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Bile acid signaling and control of mitochondrial metabolism

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Abstract not available.

<https://doi.org/10.1016/j.orcp.2018.11.007>

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The novel designer cytokine IC7Fc protects against obesity-induced metabolic diseaseTamara Allen¹, Maria Findeisen², Mark Febbraio^{2,*}¹ BakerIDI Heart & Diabetes Inst., Melbourne, VIC, Australia² Garvan Institute of Medical Research, Darlinghurst, NSW, Australia

The gp130 receptor cytokines interleukin-6 (IL-6) and ciliary neurotrophic factor (CNTF) can improve obesity and insulin resistance in mice and humans. However, due to the known pro-inflammatory effects of IL-6 and the antigenic response in some patients to the clinically used form of CNTF (AxokineTM), both proteins have limited, if any, therapeutic utility for treatment of type 2 diabetes (T2D). In an attempt to overcome these issues, we engineered a chimeric gp130 ligand, termed IC7Fc, where one gp130 binding site has been removed from IL-6 and replaced with the leukemia inhibitory factor receptor (LIFR) binding site from CNTF and then fused with the fragment crystallizable (Fc) domain of immunoglobulin G (IgG), creating a new cytokine with CNTF-like, but IL-6R- dependent signaling. We have demonstrated that IC7Fc significantly improves glucose tolerance and hyperglycemia and prevents weight gain and liver steatosis in diet-induced and genetically modified obese mice. In addition, IC7Fc improves glucose tolerance and is safe in non-human primates. In comprehensive human cell based assays, we have also shown that IC7Fc treatment results in no signs of inflammation or immunogenicity. Thus, IC7Fc is a realistic next generation biological for the treatment of obesity and T2D, disorders that are currently pandemic.

<https://doi.org/10.1016/j.orcp.2018.11.008>

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Hepatokines: linking fatty liver to diabetes

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Obesity is a risk factor for the development of secondary complications including dyslipidemia, non-alcoholic fatty liver disease, cardiovascular disease and type 2 diabetes. An accumulation of lipid in the liver, which is clinically known as hepatic steatosis, is a pathologic abnormality that is common in obese and type 2 diabetes patients. Hepatic steatosis occurs when fatty acid supply outweighs fatty acid demand and occurs in a time-course that usually precedes the induction insulin resistance and type 2 diabetes. This presentation describes how 'omics' approaches have been used to delineate the hepatocyte protein and lipid secretome in health and obesity, and unravelled unappreciated biology. Further,

we report on the pre-clinical validation of several liver secreted factors that either cause insulin resistance and disturbances in systemic metabolic homeostasis or enhance glycemic control in diabetes.

<https://doi.org/10.1016/j.orcp.2018.11.009>

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Emerging Roles of MAP kinase phosphatases in metabolic homeostasis

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Dietary interventions for adolescents affected by overweight and obesity—the evidence from randomised controlled trials.

<https://doi.org/10.1016/j.orcp.2018.11.010>

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The personal burden of stigma, bias and responsibility for obesity

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Abstract not available.

<https://doi.org/10.1016/j.orcp.2018.11.011>

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Diet as a shared risk factor for obesity and common mental disorders

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Mental illness including depression, anxiety, and bipolar disorder are a significant driver of global disability and a substantial social, economic and health burden. Treatment including pharmacotherapy such as antidepressants and psychotherapy such as Cognitive Behavioural Therapy avert less than half of the disease burden. Novel strategies are needed to prevent and treat mental disorders.

There are now consistent mechanistic, observational and interventional data to suggest diet quality and the microbiome may be a modifiable risk factor for mental illness. This presentation aims to overview of the nutritional psychiatry field. It includes a discussion of the neurobiological mechanisms such as inflammation likely modulated by diet, and focusses on the use of dietary, microbiome and nutraceutical interventions in mental disorders.

