Recombinant human antibodies

Institute of Virology, University of Leipzig

Medical Problem:

For several dangerous viral diseases such as Ebola fever no vaccine or treatment is available. Human antibodies have the potential to protect against the diseases but it has been difficult to generate such antibodies. The main reason for the lack of antibodies is that it has been difficult to isolate and culture antibody-secreting B-cells from humans.

Solutions:

We have established a method to isolate virus-specific memory B-cells from blood samples of healthy donors. From these cells, we cloned the antibody genes and produced antibody in cell culture. Antibodies can be produced in unlimited quantities (Figure 1).

Results:

We have produced numerous antibodies against the influenza virus. The antibodies react strongly with the influenza virus nucleoprotein in ELISA and Western blot tests (Figure 2).

Applications:

The method constitutes a platform that can be applied to human antibodies against

- Viruses such as Hepatitis A virus, Hepatitis B virus, Ebola virus, Lassa virus, Rift-Valley fever virus etc.
- Bacteria and parasites
- Toxins such as tetanus toxin, diphtheria toxin
- Allergens such as be venome proteins

Figure 1: Production scheme for human virus-specific antibodies by antibody gene cloning

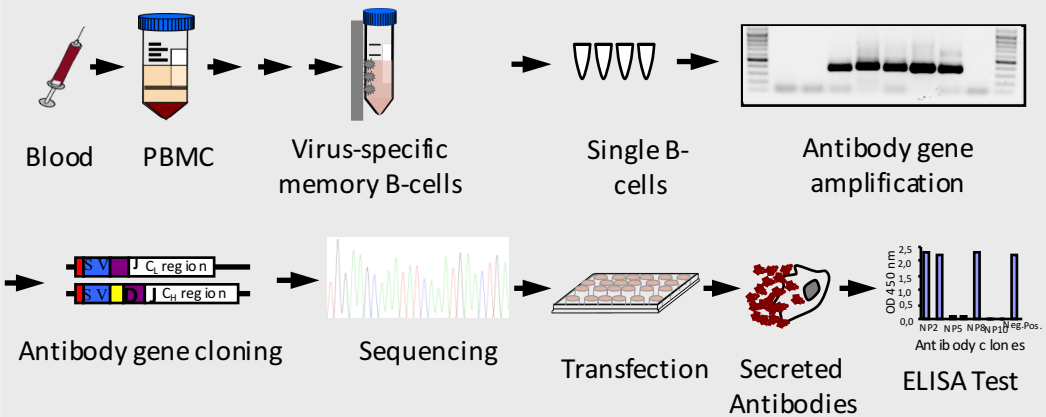
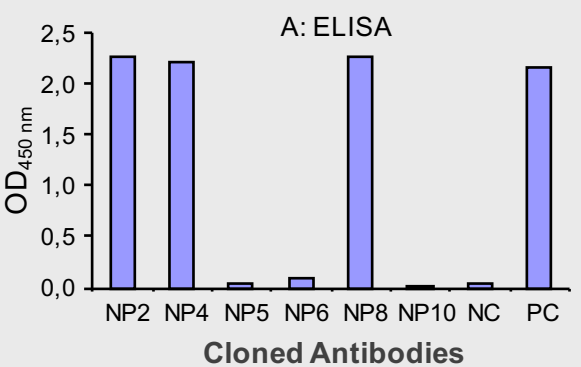
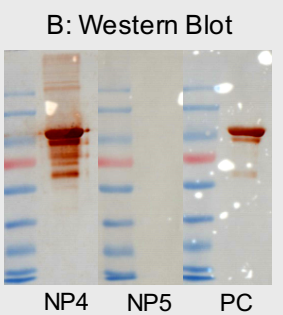


Figure 2: Reactivity of cloned human antibodies with the influenza virus nucleoprotein



A: Three of six cloned antibodies react with the influenza virus nucleoprotein. NC: negative control, PC: positive control.



B: Antibody
NP4 binds to the influenza virus nucleoprotein.
PC: positive control

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GWT forschung+innovation

Status of invention and next steps

Idea

Field of activity:
- Molecular Virology
- Immune response to virus infections

✓

Demonstrator

Proof of principle:
method to isolate virus-specific memory B-cells; design and manufacture of numerous antibodies against influenza virus

✓

Prototype

The scientist want

- **To develop human antibodies against a viral target in collaboration with an industrial partner**
- **To license a protocol and plasmids for human antibody gene cloning and antibody production**
- **To license recombinant human monoclonal antibodies against the nucleoprotein of influenza A virus**

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Series Production

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