Of Mice And Women: Chemically Altered Rodents Help Researchers Study Diseases In Postmenopausal Women

University of Arizona

It took 12 years, an interdisciplinary collaboration between University of Arizona professors from physiology and pharmacology, and the professional nurturing of a post-doctoral fellow to discover a way to cause premature ovarian failure in female mice without surgically removing their ovaries.

What the Physiology Department's Patricia Hoyer has accomplished, along with post-doc Loretta Mayer, is the creation of a mouse model that can be used to study postmenopausal conditions such as cardiovascular disease, Alzheimer's disease, osteoporosis, and a number of other conditions that increase in women after menopause. The research was funded by grants from the National Institutes of Health, March of Dimes and the Arizona Disease Control and Research Commission.

> *The method developed by Hoyer and her team uses a chemical called 4-vinylcyclohexine diepoxide (VCD), an industrial solvent normally used in the manufacture of tires, plasticizers and*

> *insecticides. When administered to a female rat or mouse they found that is destroys oocytes (eggs) in their ovaries.*

Furthermore, it is selective for the smallest form of oocyte containing particles, so it does not produce extensive effects within the ovary. By destroying the eggs in the mouse and rat ovaries, VCD accelerates a natural process called "atresia." As a result, the ovaries become depleted of eggs and the animals go into a state of premature ovarian failure, similar to menopause in women. Hoyer says she and her team determined early on that except for causing ovarian failure, VCD causes no other adverse effect in animals.

Hoyer has moved the discovery beyond the University of Arizona campus through collaborations with La Jolla Institute of Molecular Medicine, Northern Arizona University and the University of California, Davis. The research group disclosed the technology in October 2001. And with help from the university's Office of Technology Transfer and Arizona's Technology and Research Initiative Fund have worked to move the Mouseopause™ mouse model into broader availability through patenting and licensing. The VCD mouse model has been used in studying important human diseases and may also be applied to the study of wild animal population control and "neutering" of pets without surgery. These new applications of the technology are being developed in a startup directed by Dr. Mayer at NAU in Flagstaff, Ariz., called Senestech.

Excerpted from University of Arizona's Report on Research Special Edition – TRIF

This story was originally published in 2007.

To see available technologies from research institutions, click here to visit the AUTM Innovation Marketplace.