

Model for Study of Glomerular Disorders: Conditionally-Immortalized Mouse Podocyte Cell Line with Tet-on-Regulated Gene Expression

Published date: Feb. 1, 2012

Technology description

Summary

Podocytes, cells of the visceral epithelium in the kidneys, are a key component of the glomerular filtration barrier. As such, they play a vital role in glomerular disorders, which are a major cause of chronic kidney disease. Examples of these disorders include focal segmental glomerulosclerosis, membranous glomerulonephritis, minimal change disease, and diabetic nephropathy.

The inventors have developed a conditionally-immortalized mouse podocyte cell line with tightly controlled conditional gene expression. The cell line has been conditionally immortalized through the introduction of the H-2Kb-tsA58 transgene, which is a temperature-sensitive mutant of the SV40T antigen. Inducible gene expression is tightly controlled through two introduced transgenes, podocin-rtTA and CMV-tTS, that produce a "Tet-on" system wherein gene expression is induced by tetracycline or doxycycline. The combination of the two transgenes for Tet-on gene expression has resulted in much tighter regulation and lower background expression compared to cells carrying the podocin-rtTA transgene alone. Glomerular disorders are a major cause of chronic kidney disease. Approximately 20 to 35 percent of patients requiring renal replacement therapy have a glomerular disorder.

Application area

Model system for study of glomerular disorders

Model system for podocyte cell biology

Institution

[NIH - National Institutes of Health](#)

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