Expression of receptors for progesterone in blood leukocytes of cattle.

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Contradicting evidence exists about the presence of nuclear progesterone receptor (PGR) in immune cells in cattle. Nonetheless, previous literature has identified that bovine peripheral blood mononuclear cells (PBMC) express membrane-associated molecules from the family of Progestin and AdipoQ receptors (PAQR) and progesterone receptor membrane components (PGRMC). Here we determined expression of progesterone and estradiol receptors in peripheral blood leukocytes (PBL) and effects of reproductive status (cyclic vs pregnant), parity (heifers vs cows), or day of pregnancy on expression. Nulliparous heifers and lactating cows were assigned to be bred or remain non-pregnant. Blood was collected on day 18 of the estrous cycle and pregnancy in cows and heifers, and on days 30 and 60 of pregnancy in cows. PBL were isolated from blood and RT-qPCR analysis determined expression of PGR, ESR1, PAQR7, PAQR8, PAQR6, PAQR5, PGRMC1, and PGRMC2. PGR expression was undetected using RT-qPCR in PBL. On day 18 of the estrous cycle and pregnancy, ESR1, PAQR8, PGRMC1, and PGRMC2 mRNA were detected in PBL of heifers and cows. On days 30 and 60 of pregnancy, ESR1, PAQR7, PAQR8, PAQR6, PAQR5, PGRMC1, and PGRMC2 were detectable in PBL of cows. In heifers, PGRMC1 expression was less in pregnant than cyclic animals while in cows the inverse relationship was observed. PAQR8 mRNA tended to be greater in cows than heifers while PGRMC2 mRNA tended to be greater in pregnant than cyclic animals. Results support previous reports, and extend those findings to include neutrophils, revealing that bovine PBL do not express PGR. Instead, membrane progesterone receptors (mPGR) of the PAQR and PGRMC family are present and could mediate progesterone effects on leukocyte function. Additional research is required to determine effects of membrane progesterone receptors in leukocyte subsets. Supported in part by USDA NIFA grant # 2017-67015-26455 to TLO and NIH-T32 Fellowship grant #T32GM108563.