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Immortalized sponge cell culture

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Introduction

Marine sponges are the champions with respect to the number and diversity of bioactive compounds that have been discovered in the marine environment during the last decades[1] (figure 1).

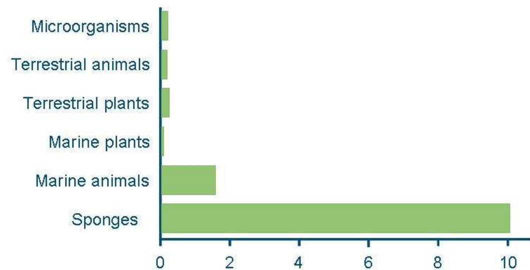

Figure 1. Percentage of screened plants, animals and microorganisms that show a significant cytotoxic activity[2] (%).

Harvesting sponges for bioactive compounds is neither environmentally nor economically feasible. Therefore, large-scale *in vitro* sponge cell culture may provide a well-defined and controllable environment for the production of bioactive compounds. However, to date, no cell line from sponges has been developed[3].

Aim

Develop immortalized sponge cell cultures for the production of marine- derived bioproducts.

Target sponges

The target sponges will be, *Axinella corrugata*, which produces stevensine (anti-cancer), *Dysidea avara*, which produces avarol (anti-psoriasis), *Xestospongia muta* and *Haliclona oculata* (figure 2).

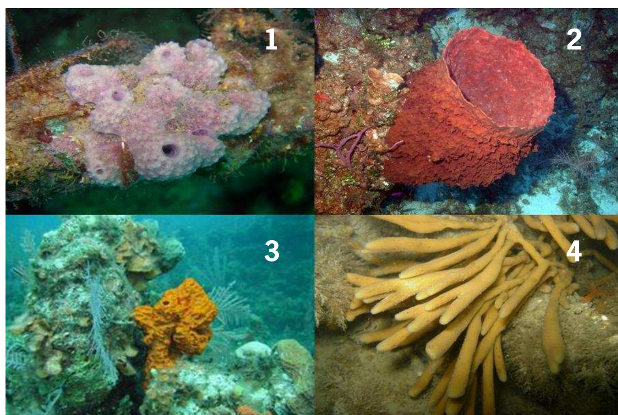

Figure 2. 1. Dysidea avara, 2. Xestospongia muta, 3. Axinella corrugata, 4. Haliclona oculata.

Approach

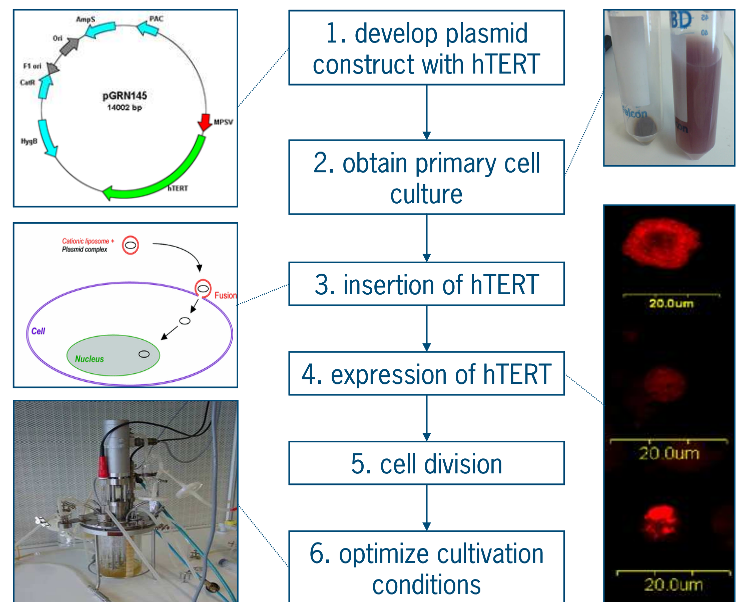

Figure 3. Approach to achieve immortalized sponge cell cultures.

A possible method to achieve immortalization of sponge cells, is the introduction of the immortalizing gene hTERT (human Telomerase Reverse Transcriptase) (figure 3). Primary sponge cell cultures (2) will be transfected with the plasmid pGRN145 (1) using lipofection (3). After transfection, expression of hTERT (4) and subsequently cell proliferation (5) will be proven. In case of success, the last step will be the optimization of the cultivation and product formation (6).

Acknowledgements

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References

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