

# Functional screening of gene therapy and CRISPR gene editing therapy in patient-derived rectal organoids

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## SCOPE OF THE METHOD

<b>The Method relates to</b>	Human health
<b>The Method is situated in</b>	Basic Research, Translational - Applied Research
<b>Type of method</b>	In vitro - Ex vivo
<b>Specify the type of cells/tissues/organs</b>	rectal organoids

## DESCRIPTION

### Method keywords

Patient-derived  
organoids

CRISPR-Cas9  
CrispR  
CRISPR/Cas  
AI  
screening  
forskolin-induced swelling

### **Scientific area keywords**

cystic fibrosis  
CRISPR  
gene therapy

### **Method description**

The DETECTOR algorithm allows to functionally screen genetic strategies for Cystic Fibrosis in patient-derived rectal organoids. DETECTOR is a machine-learning based software that takes frames from forskolin-induced swelling (FIS) assay on organoids as input and gives the number of functionally corrected organoids as output. The DETECTOR tool for automated organoid analysis is freely accessible from Dataverse (<https://doi.org/10.7910/DVN/OZZRPG>) and Github <https://github.com/RL-arch/detector>.

### **Lab equipment**

The algorithm runs on any regular computer. Acquiring FIS data requires experience with organoid culture and a confocal microscope with robotics to capture images of 96 well plates at fixed intervals.

### **Method status**

Published in peer reviewed journal

## **PROS, CONS & FUTURE POTENTIAL**

### **Advantages**

The software allows to screen in primary human organoids in medium throughput and gives an per-organoid analysis.

## REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

### References

Bulcaen et al., Cell Reports Medicine, 2024 <https://organoids-3dmodels.gbiomed.kuleuven.be/info/adult-stem-cell-derived-rectal-organoid-models>

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