INFRAFRONTIER via canSERV

Generation of precision cancer mouse models using CRISPR-Cas9

What service do we offer?

Generation of precision cancer mouse models using CRISPR-Cas9

Cancer mouse models are generated using CRISPR-Cas9 technology that enables the modification of genome to produce precise and unique GM mouse models. This service is for academic customers only. The service includes the design of guides and DNA template, prediction of off-target sites, preparation, and electroporation of the targeting complex into zygotes to generate F0 founder mutant animals (C57BL/6N or C57BL/6J genetic background preferred). Selected F0 animals will be bred to germline to produce F1 genome edited animals. Possible allele types that can be generated are indels, exon deletions (< 10kb) and point mutations and insertions. Newly developed mouse models will be made available to selected applicants within an average of 12 months following provision of all required information to start the mouse production. Novel models are archived as cryopreserved material and distributed as part of the EMMA archive.

APPLY NOW!!

Included in the service:

This is included in the service provision by default.

- **Generation of novel knock-out or knock-in mouse models including**
  - design of the guides (crRNA+tracrRNA),
  - design of ssODN or lsODN DNA templates,
  - prediction of off-targets,
  - electroporation into either C57BL/6N or C57BL/6J zygotes
  - genotyping of founders by sequencing of the target site
  - breeding of founders (2-4 per line)
  - genotyping of F1 mice by sequencing of the target
  - organising the shipment of mice (two founder lines for each mutation), costs covered by the customer.

- **Archiving (20 straws of sperm of F2 generation) and distribution as EMMA service**.

Additional support:

This can be provided on demand if there is canSERV funding available, or on a fee-for-service or collaborative basis and will require further negotiations with the applicant.

- Breeding of animals in a specific pathogen free environment (from summer 2024 onwards).
- Breeding of F1 animals (2-4) and genotyping of F2 generation.
- Logistics support and advice to ship generated/rederived mice to the receiving institute.
- Dedicated shippers for transportation of frozen materials and recommendations on specialised courier services,
- Other methods for generation of GM mouse lines available are ES cell targeting, or transgenic DNA injections. The Core may assist in designing genomic editions.
- Recovery of EMMA-archived/customer-provided mouse lines from frozen materials.
- Sequencing of the off-target sites on the same chromosome

Who provides this service?

Transgenic and Tissue Phenotyping Core Facility, Biocenter Oulu, University of Oulu (Finland)

UNIVERSITY OF OULU

Biocenter Oulu research infrastructure operates at the University of Oulu, Finland, and serves academic and non-academic customers in research and R&D projects. Our open access services are available through Ilab reservation system to all customers. Transgenic and Tissue Phenotyping (TTP) Core Facility provides a wide range of services for planning, generation, archiving, recovery, and re-derivation of gene-modified (GM) mouse lines as well as for tissue phenotyping: histology, digital pathology, and image analysis. TTP Core Facility serves as the Finnish European Mouse Mutant Archive (EMMA)

node in INFRAFRONTIER ESFRI infrastructure (www.infrafrontier.eu/) holding about 380 publicly available mouse lines.

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References:

During 2021-2023 we have generated 18 knock-in lines using CRISPR technology, of which research is currently ongoing.

- Hiltunen AE, Kangas SM, Ohlmeier S, Pietilä I, Hiltunen J, Tanila H, McKerlie C, Govindan S, Tuominen H, Kaarteenaho R, Hallman M, Uusimaa J, Hinttala R. **Variant in NHLRC2 leads to increased hnRNP C2 in developing neurons and the hippocampus of a mouse model of FINCA disease**. Mol Med. 2020 Dec 9;26(1):123. doi: 10.1186/s10020-020-00245-4. PMID: 33297935; PMCID: PMC7724728.

- Kapiainen E, Elamaa H, Miinalainen I, Izzi V, Eklund L. **Cooperation of Angiopoietin-2 and Angiopoietin-4 in Schlemm's Canal Maintenance**. Invest Ophthalmol Vis Sci. 2022 Oct 3;63(11):1. doi: 10.1167/iovs.63.11.1. PMID: 36190459; PMCID: PMC9547357.