

HOLLOW FIBER BIOREACTORS FOR HORMONE PRODUCTION IN CHO CELLS

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Hollow fiber bioreactors are growing in popularity as an alternative to tank-type systems due to many advantages such as support of a large number of cells in a small volume, isolation and concentration of cell products before harvest and high per-cell productivity.

In these bioreactors (*Cellmax Artificial Capillary Module*, Laguna Hills, CA, USA), the producing cells are inoculated into the extracapillary space of the cartridge and they are nourished by diffusion of nutrients provided by a perfusing (intracapillary) medium. The extracapillary space is drained periodically to harvest the culture medium containing the desired product.

This system was utilized to set up the production of two recombinant hormones: human prolactin (hPRL) and human thyrotropin (hTSH). In the case of hPRL, we obtained a synthesis of about 200 μ g hPRL/mL/day, starting from clones able to secrete up to 25 μ g hPRL/10⁶ cells/day (7.7 μ g hPRL/mL/day) in culture dishes, while for hTSH, a production of the order of 20 μ g hTSH/mL/day was obtained from clones that presented a secretion level up to 5.7 μ g hTSH/10⁶ cells/day (1.4 μ g hTSH/mL/day) in culture dishes. Thus, the concentration obtained was ca. 15 fold higher when compared to the secretion in dishes.

In conclusion, the hollow fiber bioreactor is a practical system for growing transformed cells and obtainement of useful quantities of diagnostic and therapeutic recombinant proteins at the laboratory scale with significant reduction of cost, time and space requirements.