2021 Lecture Series

Dr Alex Cristino

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GRIDD
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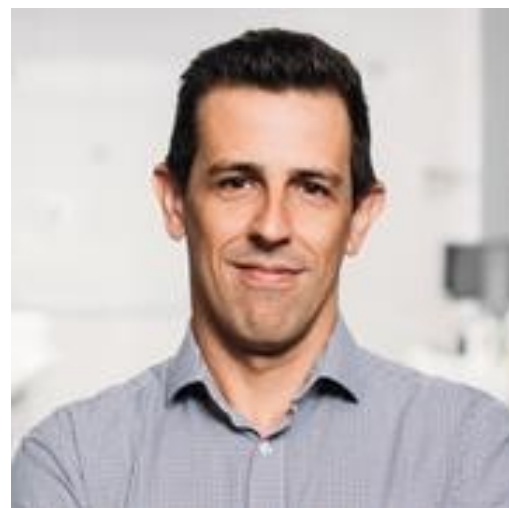Griffith University

will present a seminar entitled

An integrated analysis of gene networks underlying schizophrenia: new prospects for individualised therapies

Friday 17 September 2021, 11am

Institute for Glycomics
Lecture Theatre (G26 4.09)

(No food or drink allowed in the lecture theatre)

Abstract

Genome-wide association studies have identified over 100 loci in which genetic variants are associated with schizophrenia in the population. However, the challenge to the field is to understand how idiosyncratic combinations of common and rare genetic variants in protein-coding and regulatory regions of the genome disrupt gene networks and biological pathways underlying disease. We are building a high-resolution multi-omics map of a well-studied cohort of schizophrenia patients using olfactory neural stem cells (ONS cells) derived from nasal biopsies as our model system. We propose an integrated analysis to highlight the most relevant genes and pathways potentially linked to disease in each patient. We combine whole-genome sequencing data, transcriptome, proteome and cell function assays from the same individuals to investigate molecular and cellular signatures associated with disease. Considering the great majority of genetic variation associated with disease lies in non-coding regions, we focus our experimental validations on regulatory variants found within microRNA-137 locus which is a well-known locus associated with schizophrenia. Our research suggests a "perfect storm" of common and rare mutations may directly affect disease-associated cell functions by fine-tuning the expression of multiple genes. Our goal is to develop a systems-based approach to integrate experimental data collected from patient stem cells and guide identification of biomarkers for drug screening and new modalities of gene therapies.