

Introduction

Severity of the **envenoming by apitoxin** depends on the individual's sensitivity and also on the number of stings. No specific therapy is currently available and then a safe and effective treatments, such as antivenoms, are required.

An alternative to mammal polyclonal immunoglobulins is the use of **egg yolk antibodies (IgY)** due to its advantages regarding animal welfare and lower costs of production.

In this work, we evaluated the efficacy of an **IgY-based antivenom** against apitoxin from honeybees (*Apis mellifera*).

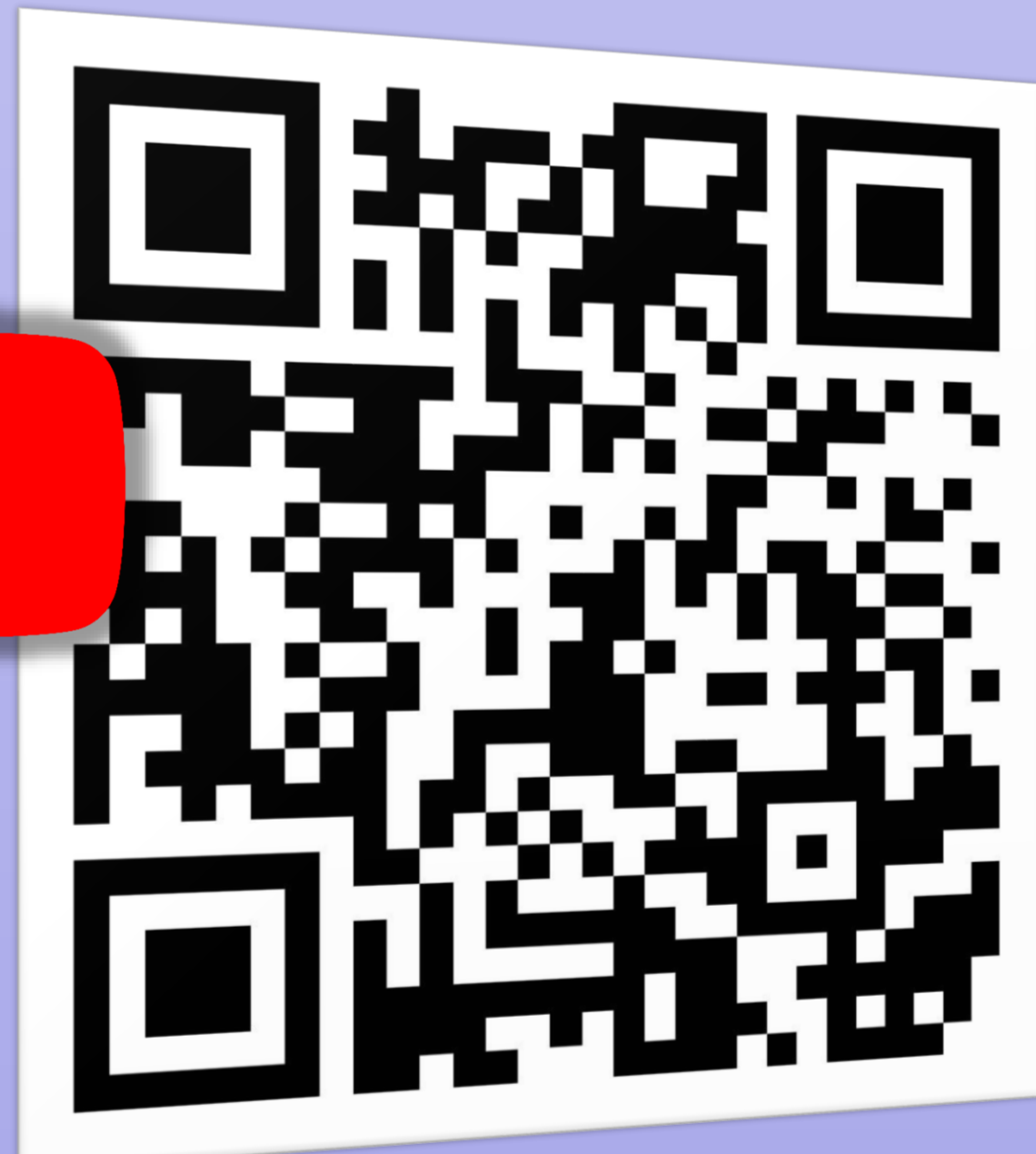


Figure 1. The venom of *Apis mellifera* is a complex mixture of proteins with hemolytic and myotoxic activities.

