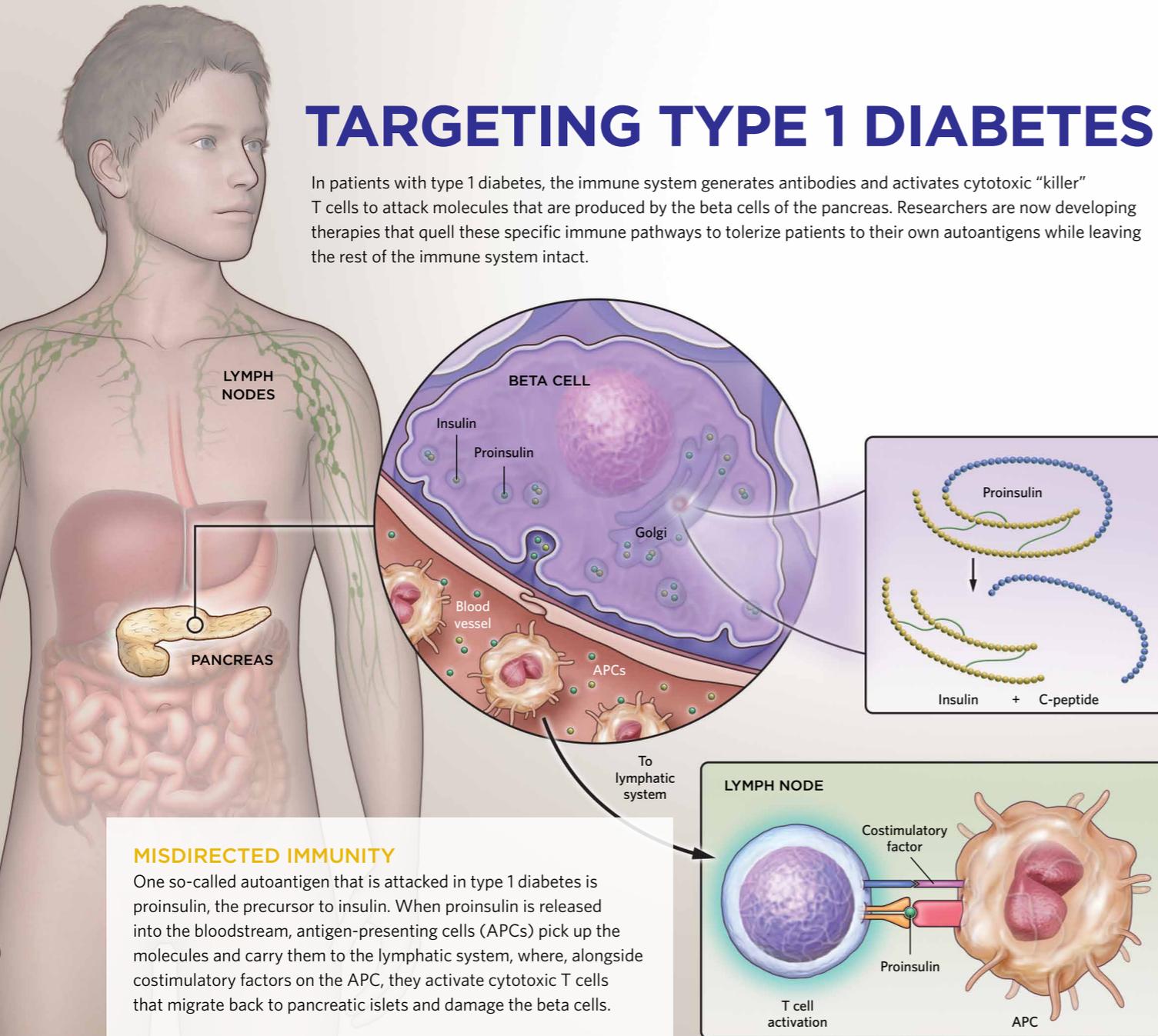


TARGETING TYPE 1 DIABETES

In patients with type 1 diabetes, the immune system generates antibodies and activates cytotoxic "killer" T cells to attack molecules that are produced by the beta cells of the pancreas. Researchers are now developing therapies that quell these specific immune pathways to tolerize patients to their own autoantigens while leaving the rest of the immune system intact.



MISDIRECTED IMMUNITY

One so-called autoantigen that is attacked in type 1 diabetes is proinsulin, the precursor to insulin. When proinsulin is released into the bloodstream, antigen-presenting cells (APCs) pick up the molecules and carry them to the lymphatic system, where, alongside costimulatory factors on the APC, they activate cytotoxic T cells that migrate back to pancreatic islets and damage the beta cells.

TOLERIZING THE IMMUNE SYSTEM

One method that has enjoyed preliminary success in reversing the aberrant immune response in type 1 diabetes is the presentation of the proinsulin autoantigen without the costimulatory factors needed to activate cytotoxic T cells. Patients treated with a plasmid that is engineered to be non-immunostimulatory and to express the gene for proinsulin experienced an increase in the production of C-peptide (a measure of beta cell function) and a corresponding decrease in cytotoxic T cells that recognized proinsulin.

