The battle of the sexes: brain differences between male and female in carnivoran species

Context: The social brain hypothesis advocates that social complexity is one of the major drivers of brain size increase within mammal lineages. For some Carnivora such as spotted hyenas, wild dogs and lions, groups can reach more than 20 individuals and present a complex hierarchical structure. In addition, behavioural differences between males and females are observed especially in gregarious species. For example, aggressive behaviours, alloparental care and hunting techniques can vary widely depending on gender. Despite an increasing interest for studying brain evolution in relation with sociality, few studies have focused on the impact of differential social life history experienced by male and female on the brain. Using carnivoran species with different patterns of social complexity (from solitary species to highly gregarious), our aims is to compare total and regional brain volumes and shape in male and female in order to determine if intraspecific variation in social life history correspond to brain differences.

Objectives of the internship: With the help of the supervisors, the aim of this work is to allow the student to publish a scientific paper as first author.

1. The intern will initially have to undertake 3D segmentation on CT-scanners data of the cranium to obtain the endocasts;
2. Then, 3D morphometric geometrics and statistical analyses associated will be conducted on the dataset using R software;
3. Finally, the intern will carry out bibliographic research and manuscript redaction in order to publish his work in an international peer-reviewed journal.

Required specialized knowledge and skills: This internship is open to all students in evolutionary biology / veterinary sciences / neurology with at least three years of study with a preference for students invested in the research community. This research project can also be used to complete a Master degree in biology.

- Must be proficient in R
- Must have good English skills
- Must have good reactional skills
- Theoretical or practical knowledge in the study of evolutionary biology
- Preferably comfortable with segmentation software (Mimics or AVIZO)
- Completed courses in neurology is a bonus

Languages: French and/or English

Work environment: Intern will work in the Royal Museum for Central Africa, Tervuren (Belgium). Practical arrangements to enable telework may be implemented depending on the global health situation, which do not require the presence on the student on site.

Start/end date: Negotiable

Supervisors: Margot Michaud (post-doctoral researcher, Department of African Zoology) and Emmanuel Gilissen (Researcher and Curator mammalogy, Department of African Zoology).

Please send your CV with an introductory letter to: m.mar33@hotmail.fr. Applications in French and English are both accepted.