Idiopathic nephrotic syndrome (INS) is caused by an unknown substance that is released by the immune system and travels around the body in the blood. This is known as the circulating factor. It can damage a cell known as the podocyte in the kidney. The podocyte is an octopus-like cells that wraps its tentacles around the blood vessels of the glomerulus of the kidney.

Professors Moin Saleem and Gavin Welsh at Bristol Renal, University of Bristol, along with their postdoc Dr Carl May have recently published a paper shedding light on how the circulating factor might be working.

Cells have receptors on their surface. This helps them get information about their environment and adapt their behaviour. Substances in the blood can act like a key and unlock receptors on the surface of cells. The team at Bristol thought that the unknown circulating factor might be working on a receptor called PAR-1. The circulating factor can unlock PAR-1, damage the podocyte and cause proteinuria and nephrotic syndrome.

They made changes to the PAR-1 receptor in podocytes. These changes made it so that the PAR-1 receptor was always unlocked. This causes damage to the podocyte in the same way the circulating factor does. This caused damage that looked very similar to the damage seen in human FSGS. The podocyte communicates this damage via special signalling pathways. The team saw the same communication in podocytes in a dish in the lab and in tissue biopsies from INS patients.

This work identifies the PAR-1 receptor as being important in the damage the podocyte suffers in response to the circulating factor. Work will now focus on finding out how to jam the PAR-1 lock on the podocytes to stop the damage.

**“It’s been great to work for Gav and Moin on this project. This is a brilliant result that could help us protect the kidney against the damage that is wrought by the circulating factor. I am at the point of branching out and becoming an independent scientist and want to make blocking this receptor in the podocyte my research focus” Dr Carl May**