



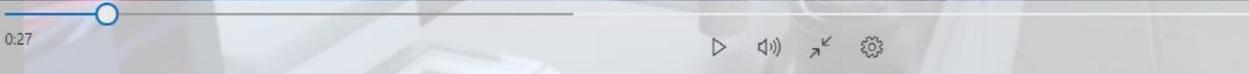
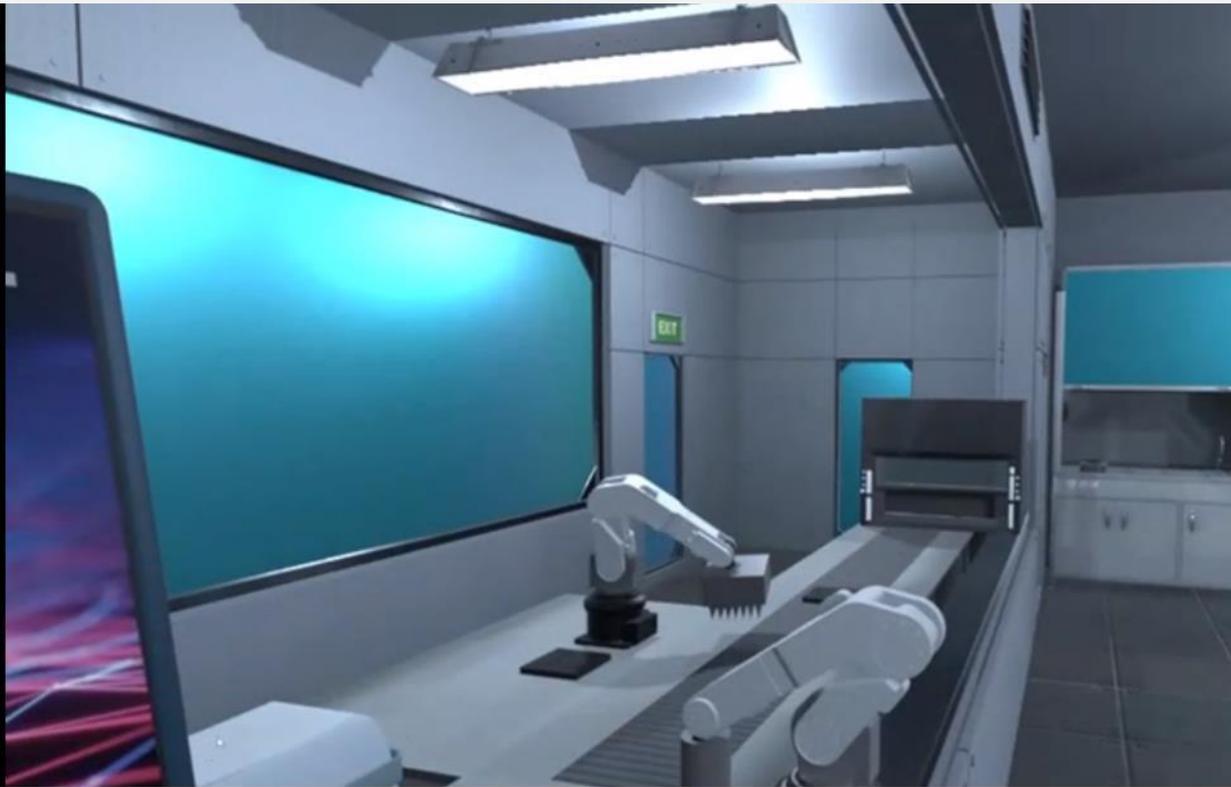
The Science behind the VR

