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MEDIA RELEASE

One big biology question solved

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An Australian research team has solved one of biology's most fundamental questions – why males produce sperm and females produce eggs.

The finding is a breakthrough that could lead to improved infertility treatment, cancer therapy and pest management.

The team, led by Dr Josephine Bowles and Professor Peter Koopman from the Institute for Molecular Bioscience at The University of Queensland, has discovered that derivatives of Vitamin A trigger the beginning of egg and sperm production, a process known as meiosis.

The cells that eventually turn into either eggs or sperm – known as germ cells – are identical in male and female embryos.

“Whether a germ cell develops into an egg or a sperm depends on the time at which meiosis begins,” Professor Koopman said.

“In females, meiosis begins before birth and eggs are produced, whereas in males, meiosis begins after birth and the result is sperm.”

Professor Koopman and his team found that retinoic acid, a derivative of Vitamin A, causes germ cells in female embryos to begin meiosis, leading to the production of eggs.

They also discovered an enzyme present in male embryos that wipes out retinoic acid and so suppresses meiosis until after birth, resulting in sperm production.

“This is an extremely important process that nobody has been able to figure out until now,” Professor Koopman said.

“It is textbook science and it should provide the basis for a number of practical applications.”

Knowledge of what triggers and suppresses meiosis may allow researchers to improve fertility, for example in the case of an infertile couple wanting a baby, or suppress it, in the case of pest management.

Professor Koopman also suggested that an inappropriate retinoid signal might give the wrong instructions to germ cells, which could lead to the formation of germ cell tumours.

“Our research has suggested a possible cause for these common testicular cancers, opening up avenues of investigation which will hopefully one day lead to a cure,” Professor Koopman said.

The findings of the team will be published in one of the world's top scientific journals *Science* and will be available in its online version, *SciencExpress*, from today (Friday 31

March).

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