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New era in diabetes management: Artificial pancreas systems and beyond

The incorporation of new technology into diabetes treatment provided diabetologists with additional tools like glucose sensors, smart insulin pumps and the promise of closed loop insulin therapy (i.e., the artificial pancreas project), a mechanical solution for diabetes management to restore near-physiologic glycemic control automatically. Such a system consists of three main elements: Insulin delivery, continuous glucose sensing and a controller or algorithm, that is similar to the beta cell, regulates the proper amount of insulin delivery at the proper time. Advances in newer insulin formulations with improved pharmacokinetics (PK) and pharmacodynamics (PD) will galvanize closed loop insulin therapy systems and overcome challenges, such as late action of rapid acting insulins resulting in postprandial hyperglycemia. The Yale Pediatric Diabetes Center has been one of the main hubs of the artificial pancreas project and of research studies investigating the PK-PD of new insulin formulations. This talk highlights the results of key studies in the field of diabetes technology including euglycemic clamp studies investigating the PK-PD of novel ultra-fast acting insulins, the impact of innovative insulin delivery devices on insulin action and the artificial pancreas project and also discusses the barriers and limitations of this relatively nascent technology and solutions to overcome these challenges.

Biography

Eda Cengiz is an Associate Professor at Yale School of Medicine, Division of Pediatric Endocrinology and a Visiting Professor at Koc School of Medicine. She has carried out various diabetes-related clinical studies focusing on insulin action (pharmacokinetics and pharmacodynamics), diabetes technology (continuous glucose sensors and insulin pumps) and artificial pancreas (closed-loop) systems in people with T1D as a Principal Investigator or Co-Investigator. She is a Reviewer and Editorial Board Member of many scientific journals and meetings. She is also the Co-Chair of the pharmacology sub-group of the National Institutes of Health Pediatric Diabetes Treatment Core Group.

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