

## Progress in Development of an Artificial Pancreas

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### Abstract

This issue of *Journal of Diabetes Science and Technology* contains a collection of 12 original articles describing the latest advances in the development of algorithms for controlling insulin delivery in an artificial pancreas. Algorithms presented in this issue are affected by numerous quantifiable factors, including insulin pharmacokinetics, timing of meal carbohydrate appearance, meal size, amount of exercise, presence of stress, day-to-day variations in insulin sensitivity, insulin time-activity profiles, accuracy of glucose monitor calibration, metabolic profiles of both adults and neonates, and risks of hypoglycemia/hyperglycemia. These articles present theoretical advances in insulin delivery algorithms from modeled *in silico* patients, as well as clinical data from actual patients who have used closed loop systems. The novel approaches described in these articles are expected to bring us much closer to realization of a commercially available closed loop system for controlling glucose levels in patients with diabetes.

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**Abbreviations:** (FDA) Food and Drug Administration, (IOB) insulin on board, (MPC) model predictive control

**Keywords:** algorithm, artificial pancreas, closed loop, diabetes, hypoglycemia, insulin

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