Monoclonal mouse antibodies against Camel Immunglobulins

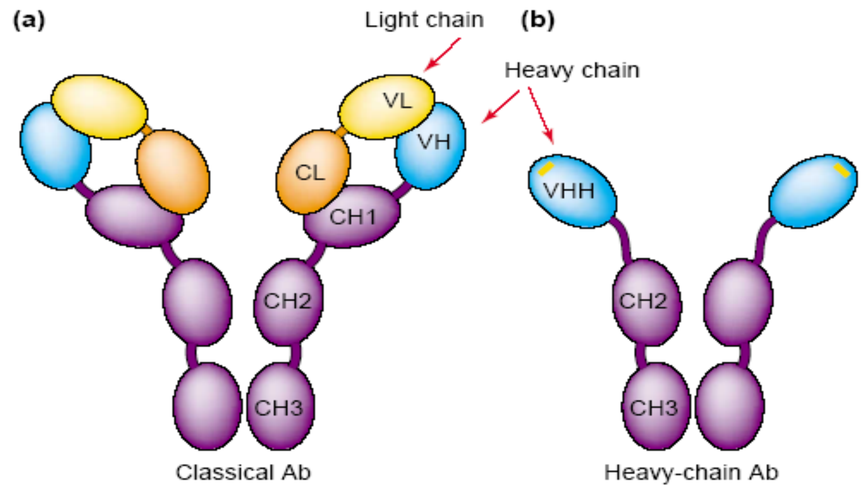
Pamela Holzloehner[1], Monique Butze[1], Erik Schliebs[2], Natalia Maier[1], Jonas Füner[2], Burkhard Micheel[1], Katja Hanack[1]

[1] University of Potsdam, Antibody Technologies, 14476 Potsdam, Germany

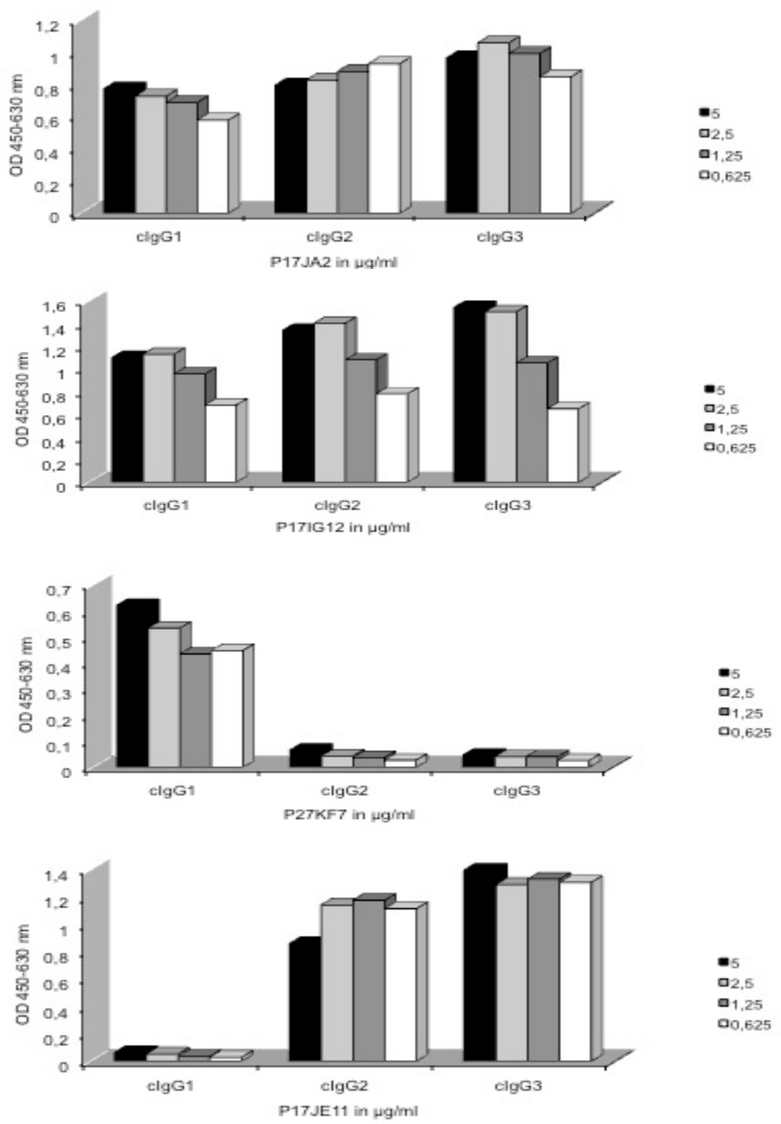
[2] Preclinics GmbH, 14482 Potsdam, Germany

Introduction

Camelid antibodies are of special interest because some of them belong to immunoglobulin subclasses (IgG2 and IgG3) which are build up only by heavy chains. The advantages of these heavy chain antibodies is their small size which allows them to penetrate deep into tissues. It is furthermore assumed that their fingerlike VHH binding domain can bind within the active center of enzymes. To use such antibodies for practical application we need specific identification tools. Therefore, we generated monoclonal antibodies, that bind to camelide total IgG as well as only to the conventional camelide IgG1 and the heavy chain camelid IgG2/3. The monoclonal antibodies are suitable to detect camelid antibodies by enzyme immunoassay (ELISA) but not in western blots, indicating that the binding epitopes are discontinuous.



Daley et.al., Clin Diagn Lab Immunol. 12, 380-386,2005



Results and conclusion

Mouse monoclonal antibodies were generated by hybridoma technology and selected for specific binding of camelid subclasses. We could identify two monoclonal antibodies (P17JA2 and P17IG12) which are able to detect whole camelid immunoglobulin. Further we selected monoclonal antibodies specific for camelid IgG1 (P27KF7) and camelid heavy chain immunglobulins (P17JE11). With those antibodies we were able to build up sandwich based immunoassays to detect the presence of different subclasses in camelid sera. With this assay we could further investigate related antibody responses in New and Old World Camels after vaccination with several antigens. We also tested the monoclonal antibodies for cross reactivity with sera of other species as rabbit, human, goat, sheep, chicken and bovine and could not detect any cross reactivity with immunoglobulins of those species.

The generated antibodies are very useful tools to investigate the presence of conventional and heavy chain subclasses in sera of healthy and diseased camels and also in supernatants of hybridoma cultures. Currently, experiments are performed which allows the generation of monoclonal camelid antibodies by hybridoma technology. Both conventional four-chain and heavy chain-only antibodies will be of interest since new species will in any case offer a new spectrum of antibody specificities. This might be especially important when immunizing camels with human cells and tissues. Since the Camelidae do have the same evolutionary distance to both primates and rodents it can be assumed that several camel anti-human cell-specific antibodies might also react with mouse cells and tissues. Mouse models are still the most important experimental models for human diseases, and antibodies which react both in human beings and in the mouse will be particularly valuable.

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Contact:

Pamela Holzlöhner pamela.holzloehner@uni-potsdam.de
Erik Schliebs es@preclinics.com
Katja Hanack katja.heilmann@uni-potsdam.de