

## **Basigin as a major regulator of podocyte function. The impact on the functioning of the glomerular filtration barrier in diabetes.**

Podocytes are highly specialized cells that cover the glomerular capillaries and play a crucial role in forming the glomerular filtration barrier. They constantly encounter transmural hydrostatic pressure, which facilitates glomerular filtration. Podocytes contribute to the specific size and charge characteristics of the filtration barrier, and damage to podocytes can lead to a retraction of their foot processes, resulting in proteinuria.

Basigin (CD147) is a transmembrane glycoprotein involved in various physiological and pathological activities by interacting with multiple partners, including cyclophilins, monocarboxylate transporters, Caveolin-1, and integrins. While basigin is best known for activating extracellular matrix metalloproteinases (also known as EMMPRIN), it also plays a role as a mediator of inflammatory and immune responses. Moreover, increased basigin expression has been associated with the pathogenesis of several diseases, including diabetes. However, its role in podocytes has not been extensively studied.

Thus, the primary objective of this project is to investigate the role of basigin in the development of pathological changes in the renal filtration barrier observed in diabetes, which can ultimately lead to diabetic nephropathy and kidney failure.

The research project will be conducted in two parts: *in vivo* and *in vitro*. The *in vitro* experiments will focus on exploring the cellular and molecular mechanisms of basigin interactions with its multiple partners in podocytes, assessing the permeability of albumin across the podocyte monolayer, and examining glomerular permeability to albumin. A significant portion of the project will involve identifying new biomarkers of early diabetic nephropathy and podocyte damage in urine samples from diabetic rats. The successful execution of this project has the potential to enhance our understanding of the molecular mechanisms behind proteinuria and aid in the development of innovative diagnostic markers for early detection of diabetic nephropathy and podocyte damage in diabetes.