

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/t1d-immunology-islet-research-unanswered-questions/67281/>

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Unanswered Questions in T1D: What Immunology and Islet Research Can Tell Us

Announcer:

You're listening to *Diabetes Discourse* on ReachMD. On this episode, we'll hear from Dr. Edward Phelps, who's an Associate Professor in the J. Crayton Pruitt Family Department of Biomedical Engineering at the University of Florida. He'll be shedding light on the unanswered questions that immunology and islet research in type 1 diabetes are trying to address, which was a focus at the 2026 European Association for the Study of Diabetes Annual Meeting. Here's Dr. Phelps now.

Dr. Phelps:

We're still learning about type 1 diabetes in humans. We've learned a lot about diabetes from NOD mice, for example, which are a really important model for us to use in this research space. But it's much harder to study diabetes in humans because it's very difficult to get longitudinal data, especially within the tissue.

One of the things we don't understand well is timing for intervention and detection. So if we're going to give, say, an immune-type therapy, whether that's Tregs or antibody-based therapies, is there a window when that therapy's going to work or be most effective? And is there a window when it's really not going to do very much or it will be too late? And you would want it to be as late as possible. Can you give Tzield, for example, after diagnosis and it's still effective? If beta cell dysfunction proves to be a hallmark of type 1 diabetes very early—we don't know that yet—but if that's the case and if we could detect that, would that improve our window of opportunity for intervention? I think that would be important.

Another thing we're finding out about is what's happening in the pancreatic lymph node in type 1 diabetes, like the presentation of antigen in the pancreatic lymph node. Are you able to detect memory-type T cells or stem-like T cells in the pancreatic lymph node? And how are they contributing to progression?

One of the challenges is we're dealing with an incompletely defined list of antigens, including neoantigens and modified antigens, and all the time we're hearing about new discoveries in that space in terms of how autoimmunity in type 1 diabetes escapes central tolerance. What are the targets? If we can figure that out, we might be able to create a tolerance therapy, for example.

I think we'll probably continue to see progress in biologics in terms of effective treatments. And we'll probably over time get better biologics that are more effective and prolong the duration so you can delay onset and things like that.

I also think we're seeing tremendous progress in beta cell replacement for individuals who are already diagnosed with diabetes who have already lost most of their beta cell mass. And that intersects very strongly with immunology because it's an allotransplant situation or it's a stem cell-derived beta cell. This is cell manufacturing, but it's also a question of how to escape the immune rejection of an allograft without having to give broad-spectrum immunosuppression, which I think is a tough trade-off with just having insulin therapy.

Announcer:

That was Dr. Edward Phelps talking about what we can learn from immunology and islet research 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!