Methodology

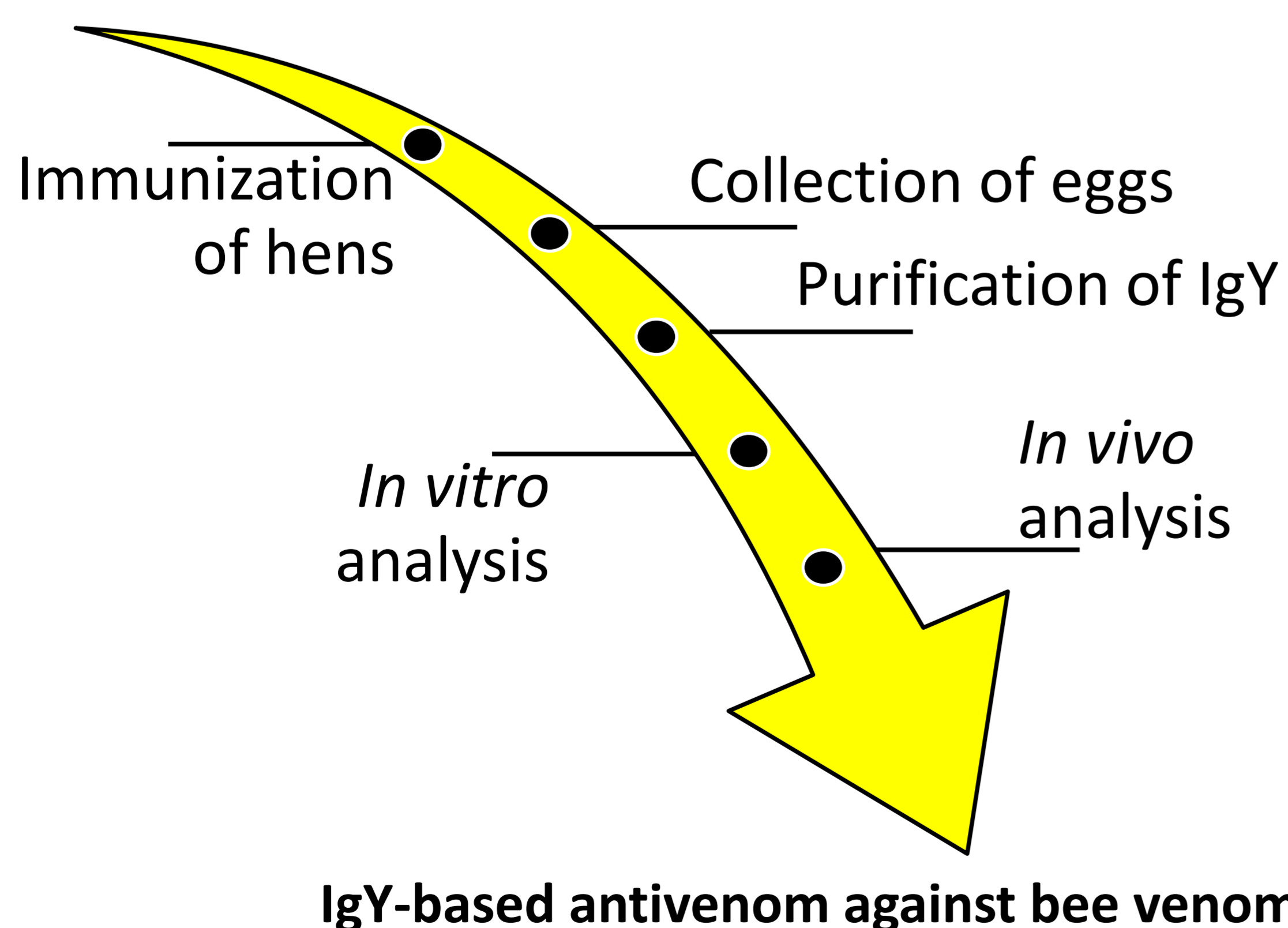


Figure 2. Overview of the production of IgY antibodies against apitoxin. Experiments were approved by the IACUC from the CICVYA-INTA (Procedure Nr. 20/2012). Median effective dose (ED₅₀) assay was performed according to WHO guidelines (2017).

Results

Titers of specific IgY increased after the subsequent immunizations and IgY antibodies detected the main components of the apitoxin. After 4 immunizations, hens produced IgY able to neutralize the venom.

