Decreased fertility in female cystic fibrosis patients: deciphering the role of the endometrium using organoid models

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Background

Cystic fibrosis (CF) is the most common recessive genetic disease in Caucasians. CF is caused by mutations in the gene encoding CF transmembrane conductance regulator (CFTR), a Cl-/HCO3- channel which plays a key role in the secretion of electrolytes and fluid in epithelial cells. Due to substantial increase in life expectancy over the past decade, CF is now considered a chronic disease of adults. Therefore, people with CF become increasingly interested in starting families. However, female CF patients suffer from decreased fertility. The position of the endometrium (i.e., the inner mucosal lining of the uterus) in this defective reproductive condition has only poorly been investigated, largely due to a lack of reliable and flexible study models.

Goal and methodology

Deciphering role of the endometrium in decreased fertility of female CF patients

Results

Endometrial organoids from CF mouse model

- CFTR expression in healthy hEMOs
- Assessing CFTR functionality in healthy hEMOs: two ways
- CFTR inhibition in healthy hEMOs
- Future perspectives

Conclusions

- Endometrial organoids provide a new and powerful research model to unravel the role of the endometrium in CF-associated sub-/infertility.
- WT and CF mEMOs show morphological and functional differences, supporting the ion channel defect in CF.
- CFTR is expressed and functional in healthy hEMOs. CFTR inhibition abrogated organoid formation.