

Introduction

Canine B-cell lymphoma (BCL) is one of the commonest lymphoid malignancies in dogs. Conventionally, its treatment consists in a chemotherapy protocol but new therapies are emerging such as immunotherapy. It consists in the creation of an immune response against malignant B-cells through immunomodulatory agents.

Objectives

- ✓ Investigate if monoclonal antibodies for human B-cell lymphoma could be used in canine B-cell lymphoma.
- ✓ To do research on specific monoclonal antibodies against canine B-cell lymphoma.
- ✓ To review the vaccine-based therapies studied in human NHL and more extensively in canine BCL.

Monoclonal Antibodies (MAbs)

Rituximab is a MAb against human CD20 thus not binding to canine CD20. New therapeutic MAbs have been developed, such as AT-004 (Aratana Therapeutics Inc.) which bind specifically to canine CD20 (Figure 1). Studies show longer median progression-free survival (PFS) and overall survival (OS) times in animals treated with anti-canine CD20 MAb (Figure 2).

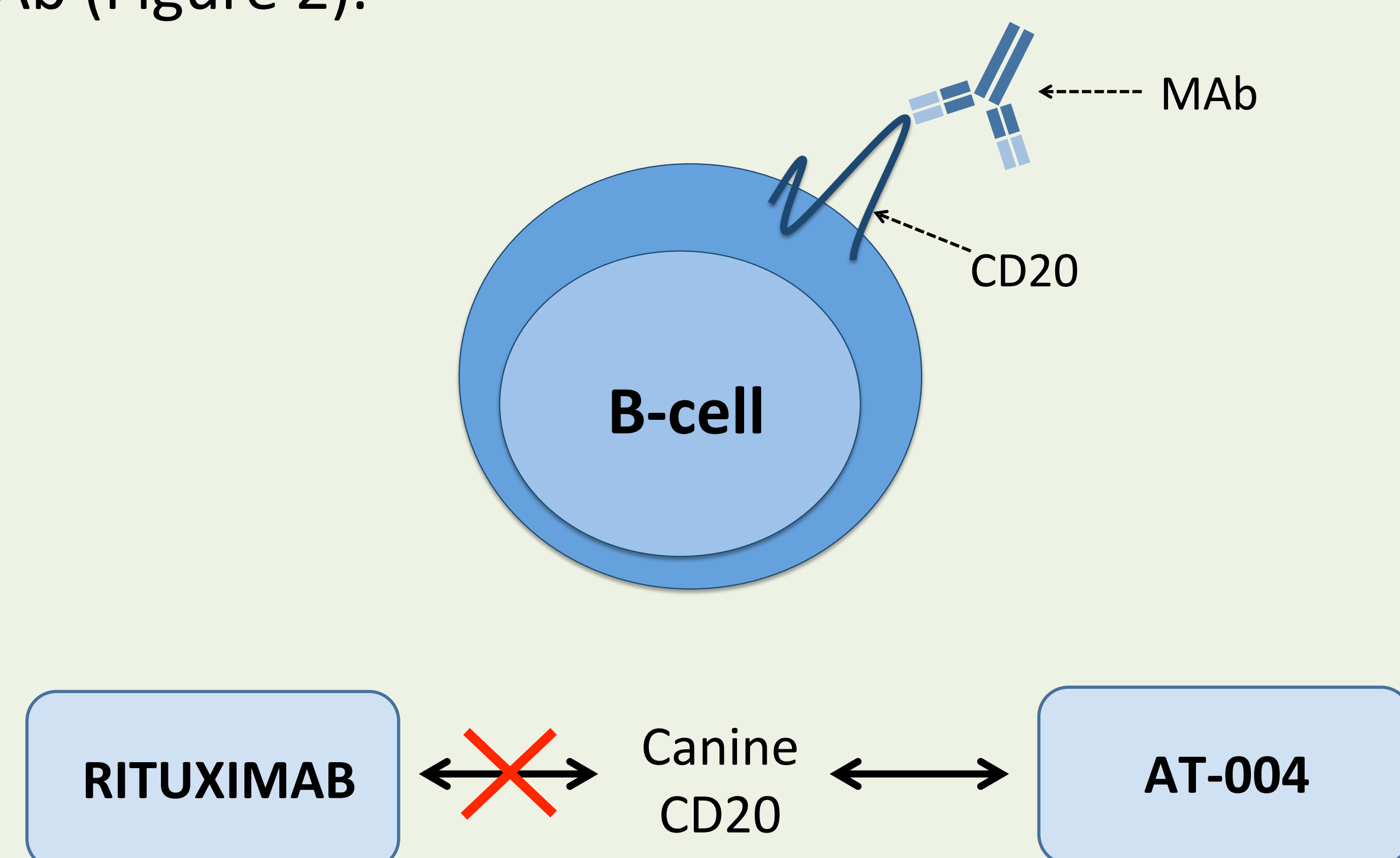


Figure 1. Contrary to rituximab, AT-004 binds to canine CD20, specifically, it binds to large extracellular loop.

