

PhD Position in Intestinal Microbiology and Neurodevelopment

Division of Microbial Ecology (www.microbial-ecology.net)
Department of Microbiology and Ecosystem Science
University of Vienna

A PhD position is available as part of the project “The premature gut microbiome and the influence on neonatal immunity, brain development and white matter injury - The PreMiBraIn study”. This is a joint project between the Department of Neonatology (Medical University Vienna) and the Department of Microbiology and Ecosystem Science (University of Vienna).

Project Description

Recent advances in neonatal intensive care have dramatically increased the survival rate of extremely premature infants but the number of survivors with severe morbidity and lifelong neurodevelopmental impairment remains high. Perinatal white matter injury is the predominant form of brain injury in premature infants, often leading to adverse outcome. Hypoxic-ischemic events as well as intrauterine and neonatal infection and inflammation have been identified as major risk factors of neonatal brain injury. The fragile gut microbiome of premature infants seems to play an important role in health and disease as distortions of the microbiome occur prior to sepsis and necrotizing enterocolitis. Furthermore, the close link of the gut microbiome to psychiatric and neurological diseases suggests that the microbiome may even influence infant development. Recent studies have underlined the importance of regulatory T cells as well as $\gamma\delta$ T cells in brain injury, which can be directly influenced by the gut microbiome. It is therefore likely that an underdeveloped or distorted gut microbiome affects host immune response and may be a risk factor for neurodevelopmental disabilities in extremely premature infants. Therefore, the overarching aim of the PreMiBraIn study is to elucidate the role of the gut-immune-brain axis on neonatal brain injury and its impact on long-term neurodevelopmental outcome of extremely premature infants. This goal will be achieved by state-of-the-art techniques using 16S rRNA gene sequencing of the gut microbiome, holistic analysis of T cell biology using flow cytometry, whole transcriptome analysis and proteomics as well as neurophysiological measurements (aEEG, NIRS, VEP) and cranial MRI of extremely premature infants. Short- and long-term neurological outcome will be investigated using Bayley Scales of Infant Development, Third Edition (BSID-III) at one and two years corrected age, and Kaufmann-Assessment Battery for Children (K-ABC) at five years of age. The prospects of precision medicine targeting the gut-immune-brain axis in extremely premature infants hold the opportunity to improve the overall outcome of these high-risk patients.

Your qualifications

We are looking for a highly motivated and independent scientist interested in gut microbiota, immunology, and neurodevelopment. Applicants should have demonstrated expertise molecular biology, immunobiology, or neurobiology. Proficiency in spoken and written English and German is mandatory.

Conditions of appointment

We offer up to 3 years of appointment according to the salary scheme of the University of Vienna. The University of Vienna is an equal opportunity employer.

Mode of application

To apply, please **send an email** to David Berry, berry@microbial-ecology.net containing a **single pdf-file** with a **short letter of motivation**, a **detailed CV** (including a brief description of research interests, previous employments, and publication list), and **contact details of at least two references** (letters of recommendation are optional).

Application deadline is continuous until positions have been filled.

Job start is flexible, with an option to start immediately.