

Size matters: Baby's size at birth may predict risk for disease later in life

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A new research report published in the November 2014 issue of *The FASEB Journal* suggests that being overweight might be better in the long term than being underweight. Before you reach for that box of Twinkies, however, it's important to note that this discovery only applies to the weight of newborn babies in relation to risk of future disease.

"These findings support the hypothesis that common long-term variation in the activity of genes established in the womb may underpin links between size at birth and risk for adult disease," said Claire R. Quilter, Ph.D., study author from the Mammalian Molecular Genetics Group, Department of Pathology at the University of Cambridge in the United Kingdom. "If confirmed these could be important markers of optimal fetal growth and may be the first step along a path to very early disease prevention in the womb."

Quilter and colleagues set out to determine whether or not there was any truth to the prevailing hypothesis that conditions in the womb that lead to a high [birth weight](#) or [low birth weight](#) could affect expression of genes in the baby, which in turn, leads to effects that persist into adult life. To do this, scientists looked at DNA derived from the cord blood of newborn [babies](#) from mothers with raised glucose levels during late pregnancy and in those babies born following relatively slow growth in the [womb](#) that later caught up after birth. Researchers looked for differences in DNA methylation patterns (chemical modifications of DNA known to effect changes in gene activity). Results showed differences in these methylation changes which were specific to boys and girls and to each of the two groups. However, changes were also identified that were common to both groups of babies. Similar overlapping signals were seen in two other groups of babies studied.

"In the age of epigenetics, prenatal care is moving beyond infant survival and into optimizing the

health of the baby for his or her entire life," said Gerald Weissmann, M.D., Editor-in-Chief of *The FASEB Journal*. "Understanding the epigenetic factors that play a role in a baby's birthweight will eventually help doctors give the best care and advice to their pregnant patients."

More information: Claire R. Quilter, Wendy N. Cooper, Kerry M. Cliffe, Benjamin M. Skinner, Philippa M. Prentice, LaTasha Nelson, Julien Bauer, Ken K. Ong, Miguel Constância, William L. Lowe, Nabeel A. Affara, and David B. Dunger. Impact on offspring methylation patterns of maternal gestational diabetes mellitus and intrauterine growth restraint suggest common genes and pathways linked to subsequent type 2 diabetes risk. *FASEB J.* November 2014 28:4868-4879; [DOI: 10.1096/fj.14-255240](#)

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