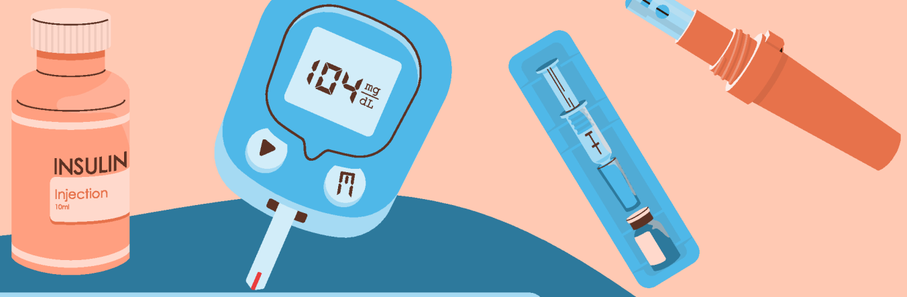
Cross Talk Between β Cells and Immune Cells

What We Know



1. T1D is both an autoimmune disease and a β-cell disorder.
2. β-cells have unique biological features (high insulin production, rich vascularization) that make them susceptible to autoimmunity.
3. Interaction between β-cells and immune cells involves specific receptor/ligand pairs that can either increase β-cell vulnerability or offer protection.
4. There is a state of "benign" islet autoimmunity in healthy individuals, suggesting that everyone has some level of autoimmunity but not everyone develops diabetes.

WHAT WE THINK WE KNOW

1. The shift from benign to pathogenic autoimmunity could involve a loss of immune tolerance due to interferon (IFN) signaling.
2. HLA class I upregulation in β-cells could break immune ignorance, leading to T-cell priming and attack.
3. There is potential for β-cells to actively engage in immune regulation through inhibitory receptor/ligand pairs such as PD-1/PD-L1.
4. HLA-E, HLA-F, and HLA-G molecules may play roles in immune evasion and β-cell protection, but this needs further study.

WHAT WE SHOULD LEARN

1. Investigate novel protective mechanisms and receptor-ligand interactions on β cells that might prevent or halt autoimmunity.
2. Investigating why α-cells, despite similarities to β-cells, are not targeted in T1D.
3. Developing therapies that can balance immune tolerance and response, potentially using β-cell-protective agents like Verapamil or inhibitors of IFN signaling.
4. Emphasizing the importance of combination therapies to achieve optimal outcomes in treating or preventing T1D.