

# 45. Engineered Fibroblasts as Cell therapy

(Johns Hopkins University)



## ► Asset Overview

<b>Product Type</b>	Cell Therapy
<b>Disease Area</b>	Oncology
<b>Indication</b>	Cancer
<b>Current Stage</b>	Lead Optimization
<b>Target</b>	Extracellular matrix where the primary tumor was to inhibit the diffusion of soluble tumor-promoting factors secreted by residual cancer cells
<b>MoA</b>	Genetically engineered fibroblasts that are directed to hinder CAF induction into cancer cells to slow cancer recurrence when implanted into cancer-affected tissue.
<b>Brief Description</b>	<ul style="list-style-type: none"><li>• It is known cancer cells secrete cytokines inducing normal fibroblasts (NFs) to become carcinoma-associated fibroblasts (CAFs). However, it is not clear how the CAF-promoting cytokines can effectively navigate the dense ECM, a diffusion barrier, in the tumor microenvironment to reach NFs during the early stages of cancer development.</li><li>• Inventors have developed genetically engineered fibroblasts, called “Stabilization against Remodeling” (STAR), as a novel advanced cell therapy to be applied following surgery, radiotherapy or chemotherapy.</li><li>• Specifically, STAR fibroblasts deliver cross-linking molecules to stabilize extracellular matrix where the primary tumor was to inhibit the diffusion of soluble tumor-promoting factors secreted by residual cancer cells. As demonstrated by in-vitro studies, extracellular matrix stabilization are effective to and prevent carcinoma and stop tumor progression.</li></ul>
<b>Intellectual Property</b>	WO2021146566A1
<b>Publication</b>	Force-dependent extracellular matrix remodeling by early-stage cancer cells alters diffusion and induces carcinoma-associated fibroblasts. Biomaterials, (2020)
<b>Inventors</b>	Yun Chen, Wei-Hung JUNG, Michael J. Betenbaugh, Franck Housseau

## ► Highlights

- Entirely new classification of cancer therapeutic—STAR will be the first fibroblast-based cancer treatment
- Effective cell therapy for variety of cancers, including breast, colorectal, and squamous cell carcinoma
- Cancerous tissues can be directly targeted using STAR cell therapy
- Fibroblasts, unlike stem cells, can be easily harvested from biological waste, cultured, and modified

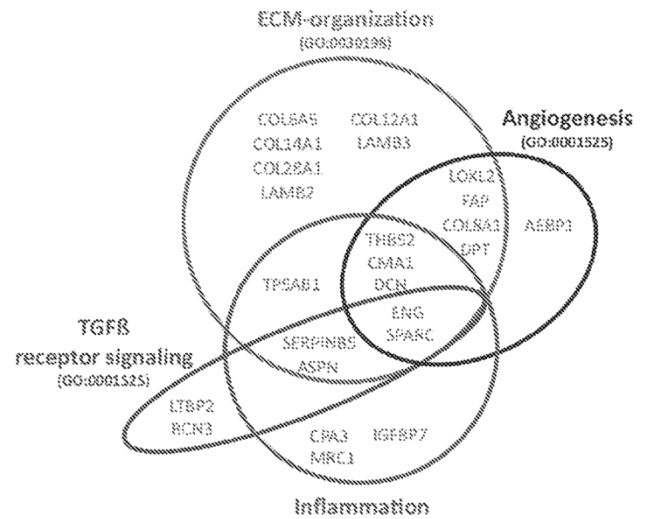
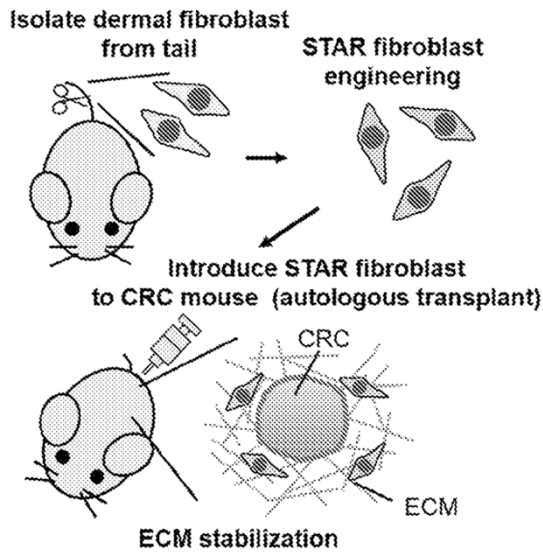
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## Key Data

### The workflow of engineering STAR fibroblasts



### ECM crosslinking reduces fibril alignment and CAF induction

