Zink transportøren ZIP14 påvirker sukkerstofskiftet og er forstyrret ved metabolisk sygdom

Et nyt ph.d.-projekt fra Aarhus Universitet, Health, viser en ændret regulering af zink- transport proteinet ZIP14 ved metabolisk sygdom, og indikerer at dette protein har betydning for bugspytkirtelcellernes kontrol af sukkerstofskiftet. Projektet er gennemført af læge Trine Maxel Juul, som forsvarer det d 24. februar 2017.

Zink er et essentielt mineral for kroppens metabolisme og i særdeleshed for sukkerstofskiftet. Fordeling og optag af zink i kroppens celler styres af en række transport proteiner, her i blandt ZIP14. Dyrestudier har vist, at ZIP14 påvirker kroppens sukkerstofskifte og fedtvæv via dets zink importerende funktion, dette er dog aldrig undersøgt hos mennesker. Ph.d. projektet har således fokuseret på reguleringen af ZIP14 i fedtvæv hos mennesker med overvægt og/eller polycystisk ovarie syndrom, da begge disse tilstande er karakteriseret ved metaboliske forstyrrelser. Resultaterne viser, at ZIP14 er signifikant nedreguleret hos overvægtige, og data indikerer en muligt sammenhæng med den nedsatte insulin følsomhed og dysfunktion af fedtvævet, som ses ved overvægt. Yderligere undersøgelser af insulin-producerende beta-celler bekræfter ZIP14´s funktion i regulering af sukkerstofskiftet, og viser at ZIP14 spiller en funktionel rolle i insulin-frigivelse. Samlet set indikerer disse studier, at forstyrrelser af ZIP14 niveauet ved metabolisk sygdom kan have en negativ indflydelse på kroppens sukkermetabolisme. ZIP14 kan dermed vise sig at være et fremtidigt medicinsk angrebspunkt i behandlingen af overvægts-relaterede metaboliske forstyrrelser som type 2 diabetes.

Forsvaret af ph.d.-projektet er offentligt og finder sted den 24. februar 2017 kl 10.30 i Lille Anatomisk auditorium, Bygning 1231, lokale 424, Aarhus Universitet, 8000, Aarhus C. Titlen på projektet er ”Investigations of zinc transporter ZIP14’s functions in beta-cells and adipose tissue in metabolic diseases”. Yderligere oplysninger: Ph.d.-studerende Trine Maxel Juul, e-mail: tmj@biomed.au.dk, tlf. 50 90 73 40.

The zinc transporter ZIP14 is affected in metabolic disease and plays a role in glucose metabolism

A new PhD project from Aarhus University, Denmark, shows that the regulation of the zinc importing protein, ZIP14, is affected in metabolic disease and that this protein plays an important role in insulin producing cells. The project was carried out by Trine Maxel Juul, who is defending her dissertation on February 24th 2017.

Zinc is an essential trace metal affecting the metabolic regulation of the body. In addition, intracellular zinc plays an important role in insulin-producing cells hence affecting glucose metabolism. The cellular uptake and distribution of zinc is controlled by specific zinc transporters, among them the zinc importing protein ZIP14. Animal studies have revealed a role of ZIP14 in glucose metabolism and the function of adipose tissue, but this has never been investigated in humans. This PhD project aimed at exploring the regulation of ZIP14 in adipose tissue in human metabolic disease focusing on obesity and polycystic ovary syndrome, as both of these conditions are characterized by metabolic dysfunction. The investigations showed that the presence of ZIP14 is significantly down-regulated in obesity and correlated with markers of insulin resistance and dysfunction of adipose tissue. Additional studies of insulin producing beta-cells confirm the role of ZIP14 in glucose metabolism as a down-regulation of ZIP14 significantly alters insulin processing. Combined, these results indicates that the lowered level of ZIP14 found in metabolic disease has a negative influence on glucose metabolism and adipose tissue functioning. ZIP14 thus constitutes a

potential future target for pharmaceutical treatment of obesity-related metabolic diseases and type 2 diabetes.

The defence is public and takes place on February 24th, 2017 at 10.30 AM in Lille Anatomisk auditorium, Building 1231, room 424, Aarhus University, 8000, Aarhus C. The title of the project is “”Investigations of zinc transporter ZIP14’s functions in beta-cells and adipose tissue in metabolic diseases”. For more information, please contact PhD student Trine Maxel Juul, email: tmj@biomed.au.dk, Phone +45 50907340.