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Establishing fertility preservation strategies for conservation of endangered carnivores

Statement of the Problem: Within the ovary, there are thousands of immature follicles containing oocytes that are never ovulated or fertilized. The ability to grow these immature follicles to a mature stage containing fertilizable eggs has enormous potential for rescuing and protecting genetic diversity of valuable genotypes and species, including endangered wildlife. This approach would allow 'genomic rescue' and be especially valuable for the genetic management of rare species where there is a prevalence of females who are under-represented in the population or die before reaching puberty. Our laboratory has studied the dog and cat models to generate fundamental data on these two important companion animals, and to produce knowledge and approaches applicable to wildlife counterparts. This is important because 5 of 36 extant canids and 25 of 37 felids are listed as threatened by extinction.

Methodology & Theoretical Orientation: We have studied the factors regulating the survival of ovarian tissue and isolated follicles *in vitro.* An advantage of simultaneously studying both species is the recognition of remarkable species-specificity in requirements.

Findings: For examples, dog follicles preferred -MEM, an amino acid rich medium to MEM whereas cat tissues better survived and grew larger in the latter medium than the former.

Conclusion & Significance: In sum, it is clear that the mechanisms driving in vitro follicle growth in cats and dogs are much different from the traditionally studied mouse model and even between these two-carnivore species. This finding itself reinforces the need for more comparative studies between species and the investigation of larger sized models, especially for those keen to adapt this technology to fertility preservation in women and endangered species. Although existing culture systems can promote *in vitro* growth of cat and dog follicles, actual practical application will require creating microenvironment that allows recovering mature-stage, fertilizable oocytes.

Biography

Nucharin Songsasen is a Research Scientist at Center for Species Survival, Smithsonian Conservation Biology Institute (SCBI). She has joined SCBI in 2002, has led the Global Canid Conservation program and expanded this conservation and research initiative from laboratory setting to field conservation in range countries. She has established partnerships with several national and international organizations and currently holds an adjunct appointment at the University of Maryland, Cornell University and George Mason University. She is a Member of the IUCN's Canid Specialist Group, the Coordinator of Dhole Working Group and the Maned Wolf Species Survival Plan as well as Reproductive Advisor to the Canid Taxon Advisory Group. She has received a DVM degree from the Kasetsart University, Thailand and a PhD in Biomedical Sciences from the University of Guelph, Canada..

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