Dogizing Antibodies Against PD1 and CD20

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1. INTRODUCTION

Monoclonal antibodies are considered breakthrough therapeutics in several human cancers

These targeted treatments are mostly not available for companion animals

Development of efficient and safe immunotherapies is limited by the low clinical relevance of the available disease models

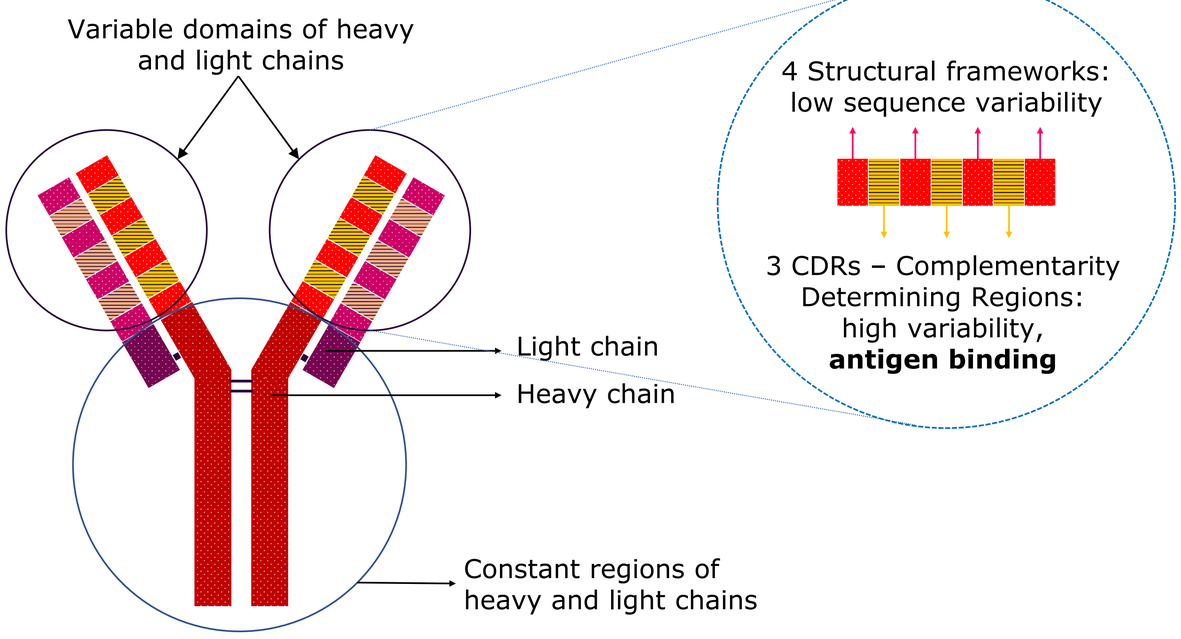
There is a high degree of similarity between some spontaneous **canine (dog)** cancers and their human equivalents, e.g. melanoma

2. OBJECTIVES

Mouse antibodies against canine CD20 and PD1 were developed to provide novel veterinary therapeutics and a model for comparative oncology. Although effective *in vitro*, murine antibodies cannot be used clinically in dogs due to immunogenicity. The aim of this project is

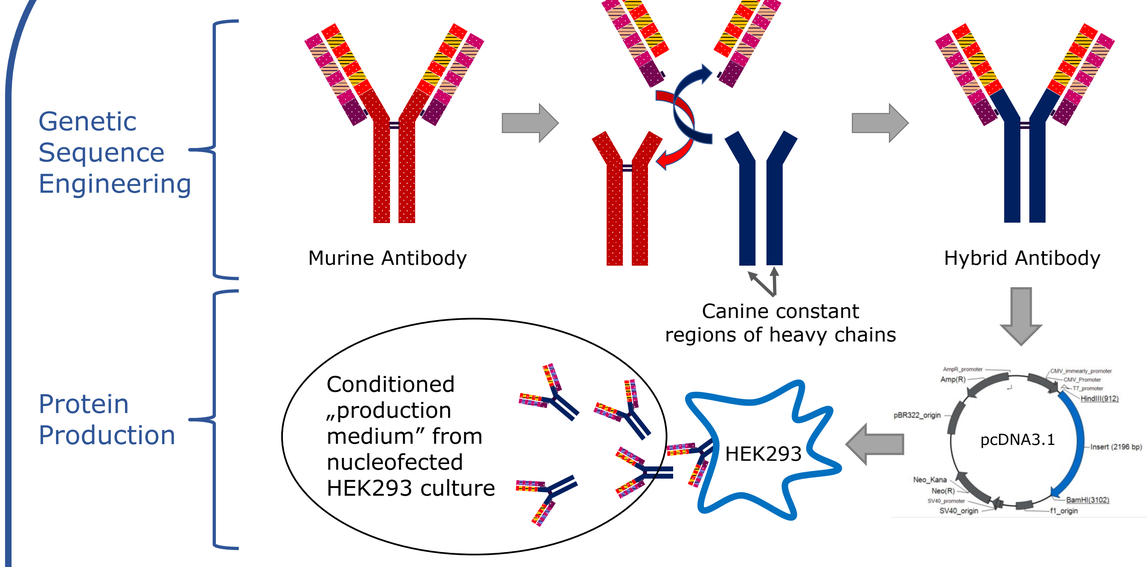
Engineering dogized antibodies against dog PD1 & CD20