Nadja Ring - ICGEB

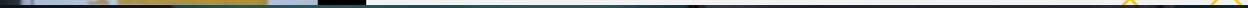
The Facility



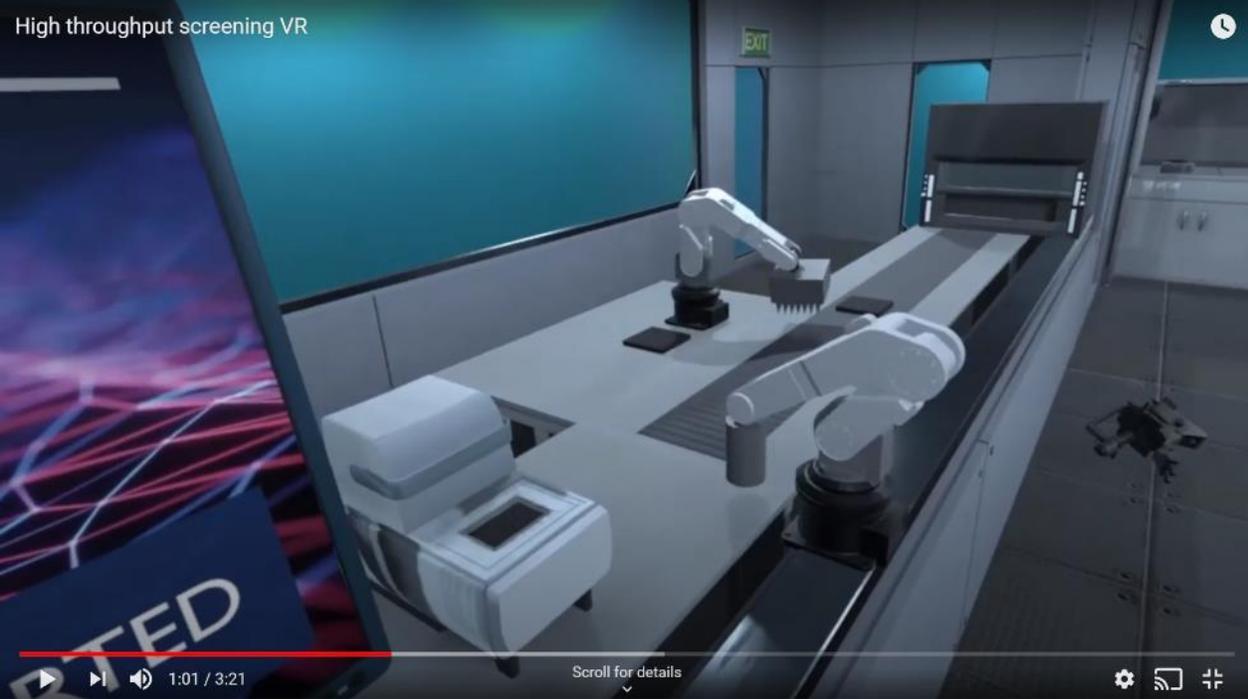
Interreg ITA-SLO 2014-2020



High throughput screening VR



High throughput screening VR



A main area of expertise: High Throughput Screenings

Problem

Simple model of your problem

Collections of molecules

Solution

Unbiased

Based on function

Cardiac regeneration

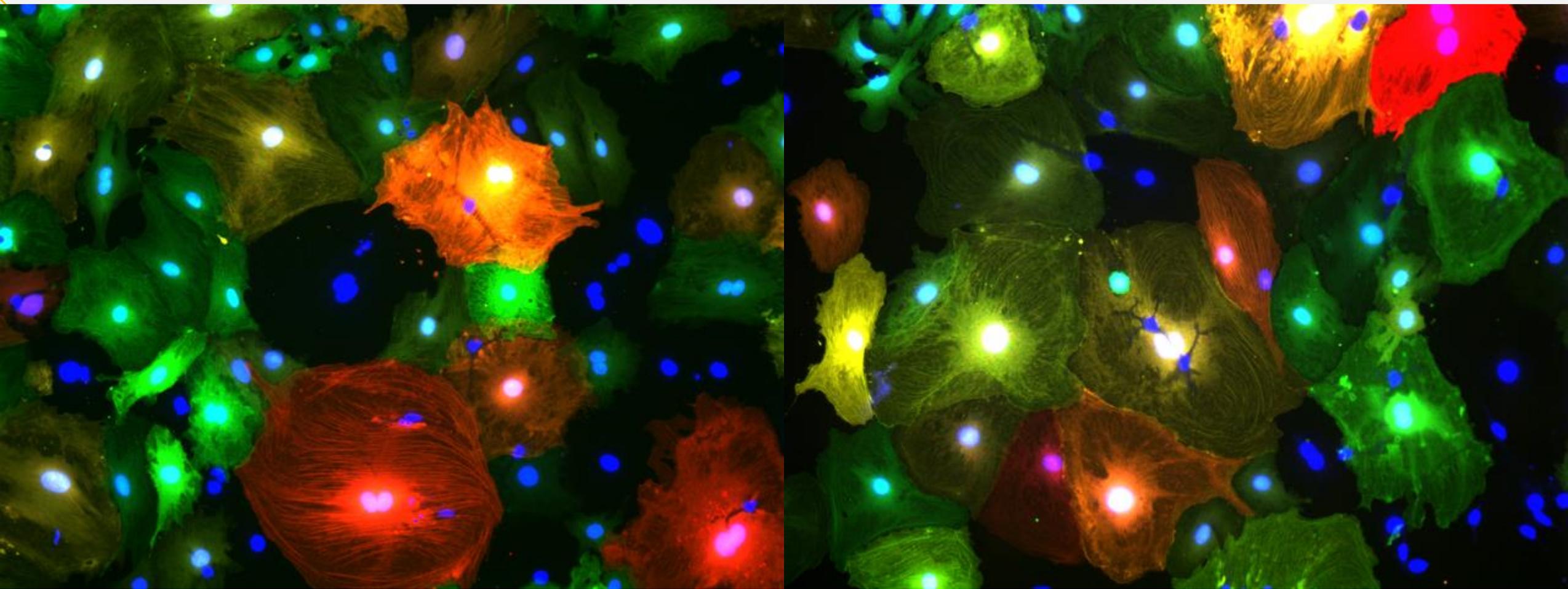
Lack of vascularisation, reduction of contractive tissue, formation of scar tissue
Endothelial cell tube formation, cardiomyocyte proliferation, **fibroblast activation**

Library of chemical compounds
Library of RNAs (miRNAs or siRNAs)

