

## HORMONE MONITORING: AN IMPORTANT TOOL FOR BREEDING MANAGEMENT OF WILDLIFE SPECIES

**Janine L. Brown**

Smithsonian Conservation Biology Institute, USA

As more species reach vulnerable or endangered status, captive breeding is increasingly viewed as a means to sustain important insurance populations in case of catastrophic extinctions. Unfortunately, many captive populations are not self-sustaining. As reproduction is key to species survival, understanding how to control and monitor ovarian function is vital. It is now clear that the ability to track reproductive activity via hormones is vital to developing successful *ex situ* breeding programs, through both natural and assisted reproductive means. What we have learned is that a diversity of reproductive mechanisms exists across taxa. The development of noninvasive monitoring techniques to analyze hormones or their metabolites excreted in urine or feces, greatly expanded our ability to study rare species, including in the wild. Perhaps it should not be surprising then, that major differences in metabolism and routes of excretion exist, not only between species, but also between hormone types within a species. This means that a species by species, and sometimes hormone by hormone, approach is needed for developing effective reproductive monitoring and control strategies. Over the past 30 years, our laboratory has developed and validated a number of reproductive assay techniques, which has led to our amassing a database of ovarian cycle dynamics on over 100 species. Even among related species, there are marked differences in seasonal, environmental and social influences on ovarian cycle dynamics, ovulatory mechanisms, and responses to assisted reproductive/ovulation induction protocols. This presentation summarizes comparative ovarian function research on some of the most well-studied species in our laboratory: felids, elephants, rhinos, tapirs and the giant panda, and how that information has been used to aid *ex situ* management. Each of these species represents a range of reproductive strategies, from the highly seasonal, monestrus giant panda to the aseasonal, polyestrus elephant. Some species exhibit spontaneous ovulations, while others are induced ovulators or both, with variations in ovarian cycle lengths that range from a few days to several months. These differences reinforce the need for studies of species basic biology to optimize breeding strategies.