In vitro human experimental model for pancreatic acinar dedifferentiation

Commonly used acronym: In vitro human ADM culture model

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Organisation

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SCOPE OF THE METHOD

<table>
<thead>
<tr>
<th>The Method relates to</th>
<th>Animal health, Human health</th>
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<tbody>
<tr>
<td>The Method is situated in</td>
<td>Basic Research</td>
</tr>
<tr>
<td>Type of method</td>
<td>In vitro - Ex vivo</td>
</tr>
<tr>
<td>Species from which cells/tissues/organs are derived</td>
<td>Human</td>
</tr>
<tr>
<td>Specify the type of cells/tissues/organs</td>
<td>Pancreatic exocrine cells</td>
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</tbody>
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DESCRIPTION

Method keywords

acinar dedifferentiation
acinar-to-ductal metaplasia

Scientific area keywords
pancreatic cancer

Method description
Loss of acinar differentiation drives pancreatic cancer. An established human in vitro experimental model is used in our lab to study this process. Pancreatic exocrine cells from human donors are placed in suspension culture in Advanced RPMI medium supplemented with 5% heat-inactivated fetal bovine serum, and undergo stress due to isolation, which causes the acinar cells to lose their typical characteristics and eventually transdifferentiate into ductal-like cells. This enables us to study the process of acinar dedifferentiation without the use of any in vivo model. If exocrine cells are placed in monolayer culture, they acquire a ductal-like phenotype, while in suspension culture they acquire a more progenitor-like phenotype with an activation of a senescence program.

Lab equipment
No special lab equipment is needed except for suspension culture plates.

Method status
Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages
The experimental model provides excellent foundation to study the first step in pancreatic cancer formation.

Challenges
Primary pancreatic exocrine cells grow in spheroid-like structures, which makes it hard to dissociate and manipulate. They are very sensitive to stress and a high rate of cell death can be observed the first days after seeding. Daily culture medium refreshments are needed to have a healthy culture.
REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Baldan et al., 2019 (Sci Rep) Mfopou JK et al., 2016 (Biosci Rep) Houbracken et al., 2012 (BMC Biotechnol.) Houbracken et al., 2011 (Gastroenterology)