

Postdoctoral Position in Cancer Resistance in Wild Mammals

The WICANE team (wicane.recherche.univ-lr.fr) is seeking a motivated and innovative postdoctoral researcher to join a project aimed at understanding why some wild mammal species exhibit remarkable resistance to cancer. Cancer remains one of the leading causes of death in modern human societies, with nearly one in two people developing the disease during their lifetime. Despite decades of research and significant investments, cancer continues to pose a major challenge to prevention and treatment, indicating the need for new perspectives in cancer research. One fundamental, but informative track could be the exploration of why some animal species develop very few, or no cancer at all, especially despite their long lifespans and extensive cell numbers, which are expected to exacerbate their risk of malignant transformation? This question offers a unique opportunity to discover new natural mechanisms of cancer resistance. Over millions of years of evolution, nature has repeatedly found effective solutions to suppress cancer. By studying species that appear naturally protected, we can uncover the mechanisms that eliminate abnormal cells or prevent tumor development, and ultimately translate these discoveries into strategies that may improve cancer prevention and treatment in humans.

The WICANE team addresses this challenge through two complementary approaches.

The first approach involves large-scale comparative studies to explore the variation in cancer prevalence across a broad range of vertebrate species. This includes analyzing phylogenetic patterns to identify evolutionary trends associated with cancer resistance. We combine large scale physiological and life-history databases with comparative genomics and bioinformatic approaches to identify the key traits, genes or pathways that predict cancer resistance. These studies help to uncover macroevolutionary patterns in cancer resistance and generate candidate mechanisms for subsequent functional validation.

The second approach focuses on small number of exceptionally resistant species, such as whales, the blackbuck, the Greenland shark, or the Patagonian mara. Using established primary cell cultures and *in vitro* and *in vivo* functional assays, we investigate how cells of these remarkable species maintain genome stability with such high efficiency, for example through enhanced protection against DNA damage or more effective DNA repair. The project aims to systematically study the extent of cellular transformation and cellular response to carcinogenic stressors, such as ionizing radiation, radiomimetic compounds, oxidative stress, and other DNA-damaging agents. By comparing these responses to those observed in more cancer-prone organisms, we seek to identify the cellular and molecular mechanisms that limit malignant transformation and preserve tissue integrity throughout life in cancer resistant taxa .

We are looking for a postdoctoral researcher with expertise in one of the two complementary approaches described above. The successful candidate may choose to focus primarily on either approach, depending on their background and interests.

For the large-scale comparative studies, we seek a candidate with a strong background in evolutionary biology. Experience in biostatistical analyses, including phylogenetic modelling, comparative genomics and bioinformatic analyses, the integration of large-scale databases, and a good understanding of animal physiology and cancer biology would be an advantage.

For the functional studies in highly resistant species, we are interested in candidates with experience in maintaining primary cell cultures, *in vitro* and *in vivo* functional assays, DNA damage and repair assays. Experience in bioinformatics, transcriptomic, proteomic and

epigenomic profiling, as well as comparative analyses of cellular responses to carcinogenic stressors would be an advantage.

Experience in both approaches would be a significant advantage, as it would allow the candidate to contribute comprehensively to the project's objectives by bridging evolutionary insights with functional validation.

The postdoc will primarily work at LIENSs (Université de La Rochelle, France), but some experimental work may also be carried out in the laboratory of Mauro Modesti at the CRCM (Marseille), a comprehensive research center focused on cancer. More information about the CRCM can be found here : <https://crcm-marseille.fr/en/>

Please also see: <https://crcm-marseille.fr/en/genome-integrity-department/homologous-recombination-nhej-and-genomic-integrity/>

We are looking for a candidate who could ideally start in January 2027. The position is funded for 2 years by the ANR project COVER and the Chaire d'Excellence Nouvelle-Aquitaine to Mathieu Giraudeau.

Applications should be submitted before September 1st 2026 to Mathieu Giraudeau (giraudeau.mathieu@gmail.com), Orsolya Vincze (orsolya.vincze@univ-lr.fr), and Steve Desaiivre (steve.desaiivre@univ-lr.fr). The application must include a CV with a publication list, a research statement, a cover letter, and contact information for at least two references (name, address, email, and phone number).

For informal inquiries, please contact Mathieu Giraudeau and Orsolya Vincze.