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The beginning of a new era in the genetics of type 2 diabetes

Kiymet Bozaoglu

Baker IDI Heart and Diabetes Institute, Australia

Changes in human behaviour and lifestyle over the last century have resulted in a dramatic increase in the incidence of diabetes and obesity worldwide. The etiology of Type 2 Diabetes Mellitus (T2D) is complex involving environmental and genetic interactions. Current drugs are ineffective in controlling the rising epidemic predicted to reach 439 million globally by 2030. Inaction will result in an unsustainable burden on the world's public health system. New pharmacological interventions are urgently needed, and progress toward this goal will require greater depth of knowledge surrounding the mechanisms of development of the disease.

Recent large scale genome wide association (GWA) studies have identified over 60 loci associated with T2D. However these only explain a small proportion of the familial risk (or heritability of the disease). It is likely that this has been due to the focus on common variants of small effect size by GWA studies. As such there is now rapidly mounting interest in and evidence to support the role of rare genetic variation with moderate effect sizes in complex diseases. With the outburst of the importance of next generation sequencing, we are now able to identify rare variants (minor allele frequency < 5%) in large familial cohorts at high risk of T2D. Such cohorts, where rare variants are enriched, offer a solution, and advances in large scale DNA sequencing now make this approach feasible. This new knowledge will accelerate the identification of novel T2D causative genes and the development of novel therapeutic approaches to stem the rising epidemic.

Biography

Kiymet Bozaoglu completed her PhD in 2009 at the Metabolic Research Unit, Geelong. Dr Bozaoglu has a multi-disciplinary track record with publications in the fields of genetics and endocrinology, and with a particular focus on genetics as well as cell and molecular biology. She is the Acting Head of the Genomics and Systems Biology Laboratory at Baker IDI Heart and Diabetes Institute and holds a number of competitive NHMRC grants. Her research has really taken off with the novel discovery of a novel adipokine chemerin, where she has made a significant contribution to the field of adipose biology.

Kiymet.Bozaoglu@bakeridi.edu.au