

We have a fully-funded 3-year PhD position in Evolutionary biology available at the LIENSs (La Rochelle, France).

Title: Evolution of anticancer defenses in wild animals.

Supervisors: Drs. Mathieu Giraudeau and Orsolya Vincze.

Cancer is recognized as a pathology that affects almost every member of the animal kingdom. Accurate estimates on cancer in wildlife promise extremely valuable information on oncogenic processes, as the limited research conducted on non-standard model organisms already provided tremendous insights on the natural mechanisms of cancer resistance. We propose to use a multidisciplinary approach at the interface of oncology, physiology, cellular and evolutionary biology to characterize the prevalence of cancer in wildlife and identify the genetic, physiological and life-history predictors of the cross-species pattern of cancer susceptibility. Specifically, this project proposes to first build a new database on cancer prevalence, life history traits and physiology of hundreds of vertebrate species in order to run large-scale comparative analyses to study the variability of cancer resistance across vertebrates. Then, we propose to assess genomic tumor-suppressor mechanisms by quantifying the duplication of cancer-related genes in vertebrate species. Finally, using cell cultures from 15 species more or less resistant to cancer, we will evaluate oncogenic susceptibility and the efficacy of putative tumor-suppressive mechanisms using a number of validated *in vitro* assays. Our studies are well grounded, partly being based on pre-existent data or already available cell cultures and without doubt will provide the broadest and most detailed characterization of cancer in wildlife to date. We hope to unravel the cross-species diversity of cancer resistance, and highlight future avenues in the identification of efficient tumor-suppressor mechanisms.

Requirements: We are looking for a student with relevant background in evolutionary biology, with enthusiasm to learn advanced statistical analyses (experience with R is a strong asset). The candidate will have to hold a master's degree (or an equivalent degree) at the time of enrollment in the PhD program.

How to apply: If you are interested in the job, please send me by e-mail (giraudeau.mathieu@gmail.com) a letter describing your motivation, CV, and e-mail addresses of two academic referees, by 25th of May 2023. If you have any further questions, don't hesitate to contact me.

Representative Publications and Preprints:

Vincze, O., Colchero, F., Lemaître, J. F., Conde, D. A., Pavard, S., Bieuville, M., ... & Giraudeau, M. (2022). Cancer risk across mammals. *Nature*, 601(7892), 263-267.

Giraudeau, M., Sepp, T., Ujvari, B., Ewald, P. W., & Thomas, F. (2018). Human activities might influence oncogenic processes in wild animal populations. *Nature Ecology & Evolution*, 2(7), 1065-1070.

Vincze, O., Vágási, C. I., Péntzes, J., Szabó, K., Magonyi, N. M., Czirják, G. Á., & Pap, P. L. (2022). Sexual dimorphism in immune function and oxidative physiology across birds: The role of sexual selection. *Ecology Letters*, 25(4), 958-970.