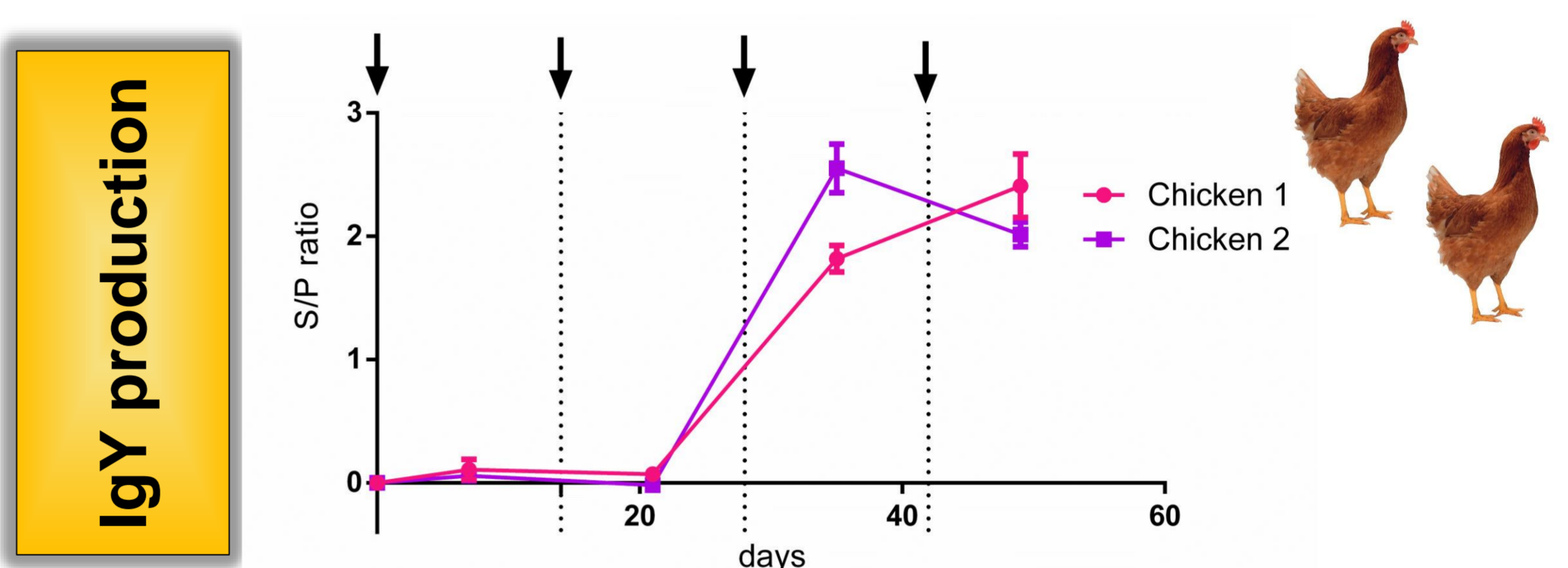


Figure 3. Relative level of IgY antibodies.

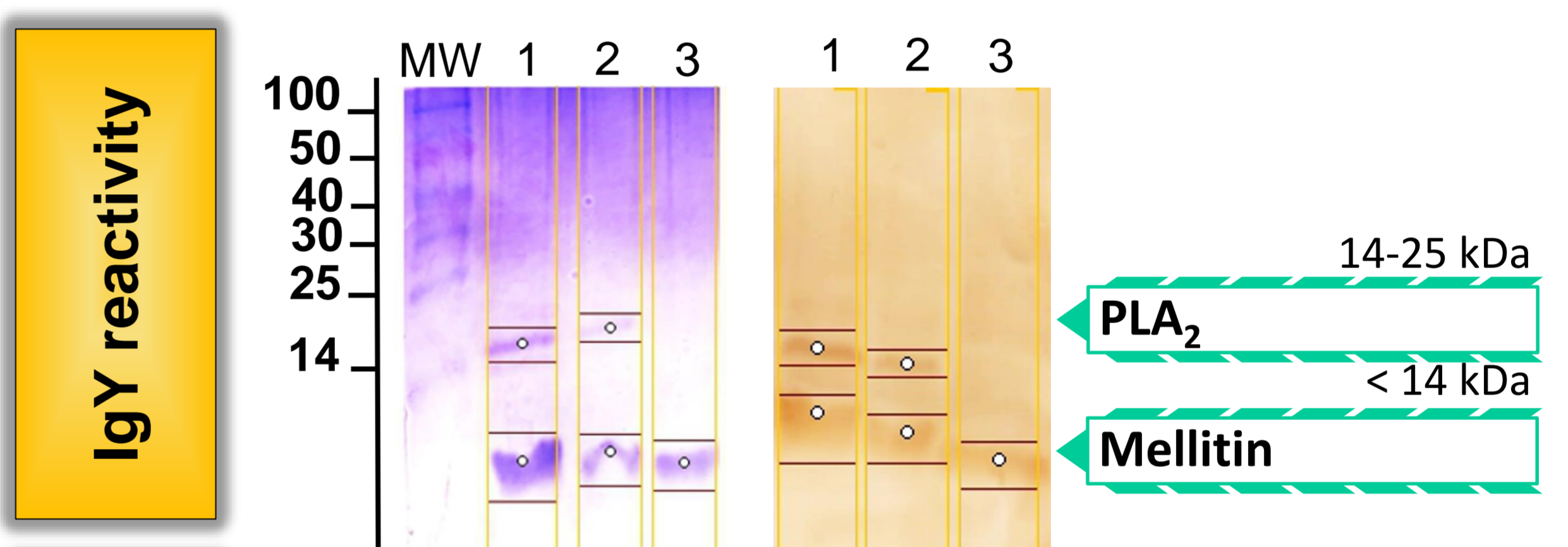


Figure 4. SDS-PAGE (20% under reducing conditions) and Western-Blot of apitoxin. Lanes 1: apitoxin 10 µg; lanes 2: apitoxin 5 µg; lanes 3: mellitin (Sigma) 5 µg.

