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IN BRIEF

NUTRITION

Microbiota key to diet-associated risk of colon cancer

Risk of colon cancer is known to be increased by Western diets that are high in animal fat and low in fibre. A team of researchers has now shown that a short-term diet swap (in terms of fat and fibre content) in individuals from populations at high risk (African American) or low risk (rural South African) of colon cancer is associated with reciprocal changes in indices of cancer risk, such as levels of mucosal biomarkers and microbiota-derived metabolites. Specifically, African American individuals fed a low-fat, high-fibre diet exhibited increased rates of saccharolytic fermentation and butyrogenesis (producing anti-neoplastic metabolites), and reduced synthesis of secondary bile acids (pro-neoplastic metabolites). The findings support increasing fibre consumption and decreasing fat intake as a possible way to reduce the high incidence of colon cancer in African American individuals and other Western populations.

Original article O'Keefe, S. J. *et al*. Fat, fibre and cancer risk in African Americans and rural Africans. *Nat. Commun*. doi:10.1038/ncomms7342

DIABETES

Reconstruction of myocyte metabolic network

New research using a systems biology approach has uncovered the metabolic signature of skeletal muscle in patients with type 2 diabetes mellitus (T2DM). The researchers generated RNA-sequencing data from skeletal myocytes. Correlation between this data and the available myocyte proteome was then assessed, before reconstructing a comprehensive myocyte genome-scale metabolic model (GEM). Mapping of transcriptional changes identified from a meta-analysis of six studies, which compared transcription in patients with T2DM with that in healthy individuals, onto the GEM revealed extensive transcriptional regulation of several metabolic pathways in T2DM. Regulation of these pathways could be a key feature of the response of myocytes to T2DM.

Original article Väremo, L. *et al*. Proteome- and transcriptome-driven reconstruction of the human myocyte metabolic network and its use for identification of markers for diabetes. *Cell Rep*. doi:10.1016/j.celrep.2015.04.010

OBESITY

IRF5 controls mass of adipose tissue depots and insulin sensitivity

Limiting expansion of visceral adipose tissue (VAT) while expanding subcutaneous adipose tissue (SAT) improves glucose homeostasis, according to a new study. Mice with global or myeloid-cell-specific knockout of *Irf5* (encoding the transcription factor interferon regulatory factor 5) fed a high-fat diet had marked expansion of SAT, but not of VAT, in comparison with wild-type littermates fed the same diet. Adiponectin secretion and insulin sensitivity were increased in both adipose tissue depots in *Irf5* knockout mice, which contributed to metabolic improvements in these mice. In humans with obesity, *IRF5* expression was positively correlated with visceral obesity and was negatively correlated with insulin sensitivity. The findings identify IRF5 as a pivotal factor in the control of metabolic disease during obesity; inhibition of IRF5 might, thus, promote a metabolically healthy state during obesity.

Original article Dalmas, E. *et al*. Irf5 deficiency in macrophages promotes beneficial adipose tissue expansion and insulin sensitivity during obesity. *Nat. Med*. doi:10.1038/nm.3829