

 <p>UniSR Università Vita-Salute San Raffaele</p>	<p>APPLICATION TO ACT AS SUPERVISOR AND RESEARCH PROJECT PROPOSAL</p>	<p>MO 20-5 ed. 01 del 21/02/2025 PO 20 Page 4 of 10</p>
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PROJECT

Supervisor: Prof.ssa Chiara Livia Saveria Lanzani

Title: **Evaluation of metabolic, biohumoral, body composition and quality of life effects of low-protein diet (LPD) in chronic kidney disease (CKD).**

Curriculum: Clinical and Experimental Medicine

Link to the personal page of the University or relevant hospital site website: <https://www.unisr.it/docenti/l/lanzani-chiara-livia-maria>

Description of the Project (max 3,000 characters including spaces)

Background/gap of knowledge

In Italy, the prevalence of Chronic Kidney Disease (CKD) in the adult population is 6.3%. CKD imposes substantial individual and societal costs, necessitating early intervention to prevent progression to dialysis and reduce associated morbidity and mortality. Therefore, it is crucial to adopt conservative management strategies for CKD patients. In this way, a low protein diet (LPD) represents a cornerstone of conservative management in most patients. The objective of LPD is to ensure optimal nutritional status, prevent or correct complications related to CKD, and delay dialysis initiation. Recently, a consensus document has been published, emphasizing the importance of LPD in improving and maintaining the clinical condition of CKD patients, and establishing clear guidelines for proper dietary management. However, some concerns remain about the safety of this therapeutical approach in specific cohorts of CKD patients such as diabetes mellitus (DM), autosomal dominant polycystic kidney disease (ADPKD), and protein-energy wasting patients (PEW).

Rationale and hypothesis

The rationale for the LPD is based on reducing the nitrogen load and consequent glomerular hyperfiltration while maintaining adequate caloric intake by increasing the proportion of carbohydrates and lipids. However, it is not known whether this approach is risk-free in patients with impaired glucose metabolism as some authors have pointed out that the metabolic benefits in terms of reduced azotemia values, improved acidosis status, and reduced oxidative stress outweigh any potential risks.



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Objectives and specific aims

The main objective is to evaluate the metabolomic substrate determined by a LPD (0.6 g/kg/day) and its efficacy on the progression of CKD as a function of the metabolomic substrate. The secondary objective is to estimate glycemic tolerability, and potential side effects of the LPD in these cohorts of patients. The study will be conducted as a prospective observational case-control study, involving CKD. Participants will undergo baseline assessments and be followed for 24 months, during which clinical (Cardiovascular events, serum urea, phosphate and bicarbonate), anthropometric variables (BMI, body weight), renal variables (GFR, protein and urea excretion), and body composition parameters (skeletal muscle mass, free fat mass) and the urinary metabolomic pattern will be monitored to evaluate the variation of these variables induced by the LPD. The collected data will be analyzed by appropriate statistical methods to assess any differences in the changes in the assessed parameters within the three individual groups and between these patient cohorts and the other CKD patients already treated with a hypoproteic diet.

Expected outcomes

We expect that this study will confirm how dietary nutritional therapy and the development of a personalized protein-controlled diet constitute an essential element of conservative nephrology therapy in all CKD patients.

Skills that the student should acquire (max. 600 characters including spaces):

The PhD student will develop scientific knowledge in dietary nutritional therapy with a particular focus on the nephrology field. More specifically, the acquisition of proficient knowledge in the assessment of the nutritional status and the body state composition, drafting personalized diets with adequate protein-caloric content, and interpretation of laboratory tests referring to nutritional status in the context of CKD.

Moreover, the acquisition of adequate skills to 1) figure out and design their investigation; 2) submit a grant application; and 3) lead an independent research group.



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