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Pros and cons of different therapeutic antibody formats for recombinant antivenom development

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1 *Review*

## 2 **Pros and cons of different therapeutic antibody formats for** 3 **recombinant antivenom development**

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### 16 **Abstract:**

17 Antibody technologies are being increasingly applied in the field of toxinology. Fuelled by the many advances in  
18 immunology, synthetic biology, and antibody research, different approaches and antibody formats are being  
19 investigated for the ability to neutralize animal toxins. These different molecular formats each have their own  
20 therapeutic characteristics. In this review, we provide an overview of the advances made in the development of  
21 toxin-targeting antibodies, and discuss the benefits and drawbacks of different antibody formats in relation to their  
22 ability to neutralize toxins, pharmacokinetic features, propensity to cause adverse reactions, formulation, and  
23 expression for research and development (R&D) purposes and large-scale manufacturing. A research trend seems to  
24 be emerging towards the use of human antibody formats as well as camelid heavy-domain antibody fragments due to  
25 their compatibility with the human immune system, beneficial therapeutic properties, and the ability to manufacture  
26 these molecules cost-effectively.

27 **Keywords:** Antivenom; venom; recombinant antivenom; antibodies; snakebite; scorpion sting; spider bite; animal  
28 envenoming; pharmacokinetics; pharmacodynamics; immunogenicity; venom neutralization; antibody expression;  
29 antivenom design; adverse reaction; neglected tropical diseases; biotechnology

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