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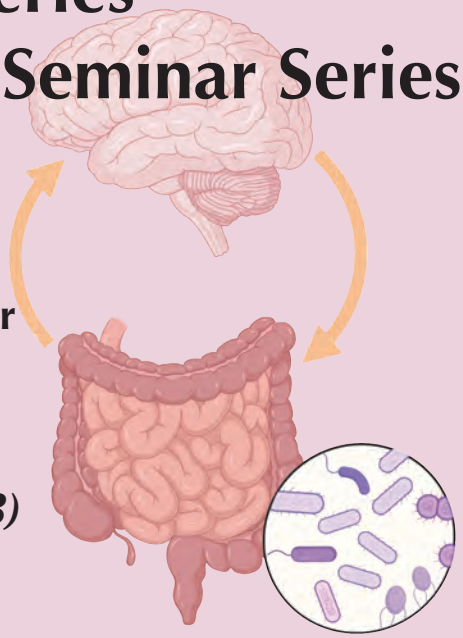
IMCB Seminar Series
BRAIN & BODY Seminar Series



in partnership with

SfN.SG Society for Neuroscience SINGAPORE CHAPTER

Justin O'Sullivan

Professor & Deputy Director
Liggins Institute
University of Auckland, NZ

Host: Caroline Wee (IMCB)

Thursday, 23 March (Hybrid)
2:00 PM-3:00PM
IMCB Seminar Room 3-46, Level 3, Proteos, Biopolis
Singapore 138673 (or scan QR code for zoom registration)

Restoring the microbiome in obese adolescents – does it make a difference?

Treatment of pediatric obesity is challenging. Preclinical studies in mice indicated that weight and metabolism can be altered by gut microbiome manipulation. In this study we set out to assess the efficacy of fecal microbiome transfer (FMT) to treat adolescent obesity and improve metabolism through a randomized, double-masked, placebo-controlled trial with a 26-week and 4 year follow up. The trial was conducted among adolescents aged 14 to 18 years with a body mass index (BMI) of 30 or more in Auckland, New Zealand. A total of 87 individuals took part. The intervention was a single course of oral encapsulated fecal microbiome from 4 healthy lean donors of the same sex or saline placebo. Primary outcome was BMI standard deviation score at 6 weeks using intention-to-treat analysis. Secondary outcomes included body composition, cardiometabolic parameters, well-being, and gut microbiome composition. Eighty-seven participants were randomized 1:1, in groups stratified by sex, to FMT (42 participants) or placebo (45 participants). Multi-donor FMT sustainably altered the structure and the function of the gut microbiome. There was no effect of FMT on BMI standard deviation score at 6 weeks. Reductions in android-to-gynoid-fat ratio in the FMT vs placebo group were observed at 6, 12, and 26 weeks. In post-hoc exploratory analyses among participants with metabolic syndrome at baseline, FMT led to greater resolution of this condition compared with placebo by 26 weeks. Two donor microbiomes (one female, one male) dominated strain engraftment and were characterized by high microbial diversity and a high Prevotella to Bacteroides (P/B) ratio. Engrafted strains led to enterotype-level shifts in community composition and provided genes that altered the metabolic potential of the community out to 26 weeks post FMT. Four year follow up showed significant sex-specific responses in weight and BMI. differences There were no serious adverse events recorded throughout the trial. **Conclusion:** This randomized clinical trial of obese adolescents provides evidence for long-term beneficial effects of FMT.

Justin M. O'Sullivan is a Professor and Deputy Director of the Liggins Institute at the University of Auckland. Justin was awarded the 2010 Life Technologies Life Science Award: for Emerging Excellence in Molecular biology in New Zealand. Justin has published >110 peer reviewed articles and has honorary appointments at the Garvan Institute of Medical Research, University of Southampton and A*STAR Singapore Institute for Clinical Sciences. Justin's research is focused on two main areas: 1) understanding how disease associated mutations in non-coding DNA affect gene regulatory networks and the pathways that underlie disease development; and 2) understanding and manipulating the role and functions of the human gut microbiome. His goal is to integrate these two fields of study.