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Immunohistochemical expression of myeloperoxidase in the equine endometrium suffering from endometriosis

Sonia Parrilla Hernández^{1,*}, Fabrice Reigner², Émilie Feyereisen³, Carine Munaut³, Thierry Franck⁴, Stéfan Deleuze^{1,5}

¹ *Physiology of Reproduction, Veterinary Medicine Faculty, ULiège, Liège, Belgium*

² *INRAE, UE1297 PAO, Nouzilly, France*

³ *Laboratory of Tumor and Developmental Biology, GIGA-Cancer, ULiège, Liège, Belgium*

⁴ *CARD, ULiège, Liège, Belgium*

⁵ *Equine and Companion Animal Reproduction, Veterinary Medicine Faculty, ULiège, Liège, Belgium*

Myeloperoxidase (MPO) is a pro-oxidant enzyme with potent bactericidal activity playing an important role in the innate immune response against microbial pathogens. MPO is a marker of neutrophil activation, but it is also expressed by epithelial cells. In the endometrium of mares in physiological conditions, MPO is immunohistochemically expressed in a hormonal-dependent fashion with maximal expression in mid and basal glands during estrus (Parrilla Hernández et al. *Animals*. 2023;13(3):375). This suggests that MPO, as a part of the uterine mucosal immune system, contributes to the prevention of equine endometrial contamination and inflammation. Thus, an alteration of the MPO expression may have an impact on uterine immune defense. A deviation in the endometrial expression pattern of some other proteins has already been associated with endometriosis (Hoffmann et al. *Theriogenology*. 2009;71:264-274) and it has been proposed as one of the reasons for the reduced fertility in mares suffering of this condition. Therefore, the aim of this study was to investigate the immunohistochemical expression pattern of MPO in the estrous equine endometrium affected by endometriosis. Endometrial biopsies (n=7) obtained from mares in estrus with histological detection of three or less neutrophils per field

(400x) and presenting a moderate endometrial fibrosis were studied. Immunohistochemical analysis using MPO-specific horse antibody was performed. The uterine glandular epithelium within fibrotic foci mostly presented a non-steroidal dependent immunostaining pattern reaction. In comparison to unaffected glands, most glandular epithelial cells surrounded by periglandular fibrosis exhibited no or decreased MPO immunostaining. No differences were observed between single glands or nests. These results are in accordance with previous studies for other endometrial expressed proteins. This decrease of MPO expression in the presence of periglandular fibrosis may be produced by a lack of paracrine communication between stromal and epithelial cells, which is necessary for the regulation of uterine secretory proteins by sex hormones (Pierro et al. *Biology of reproduction*. 2001;64(3):831-838). Although further investigation with different degrees of endometriosis is necessary, the reduced expression of MPO compared to that expected in estrus we observed in this study suggests that endometriosis may lead to disturbance in the uterine immune environment, which in turn may predispose to an increase of susceptibility to uterine infections and endometritis in mares.