

Coping and copulation behavior may help calculate diabetes risk

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Discussion of a man's background, attitude, and sexual history isn't just the fodder of Sex and The City episodes – in the future, it could also be a way of evaluating his risk of diabetes.

Risk of developing type 2 diabetes and metabolic syndrome is determined by an individual's genetic background. Since this background has in turn been influenced by environment and behavior, it's important to consider these factors when assessing disease risk. While scientists have learned a lot about human disease through research in traditional laboratory mice, there are limits in studying genetic variation since controlled breeding and diet introduces artificially influences.

In order to study diabetes risk in a more naturally genetically diverse animal, Roxanne Oriel, Paul Vrana and colleagues studied glucose tolerance, a test often used to diagnose diabetes and metabolic syndrome, in a type of field mouse native to North America. As reported in their new study published in *Disease Models & Mechanisms* (DMM), dmm.biologists.org, they specifically chose two species of *Peromyscus* that are closely genetically related, but differ significantly in their behavioral traits and native environment.

During their tests, they discovered that merely handling the male mice and subjecting them to a placebo test – where glucose was replaced with saline – resulted in significant differences in blood sugar levels. Males of a calmer, more monogamous species had a higher level of stress hormones and a superior ability to regulate blood sugar, in comparison to

males of a less calm, less monogamous species, or females of either species. In combination with studies with male mice bred to have only swapped "male" Y chromosomes, their study shows that a genetic variance linked to the Y chromosome is responsible for the species-specific responses of the males to stress.

Since previous studies of non-human primates by other research groups demonstrates a link between stress hormone levels and monogamy, the UC Irvine group propose that superior stress tolerance and blood sugar regulation is related to monogamy in these mice. Their work not only supports the study of mice with a more natural genetic background, but also points to the importance of considering gene-environment interactions, as well as behavior, when calculating risk of diabetes, metabolic syndrome, and other common diseases.

Source: The Company of Biologists

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