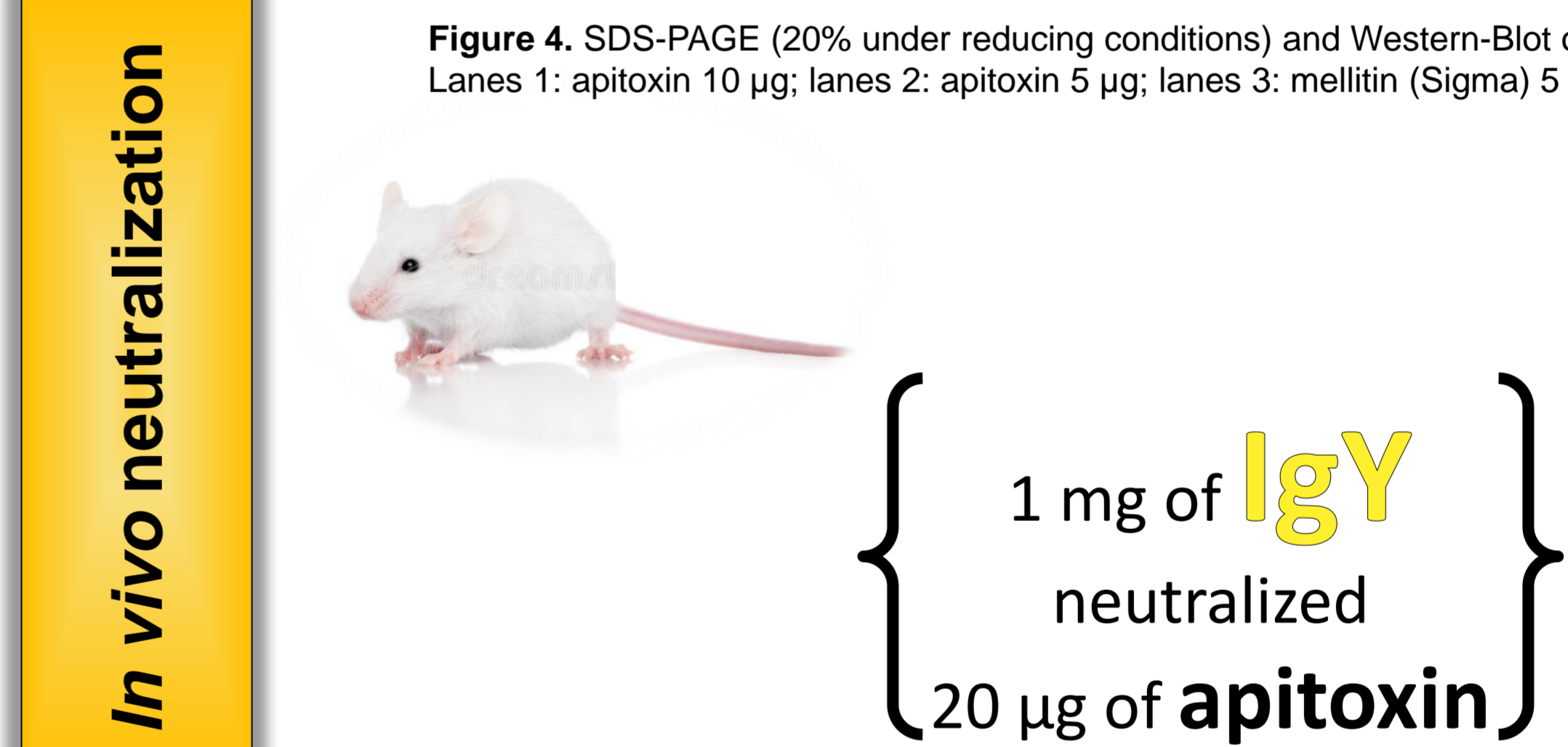


Figure 5. Neutralization of lethality of IgY antivenom.

Conclusions

We produced **IgY antivenoms** capable of neutralizing the lethal activity of **apitoxin** at a preclinical level. Thus, our results show the feasibility to develop antivenoms based on egg yolk antibodies for the **treatment of hypersensitive patients** to bee venom.