

Expression of Slit Diaphragm Genes of Chicken Embryo Mesonephros

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Abstract : Purpose: Applications of nanotechnology nowadays extended to include a wide range of scientific areas such electron microscopy and gene expression. The aim of the current study was to investigate the developmental expression pattern of genes involved in human glomerulo-nephropathies associated with massive proteinuria and podocyte differentiation using the chicken mesonephros as a model system. Method: We performed in situ hybridization using chicken specific mRNA probes for genes expressed in the early nephron and slit diaphragm genes. The probes used were cNeph1, cNeph2, cSim1, cLmx1b, and cAtoh8. Chicken embryos from Hamburger Hamilton developmental stage HH19 (E3) to HH 34 (E9) were used for the in situ hybridization (ISH). ISH was performed on whole mount embryos which were sectioned by vibratome. Results: Our result show that Neph1, Neph2, Sim1. Lmx1b and Atoh8 genes are dynamically expressed during nephron morphogenesis and Neph1 and Atoh8 are also specifically expressed in the podocytes during late stages of differentiation. Conclusion: We conclude from our results that the genes implicated in congenital and acquired glomerulo-nephropathies like Neph1 and Neph2 are dynamically expressed during mesonephros development pointing towards a role in the formation of the filtration barrier and the differentiation of the mesonephric podocytes. Thus the avian mesonephros could serve as a model to study human kidney diseases.

Keywords : mesonephros, chicken embryo, gene expression, immunohistochemistry

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