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Development of two monovalent antivenoms against two Moroccan viper venoms– daboia Mauritanica and Cerastes Cerastes

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DEVELOPPEMENT OF TWO MONOSPECIFIC FAB'2 ANTIVENOMS AGAINST CERASTES CERASTES AND MACROVIPERA MAURETANICA VENOMS

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Snake envenomation entails more than 5 million people bitten yearly, out of whom 100,000 died and more than 300,000 are permanently disabled. This prompted the World Health Organization to classify snake envenoming as a neglected tropical disease in 2017.

In North Africa, we have more than 400.000 cases of envenomation with 50 deaths per year. These numbers are underestimated with the Cerastes cerastes (Cc) and Macrovipera mauretanica (Mm)are the most medically important snake species.

To this day, the only medication for snake envenomation is immunotherapy. The lack of a specific antivenom against Cc and Mm venoms in North Africa, prompted us to develop two monospecific Fab'2 antivenoms in collaboration with the Butantan Institute in Brazil: one is produced against Moroccan Cc venom and the other against Moroccan Mm.

While we determiated the paraspecific cross-reactivity of the antivenoms developped, the in vitro paraspecifity study surprisingly revealed a cross reactivity between the two monospecific Fab'2 antivenoms developped towards Mm and Cc venoms

venoms from Morocco, Algeria and Tunisia

This convince us to apply an antivenomic approach to assess the immunoreactivity profile of the two antivenoms towards Cc and Mm venoms from Morocco and Tunisia

our results show that the Tunisian and Moroccan Mm and Cc venoms that are remarkably similar, and for practical purposes can be regarded as geographic variants. Antivenoms generated in Morocco have a high degree of paraspecificity.

Then, we can say that The translational venomic approach combining venomic and antivenomic should assist the preclinical assessment of antivenom efficacy, and will lead to a new generation of pre- and clinically more effective antivenoms.