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PhD Studentship

Quantitative Genetics (65% TvL-E)

The research group of **Professor Dr. Ute Krämer** has an opening for a **PhD student** in **experimental quantitative genetics**, including large-scale phenotyping and sequencing-based genotyping. The successful candidate will work independently on existing, or generate novel, segregating populations, based on a **large in-house biodiversity collection** comprising ~850 individuals of the **plant species *Arabidopsis halleri***. Among the closest wild relatives of the common genetic model *A. thaliana*, the ecological model *A. halleri* has strongly differing biological features including extraordinarily large within-species phenotypic variation, extreme traits as well as high genetic diversity (**1-3**). The focus will be on traits such as **tolerance** to toxic levels of **zinc, cadmium** and **lead**, **pH** extremes or **low nutrient concentrations** (P, N, S) in **soil**, and **heavy metal hyperaccumulation** in leaf tissues. Our results will identify effective strategies for future **crop improvement, phytoremediation** and **phytomining**. The successful candidate will be a member of an inter-disciplinary team of researchers in **experimental genetics, computational genetics/genomics, molecular physiology** and **field biology**. Funding is from an **ERC Advanced Grant** awarded for an ambitious and comprehensive approach employing *A. halleri* as a model for addressing **plant local adaptation**. The goal is to understand the **nature and origin of the underlying genetic variants** as well as **genotype-phenotype relationships** in a functional network context.

Knowledge and **practical experience** in the **mapping** of **quantitative trait loci** and in the analysis of the genetic basis preferably of **ionomic** and **abiotic stress-** and **nutrition-related** phenotypic traits, including also **statistics** and the associated **software packages**, are highly advantageous. Applicants should have a keen interest in the **analysis of genome-wide sequence data**, programming using **R/bioconductor, Python** or **Perl**, **data management, automation** (for example DNA extraction, preparation of libraries for sequencing), **experimental evolution** and the **integration of data** from different research approaches (see also https://www.ruhr-uni-bochum.de/mgpp/Downloads/job_ad_2018_05_15_ERC.pdf).

Our **research group** is diverse and international (<http://www.rub.de/mgpp/kraemer.html>). The **laboratory, office** and **plant growth infrastructure** is large and **outstanding**, and we have substantive **gardener** and other **technical and administrative support**. **Ruhr University Bochum (RUB)** is among the **leading research universities** in Germany. As a modern reform-oriented University hosting **ca. 40,000 students**, RUB bundles the entire scope of scientific disciplines on a **single campus**. Bochum is a medium-sized city of around 300,000 inhabitants positioned in the **heart of Central Europe**, within the Rhein-Ruhr metropolitan region of more than 5 million inhabitants. Short- and long-distance **public transport** is seamless, with fast access to neighbouring **mountains and forests** as well as the **cultural programme** in Bochum and nearby cities, for example **Essen** (10 minutes), **Dortmund** (10 minutes), **Düsseldorf** (30 minutes) and **Cologne** (1 h). The University has outstanding **family support** and **day-care facilities**.

Please send your **application**, including a **cover letter** summarizing your expertise and research interests, a **CV**, a list of **publications, degree certificates** and the **summary** of your Master **thesis**, to Prof. Dr. Ute Krämer (Ute.Kraemer@rub.de) by email, with the subject line "**Application PhD Studentship ERC QG-2018**". Projected start date 10/2018 (change possible)

References

1. Hanikenne M, *et al.* (2008) *Nature* **453**: 391-395. DOI: 10.1038/nature06877; 2. Stein RJ, *et al.* (2017) *New Phytol* **213**: 1274-1286. DOI: 10.1111/nph.14219; 3. Hanikenne M, *et al.* (2013) *PLoS Genet* 9(8):e1003707. DOI: 10.1371/journal.pgen.1003707