

PEPTIDES RESPONSIBLE FOR TYPE 1 DIABETES

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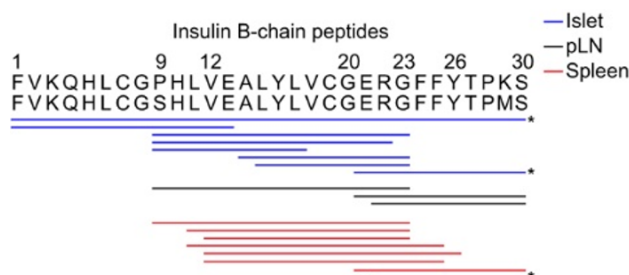
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Technology Description:

Researchers in the lab of Emil Unanue at Washington University have discovered a panel of peptides responsible for autoimmune activation in Type 1 diabetes and potentially capable of diagnosing T1D at an early stage. These peptide fragments of insulin are found circulating during T1D, including in the early stages before symptomatic disease, where they may contribute to disease initiation independent of canonical antigen presentation processes.

Patients with T1D could be diagnosed much earlier if the presence of these peptides could be detected, providing an opportunity for earlier interventions. As the peptides bind directly with the autoreactive T cells mediating T1D, they could also be useful as a conjugated targeting system in a therapeutic.



Stage of Research:

The inventors have identified the insulin peptides responsible for MHC-II-mediated immune recognition in nonobese diabetic (NOD) mice. Further experiments are necessary to validate a clinical diagnostic or therapeutic for the equivalent peptides in human Type 1 diabetes patients.

Publications:

- Wan X, Vomund AN, Peterson OJ, Chervonsky AV, Lichti CF, Unanue ER. (2020). [The MHC-II peptidome of pancreatic islets identifies key features of autoimmune peptides](#). *Nature Immunology*, 21:455-463.
- Vomund AN, Lichti CF, Peterson OJ, Arbelaez AM, Wan X, Unanue ER. (2021). [Blood leukocytes recapitulate diabetogenic peptide-MHC-II complexes displayed in the pancreatic islets](#). *JEM*, 218(6): e20202530.

Applications:

- Diagnostic for early-stage Type 1 diabetes
- Targeting system for novel therapies directed against autoreactive T cells in T1D

Key Advantages:

- Peptides present during early stages of autoimmune disease
 - Target for early-stage diagnostic, before presentation of symptoms
- Peptides responsible for autoimmune recognition
 - Mechanism to target autoreactive T cells when paired with cytotoxic modality

Patent Application: [US20210018520](#)

Related Web Links: Unanue [Profile](#) & [Lab](#)