



## **Computational biology PhD position (f/m/d): Deciphering molecular mechanisms of acute kidney injury (AKI) to chronic kidney disease (CKD) transition**

**PhD position:** Deciphering molecular mechanisms of acute kidney injury (AKI) to chronic kidney disease (CKD) transition – identification of biomarkers and potential druggable targets

This is a 3-year PhD position, that is part of a European Doctoral Network (DN) program entitled “**Personalized medicine in Chronic Kidney Disease (PICKED)**” involving 10 research centres from France, Austria, Spain, Greece, Germany, Denmark, and Estonia.

The PhD position is hosted at Delta 4 GmbH, Vienna, Austria.

**Delta4** is a Vienna-based TechBio company at the forefront of digital drug discovery and development. Delta4 leverages a proprietary computational analytics platform (Hyper-C), combined with biomedical testing and clinical validation of candidate drugs. Our unique approach integrates iterative big data/in silico and experimental screens, offering the most efficient matching of clinical indications and compound/drug effects. Our R&D process allows a fast track to clinical stage testing; our methodological core is tailored toward precision to increase the probability of success.

**Our focus is the repositioning of existing drugs for novel indications.**

With generating IP for such drug-disease combinations we establish a pipeline of clinically and economically attractive indications. Results of our lead program on the rare chronic kidney disease focal segmental glomerulosclerosis have been published recently (Transl Res. 2023 259:28-34; Kidney Int Rep. 2023 9(2):478-481).

### **The PICKED Consortium / Background**

Kidney diseases both chronic (CKD) and acute (AKI) should be considered as a priority, but also a challenge, for Public Health Policies as they concern >850 million persons in the world. The major urgent needs that have been identified over the last years include i) early detection in “at-risk” patients of CKD, ii) detection and prediction of CKD progression/complications, and iii) personalized treatment avoiding over- or unnecessary treatment, which collectively contributes to the adoption of Personalized Medicine (PM) in CKD.

To address such ambitious challenges, it is essential to train professionals to identify these issues. Constituting a network of 10 PhD students, 6 public laboratories, 4 research and development companies, and several associated partners, the PICKED consortium will work on different aspects of PM aiming to significantly reduce the burden of CKD including: early detection of CKD and its progression; personalized drug and dialysis treatment and the social-economic impact of PM in CKD.

## Objectives of the PhD

The overall objective of this PhD-project in PICKED is to consolidate AKI and CKD omics profiles and generate network-based molecular models for the two disease entities. Network alignment methods shall be used to identify overlapping/interacting molecular mechanisms at the AKI-to-CKD transition. Key molecules of the identified molecular processes will be evaluated regarding their potential to serve as AKI-to-CKD biomarkers or drug targets taking into account information on tissue-specific expression, subcellular location, evidence in scientific literature, and mechanistic role in the context of dysregulated molecular processes. The prognostic potential of selected biomarkers will be evaluated in collaboration with the research group from Inserm, Toulouse.

## Methods

The PhD student will mostly work on data analysis and statistical analysis using R or Python. There will be some interaction with the wet laboratory (mass spectrometry, ELISAs).

## Expected Results

- Generation of the molecular landscape of the AKI-to-CKD transition
- Identification of biomarker candidates linked to relevant AKI-to-CKD mechanisms
- Identification of novel drug targets being linked to AKI-to-CKD pathobiology

## Additional Information on the PhD

### Supervision

- You will be enrolled in a PhD program at the Medical University of Vienna or Innsbruck
- You will be supervised by Dr Paul Perco, Dr Klaus Kratochwill, and Dr Joost Schanstra

### Planned secondments

The position includes 2 mandatory stays in partner laboratories to complete training:

- 1) Mosaiques Diagnostics (2 months), training for CE-MS peptidomics analysis.
- 2) University of Toulouse (INSERM) (2 months), training in molecular mechanisms of the AKI-to-CKD transition.

### Required skills and education:

- You hold a master's degree in bioinformatics/computational biology.
- Fluent in a scripting language (R or Python) for data wrangling, explorative analysis and data visualization
- A solid understanding of cellular and molecular biology
- Experience with SQL, JSON, XML
- Statistical analysis of large biological datasets (e.g. Omics data)
- Experience with extracting data from key biological databases (NCBI, Ensembl, UniProt, GEO, ArrayExpress)
- Knowledge of key biological ontologies/vocabularies (Medical Subject Headings, Gene Ontology, Anatomical Therapeutic Chemical Classification, ...)
- Knowledge of graph theory and key graph measures
- Experience with biological network modelling and visualization (e.g. Cytoscape, igraph, ...)

### Marie Skłodowska-Curie ITN rules

- You must **NOT** have a doctoral degree at the date of your recruitment.
- You must comply with the **mobility rule**: not have resided or carried out your main activity (work, studies, etc.) in Austria for more than 12 months in the 36 months immediately before the recruitment date.

### Benefits

- You will benefit from all Marie Skłodowska-Curie Action scheme advantages.
- You will participate in web seminars (in English) of the collaborative network of the laboratory.
- You will attend yearly meetings organised by the PICKED consortium, as well as international and national congresses.
- You will work at a modern office in the beautiful 8<sup>th</sup> district of Vienna.
- Salary range: 3.200 - 4.000 EUR brutto / month

### How to apply

Please submit your candidacy via [JOIN](#) (or email to [office@delta4.ai](mailto:office@delta4.ai)) including the following information:

- your CV and motivation letter
- your MSc transcript (diploma, courses, and grades)
- two reference letters or contact details from your previous scientific supervisors