

# Canine B-Cell Lymphoma



The standard of care for B-cell

lymphoma (BCL), one of the most common neoplasms in dogs, is a combination chemotherapy protocol usually consisting of cyclophosphamide, hydroxydaunorubicin/doxorubicin, vincristine (Oncovin), and prednisone (CHOP). CHOP therapy typically extends survival from 6 weeks to 10 to 14 months. The addition of the monoclonal antibody rituximab to CHOP treatment in human nonHodgkins lymphoma cases has significantly increased response and survival rates. Rituximab targets CD20-positive B cells. This study described the creation of an anti-CD20 antibody used to treat B-cell lymphoma in dogs. A panel of anticanine CD20 monoclonal antibodies was generated;

one antibody (mouse monoclonal antibody 1E4) was selected because it binds to nearly the same location of CD20 as does rituximab. Chimeric antibodies were next assembled using 2 canine IgG subclasses. Two of these, 1E4-clgGB and 1E4-clgGC, were found to significantly deplete B-cell levels in healthy beagles in a manner similar to that seen when humans with normal lymphocyte levels are treated with rituximab. However, because of difficulties encountered in the production of 1E4-clgC, only 1E4-clgGB was selected for further research and development for treating canine B-cell lymphoma.

## Commentary

The development and use of rituximab in combination with chemotherapy for diffuse B-cell lymphoma in humans has dramatically improved disease-free time and overall survival as compared with chemotherapy alone. However, rituximab does not bind or deplete canine B cells; this renders it unusable for canine

lymphoma treatment.<sup>1</sup> This article described the development of a canine B-cell monoclonal antibody targeting canine CD20. Currently, a B-cell monoclonal antibody is USDA-approved and under investigation for efficacy when combined with chemotherapy; similarly, a T-cell monoclonal antibody targeting CD52 is conditionally approved by the USDA and under investigation. Although published efficacy data are pending, early results are promising; these developments represent significant steps forward in improving the prognosis for dogs with lymphoma.—Sandra Bechtel, DVM, DACVIM (Oncology)

## Reference

1. Impellizzeri JA, Howell K, McKeever KP, Crow SE. The role of rituximab in the treatment of canine lymphoma: an ex vivo evaluation. *Vet J.* 2006;171(3): 556-558.

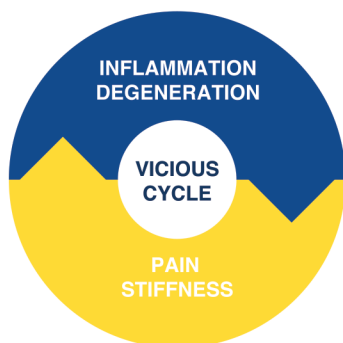
## Source

Rue SM, Eckelman BP, Efe JA, et al. Identification of a candidate therapeutic antibody for treatment of canine B-cell lymphoma. *Vet Immunol Immunopathol.* 2015;164(3-4):148-159.



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