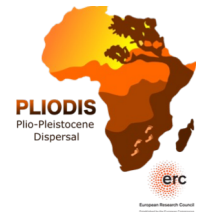




Post-doctoral Fellowship in *Deep Time Hominin Evolutionary Modelling*



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As part of the project *Plio-Pleistocene Hominin Dispersal to southern Africa: Choice or Chance?* ([PLIODIS](#)) we are recruiting a **Post-Doctoral Researcher** whose work will focus on **mathematical/theoretical modelling**. The project is funded by the European Research Council (ERC) and aims to reconstruct the phylogenetic relationship(s) of early hominins against the backdrop of changing tectonic and hydroclimatic conditions.

We are seeking an innovative researcher to challenge traditional phylogenetic models using advanced computational frameworks. The focus of this project will be on the hominin fossil record itself, testing probabilities about evolutionary relationships to tackle "The 1% Problem" in paleoanthropology—the realisation that our current understanding of Plio-Pleistocene hominin evolution relies heavily on fossils restricted to a tiny fraction of the African landmass. We are looking for a candidate with a strong background in **morphology, biological modelling, ecology, and phylogeny** to pioneer research into how deep-time spatial dynamics shaped the early human family tree.

The Scientific Challenge

Existing evolutionary models frequently draw direct lines of relatedness between hominin species found thousands of kilometres apart in eastern and southern Africa. However, these localised fossil records cover a mere 1% of the total African land mass.

Recent genetic breakthroughs in late Pleistocene hominins have illuminated the substantial role of "ghost lineages"—entire unrecorded populations that left genetic footprints but no physical fossils. It is highly probable that similar conditions applied to Plio-Pleistocene taxa, and some of the ancestral taxa may never have fossilised (or be found). This project will test this possibility and explore the influence of source-sink dynamics across deep geological time. Rather than making definitive predictions, the project will map the mathematical probabilities of various evolutionary scenarios, and model how ancient populations migrated, adapted, or vanished across the remaining 99% of the continent.

Key Responsibilities

- **Establish Probabilities for Evolutionary Pathways:** Analyse morphological data from early hominin fossils to build robust phylogenetic frameworks that quantify the probability that eastern and southern early hominins represent sink populations (with the source population remaining unknown/unsampled).
- **Simulate Population Dynamics:** Develop spatial, agent-based, or mathematical models to simulate how environmental shifts triggered source-sink population movements. For this aspect, the candidate will work closely with other PLIODIS team members, particularly those investigating geomorphological and climatic changes.
- **Integrate Theoretical Frameworks:** Bridge the gap between paleoanthropology and macroecological modelling to computationally account for missing fossil data (ghost lineages).
- **Publish & Collaborate:** Present findings at national and international conferences and publish in high-impact evolutionary biology journals.

Required Qualifications

- PhD in Evolutionary Biology, Biological Anthropology, Computational Macroecology, or a related quantitative field.
- Proven expertise in biological modelling (e.g., population genetics simulators, geographic information systems (GIS), or ecological niche modelling).
- Strong foundational knowledge in hominin skeletal morphology and quantitative phylogenetics.
- Proficiency in programming languages common to biological data science (e.g., R, Python, or MATLAB).
- Demonstrated ability to work effectively within large, collaborative teams and communicate complex computational and morphological concepts to researchers from different scientific disciplines.

The appointment is initially for **2 years**, with the possibility of extension up to a total of **3 years**, subject to performance and funding. Remuneration follows the National Salary Scheme, dynamically adjusted according to your age and experience level.

How to Apply

Please submit your CV, a statement of research interests detailing your experience with biological modelling and contact information for two academic references to Gabriele.Macho@vub.be

Applications will be accepted until the job has been filled.