

Accepted Manuscript

Review

Cytochrome b₅: novel roles in steroidogenesis

Karl-Heinz Storbeck, Amanda C. Swart, Pierre Goosen, Pieter Swart

PII: S0303-7207(12)00512-6

DOI: <http://dx.doi.org/10.1016/j.mce.2012.11.020>

Reference: MCE 8380

To appear in: *Molecular and Cellular Endocrinology Molecular and Cellular Endocrinology*



Please cite this article as: Storbeck, K-H., Swart, A.C., Goosen, P., Swart, P., Cytochrome b₅: novel roles in steroidogenesis, *Molecular and Cellular Endocrinology Molecular and Cellular Endocrinology* (2012), doi: <http://dx.doi.org/10.1016/j.mce.2012.11.020>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Cytochrome b₅: novel roles in steroidogenesis

Karl-Heinz Storbeck, Amanda C. Swart, Pierre Goosen and Pieter Swart*

Department of Biochemistry, University of Stellenbosch, Stellenbosch 7602, South Africa

*Corresponding author. Tel.: +27- 21-8085862; fax: +27-21-8085863.

Email address: pswart@sun.ac.za (P. Swart)

Abstract

Cytochrome b₅ (cyt-b₅) is essential for the regulation of steroidogenesis and as such has been implicated in a number of clinical conditions. It is well documented that this small hemoprotein augments the 17,20-lyase activity of cytochrome P450 17 α -hydroxylase/17,20-lyase (CYP17A1). Studies have revealed that this augmentation is accomplished by cyt-b₅ enhancing the interaction between cytochrome P450 reductase (POR) and CYP17A1. In this paper we present evidence that cyt-b₅ induces a conformational change in CYP17A1, in addition to facilitating the interaction between CYP17A1 and POR. We also review the recently published finding that cyt-b₅ allosterically augments the activity of 3 β -hydroxysteroid dehydrogenase/ Δ^5 - Δ^4 isomerase (3 β HSD), a non cytochrome P450 enzyme, by increasing the enzymes affinity for its cofactor, NAD⁺. The physiological importance of this finding, in terms of understanding adrenal androstenedione production, is examined. Finally, evidence that cyt-b₅ is able to form homomeric complexes in living cells is presented and discussed.

Keywords: Cytochrome b₅; cytochrome P450 17 α -hydroxylase/17,20-lyase; CYP17A1; 3 β -hydroxysteroid dehydrogenase/ Δ^5 - Δ^4 isomerase; 3 β HSD; steroidogenesis

Abbreviations

3 β -hydroxysteroid dehydrogenase/ Δ^5 - Δ^4 isomerase, 3 β HSD; 16-hydroxyprogesterone, 16OH-PROG; 17-hydroxypregnenolone, 17OH-PREG; 17-hydroxyprogesterone, 17OH-PROG; androstenedione, A4; cytochrome b₅, cyt-b₅; cytochrome P450 17 α -hydroxylase/17,20-lyase, CYP17; dehydroepiandrosterone, DHEA; pregnenolone, PREG; progesterone, PROG

Download English Version:

<https://daneshyari.com/en/article/8477511>

Download Persian Version:

<https://daneshyari.com/article/8477511>

[Daneshyari.com](https://daneshyari.com)