

Structural Changes to the Uteri in the Fat-Tailed Dunnart Across Gestation

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Fat-tailed dunnarts are a dasyurid model species for marsupial reproduction. Fat-tailed dunnarts have a short gestational period of approximately 14 days and give birth to highly altricial young which then reside in the mother's pouch where they continue their development. Many marsupials, including Fat-tailed dunnarts are listed as a threatened species in certain regions. However, marsupial reproduction remains under characterised. As a result, there are limited assisted reproductive technologies available to promote marsupial reproduction and these technologies are required to help repopulate threatened or lost species back into their natural habitat.

To develop new assisted reproductive technologies for marsupial embryo culture, further understanding of the fat-tailed dunnarts gestation is necessary. Due to marsupials giving birth to underdeveloped young, most marsupial embryos attach to the uterus and develop a choriovitelline placental late in gestation, just prior to birth. Therefore, this indicates that the marsupial uterus plays a pivotal role in the development of embryos.

To characterise the function of the uterus in marsupial embryo development, we have collected uteri across the gestational time course of the fat-tailed dunnart. Uteri of pregnant fat-tailed dunnarts have been dissected to expose the endometrium and developing embryos. Images of the uteri demonstrate that the uterine horns undergo significant and rapid vasculature and glandular remodelling throughout the course of gestation. The level of uterine remodelling can be matched with the stage of embryo development.

Further investigation of the uterine remodelling and function at critical gestational timepoints may lead to the development of novel assisted reproductive technology devices for marsupial embryo culture. The ability to culture fat-tailed dunnart embryos would be revolutionary in the ability to help conserve and reintroduce threatened, endangered and extinct species into the wild.