br1dge

Exploring the Etiology *of* Autoimmune Type 1 Diabetes (T1D)

T1D is a chronic, autoimmune disease with a complex, multifactorial etiology[1-3]

Genetic Predisposition

Some genetic variants increase the risk of T1D

HLA[4,5]
>50% risk of heritability[4]



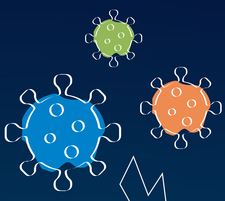


Non-HLA[4,5]
>70 genes identified[4]

In genetically predisposed individuals, environmental factors may trigger autoimmunity[1,2,6]

Environmental Factors

Viral infections[1,6,7]



Enteroviruses
Rotaviruses
Herpes viruses

Other factors[1,2,6,8,9,10]



Early nutrition
Diet
Microbiome
Body fat
Increased weight
Physical inactivity
Socioeconomic factors



Beta cell

with background genetic predisposition

Susceptibility to developing autoimmunity is greatest in the first two years of life[11]

Early Childhood Factors Predisposing to Autoimmunity



Propensity for Th1 immunity[11]



High islet activity/stress[11]

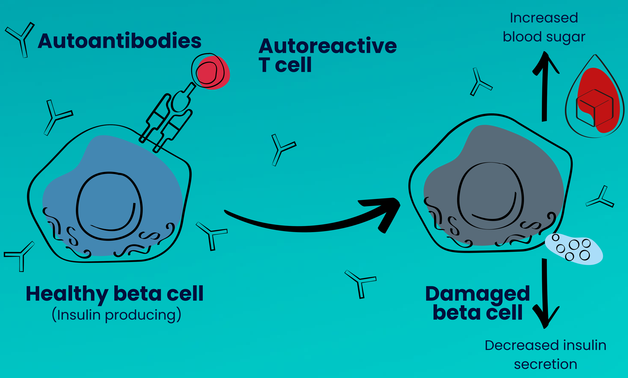


High infectivity with peak in viral infections[11]



Heightened immune response[11]

A combination of these factors may result in the development of autoreactive T cells that specifically attack beta cells in the pancreas, resulting in immune-mediated destruction[6]



Abbreviations: HLA, human leukocyte antigen; T1D, type 1 diabetes; Th, T helper cell.

References

1. Primavera M, et al. Front Endocrinol (Lausanne). 2020;11:248. **2.** Verduci E, et al. Front Nutr. 2020;7:612377. **3.** American Diabetes Association. Diabetes Care. 2024;47(Suppl.1):S20–42. **4.** Luckett AM, et al. Diabetologia. 2023;66(8):1569–600. **5.** Sticht J, et al. Front Genet. 2021;12:683946. **6.** Haueisis P, Luce S, Boitard C. Front Endocrinol (Lausanne). 2022;13:933965. **7.** Lernos JRN, Hirani K, von Herrath M. Front Immunol. 2024;14:1326711. **8.** Buzzetti R, et al. Nat Rev Dis Primers. 2022;8(1):83. **9.** Rewers M, Ludvigsson J. Lancet. 2016;387(10035):2340–8. **10.** Kondrashova A, et al. Ann Med. 2005;37(1):67–72. **11.** Ziegler AG. Diabetologia. 2023;66(7):1169–78.

BRIDGE is a non-promotional, global medical education program organized and funded by Sanofi. BRIDGE is intended for healthcare professionals only. Please note that BRIDGE may not be available in all countries. ©Sanofi 2025 - All Rights Reserved. MAT-GLB-2405108 - 2.0 - 08/2025

br1dge

sanofi