Two-chamber skin explant model for marine fish

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SCOPE OF THE METHOD

The Method relates to	Animal health, Environment
The Method is situated in	Basic Research
Type of method	In vitro - Ex vivo
Species from which cells/tissues/organs are derived	Flatfish - common dab (Limanda limanda)
Type of cells/tissues/organs	Skin

DESCRIPTION

Method keywords

Tissue culture
Two-chamber skin explant method
Marine fish
saline environment

Scientific area keywords

Fish disease
Ecotoxicology
infectious disease
host-pathogen interaction

Method description

We have developed an innovative two-chamber skin explant model specifically for studies involving skin of marine fish. An apparatus was 3D-printed and consists of two plates, a lower and upper plate (with funnel). By mounting the explant between the plates, two chambers can be created with the possibility to use different media without exchange between the chambers.

Lab equipment

Besides some pipets, no specific lab equipment is necessary. The explants are placed in a temperature-controlled room and all handlings with the explants are performed in a biosafety cabinet.

Method status

Internally validated

PROS, CONS & FUTURE POTENTIAL

Advantages

Two chambers are created allowing the use of saline and non-saline medium on the outside and inside of the tissue, respectively. A localized treatment spot is created where various processes on the skin can be studied. Reliable and useful for a broad range of skin studies. The pinpointed protocol has been proven to closely approximate the *in vivo* skin structure and cellular composition. Many future applications are possible including study on infectious diseases and effects of toxic compounds.

Challenges

Only small sample sizes possible due to the intensive protocol. Using the pinpointed protocol it is, for now, only possible to keep the explants for 24 hours.

Modifications

With possible modifications in the 3D printed apparatus, the used media or the use of continous changes of the medium, it might be possible to keep the explants for a longer time period.

Future & Other applications

We believe that the model had a broad application potential with various studies regarding skin health and integrity. It could be used to study the effect of toxic compounds on the total skin structure and integrity as well as disease-related aspects such as host-pathogen interactions or the uptake of contaminants.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

In preparation, will be added soon.

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