Intravaginal administration of dehydroepiandrosterone (DHEA, prasterone) has been found to improve VVA and sexual dysfunction in postmenopausal women. The distribution of the enzymes responsible for estradiol (E2) and androgen formation as well as their respective receptors within the monkey vagina, the closest model to humans, should help explain how DHEA improves VVA and sexual dysfunction.

Objective: Determine the sites and level of expression of steroidogenic enzymes responsible for estrogen and androgen formation as well as the androgen receptor (AR) and estrogen receptors (ERs) in vaginal specimens collected from cynomolgus monkeys.

Measurements and results: HSD3B1, HSD17B1, HSD17B3, HSD17B5, HSD17B12, HSD17B15, CYP19A1, SRD5A1, SRD5A2, Estrogen Receptors (ERalpha and ERbeta), AR and nerve fibers (PGP 9.5) were measured or localized by quantitative RT-PCR, immunohistochemistry and immunofluorescence. The above-mentioned steroidogenic enzymes are at the highest level in the cell-rich squamous epithelial layer of the vagina. ERs and AR are also mainly localized in the epithelium, especially near the basement membrane with modest levels also found in the lamina propria and muscularis. Immunostaining of the enzymes and sex steroid receptors is also seen around the blood vessels and zona muscularis of the deepest part of the tissue where nerve fibers are also mainly located.

Conclusions: This study shows the distribution of the enzymes involved in sex steroid formation as well as their site of action (ERs and AR) in the various layers of the vagina, thus supporting the role of both estrogens and androgens in regulating epithelial cell maturation and fluid secretion, smooth muscle activity, blood flow regulation and neuronal activity.