3. IgG - STRUCTURE

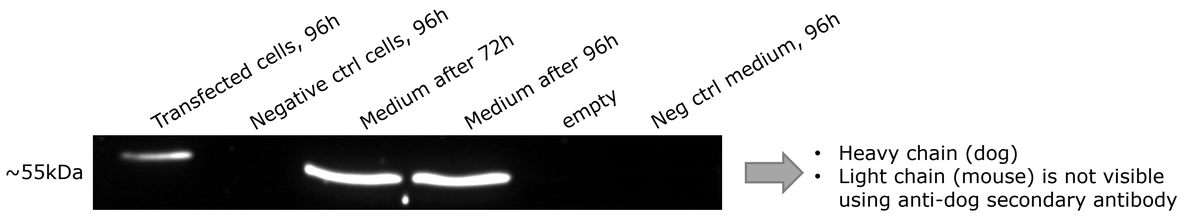


Murine antibodies developed previously are being modified in two steps

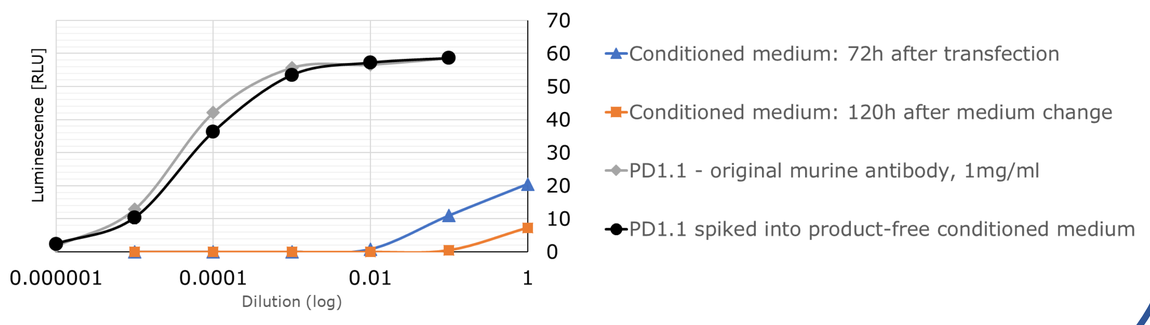
4. Hybrid Antibody



Successfull hybrid antibody production

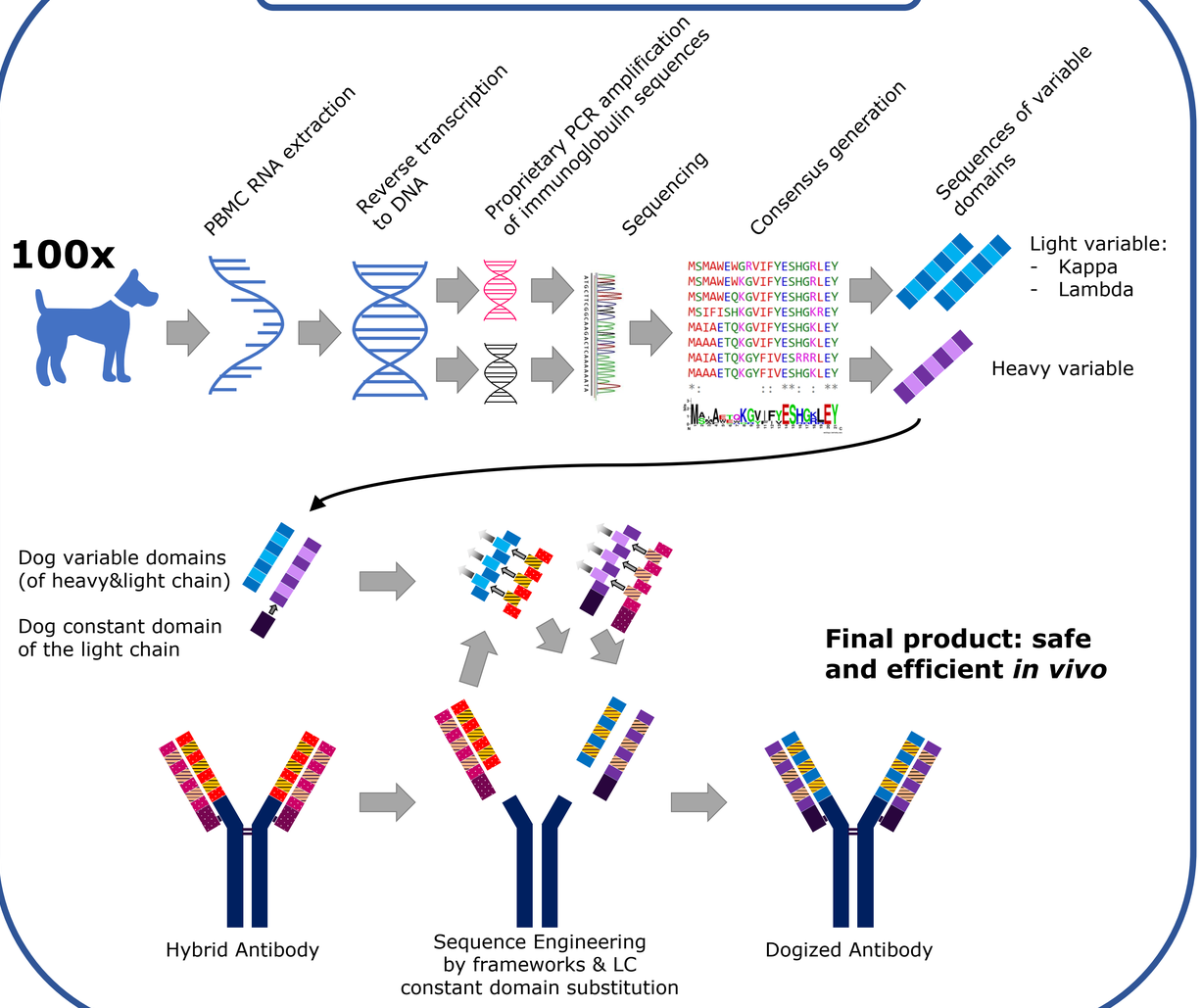


The hybrid antibody binds canine PD1 in ELISA



Lower signal strength can be explained by low AB concentration (no selection, purification). Analogous results were seen for CD20 hybrid product.

5. Fully dogized antibody



6. CONCLUSIONS

1. Hybrid antibodies have been successfully produced and exhibit target engagement
2. For each hybrid antibody a batch must be produced, purified and concentrated to enable comparison of the hybrid avidity with that of the parental molecule
3. Vectors encoding fully dogized antibodies will undergo the same procedure

7. FUTURE PLANS

If successful, the next step will produce fully dogized antibodies viable for use *in vivo* and their properties will be characterised. The results may be employed for:

1. Optimising a pipeline for cross-species antibody adaptation
2. High-yield production in cooperation with Eggcellent Proteins/Roslin Technologies
3. Clinical trial in dogs with melanoma and lymphoma, respectively
4. Engineering bi-specific antibodies, nanobodies or other therapeutic proteins

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1 - International Centre for Cancer Vaccine Science (ICCVS), PL
2 – Univerity of Edinburgh, UK
3 - University of Gdansk, PL

References:
1 Jain, S. *et al. PLoS One* 11, e0148366 (2016)
2 Parys, M. *et al. Cancer Res.* 78, LB-115-LB-115 (2018)

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