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► **To cite this version:**

Florence Le Gac, Alexis Fostier. Evolution of sensitivity to GtH and GtH receptors in the trout testis (*Salmo gairdneri*). 3. International Symposium on the Reproductive Physiology of Fish, Marine Sciences Research Laboratory., Aug 1987, St. John's, Newfoundland, Canada. hal-02783868

HAL Id: hal-02783868

<https://hal.inrae.fr/hal-02783868>

Submitted on 4 Jun 2020

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EVOLUTION OF SENSITIVITY TO GtH AND GtH RECEPTORS IN THE TROUT TESTIS (SALMO GAIRDNERI)

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Introduction

The steroidogenic response of the trout testis to maturational gonadotropin was studied at various stages of gametogenesis, in relation to the binding characteristics of GtH.

Results and discussion

The effect of Salmon GtH (provided by B. Breton) on steroidogenesis was studied during in vitro incubations of testicular tissue.

S-GtH stimulated production and output of 11-ketotestosterone (11KT) and 17 α -hydroxy-20 β dihydroprogesterone (17 α -20 β -OHP) at all stages studied. This effect was a function of incubation duration and of GtH concentration.

The steroid production under GtH stimulation was analyzed as "relative response" ("stimulated" versus "basal" production) and as sensitivity (defined by determination of the GtH concentration necessary to induce half-maximal stimulation : ED50)

For both steroids, the relative response to GtH increased during maturation.

The sensitivity of 11K production to GtH increased during spermatogenesis : It was minimal during early gametogenesis (ED50=40 ng/ml) and maximal at the beginning of spermiation (ED50=6 to 10 ng/ml).

For 17 α 20 β OHP production, the sensitivity to GtH increased during maturation and was greatest at the time of full spermiation (beginning of gametogenesis : ED50=100 ng/ml ; spermiation : ED50=3 ng/ml).

GtH receptors were studied by Scatchard analysis of specific ¹²⁵I-s-GtH binding on testicular membrane preparations. The high affinity component of this binding was studied in terms of affinity and binding capacity expressed per pair of gonads.

Significant changes in the affinity constant values at the different stages could not be demonstrated (Ka : 1 to 4 x 10¹⁰ M⁻¹). However, the maximum number of sites measured in these membrane preparations increased dramatically during gametogenesis.

The increase in plasma 11 KT and 17 α 20 β OHP observed at the end of the reproductive cycle, which could play a role in initiation and maintenance of spermiation, (Baynes & Scott, 1985 ; Fostier et al., 1982

Ueda et al., 1983) could be linked to an enhanced sensitivity to GtH. This could be due in part to an increase in GtH receptor number during this period.

Furthermore, the respective evolutions of 11KT and 17 α 20 β P productions, in terms of sensitivity to GtH during spermiation, suggest a progressive change in the steroidogenic pathways during this stage.

Stage	Regressed	Beginning of gametogenesis	Prespermiation
Ka M ⁻¹	1,3 10 ¹⁰	1,8 10 ¹⁰	2,5 10 ¹⁰
B max fmoles/2gonads	< 10	93	830

stage	spermiation	end of spermiation
Ka M ⁻¹	2,7 10 ¹⁰	1,4 10 ¹⁰
B max fmoles/2 gonads	300 to 2000	153

References

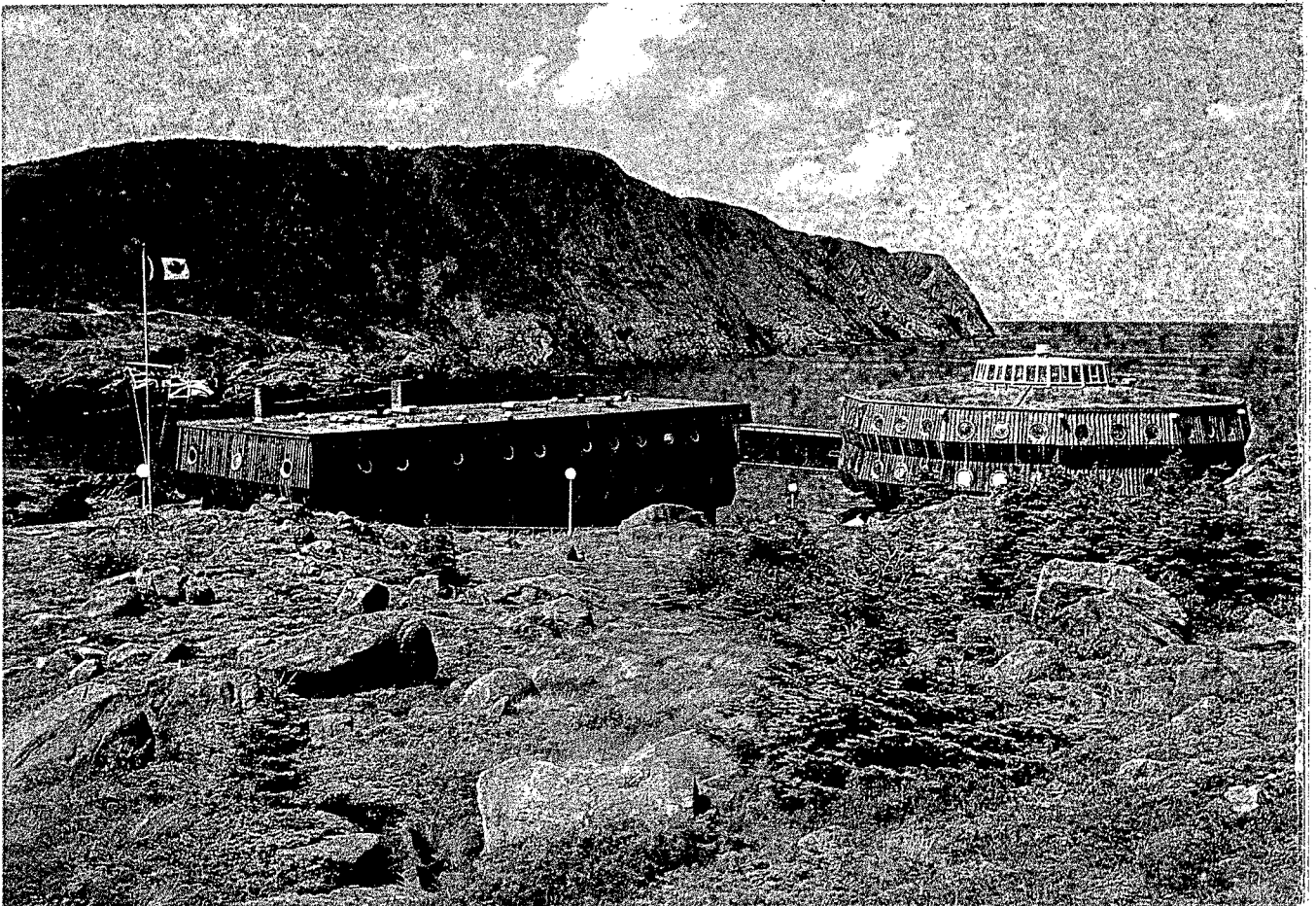
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***Proceedings of the Third International Symposium
on the Reproductive Physiology of Fish***

St. John's, Newfoundland, Canada, 2-7 August 1987



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