Potential biological pathways influenced by diet and potentially related to mental disorders include inflammation, oxidative stress, the gut microbiome, epigenetic modifications and neuroplasticity. Epidemiological data, particularly in depression, suggests an association between diet quality and mental health, across multiple populations and age groups; these do not appear to be explained by reverse causality or other demographic or lifestyle factors. Our treatment trial provides now replicated clinical evidence that dietary interventions in clinically diagnosed populations are feasible and can provide significant clinical benefit. Nutraceutical approaches including omega-3 fatty acids, folate, S-adenosylmethionine, N-acetyl cysteine and probiotics, amongst

others, are promising. Intervention studies in large cohorts and other disorders like schizophrenia, bipolar and anxiety disorders are a key next step.

<https://doi.org/10.1016/j.orcp.2018.11.012>

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Early life stress and subsequent obesity in women



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A history of childhood trauma, defined as events of abuse (physical, emotional or sexual) or neglect (physical or emotional) occurring before the age of 18 years is overwhelmingly present in individuals with Borderline Personality Disorder (BPD). This has been demonstrated repeatedly within the research, with reported figures of up to 84% of BPD patients having experienced some form of abuse or neglect and usually sexual and physical abuse. As such, childhood trauma is considered one of the most important factors in the aetiology of BPD. Childhood maltreatment coupled with genetic vulnerability evokes a stress response that can promote pathophysiological processes thus predisposing an individual to BPD. Chronic stress results from prolonged early life trauma, and also when the stressor itself is short in duration but is *perceived* to be threatening for much longer. As such, individuals with a history of childhood trauma often have altered hypothalamic–pituitary–adrenal (HPA) axis activity. The hyperactivation of the HPA axis due to chronic stress can increase the level of androgens in the body and result in clinical hyperandrogenism, which is a key feature in the diagnosis of polycystic ovarian syndrome (PCOS). Obesity is commonly associated with PCOS and also in women with early life trauma. In this presentation, the underpinning psychoneuroendocrine causal factors as well as the mental health consequences of obesity, PCOS and Borderline Personality Disorder will be discussed as well as novel treatment approaches.

<https://doi.org/10.1016/j.orcp.2018.11.013>

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Facilitating change in retail settings covering government, small stores and supermarkets



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Abstract not available.

<https://doi.org/10.1016/j.orcp.2018.11.014>

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The facilitators and barriers to implementation from the experience of government in settings under their control



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Abstract not available.

<https://doi.org/10.1016/j.orcp.2018.11.015>

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What else can be implemented to enhance policy outcomes including pricing, labelling, placement and product



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Abstract not available.

<https://doi.org/10.1016/j.orcp.2018.11.016>

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The experience of Wester Leisure Services in improving the nutritional value of the food supply from a business perspective



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Abstract not available.

<https://doi.org/10.1016/j.orcp.2018.11.017>

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Engaging food businesses in healthy eating initiatives: lessons from the UK



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Introduction: Local governments play a large role in the health of their communities, and never more so than in the UK following the decentralisation of public health to local boroughs in 2012. Following this, the Healthier Catering Commitment (HCC) award was created as a response to high childhood obesity rates and the proliferation of fast food in London boroughs. HCC is a voluntary, local government–delivered initiative that engages food businesses (restaurants and takeaways) to improve the healthiness of their offerings (e.g. switching to healthier frying methods). Understanding the successful engagement strategies, challenges, and how to overcome them, will provide valuable insight into how local governments can influence their local food environments.

Methods: Key informant, semi-structured interviews were conducted with local government staff involved in HCC delivery, exploring their experiences and challenges of engaging food businesses. A thematic analysis approach was used.

Results: Participants drew on a variety of strategies to engage businesses, highlighting incentives, the ease of joining and the potential benefits both to their business and the health of their customers and community. The main barriers to joining were a fear of loss of business, as well as practical challenges to implementing and maintaining the award. HCC officers were also impeded by limited resourcing, balancing this by drawing heavily on shared resources and in-kind support from within and across councils. The ease of understanding and implementing the HCC, and its flexibility in delivery were seen as key strengths. Participants discussed