

## IN BRIEF

## DIABETES

**Metformin linked to vitamin B<sub>12</sub> deficiency**

Secondary analysis of data from the Diabetes Prevention Program Outcomes Study (DPPOS), one of the largest and longest studies of metformin treatment in patients at high risk of developing type 2 diabetes mellitus, shows that long-term use of metformin is associated with vitamin B<sub>12</sub> deficiency. Patients treated with metformin (850 mg twice daily) for 5 years were more likely to have low vitamin B<sub>12</sub> levels (defined as  $\leq 150$  pmol/l) than placebo-treated controls (4.3% versus 2.3%, respectively). On the basis of these findings, the authors recommend "routine testing of vitamin B<sub>12</sub> levels in metformin-treated patients."

**ORIGINAL ARTICLE** Aroda, V.R. et al. Long-term metformin use and vitamin B<sub>12</sub> deficiency in the Diabetes Prevention Program Outcomes Study. *J. Clin. Endocrinol. Metab.* <http://dx.doi.org/10.1210/jc.2015-3754> (2016)

## EPIGENETICS

**Don't stress dad — it's bad for your kids' health**

Paternal exposure to psychological stress increases blood glucose levels in offspring, according to a new study in *Cell Metabolism*. Using a mouse model of restraint stress, the researchers show that offspring of stressed fathers have hyperglycaemia owing to epigenetically driven overproduction of phosphoenolpyruvate carboxykinase and enhanced hepatic gluconeogenesis. Importantly, hyperglycaemia in F1 mice could be prevented by treating stressed fathers with a glucocorticoid antagonist. The results highlight the potential for paternal transmission of metabolic disease risk to offspring.

**ORIGINAL ARTICLE** Wu, L. et al. Paternal psychological stress reprograms hepatic gluconeogenesis in offspring. *Cell Metab.* <http://dx.doi.org/10.1016/j.cmet.2016.01.014> (2016)

## THYROID CANCER

**Incidence trends in the USA**

The latest analysis of the Surveillance, Epidemiology and End Results (SEER) 13 database (covering the period 1992–2012 in the USA) shows that the incidence rates of papillary thyroid cancer (PTC), specifically conventional PTC (CPTC) and follicular-variant PTC (FVPTC), significantly increased from 1992 to 2012 ( $P < 0.001$ ). Importantly, however, the analysis suggests that the increasing incidence of PTC might have plateaued in the last 2–3 years of the study.

**ORIGINAL ARTICLE** Mao, Y. et al. Recent incidences and differential trends of thyroid cancer in the United States. *Endocr. Relat. Cancer* <http://dx.doi.org/10.1530/ERC-15-0445> (2016)

## PCOS

**Benefits of brown adipose tissue transplantation**

Key features of polycystic ovary syndrome (PCOS), including insulin resistance and menstrual irregularity, are alleviated in rats with dehydroepiandrosterone (DHEA)-induced PCOS after transplantation of brown adipose tissue (BAT), according to new research. Transplanted BAT increased endogenous BAT activity and levels of adiponectin, a regulator of ovarian physiology and whole-body energy metabolism. Consistent with this finding, administration of exogenous adiponectin rescued the DHEA-induced PCOS phenotype. The results suggest that activating BAT could be a new way to treat PCOS.

**ORIGINAL ARTICLE** Yuan, X. et al. Brown adipose tissue transplantation ameliorates polycystic ovary syndrome. *Proc. Natl Acad Sci. USA* <http://dx.doi.org/10.1073/pnas.1523236113> (2016)