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Design and Analysis of CCN Gene Activity Using CCN Knockout Mice Containing LacZ Reporters

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Abstract

Two developments have greatly facilitated the construction of CCN mutant mouse strains. The first is the availability of modified embryonic stem (ES) cells and mice developed through several large-scale government-sponsored research programs. The second is the advent of CRISPR/Cas9 technology. In this chapter, we describe the available mouse strains generated by gene targeting techniques and the CCN targeting vectors and genetically modified ES cells that are available for the generation of CCN mutant mice. Many of these mutant mouse lines and ES cells carry a β-galactosidase reporter that can be used to track CCN expression, facilitating phenotypic analysis and revealing new sites of CCN action. Therefore, we also describe a method for β-galactosidase staining.

Keywords: Cre recombinase; Embryonic stem (ES) cells; Gene targeting; Homologous recombination; International Mouse Phenotyping Consortium (IMPC); LoxP; β-galactosidase.