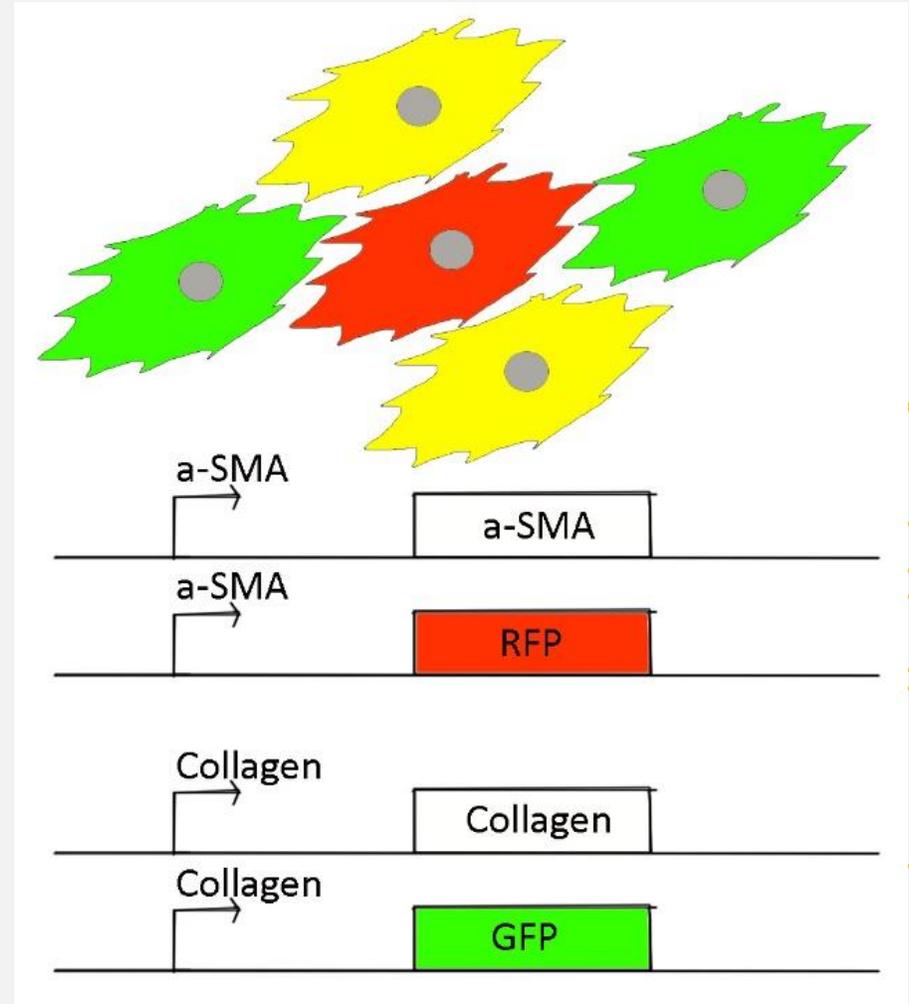
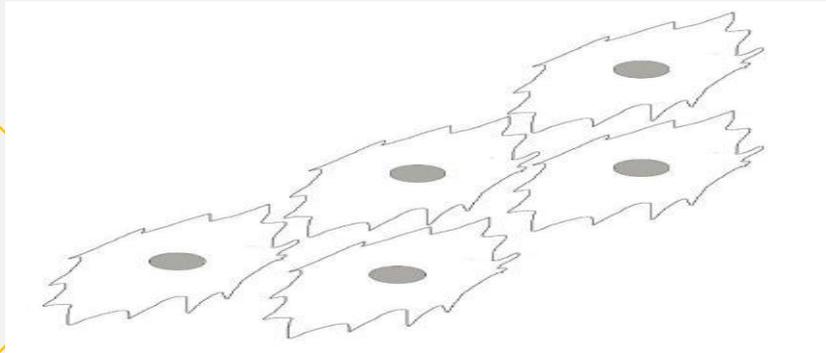
Identify compounds/RNAs which can
Increase proliferation of endothelial cells and cardiomyocytes,
Reduce activation of fibroblasts into myofibroblasts

