

Transcript Details

This is a transcript of an educational program. Details about the program and additional media formats for the program are accessible by visiting: <https://reachmd.com/programs/diabetes-discourse/alpha-beta-cell-proximity-and-t-cell-interactions-in-t1d/67279/>

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Investigating Alpha-Beta Cell Proximity and T-Cell Interactions in T1D

Announcer:

This is *Diabetes Discourse* on ReachMD. On this episode, Dr. Vira Kravets will discuss her research focusing on the role of alpha-beta cell proximity on GLP-1R-mediated communication and T-cell interaction in type 1 diabetes, which she spoke about at the 2026 European Association for the Study of Diabetes Annual Meeting. Dr. Kravets is an Assistant Professor at the University of California San Diego Bioengineering Department and holds a secondary appointment in the UC San Diego School of Medicine Pediatrics Department in the Division of Endocrinology. Let's hear from her now.

Dr. Kravets:

So the first responder beta cells are recruiting neighboring beta cells during the first phase of the islet's response to glucose, and this was shown using confocal imaging of calcium activity in the islet. The calcium activity is strongly coupled with insulin secretion, especially in this first responder beta-cell subpopulation. And when these first responder beta cells are destroyed with the laser ablation, more than half of the islet's original capacity to respond to stimulus is lost, and it also becomes sluggish in its response to glucose. And the reason I started looking at their communication with alpha cells was because I've looked at a lot of recordings of calcium dynamics in these first responders and noticed that the first responders are often located at the islet periphery, and more so specifically, they're located near alpha cells just visually.

We found that pharmacological antagonism of the GLP-1 receptors affects the alpha neighboring beta-cells more than it does the non-alpha neighboring cells. And this was not only related to the first phase of a calcium response, but also to the calcium oscillation frequency in the second phase of the islet response, which is directly related to the amount of insulin secreted during this phase.

So in human islets, we found that the islets from the donors—which were positive for autoantibodies, specifically GADA—had an increase in interaction between alpha and T cells. And when I say interaction, I mean the spatial association. There were a lot of T cells in the regions of the islets near the alpha cells. And we have tested whether this association could be due to chance by using a network theory approach with randomization of experimental islet T-cell networks, and we found that what we observed was not due to chance as there was significantly more alpha–T-cell interactions.

It is important to understand what happens in the early stages of type 1 diabetes at the cellular level because if we look at the tissue level, which was traditionally done, we can completely miss the alpha–T-cell interaction phenomenon because when we do analyses, we average over the islet populations on a tissue level. And when we do that, we average between the islets that have a lot of infiltrates—not only T cells, but also various types of T cells, macrophages, and myeloid cells—and we average that with the islets that have only maybe one T cell in the very early stage. And so we miss that trigger that maybe initiates the whole pathogenesis of type 1 diabetes.

Announcer:

That was Dr. Vira Kravets discussing the role of alpha-beta cell proximity on GLP-1R-mediated communication and T-cell interaction in type 1 diabetes. To access this and other episodes in this series, visit *Diabetes Discourse* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!