

The MAP-KD study (MetAbolic, Immunological and Pathological Factors in Kidney Disease) aimed to investigate how the levels of a variety of proteins and other factors differ in the blood and urine of those who have kidney disease, compared to those who do not. Identification of these differences is an important step in designing new therapeutic interventions. This study particularly focussed on cardiovascular risk factors, muscle deterioration, and inflammation. The longer term aim is to identify and develop lifestyle interventions such as exercise to improve the health of people living with kidney disease. 37 people volunteered to participate in the study : 8 kidney transplant recipients, 14 people with early-stage chronic kidney disease (CKD) and 15 people who do not have kidney disease (controls). We collected blood and urine samples from all the participants and also did some tests of physical function and fitness. Lab analysis gave a wealth of information about differences in the blood cells and factors of people with kidney disease :

1. People with kidney disease have higher levels of inflammatory cytokines in their blood, which have been shown to be partially responsible for the muscle weakness noted in this population ([link to manuscript below \(1\)](#)).
2. People with kidney disease have higher levels of a compound called Chemerin in their blood and urine, which is related to high levels of inflammation and reduced muscle mass ([manuscript currently in preparation](#))
3. People with a kidney transplant can undertake high-intensity interval training (HIIT) and moderate-intensity continuous training (MICT) without negative effects on the immune cells in the blood. This was previously a concern to those who had received a kidney transplant and is the first research of its kind ([link to manuscript below \(2\)](#)).
4. Factors extracted from the blood of people with kidney disease can exert similar effects on muscle cells grown in the lab as we see in the living human being. This novel work will allow us to identify and target ways to prevent muscle loss and weakness in the future ([link to manuscript below \(3\)](#))
5. We have identified a kidney disease-specific panel of blood proteins which may provide a quick and simple way to diagnose clinically significant loss of muscle mass or function. This work is being taken forward in our ongoing research studies.

Links to Publications

1. [Inflammation and physical dysfunction: responses to moderate intensity exercise in chronic kidney disease | Nephrology Dialysis Transplantation | Oxford Academic \(oup.com\)](#)
2. [Effect of high intensity interval training and moderate intensity continuous training on lymphoid, myeloid and inflammatory cells in kidney transplant recipients - PubMed \(nih.gov\)](#)
3. [Primary skeletal muscle cells from chronic kidney disease patients retain hallmarks of cachexia in vitro - Baker - 2022 - Journal of Cachexia, Sarcopenia and Muscle - Wiley Online Library](#)