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Editorial

The role of sulfated steroids in reproduction

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Sex steroids, including estrogens and androgens, are responsible for the development and regulation of male and female reproduction. Like all steroid hormones, estrogens and androgens are lipophilic molecules and diffuse across the cell membrane by diffusion. Nevertheless, cells are only responsive for sex steroids, when they express androgen and estrogen receptors at the nucleus or at the cell membrane. Apart from the free steroid form, sex steroids also circulate in a sulfo-conjugated form commonly referred to as sulfonated steroids or syn. sulfated steroid. This sulfo-conjugation is mediated by enzymes of the sulfotransferase (SULT) family and involves PAPS (3'-phospho-adenosine-5'-phosphosulfate) as co-substrate. These conjugates are more hydrophilic due to their negative charge at physiological pH and are unable to penetrate cells by diffusion. Interestingly, plasma concentrations of the sulfo-conjugated forms normally exceed that of the free steroid forms by orders of magnitude. As an example, DHEAS circulates with plasma concentration of 1-10 μM in humans, while DHEA is present at 10-25 nM. Specific membrane transporters are needed to bring these molecules to excretion. In the liver this process requires uptake transport at the basolateral membrane, e.g. by carriers of the Organic Anion Transporting Polypeptide (OATP) carrier family, while at the canalicular membrane efflux is mediated by ATP-binding cassette (ABC) transporters [1]. Apart from this carrier-mediated excretion process, membrane carriers can also mediate cell-type specific

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