

Small RNAs can play critical roles in male infertility/contraception

April 9 2009



Researcher Wei Yan's findings were published in the scientific journal *Nature Genetics*. Credit: Anne McMillan, University of Nevada School of Medicine, Reno Nevada.

University of Nevada School of Medicine scientists in the Department of Physiology and Cell Biology have discovered insight into the reproductive workings of the male sex chromosome that may have significant implications for male infertility and contraception.

This important discovery has been published in [Nature Genetics](#), one of the highest-ranking journals in the field of biomedical research based upon the impact factor.

The study findings indicate that the [X chromosome](#) in developing [sperm](#) cells encodes numerous tiny ribonucleic acids called microRNAs despite the fact that that most of genes on the X chromosomes are suppressed. This unprecedented observation implies that these small RNAs have critical roles in chromosome inactivation and also in sperm formation.

"The sex chromosome silencing in meiotic male germ cells is a well-known phenomenon, which has been termed meiotic sex chromosome inactivation. I was surprised when we first observed that numerous microRNAs were highly expressed in these cells," said Wei Yan, M.D., Ph.D., principal investigator for the study and associate professor of physiology and cell biology at the School of Medicine.

Working in collaboration with Dr. John McCarrey, professor of molecular biology and [reproductive biology](#) at the University of Texas, San Antonio, Yan's research group further investigated all the known X-linked microRNAs. Their data confirm that these X chromosome-derived microRNAs indeed escape the silencing effects and manage to be expressed.

"This finding opens a new avenue towards understanding the role of these small RNA species in the control of sperm production. Worldwide, one in nine couples in their reproductive age experience infertility. On the other hand, the number of unintended pregnancy is increasing yearly. Since these small RNAs are involved in the control of sperm formation, they can be causative factors in male infertility and also can be used as non-hormonal male contraceptive targets," added Yan.

Yan's research is focused on mammalian sperm and egg production and is funded by grants from the National Institutes of Health. Rui Song, a third year graduate student and Seungil Ro, Ph.D., an assistant professor of physiology and cell biology, co-first authored this paper. Other contributing authors include Jason D. Michaels, a third year medical

student, and Chanjae Park, Ph.D., a post-doctoral researcher.

Source: University of Nevada, Reno

Citation: Small RNAs can play critical roles in male infertility/contraception (2009, April 9)
retrieved 24 April 2024 from <https://phys.org/news/2009-04-small-rnas-critical-roles-male.html>

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