Organoids of synovial sarcoma

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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	synovial sarcoma

DESCRIPTION

Method keywords

organoids
matrigel
collagen type 1

Scientific area keywords

synovial sarcoma

Method description

The use of three-dimensional (3D) cell culture models is considered a reliable model that is successfully used for high-throughput drug testing in carcinoma research. However, the development of soft tissue sarcoma organoids is lagging behind. Soft tissue sarcoma is a group of rare malignancies from mesenchymal origin, According to the latest classification, there are more than 80 different subtypes. In our laboratory, we are developing three-dimensional models of synovial sarcoma, which is one of the more

common subtypes of soft tissue sarcoma. These models are created from patient samples or samples from patient-derived xenografts. Fresh tumor tissue is collected and enzymatically and mechanically dissociated into small cell clusters. The cells are seeded into a three-dimensional scaffold consisting of collagen type 1 and Matrigel. Advanced Dulbecco's modified Eagle's medium (DMEM)/F12 and different growth factors (like human recombinant epidermal growth factor, human insulin-like growth factor 1, human recombinant fibroblast growth factor 2 and N-acetylcysteine) are added. The Rho-kinase inhibitor Y-27632 is added to prevent apoptosis during early passages. The organoids are enzymatically (using Liberase) and mechanically passaged every 7-14 days. Established cultures are characterized and can be cryopreserved for biobanking or used for drug screening experiments.

Lab equipment

Biosafety cabinet, incubator

Method status

Still in development

PROS, CONS & FUTURE POTENTIAL

Advantages

These models can contribute to unraveling the biology of soft tissue sarcoma, they can be used for drug screening experiments and as such limit the amount of mice experiments needed for this.

Challenges

It is technically challenging to create organoids of sarcoma. Most likely, each subtype needs specific growth conditions.
Primary material cannot be expanded indefinitely.

Modifications

Further optimize the growth conditions

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

De Cock, L., Wozniak, A., Verbeeck, K., & Schöffski, P. (2023). Organoids developed from synovial sarcoma patient-derived xenografts (Vol. 83, Number 7). American Association for Cancer Research. https://doi.org/10.1158/1538-7445.AM2023-174

Other remarks

Questions?
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