

# FORMAL ABSTRACTS



## MONDAY, 14 NOVEMBER

This report exemplifies the extensive, state of the art care provided to marine mammals in a zoological setting as part of a larger, collaborative effort to ensure the health and well-being of each individual animal. Utilization of the CT scan as a routine diagnostic tool could prevent or mitigate thoracic disease and contribute to an improved understanding of these conditions among wild and stranded bottlenose dolphins.

### References

- Houser, D. S. (2004). Structural and functional imaging of bottlenose dolphin (*Tursiops truncatus*) cranial anatomy. *Journal of Experimental Biology*, 207(21), 3657-3665.
- Schwarz, T., & Saunders, J. (2011). *Veterinary computed tomography*. Chichester, West Sussex, UK: Wiley-Blackwell.
- Wellington, S., & Vinegar, H. (1987). X-Ray Computerized Tomography. *Journal of Petroleum Technology*, 39(08), 885-898.

## DEVELOPMENT OF AN ONLINE SURVEY FOR THE REVIEW OF OTARIIDS REPRODUCTION CONTROL IN CAPTIVITY AFTER PRELIMINARY RESULTS OF DESLORELIN AND GOSERELIN GnRH AGONISTS IMPLANTS, AS TEMPORARY CONTRACEPTION, IN DIFFERENT MALE PINNIPED SPECIES

**Geraldine Lacave<sup>1,2,3\*</sup>, Vanessa Alerte<sup>2</sup> and Gilles Gouverneur<sup>4\*</sup>**

<sup>1</sup>Marine Mammal Veterinary Services, Brugge, Belgium

<sup>2</sup>Zoo Amneville, Amneville, France

<sup>3</sup>Le Seaquarium, Le Grau du Roi, France

<sup>4</sup>Clinique vétérinaire les arches, Ars-sur-Moselle, France

Facing a major reproductive success in human care, it seems increasingly necessary to better understand the physiology of reproduction in Otariids and to develop reliable techniques of birth control. Physical separation, permanent castration, reversible and immunological contraception are all means of control used by zoos and marine facilities to master the reproduction of their animals. The ultimate goal is to ensure optimal genetic diversity, reduce overcrowding and the risk of intraspecific conflicts that may arise. Currently, scientific information on the various methods and consequences of contraceptive methods used among sea lions are very limited in the literature (Atkinson, 1998; Atkinson, Ragen, Gilmartin, Becker, & Johanos, 1998; AZA Reproductive Management Center: Saint Louis Zoo, 2013; Boyd, Lockyer, Marsh, 1999; Colegrove, Gulland, Naydan, & Lowenstine, 2009a; Colegrove, Gulland, Naydan, & Lowenstine, 2009b; Greig *et al.*, 2007; Robeck, Atkinson, Brook, 2001; Siebert, Driver, Rosenberger, & Atkinson, 2007).

Deslorelin and Goserelin are both GnRH agonists that suppress the production of sex hormones (testosterone and estrogen) by feedback mechanisms, with an effect similar to ovariectomy or castration but having the advantage of reversal upon expiration of the hormonal content of the implant. Because of their effect on the suppression of testosterone, these agonists have been used in males both for temporary castration and aggression control. The latest effect is important for pinnipeds presentations in zoos, marine parks and aquariums, where the highest public attendance coincide most of the time with the summer season and peak reproductive season of the animals.

A preliminary study with both types of implants was performed over several years, with different protocols and with relative flaws and successes, with males of two different facilities, comprising mixed groups of Patagonian sea lions (*Otaria byronia*), California sea lions (*Zalophus californianus*) and harbour seals (*Phoca vitulina*). Goserelin had been chosen as part of the trials for its

*(continued on next page)*

## MONDAY, 14 NOVEMBER

biodegradability and short acting (3M) effect, to purpose being to identify, for some animals, if one could postpone "heat" in males and reproduction until the end of the public season. Males were followed by regular blood samplings for testosterone controls and implants booster adjusted based on these results. In some cases females became pregnant though no typical reproduction behavior were shown by the males during the respective summer. It was not possible in this study to identify if it was through the presence of residual sperm storage at the time of the first implant, an incorrect estimation of the testosterone level through available laboratory tests, or a later impregnation of the females. Some males also had a return of their typical "heat" behavior six months past first implant, so in the middle of the winter in Europe, when using Deslorelin or Goserelin.

This has lead to the development of a thorough on-line questionnaire, aimed at veterinarians and institutions holding these species, in order to review the different techniques used nowadays and their relative success and/or failures.

During this presentation, current knowledge on contraceptive methods in pinnipeds will be overviewed and the questionnaire will be explained. The information collected herewith and their analysis will permit, in the near future, the realization of a synthetic work on the control of reproduction knowledge in sea lions, but this can only happen if the information is made available.

### References

- Atkinson S. (1997). Reproductive biology of seals. *Journal of reproduction and fertility* 2, 175-194.
- Atkinson, S., Ragen, T., Gilmartin, W., Becker, B., & Johanos, T. (1998). Use of a GnRH Agonist to Suppress Testosterone in Wild Male Hawaiian Monk Seals (*Monachus schauinslandi*). *General and Comparative Endocrinology*, 112(2), 178-182. doi:10.1006/gcen.1998.7173
- AZA Reproductive Management Center: Saint Louis Zoo. (2013). Retrieved January 25, 2016, from <https://www.stlzoo.org/animals/scienceresearch/reproductivemanagementcenter/>
- Boyd I. L. Lockyer C. Marsh H D. 1999. Reproduction in Marine Mammals. In Rommel, W. (Eds.), *Biology of marine mammals*. (pp. 218-286). Melbourne, Vic.: Melbourne University Press.
- Colegrove, K. M., Gulland, F. M., Naydan, D. K., & Lowenstine, L. J. (2009). Normal Morphology and Hormone Receptor Expression in the Male California Sea Lion (*Zalophus californianus*) Genital Tract. *The Anatomical Record: Advances in Integrative Anatomy and Evolutionary Biology*, 292(11), 1818-1826. doi:10.1002/ar.21008
- Colegrove, K. M., Gulland, F. M., Naydan, D. K., & Lowenstine, L. J. (2009). Normal Morphology and Hormone Receptor Expression in the Male California Sea Lion (*Zalophus californianus*) Genital Tract. *The Anatomical Record: Advances in Integrative Anatomy and Evolutionary Biology*, 292(11), 1818-1826. doi:10.1002/ar.21008
- Greig, D. J., Mashburn, K. L., Rutishauser, M., Gulland, F. M., Williams, T. M., & Atkinson, S. (2007). Seasonal Changes in Circulating Progesterone and Estrogen Concentrations in the California Sea Lion (*Zalophus californianus*). *Journal of Mammalogy*, 88(1), 67-72. doi:10.1644/06-mamm-a-060r2.1
- Robeck T.R, Atkinson S K C., And Brook F. 2001: Reproduction. In: L. A. Dierauf, & F. M. Gulland (Eds.), *CRC Handbook of Marine Mammal Medicine* (2nd ed.). (pp. 193-236). Boca Raton, FL: CRC Press.
- Siebert, U., Driver, J., Rosenberger, T., & Atkinson, S. (2007). Reversible reproductive control in harbour seals (*Phoca vitulina*) with a gonadotropin-releasing hormone agonist. *Theriogenology*, 67(3), 605-608. doi:10.1016/j.theriogenology.2006.09.024