Adipocytes re-enter cell cycle

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Obesity is increasing in an epidemic manner in most countries and constitutes a public health problem by enhancing the risk for diseases such as diabetes, fatty liver disease and atherosclerosis. Despite this, much remains to be discovered about the basic physiology of fat cells (adipocytes) and how they respond to changes in the fat mass. Adipocytes are specialised cells that either store lipid for times of energy need (white adipocytes) or burn lipid in the process of non-shivering thermogenesis (brown adipocytes). They are believed to be terminally differentiated cells, arising from the differentiation of resident pre-adipocyte progenitor cells. Recent observations in my laboratory show that a small subset of adipocytes (both mouse and human) are polyploid with *in vitro* studies supporting the notion that this is due to de novo DNA synthesis. These findings challenge the long-standing dogma in the field that adipocytes are terminally differentiated cells, incapable of re-entering cell cycle. These results may require changes in our understanding of metabolic disease in humans.