

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

Created on: 01-06-2024 - Last modified on: 10-06-2024

Contact person

Marianne Carlon

Organisation

Name of the organisation Katholieke Universiteit Leuven (KUL)

Department Pharmaceutical and Pharmacological Sciences

Country Belgium

Name of the organisation Katholieke Universiteit Leuven (KUL)

Department Chronic Diseases and Metabolism

Country Belgium

SCOPE OF THE METHOD

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