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Therapeutic Potential of mAb KP52 in Human and Feline Cancers

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Abstract : Introduction: Comparative oncology investigates the similarities in spontaneous carcinogenesis between humans and animals, in order to identify treatments that can benefit these patients. Companion animals (CA), like canines and felines, are of special interest when it comes to studying human cancers due to their exposure to the same environmental factors and develop tumours with similar features. The purpose of this study is to explore the cross-reactivity of monoclonal antibodies (mAbs) across cancers in humans and CA. Material and Methods: A panel of CA mAbs generated in the lab was screened on multiple human cancer cell lines through flow cytometry to identify for positive binders. Shortlisted candidates were then characterised by biochemical and functional assays e.g., antibody-drug conjugate (ADC) and western blot assays, including glycan studies. Results: Candidate mAb KP52 was generated from whole-cell immunisation using feline mammary carcinoma. KP52 showed strong positive binding to human cancer cells, such as breast cancer and ovarian cancer. Furthermore, KP52 demonstrated strong killing (> 50%) as an ADC with Saporin as the payload. Western blot results revealed the molecular weight of the antigen targets to be approximately 45kD and 50kD under reduced conditions. Glycan studies suggest that the epitope is glycan in nature, specifically an O-linked glycan. Conclusion: Candidate mAb KP52 has a therapeutic potential as an ADC against feline mammary cancer, human ovarian cancer, human mammary cancer, human pancreatic cancer, and human gastric cancer.

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