

Antivenomics: a translational venomics platform for the preclinical efficacy evaluation of antivenoms

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Snakebite envenoming is a WHO class A neglected tropical disease that claims over 100,000 human lives annually worldwide. Snakebite envenoming represents a major issue for impoverished populations living in rural areas of tropical and subtropical regions across sub-Saharan Africa, South to Southeast Asia, Latin America and Oceania. Antivenoms constitute the only scientifically validated therapy for snakebite envenomings, provided they are safe, effective, affordable, accessible and administered appropriately. The assessment of the capacity of antivenoms to neutralize the lethal activity of snake venoms is the gold standard in the preclinical analysis of antivenom efficacy. To aid in the preclinical testing of antivenoms, our group has developed "antivenomics", a venomics-guided affinity chromatography-based platform for the quantitative toxin-resolved assessment of the immunorecognition landscape of antivenoms towards homologous and heterologous venoms. Antivenomics is translational venomics. In this talk we will discuss the operational principles of this omics platform and will show its practical application towards a knowledge-based improvement of antivenom design and efficacy.