

New insight into role of male hormones in fertility and polycystic ovary syndrome

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Research led by University of Birmingham scientists in collaboration with Northwestern University in Chicago, US, has provided fresh insight into the role of male hormone in supporting and disrupting the production of eggs by ovarian follicles.

The study, newly published online in the journal *Endocrinology*, measured for the first time the production of hormones by the isolated ovarian follicle during its development, using highly sensitive and specific mass spectrometry.

The researchers, from the Institute of Metabolism and Systems Research at the University of Birmingham, showed that [ovarian follicles](#) are able to produce active male hormones, so-called androgens, from very early stages of development. They found that androgens are needed for normal function of the follicle, including the successful release of an egg that can be fertilised.

However, as lead author Professor Wiebke Arlt explains: "We could also show that too much [androgen](#) disrupts the development of the follicle, mirroring what we observe in women with [polycystic ovary syndrome](#), who have increased blood androgen concentrations and frequently have difficulties conceiving."

This was an exciting and unexpected discovery, she said, as they could show that the follicle is able to regulate the male hormone balance by decreasing androgen production in response to androgen administration

while increasing androgen production when the follicle is treated with androgen receptor blockers.

Professor Arlt concludes: "In women with polycystic ovary syndrome, this self-regulation of the male [hormone](#) balance by the follicle is overcome by the very high androgen concentrations in circulation. Thus, we can expect that a decrease in androgens will have a beneficial effect on fertility in affected women."

The Birmingham researchers used a system pioneered by Professor Teresa Woodruff, from the Women's Health Research Institute at Northwestern University Chicago. This allowed them to embed a follicle isolated from a mouse ovary in a gel and then to observe its development in a dish, until the release of a mature egg at the end of the process.

First author Marie Lebbe spent nine months in Chicago to learn the method before transferring it to Birmingham, supported by a clinical research training fellowship from the Medical Research Council. "This was a big adventure for our family, with our fourth child being born just a few months before we went to Chicago. The collaboration was a truly amazing experience," she says.

The project continued to be fruitful, with Dr. Lebbe's fifth child being born during the final year of the project, shortly before her viva and the award of her PhD in the end of 2016.

More information: The steroid metabolome in the isolated ovarian follicle and its response to androgen exposure and antagonism.

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Provided by University of Birmingham

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