Culture the cells
for the screen





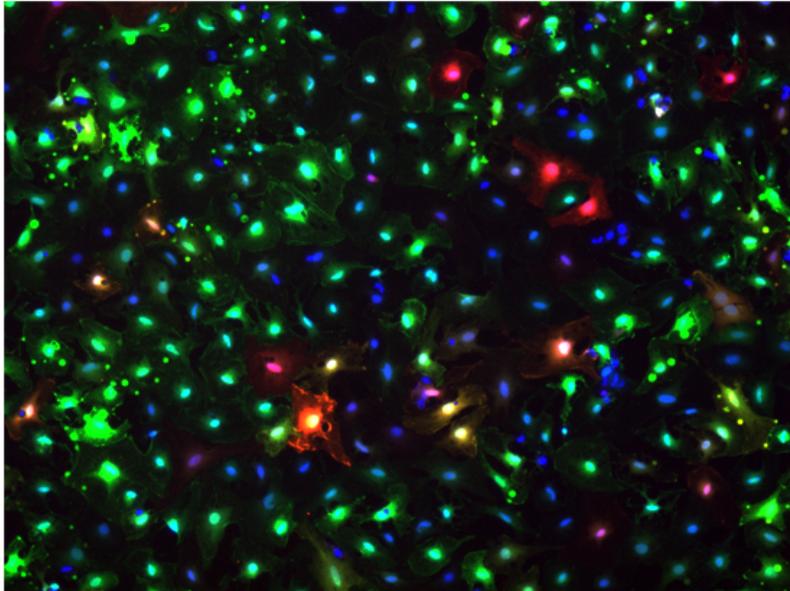
Problem: formation of scar tissue



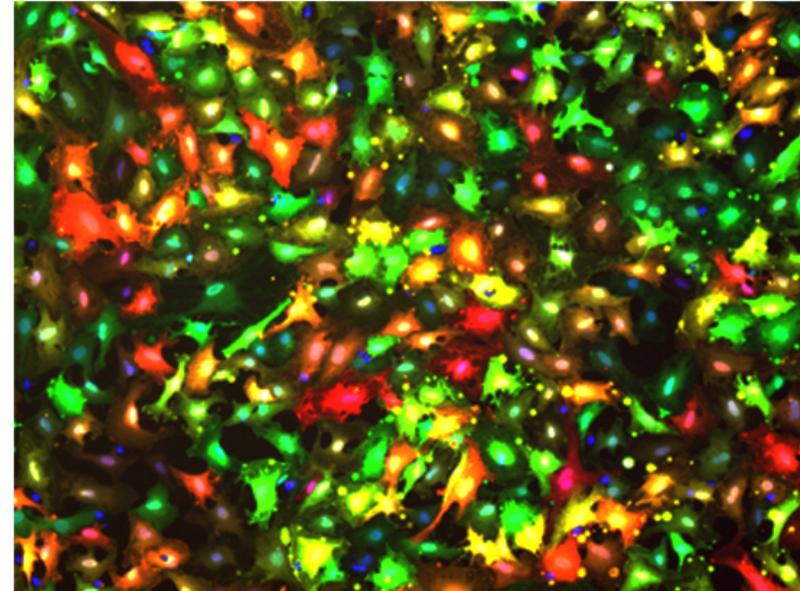
Model of fibroblast activation in myocardial infarction

