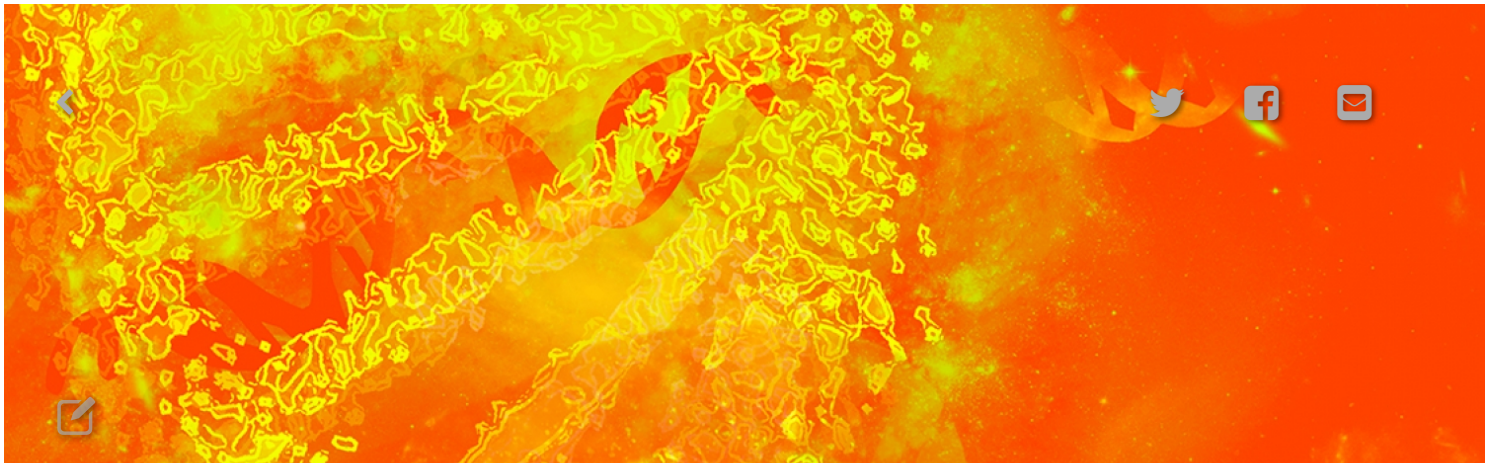


Genetic Quality Control During Meiosis

Infertility and birth defects often arise due to improper genetic quality control during meiosis. Robert Weiss, Biomedical Sciences, and Marcus Smolka, Molecular Biology and Genetics, are resolving how the cellular DNA damage response ensures genetic quality control during meiosis and enables the efficient and accurate production of gametes.

To ensure the production of gametes without genetic defects, the genome of meiocytes is monitored by a set of evolutionarily conserved kinases, known as checkpoint kinases. These kinases sense damage to DNA or problems in chromosome pairing and, upon activation, can block meiotic progression and induce cell death.

How meiotic checkpoint signaling is regulated, however, is not understood, especially in mammals. Little is known about how checkpoint kinases can act as essential regulators of normal meiotic progression as well as effectors of quality control mechanisms that lead to cell death. This knowledge gap poses a major barrier for understanding the determinants of genetic quality control and how mis-regulation of checkpoint signaling may promote infertility.

The same pathways also mediate fundamental DNA repair and checkpoint functions in mitotic cells, sometimes deregulated in cancers. Researchers are targeting these pathways as an emerging strategy for cancer clinically treatment.

The findings will provide fundamental knowledge about DNA repair and DNA damage signaling mechanisms that have key roles in organismal development, cancer, and reproduction.

NIH Award Number: 1R01HD095296-01

Robert Weiss
Biomedical Sciences, College of Veterinary Sciences

Marcus B. Smolka
Molecular Biology and Genetics, College of Agriculture and Life Sciences/Weill Institute for Cell and Molecular Biology

Funding Received

$1.2 Million
spanning 5 years

Sponsored by

NIH *Eunice Kennedy Shriver* National Institute of Child Health and Human Development

---

Other Research Sponsored by

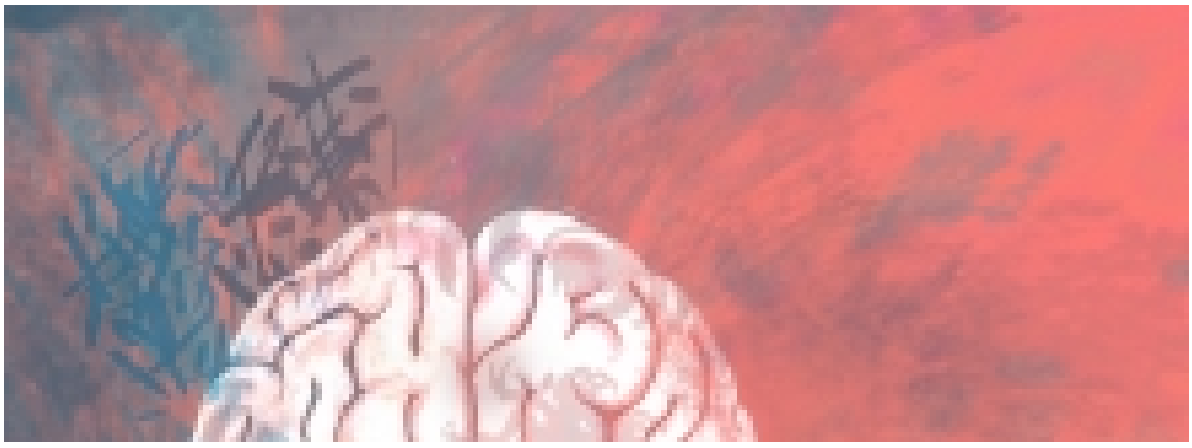
National Institutes of Health, National Institute of Child Health and Human Development

Working Couples, After Childbirth

$1.03 Million spanning 3 years

DNA Replication Stress, Inflammation, and Miscarriage

$1.3 Million spanning 4 years



Paternal and Maternal Care and Offspring Social Cognition

$1.3 Million spanning 4 years

Small RNA Pathways in Mammalian Gametogenesis

$4.7 Million spanning 5 years

Featured Researchers

Find a Center, Institute, Lab or Program