

Diabetes Research

Immune-mediated response to nutrition in physiology and pathology

Our research aims at the understanding of the pathogenesis of type 2 diabetes. We could identify an inflammatory process underlying failure of insulin production in this disease. Thereby we could show that metabolic stress induces an IL-1 β mediated immune response. We confirmed our hypothesis in clinical studies showing that modulation of the immune system may improve metabolism in patients with type 2 diabetes. The work has contributed to the concept that the innate immune system is an integral component in the regulation of metabolism, i. e. immunometabolism.



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Selected Publications

Hepprich M*, Wiedemann SJ*, Schelker BL, Trinh B, Stärkle A, Geigges M, Löliger J, Böni-Schnetzler M, Rudofsky G, Donath MY (2020). Postprandial Hypoglycemia in Patients After Gastric Bypass Surgery Is Mediated by Glucose-Induced IL-1 β . *CELL Metabolism* 31:699–709.

Donath MY, Dinarello CA, and Mandrup-Poulsen T (2019). Targeting innate immune mediators in type 1 and type 2 diabetes. *Nature Rev Immunol.* 19:734–46.

Dror E, Dalmas E, Meier DT, Wueest S, Thévenet J, Thienel C, Timper K, Nordmann TM, Traub S, Schulze F, Item F, Vallois D, Pattou F, Kerr-Conte J, Lavallard V, Berney T, Thorens B, Konrad D, Böni-Schnetzler M, Donath MY (2017). Postprandial macrophage-derived IL-1 β stimulates insulin, and both synergistically promote glucose disposal and inflammation. *Nat Immunol.* 18:283–292.

Dalmas E, Lehmann FM, Dror E, Wueest S, Thienel C, Borsigova M, Stawiski M, Trautnecker E, Lucchini FC, Dapito D, Kallert SM, Guigas B, Pattou F, Kerr-Conte J, Maechler P, Girard JP, Konrad D, Wolfrum C, Böni-Schnetzler M, Finke D, Donath MY (2017). Interleukin-33-Activated Islet-Resident Innate Lymphoid Cells Promote Insulin Secretion Through Myeloid Cell Retinoic Acid Production. *Immunity.* 47:928–942.

Timper K, Dalmas E, Dror E, Rütli S, Thienel C, Sauter NS, Bouzakri K, Bédard B, Pattou F, Kerr-Conte J, Böni-Schnetzler M, Donath MY. (2016) GIP stimulates GLP-1 in islets via alpha-cell-derived IL-6. *Gastroenterology*, 151:165–79.