- Fibrosis

Fibroblasts
+ Myofibroblasts

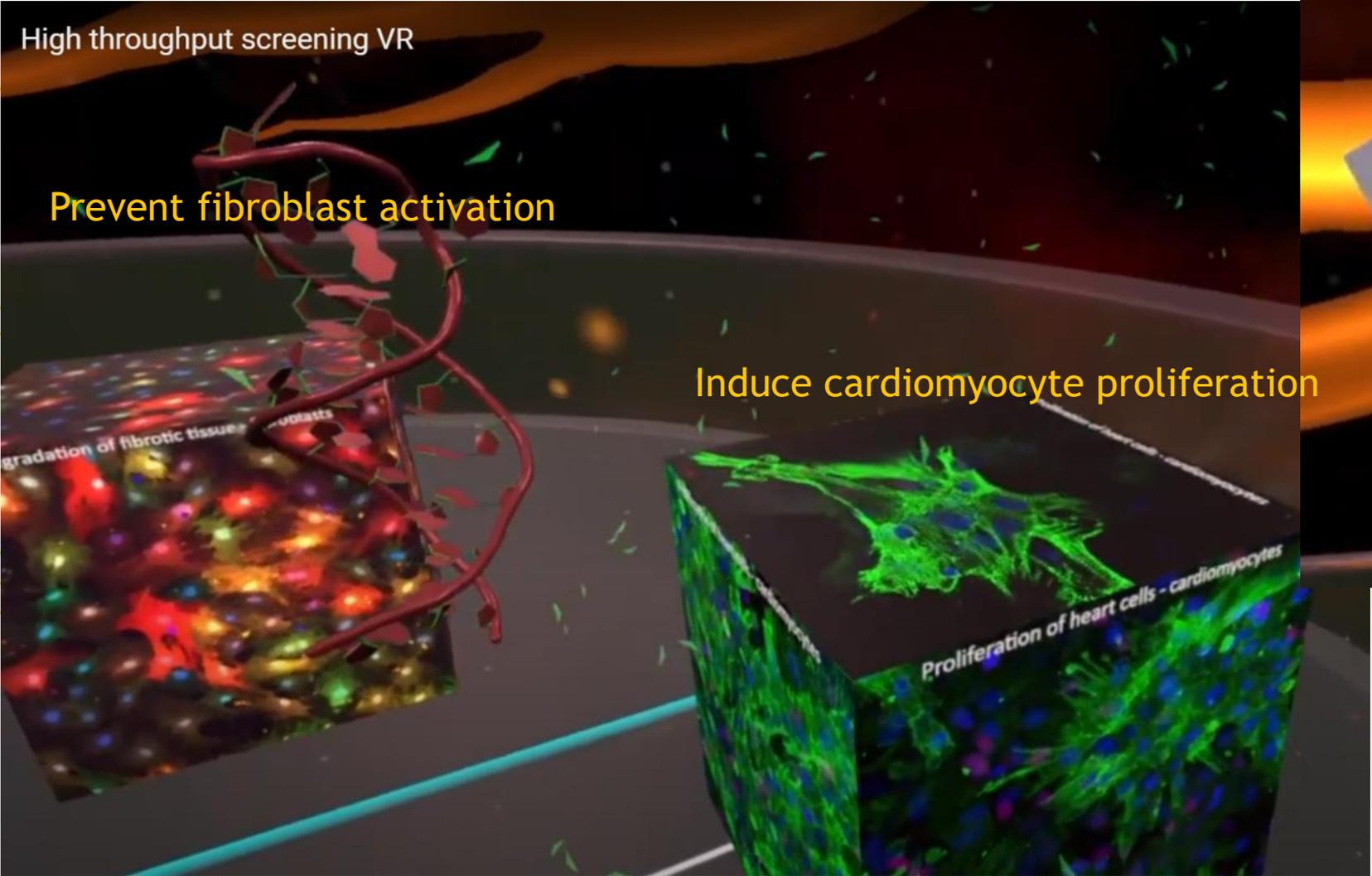


Fibroblasts
+ Myofibroblasts
treated with TGFb

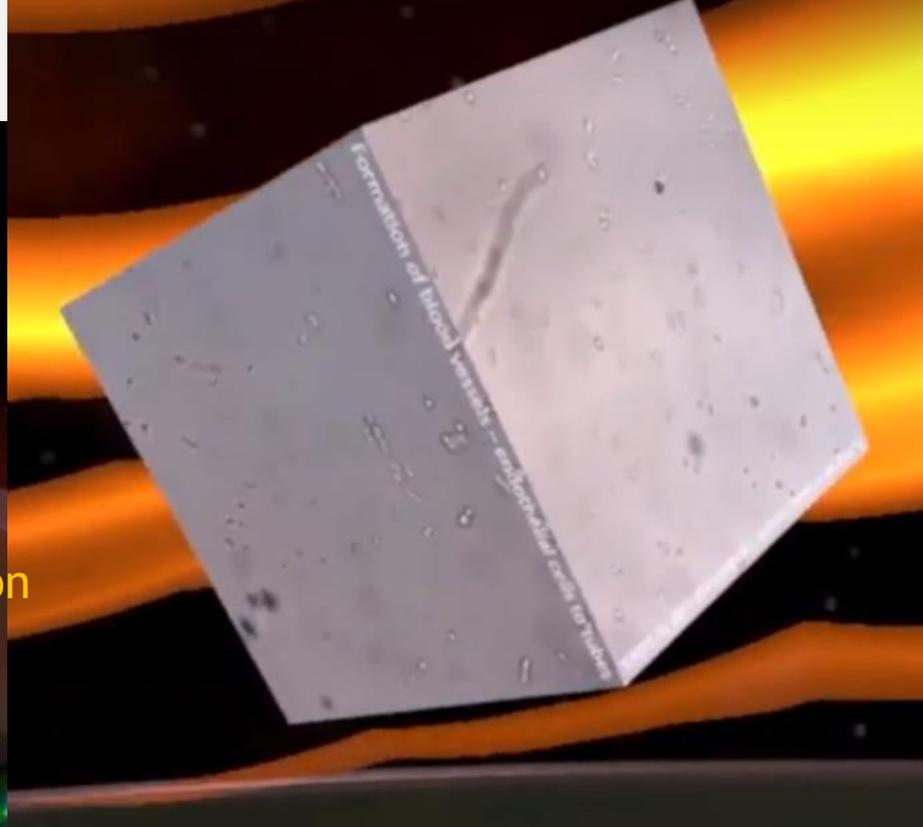


Fibroblasts (collagen-GFP)
Myofibroblasts (aSMA-RFP)
Cell nuclei (Hoechst)

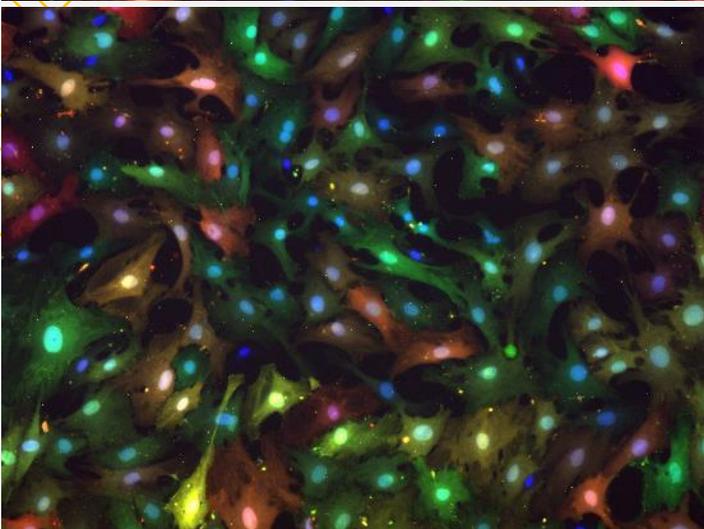
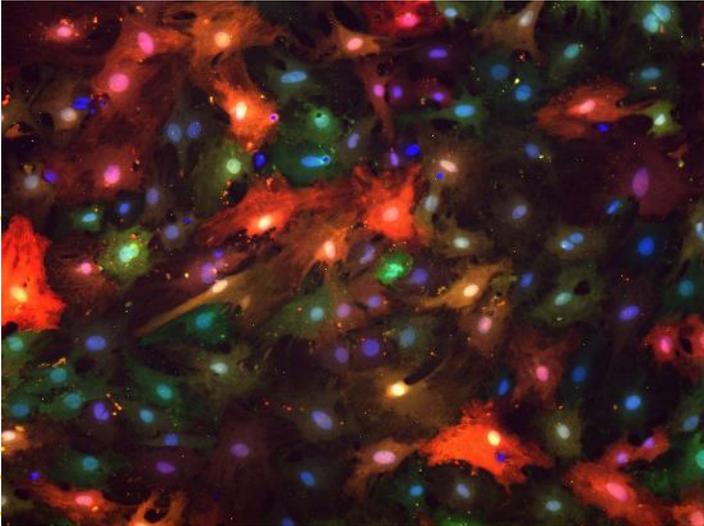
The Screen



