

PhD position in urinary cytokines for the early detection and outcome assessment of kidney injury

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 centers from France, Austria, Spain, Greece, Germany, Denmark and Estonia.

The PhD position is hosted in the Nephrology and Hypertension laboratory (<https://www.fjd.es/iis-fjd/en/areas-research-groups/kidney-metabolic-cardiovascular-diseases>) at IIS-Fundacion Jimenez Diaz UAM in Madrid, Spain within the Nephrology and Hypertension Clinical Department, Fundacion Jimenez Diaz University Hospital.

The PICKED Consortium / Background

Kidney diseases both chronic (CKD) and acute (AKI) are interconnected syndromes that should be considered as a priority, but also a challenge, for Public Health Policies as they concern >850 million persons in the world. Both AKI and CKD cause accelerated biological aging and increase the risk of premature death. Indeed, they are among the most rapidly growing global causes of death, expected to become the fifth global cause of death by 2040. In addition to increasing the risk of cardiovascular disease, kidney disease also increases the risk of death from cancer and infectious disease, among others. Contrary to common believe, kidney replacement therapy by dialysis or transplantation does not solve the issue of premature aging: life expectancy of a 20-year-old woman on dialysis is 44 years shorter than her peers and dialysis and transplantation were the comorbidities that most increased the risk of COVID-19 death. Thus, a complete change of approach to kidney diseases is needed, evolving from the 20th century focus on replacement of kidney function and the early 21st century focus on treating earlier CKD stages to defining pre-CKD and the early detection and treatment of persons “at-risk” of CKD.

PICKED approaches 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, that collectively contribute to the adoption of Personalized Medicine (PM) in CKD. To address such ambitious challenges, it is essential to embark and 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.

The PICKED partner hosting the PhD student

In the Nephrology and Hypertension lab and clinical department at IIS Fundacion Jimenez Diaz and Fundacion Jimenez Diaz University Hospital we are interested in the early detection and treatment of kidney disease and its complications with a focus on inflammatory mediators and their adverse impact on the resilience of tissues to injury through the downregulation of tissue protective genes, such as KL, encoding the antiaging protein Klotho. The present project will expand on the clinical translation of recent publications (Valiño-Rivas L. J Cell Physiol. 2024. Favero C. Biochem Pharmacol. 2024. Mora-Fernández C. Biomed Pharmacother. 2022. Cuarental L. Kidney Int. 2023. Valiño-Rivas L. Kidney Int. 2022. Martin-Sanchez D. J Am Soc Nephrol. 2022. Valiño-Rivas L. Nephrol Dial Transplant. 2020).

Objectives of the PhD

The overall objective of this PhD-project in PICKED is to identify and validate signatures of biomarkers in body fluids that identify early stages of kidney disease and or predict the development of kidney disease, so as they will allow to develop the concept of pre/kidney disease what will allow early intervention in future clinical trials so as CKD can be prevented and the need for kidney replacement therapy (dialysis, transplantation) is decreased.

Methods

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

Expected Results

- Advance in the biomarker implementation pipeline, especially for urinary cytokines (e.g., TWEAK, Fn14 and GDF15) that predict kidney disease. More specifically: 1) Analytical validated TWEAK, Fn14 and GDF15 assays for use in human urine; 2) Clinical validation of such assays for 2.1 Early detection and prognosis of AKI, 2.2 Severity assessment and prognosis in CKD and 2.3 Prediction of response to therapy in CKD.

Additional information on the PhD

Supervision

- You will be enrolled in a PhD programme at the Universidad Autonoma de Madrid.
- You will be supervised by Professor Alberto Ortiz, MD, PhD (<https://scholar.google.com/citations?user=1IKOVx0AAAAJ&hl=en>), a nephrologist and Dr Maria Dolores Sanchez-Niño, PhD (https://scholar.google.com/citations?user=C_xvVdEAAAAJ&hl=en), a biologist

Planned secondments

The position includes 3 mandatory stays in partner laboratories to complete training:

- 1) INSERM, Julie Klein (2 months), analysis of urinary TWEAK, Fn14 and GDF15 abundance in cardiac surgery induced AKI and progression to CKD
- 2) SDCC, Peter Rossing (1.5 months), urinary TWEAK, Fn14 and GDF15 abundance in CKD and CKD progression
- 3) RDN, Flore Durantou (1.5 months), multiparametric statistical analysis combining clinical data and urinary TWEAK, Fn14 and GDF15 in AKIOMIQUE, PRIORITY and PROFIL cohorts.

Required skills and education

- You hold a master's degree bioinformatics/statistics.
- Excellent level in programming in R, excellent level in statistics, experience in Bash scripting, experience in SQL, Python.
- You have an interest in health issues.
- You speak and write fluent English.
- You are ambitious, well organized and have excellent communication skills.
- You have the ability to work effectively and collaboratively.

- You are an enthusiastic and motivated person, ready to participate in personal training, international travel and public awareness activities.
- You have demonstrated your commitment to high quality research.

Marie Skłodowska-Curie ITN rules

- You must **not** have a doctoral degree at the date of their recruitment
- You must comply with the **mobility rule**: not have resided or carried out your main activity (work, studies, etc.) in Spain 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 congress.

How to apply

You should send your candidacy by email to mariadolores.sanchez@uam.es including the following information:

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