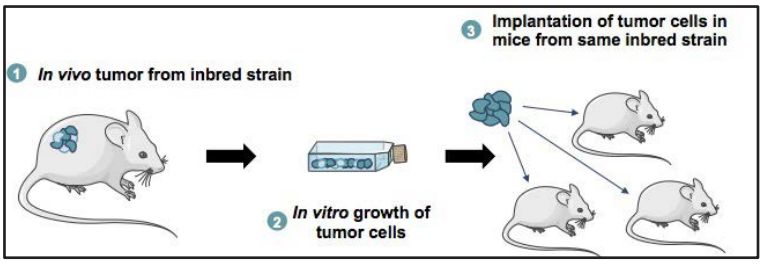
Syngeneic Mouse Models

Cancer research, especially anticancer drug discovery, relies on animal models that have been, and are still being, optimized. Mouse and rat models are broadly used to recapitulate tumor development, microenvironment, and for some the accompanying immune response.

Today, scientists can access several preclinical models in cancer research such as cell line transplantation models, patient-derived xenografts, genetically engineered mouse models, human immune system mouse models, and humanized immune-checkpoint mouse models.

Syngeneic models are transplantation models obtained by injecting a recipient of a specific genetic background with cell lines previously established through isolation of tumor cells from a mouse of the same genetic background.



The advantage of syngeneic models is that the transplanted cells, the tumor microenvironment, and the host are from the same strain, making this model particularly relevant when studying the process of metastasis.

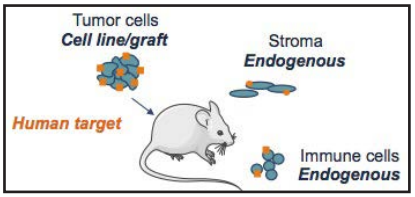
Different cell lines have been developed in syngeneic models, mostly in the C57BL/6 and Balb/c background. These cells have different features that must be taken into account when choosing your syngeneic model of interest, including:

- Tumor origin (colon, breast, lung, etc.)
- Genetic background (Balb/c mice are known to favor stronger humoral responses than C57BL/6)
- Immunogenicity (for example, B16/F10 cells are less immunogenic and thus more resistant to ICP blockade treatment)

A syngeneic model can be optimized for a specific application and study by carefully choosing the cell line used.

Genetically optimizing syngeneic models

Classical syngeneic models show only murine interactors. These models can be optimized for a specific application by genetically "humanizing" a target of interest in the recipient mouse or tumor cells



For example, we have generated a catalog of mice harboring human immune checkpoint targets such as PD-1, CTLA-4 and VISTA. We also generated MC38 cells expressing human PD-L1 and not mouse Pd-l1. In addition to this catalog, we have optimized our gene-editing platforms to provide on-demand relevant models for immuno-oncology studies.

More info on syngeneic tumor models:

- Webinar on how to "Optimize your syngeneic models with genetically engineered cell lines"
- A brief review entitled "Toward a Better Effective Preclinical Model in Immuno-Oncology"