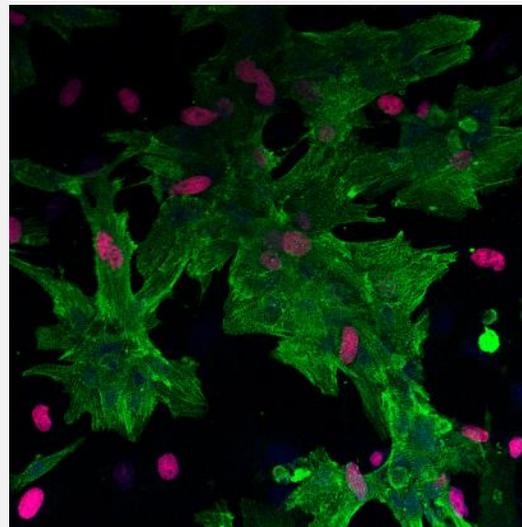
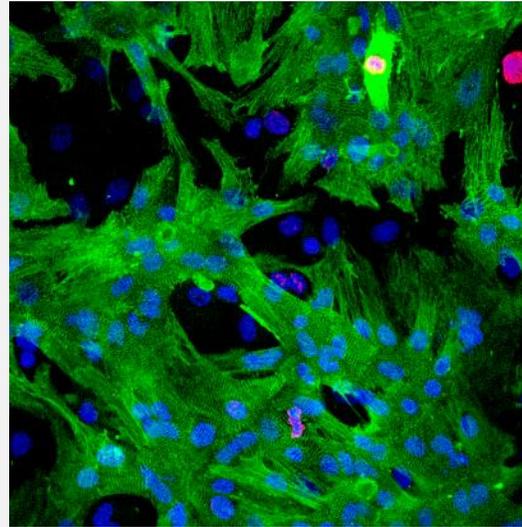
Induce endothelial cell tube formation



Fibroblast activation



Cardiomyocyte proliferation



Endothelial cell tube formation

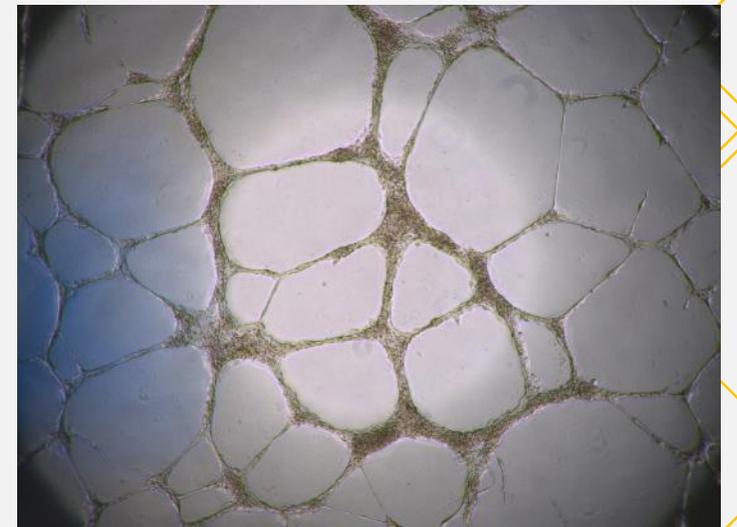
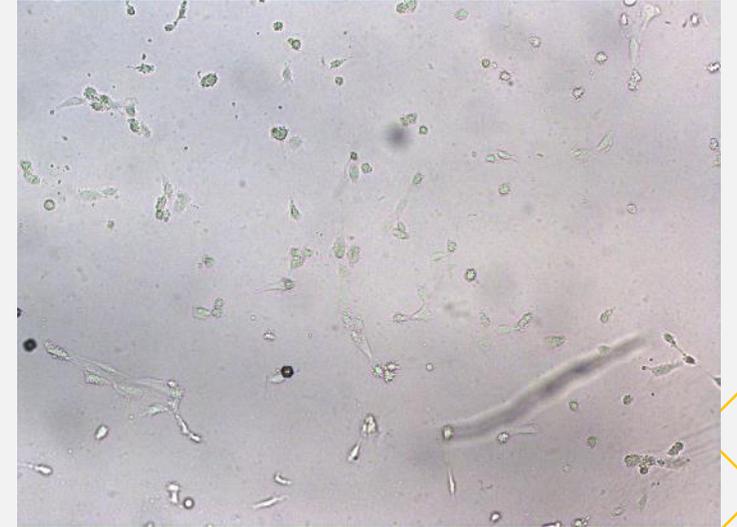




