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Mesenchymal stem cell therapy improves the expression and functionality of tubular protein endocytic receptors in diabetic nephropathy

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Megalin and cubilin are membrane endocytic receptors that interact for endocytosis of a vast variety of filtered plasma proteins in kidney proximal tubule cells. One characteristic of diabetic nephropathy is the increase of albumin filtration and the inhibition of megalin and cubilin mediated albumin endocytosis, leading to increased albuminuria. The objective of our work was to study the influence of mesenchymal stem cells (MSC) therapy on tubular protein transporters in kidney of type 1 and type 2 diabetic animals. We studied by Western Blot the expression of megalin (tissue) and cubilin (tissue and urine) and the functionality of megalin by the quantification of vitamin D-binding protein (BDP, urine) in control animals, type 1 and 2 diabetic animals (C57BL6+STZ and db/db C57BKS mouse, respectively) and treated with MSC ($0.5x10^6$ cells/animal) type 1 and 2 diabetic animals. The expression of megalin and cubilin decreases in T1 diabetic animals and after 2 weeks of MSC administration the expression increases. In T2 diabetic animals, only megalin decreases significantly its expression and treatment does not increase levels. Proteinuria and BDP concentration are increased in both diabetic models, but only BDP levels decrease in T2 animals after MSC administration. Finally, levels of cubilin in urinary samples are increased in both diabetic models and only decrease significantly in T1 diabetic animals that received the cell therapy. MSC administration in both experimental diabetic models improves the action of tubular protein transporters, however its potential role as a therapy and the physiopathologic mechanisms involved are currently under study.

Biography

Giraud-Billoud Maximiliano has completed his both Ph.D. in Medicine and Biology (Physiology) from National University of Cuyo, Argentina and is working now in a Postdoctoral project from FONDECyT-CONICyT, Chile. He has published 11 papers in reputed journals.

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