**2018 Helmholtz – OCPC – Program**

**for the involvement of postdocs in bilateral collaboration projects**

**PART A**

**Title of the project:**  **Development of a metabolite-based diagnostic algorithm to identify prediabetes and type 2 diabetes**

**Helmholtz Centre and institute: HMGU and AME**

**Project leader: Rui Wang-Sattler**

**Web-address:** https://www.helmholtz-muenchen.de/ame/about-us/team/team/ma/166/Dr.-Wang-Sattler/

**Description of the project** (max. 1 page)**:**

We are looking for a postdoctoral fellow to join the research group of Dr. Rui Wang-Sattler at the Research Unit of Molecular Epidemiology, Helmholtz Zentrum München (HMGU). The group is studying metabolic diseases using statistical, bioinformatical and machine learning approaches based on multi-levels of OMICS data from the population-based human cohort.

Type 2 diabetes (T2D) is a lifelong disease affecting multiple organs and is associated with devastating chronic complications. Prediabetes - defined by impaired fasting glucose and/or impaired glucose tolerance (IGT) - may precede T2D for years. The development of T2D in prediabetic individuals can be prevented or delayed by dietary changes and increased physical activity. The detection of prediabetes is thus essential for the development of personalized strategies to prevent T2D.

Metabolomics is still a relatively new approach for studying metabolic changes connected to disease development and progression, as well as for finding predictive biomarkers to enable early interventions. In this regard, metabolomics has become a very powerful tool as it reflects the effects of pathological factors from vastly different origins in a single measurement. We have identified a set of candidate biomarkers in patients with IGT and newly diagnosed T2D based on population-based German cohort studies using targeted metabolomics analyses.

Despite the urgent need, up to now, there is no metabolomics-based approach to diagnose IGT and T2D. The aim of the project will be to develop a metabolomics based algorithm to detect individuals with prediabetes and T2D.

The successful candidate will be working in an innovative, well-equipped and scientifically stimulating surrounding with further training opportunities. She or he will independently carrying out research projects analysing of large datasets, and training models using available metabolomics data, and developing a diagnostic score using machine learning approaches.

**Description of existing or sought Chinese collaboration partner institute** (max. half page)**:**

Dr. Rui Wang-Sattler and Prof. Dr. Yixue Li, from the CAS-MPG Partner Institute of computational Biology, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences (since 2000), have been collaborating for more than 25 years starting from their university studies and research training at the European Molecular Biology Laboratory (EMBL) in Heidelberg. The collaboration was intensified when Dr. Wang-Sattler joined the Institute of Epidemiology at the Helmholtz Zentrum München. Three joint workshops have been organized and about 12 scientists participated in mutual exchange visits. Results of these mutual exchanges yielded in 14 joint publications. Additionally two Master students from Prof. Li’s institute successfully completed the PhD under the supervision of Dr. Rui Wang-Sattler at the HMGU.

**Required qualification of the post-doc:**

* PhD in degree in bioinformatics, biostatistics or related fields
* Background in machine learning
* Experience in analyzing omics data
* Strong programming skills
* Strong team spirit, excellent communication skills in English in an international environment

**PART B**

**Documents to be provided by the post-doc, necessary for an application to OCPC via a postdoc-station:**

* + Detailed description of the interest in joining the project (motivation letter)
  + Curriculum vitae, copies of degrees
  + List of publications
  + 2 letters of recommendation
  + Proof of command of English language

**PART C**

**Additional requirements to be fulfilled by the post-doc:**

* Max. age of 35 years
* PhD degree not older than 5 years
* Very good command of the English language
* Strong ability to work independently and in a team