Plate the libraries





Acquire the images



Analyse the images to identify interesting potentially therapeutic molecules

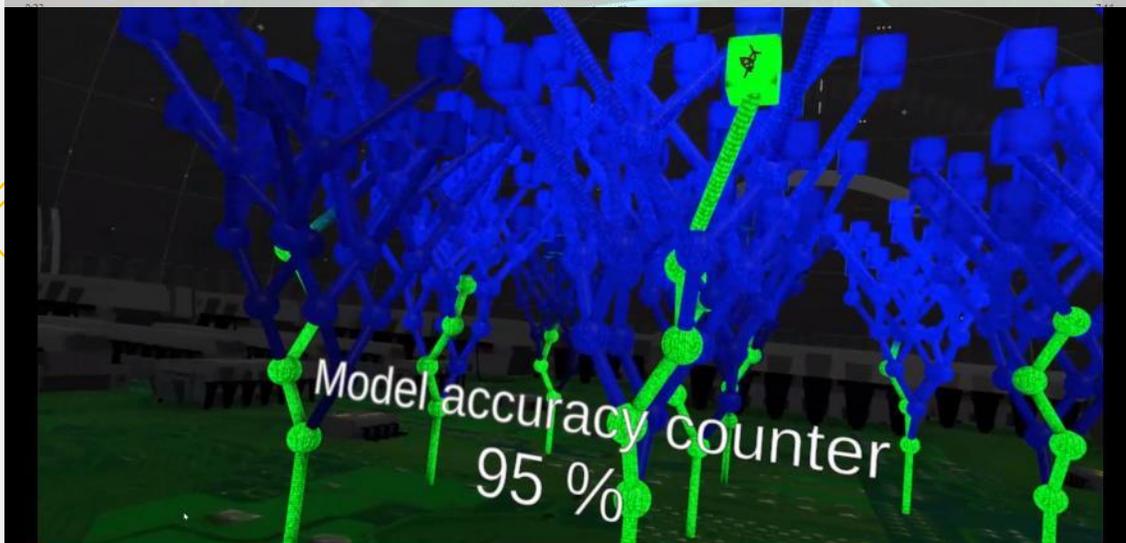
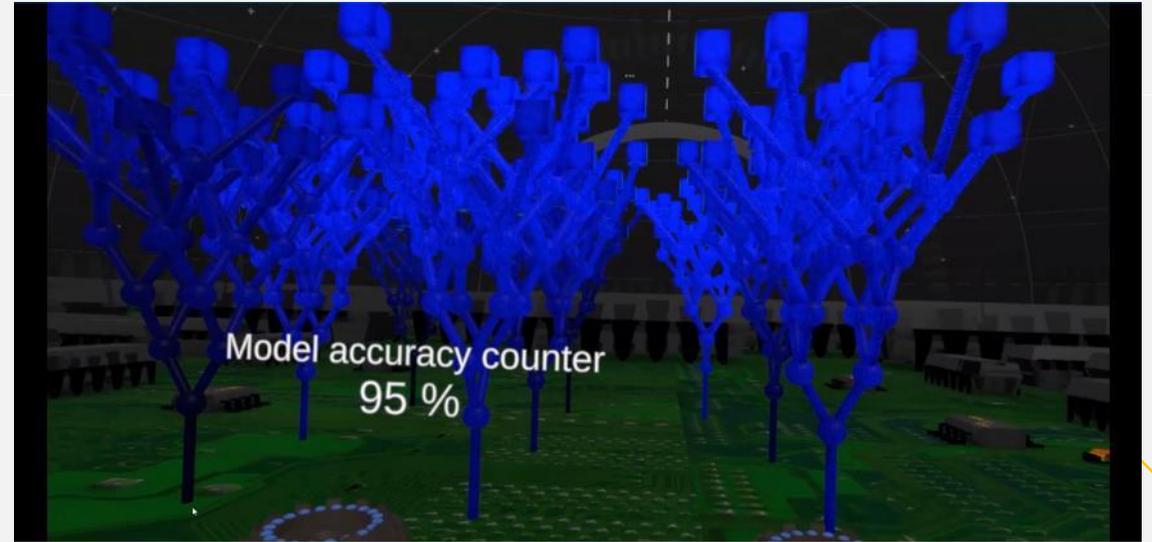


Virtual Screen to find additional hits



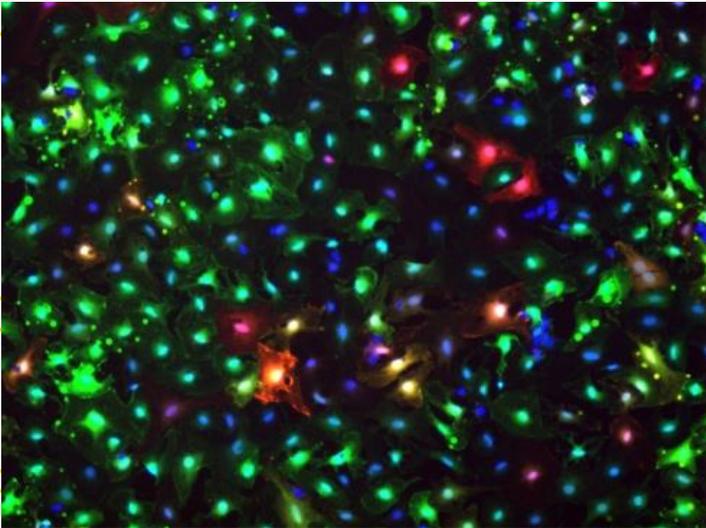
**Institut
"Jožef Stefan"
Ljubljana, Slovenija**



