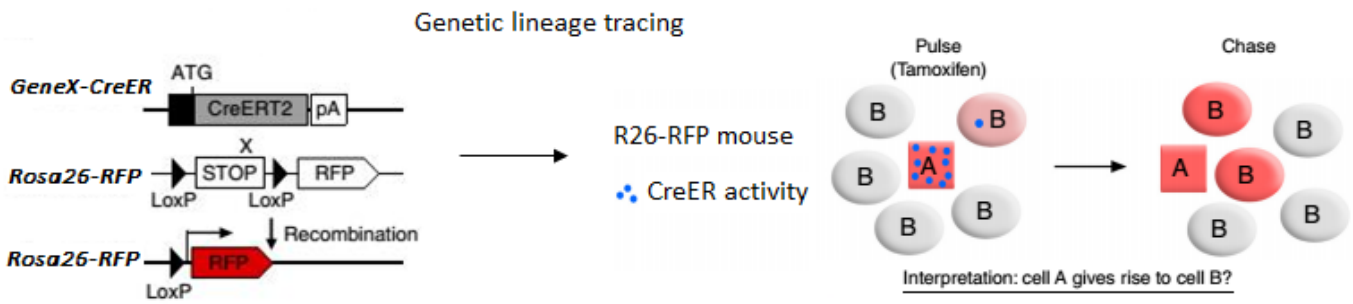
Lineage tracing

Genetic lineage tracing is a commonly used and the most effective method for studying the origin and fate of specific cell types. The construction of genetically engineered mouse model is the most important step in the lineage tracing technique.

Commonly used lineage tracers are Cre mice driven by specific promoters and Rosa26-LSL-Reporter mice, which are used together. Specifically expressed Cre recombinases will cleave the transcription termination sequence between loxP sites in Rosa26-LSL-Reporter mice, thereby activating the persistent expression of reporter genes. As this modification is carried out at the DNA level, the modification can be transmitted to progeny cells. Therefore, specific types of cells can be permanently labeled. By observing the fluorescence signals on the labels, specific cells and the proliferation, differentiation and migration of all of their progeny can be tracked. This is a powerful method for studying cell fate and lineage.

See the following figure:



Application cases

Enhancing the precision of genetic lineage tracing using dual recombinases

Shanghai Model Organisms Center, Inc. provides customized gene knock-in mouse models with high accuracy and efficiency. Click here to find out more.

Or directly contact our technical specialist for more information on what we have to offer.

Relevant articles on lineage tracing

- **Genetic Fate Mapping Defines the Vascular Potential of Endocardial Cells in the Adult Heart** Circ Res（2018）
- **Enhancing the precision of genetic lineage tracing using dual recombinases** Nat Med（2017）
- **Fibroblasts in an endocardial fibroelastosis disease model mainly originate from mesenchymal derivatives of epicardium** Cell Res（2017）
- **Identification of a hybrid myocardial zone in the mammalian heart after birth.** Nat Commun（2017）
- **Preexisting endothelial cells mediate cardiac neovascularization after injury** J Clin Invest（2017）
- **Mfsd2a+ hepatocytes repopulate the liver during injury and regeneration** Nat Commun（2016）
- **Endocardium Minimally Contributes to Coronary Endothelium in the Embryonic Ventricular Free Walls** Circ Res（2016）
- **Genetic lineage tracing identifies endocardial origin of liver vasculature** Nat Genet（2016）
- **Endocardium Contributes to Cardiac Fat** Circ Res（2016）
- **Genetic lineage tracing identifies in situ Kit-expressing cardiomyocytes** Cell Res（2016）
- **c-kit(+) cells adopt vascular endothelial but not epithelial cell fates during lung maintenance and repair** Nat Med（2015）