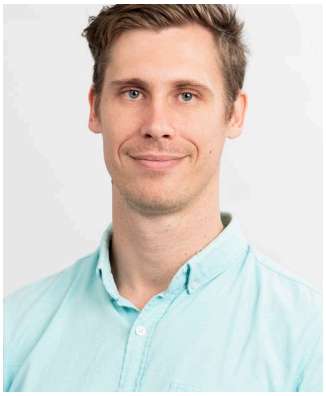
Neuroscience & Non-Communicable Diseases WEBINAR – All welcome

Friday 6 May 2022, 3pm

"Oral Nanotherapeutic formulations of Insulin and Liraglutide"

Speaker: Dr Nicholas J. Hunt, Concord Clinical School, Faculty of Medicine and Health, University of Sydney, Australia



Biography:

Dr Nicholas (Nick) J. Hunt is a Lecturer based at the Concord Clinical School, within the Faculty of Medicine and Health (FMH) at the University of Sydney, Australia. Nick is a 2022 University of Sydney SOAR prize winner and the 2021 Australian Diabetes Society – Skip Martin ECR Fellow. Hi group has examines the use of nanotechnology for the targeted drug delivery of therapeutic agents for metabolic disease and diabetes. Nick is also co-chair of the NanoPharma cluster of the Sydney Nano-Health Network, an ECR Ambassador for Sydney Nano and secretary of the FMH EMCR committee. He has received publication awards from the American Physiological Society and Sydney Nano, has received innovation and best ECR presentation awards from Griffith Hack and the 10th International Nanomedicine Conference and has guest lectured as part of the NANO2002 and NANO4001 courses.

Abstract:

Reformulation of injectable only medications to make them orally bioavailable is a growing area of research with the aim to improve patient compliance and quality of life. Insulin in particular is a diabetic medication that must be given 3-6 times a day and has a high risk of adverse events such as hypoglycaemia. Previously we have shown orally administered nanomaterials rapidly cross the small intestine and are taken up by the liver in animal models (Hunt et al 2020). A follow up study showing this nanotechnology could be utilised to improve the bioavailability of orally available diabetic medications that have target cites of action in the liver (e.g. metformin) (Hunt et al 2021). Currently both insulin and liraglutide must be given via subcutaneous injection, however these agents have distinct cites of action: insulin acts on the liver, muscle and fat and; liraglutide acts almost excessively on the pancreas. This study aimed to develop and demonstrate a nanotechnology based oral peptide delivery system for both these medications. In this study we showed that oral insulin is effective in animal models of type 1 diabetes (non-obese diabetic (NOD) mice and streptozotocin (STZ) treated rats) and in non-human primates (baboons). Our oral formulation of liraglutide demonstrates similar effectiveness in high fat diet (HFD) fed mice compared to injectable liraglutide. Finally, we highlight that liver targeting provides greater safety and reduced incidence of hypoglycaemia for oral insulin. These studies demonstrate the application of our nanotechnology to both liver acting and non-liver acting medications.

Hunt et al: 2020 ACS Nano 10.1021/acsnano.9b06071, 2021 ACS Nano 10.1021/acsnano.0c09278

All welcome!

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