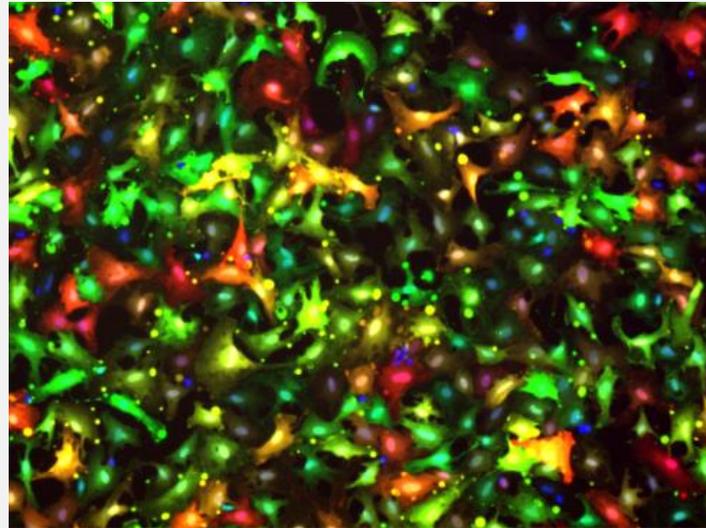


Validation of bioinformatically predicted compounds

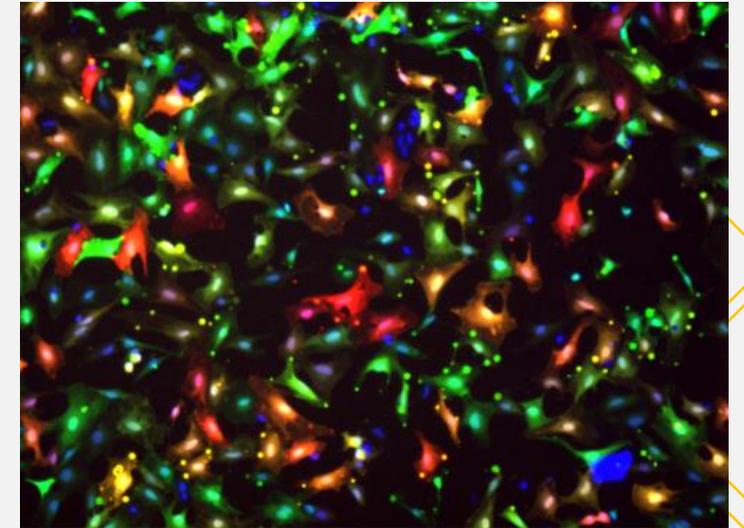
untreated



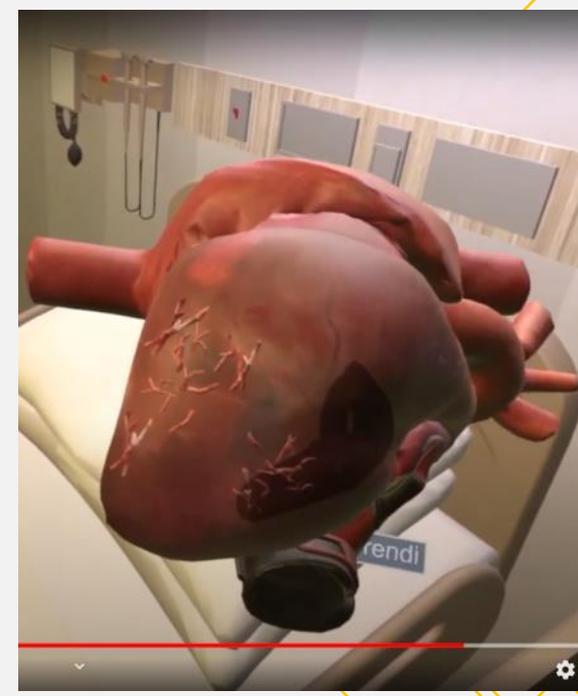
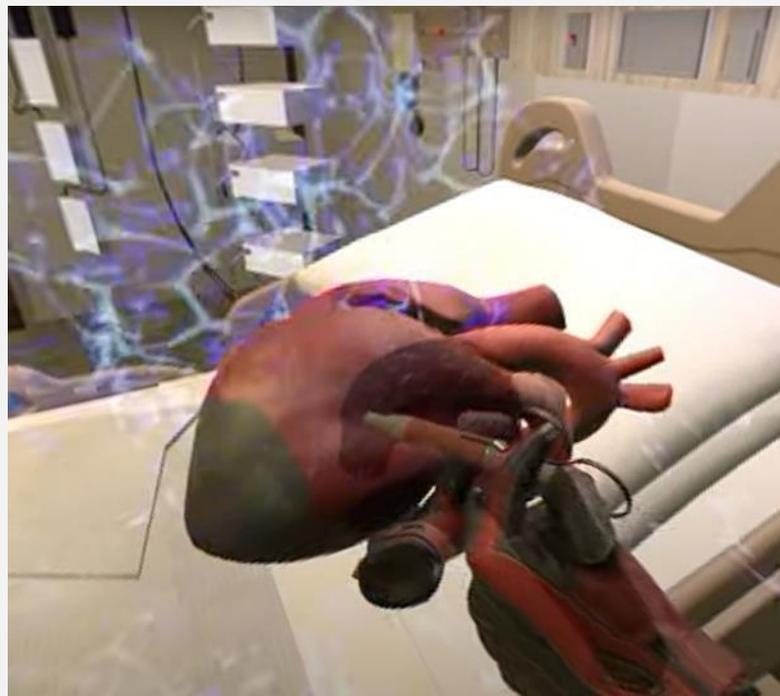
TGFb



TGFb +
anti-fibrotic drug



Identified compounds can be developed for clinical application



Interreg



UNIONE EUROPEA
EVROPSKA UNIJA

ITALIA-SLOVENIJA



TRAIN

Progetto standard co-finanziato dal Fondo europeo di sviluppo regionale
Standardni projekt sofinancira Evropski sklad za regionalni razvoj

**BIG DATA e MODELLI DI MALATTIE: PIATTAFORMA TRANSFRONTALIERA
DI KIT VALIDATI PER L'INDUSTRIA BIOTECH**

**BIG DATA in MODELI BOLEZNI: EZMEJNA PLATFORMA VALIDIRANIH
KOMPLETOV ZA BIOTEHNOLOŠKO INDUSTRIJO**