# Immunohistochemical characterization of tumor-associated macrophages in canine lymphomas


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**Abstract**
Macrophages have been confirmed to play a significant role in the behavior of human lymphomas, albeit no consistent data are so far available in canine lymphomas. The present study characterizes the macrophages present in cases of canine nodal lymphoma and their relationship with the histological grade and the immunophenotype. Samples from the lymph nodes of 25 dogs diagnosed with lymphoma were selected. Immunohistochemistry was used to determine the tumor immunophenotype (CD3 and CD20 antibodies) and macrophage characterization (Iba1, MAC387, CD204, CD163 and iNOS antibodies). Macrophage counting was performed in 10 randomly selected, high-power fields per sample. Generalized linear models with Poisson distribution were used for statistical analysis. A significantly greater number of macrophages (Iba1+) were detected in high-grade and B-cell lymphomas. The highest amount of both M1 (iNOS+) and M2 (CD204+ and CD163+) subtypes were observed in B-cell lymphomas. High-grade lymphomas showed a greater number of CD204+ and CD163+ cells and recently recruited MAC387+ macrophages. The latter were most abundant in T than in B-cell lymphomas. In conclusion, a significant population of macrophages is present in canine lymphomas, which constitute a heterogeneous population that shows variations in the amount and immunohistochemical profile according to the histological grade and immunophenotype.




**Author keywords**
Canine; Histology; Immunohistochemistry; Lymphoma; Macrophages