Nature Reviews Endocrinology **10**, 446 (2014); published online 27 May 2014;
doi:10.1038/nrendo.2014.86;
doi:10.1038/nrendo.2014.85;
doi:10.1038/nrendo.2014.87;
doi:10.1038/nrendo.2014.88

IN BRIEF

DIABETES

Physical activity lowers risk of T2DM in women with a history of gestational diabetes mellitus

A prospective cohort study of women with a history of gestational diabetes mellitus (GDM) revealed that participants who increased their physical activity from baseline levels over 16 years of observation had a 47% reduced risk of developing type 2 diabetes mellitus (T2DM), when compared with those who maintained their total levels of physical activity (RR 0.53, 95% CI 0.38–0.75). Among 4,554 women with GDM, 635 cases of T2DM were identified over the course of the study (1991–2007).

Original article Bao, W. *et al.* Physical activity and sedentary behaviors associated with risk of progression from gestational diabetes mellitus to type 2 diabetes mellitus. *JAMA Intern. Med.* doi:10.1001/jamainternmed.2014.1795

NUTRITION

Obesity causes irreversible loss of olfaction

Obesity in mice that was induced by exposure to a high-fat diet (HFD) resulted in loss of olfactory sensory neurons, reduced olfactory discrimination and disruption of odour-reversal learning. Obese mice exhibited reduced ability to learn reward-reinforced behaviours and had increased overall behavioural inflexibility. When the mice were removed from the HFD feeding regime and allowed to return to normal weight, the olfactory dysfunctions that were associated with obesity did not resolve, suggesting that long-lasting functional changes had occurred.

Original article Thiebaud, N. *et al.* Hyperlipidemic diet causes loss of olfactory sensory neurons, reduces olfactory discrimination, and disrupts odor-reversal learning. *J. Neurosci.* doi:10.1523/jneurosci.3366-13.2014

THERAPY

Targeting insulin-degrading enzyme in diabetes mellitus

A new study has identified a physiologically active macrocycle that selectively inhibits insulin-degrading enzyme and might provide novel therapeutic options for patients with diabetes mellitus. Lean and obese mice that were treated with the inhibitor showed substantially improved glucose tolerance and slower gastric emptying. In addition to augmenting insulin levels in the mice, the inhibitor regulated circulating levels of glucagon and amylin, two hormones that modulate glucose and blood sugar levels.

Original article Pablo Maiani, J. *et al.* Anti-diabetic activity of insulin-degrading enzyme inhibitors mediated by multiple hormones. *Nature* doi:10.1038/nature13297

METABOLISM

PDX improves insulin sensitivity via skeletal muscle IL-6

Administration of the docosanoid resolution mediator, protectin DX (PDX), to obese diabetic mice resulted in release of IL-6 from skeletal muscle, which abrogated hepatic gluconeogenesis via Stat3-dependent transcriptional suppression. Insulin sensitivity in the treated mice was improved and inflammation of adipose tissue was unaffected. The authors suggest that these findings support a rationale for developing PDX-based muscle IL-6 secretagogues to treat type 2 diabetes mellitus.

Original article White, P.J. *et al.* Protectin DX alleviates insulin resistance by activating a myokine–liver glucoregulatory axis. *Nat. Med.* doi:10.1038/nm.3549