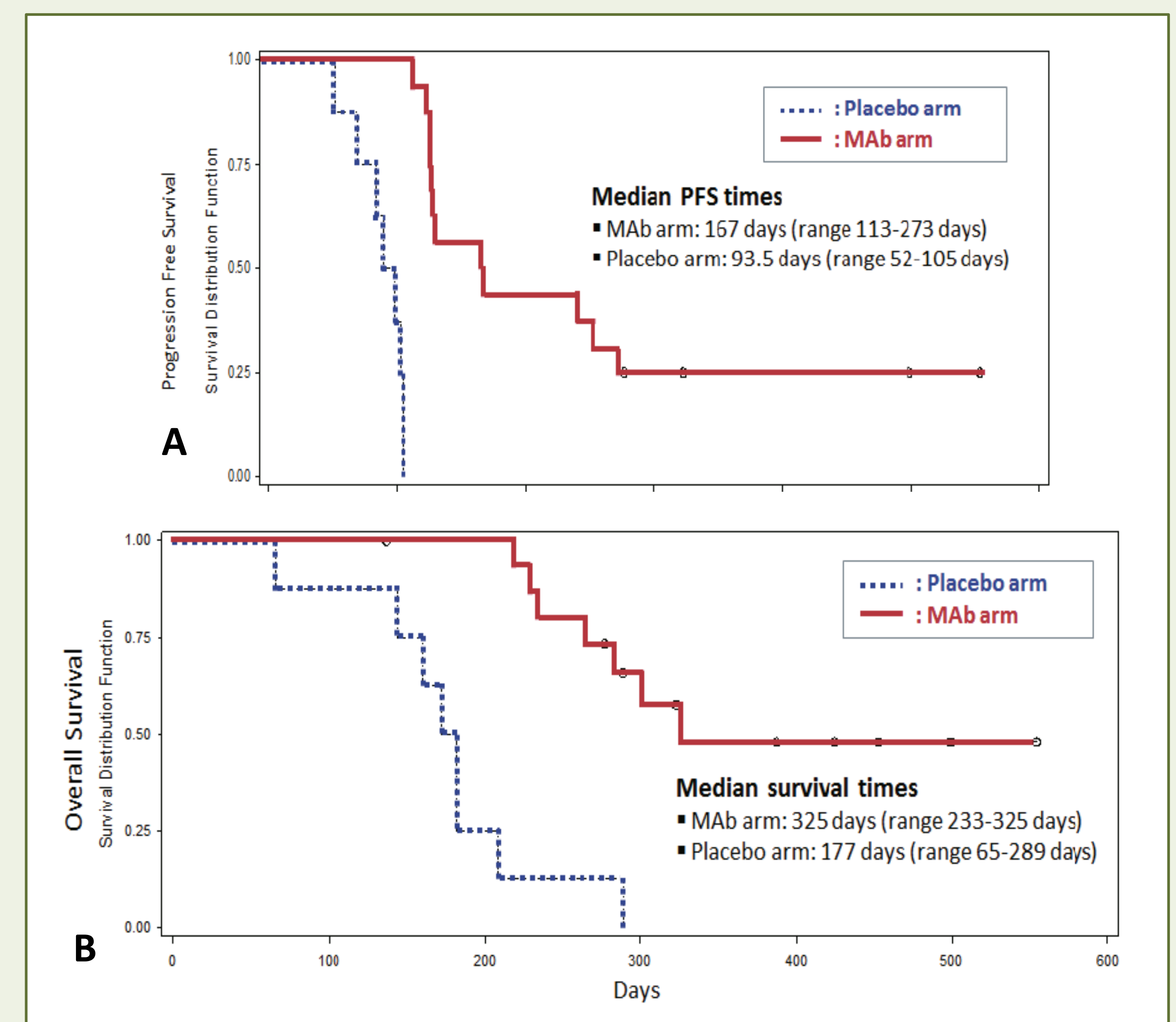


Figure 2. Median PFS (A) and OS (B) times in animals treated with MAb or placebo [1].

Tumor vaccines

Meriel has developed a xenogeneic vaccine containing plasmid DNA which encodes for CD20. Consequently, it enhances the production of antibodies against CD20 and creating a long-term destruction of malignant B-cells (Figure 3).

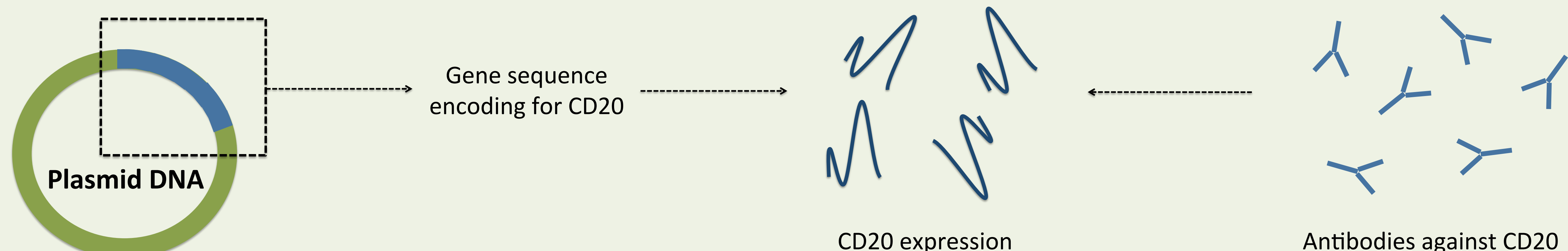


Figure 3. Mechanism of action of plasmid DNA vaccine against canine B-cell lymphoma.

Conclusions

- Rituximab uniquely binds to human CD20.
- New MAbs specifically targeted against canine CD20, such as AT-004, seem a promising strategy for treatment of canine B-cell lymphoma.
- Studies with Meriel's DNA vaccine against CD20 show great efficacy but further studies need to be carried out.

References

- [1] Ogilvie GK, Proulx DR, VanHorn L, Archer G, Monreal B, Moe E, Pope L, Hansen G, Alkuzweny B, FitzPatrick WM. Treatment of Canine B-Cell Lymphoma with Chemotherapy and a Canine Anti-CD20 Monoclonal Antibody: A Prospective Double-Blind, Randomized, Placebo-Controlled Study. Poster session presented at: Veterinary Cancer Society/American College of Veterinary Internal Medicine congress. October 2016/June 2017. St. Louis, MO/ Indianapolis, IN.