

SINGLE IMMUNIZATION WITH CODON-OPTIMISED GENE OF CONSENSUS RABIES VIRUS GLYCOPROTEIN IS ABLE TO ELICIT NEUTRALIZING ANTIBODIES IN MICE

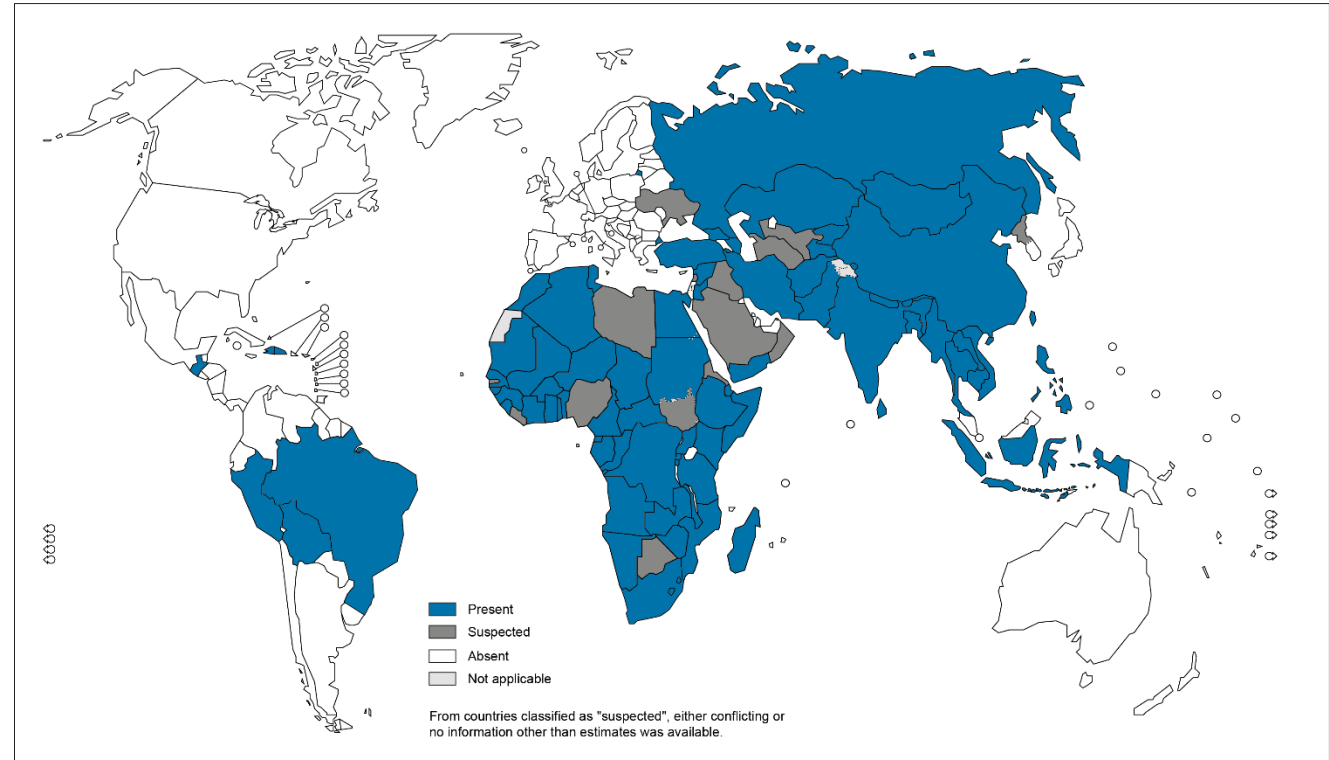
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Distribution of rabies

- 150 countries
- All continents, except for Antarctic
- >50 000 death cases
- Not only in developing countries

Presence of dog-transmitted human rabies based on most recent data points from different sources, 2010-2014



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Data Source: World Health Organization
Map Production: Control of Neglected
Tropical Diseases (NTD)
World Health Organization



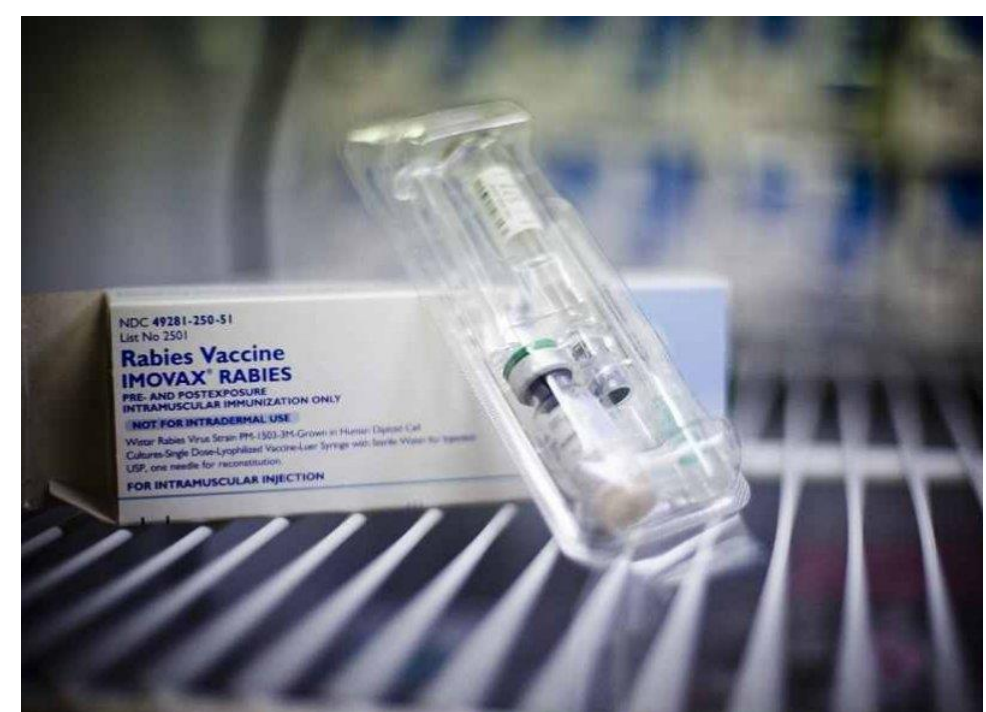
<http://www.who.int/rabies/epidemiology/en/>

Vaccines

- Only inactivated virus
- Cell culture or chicken embryo origin
- Safety

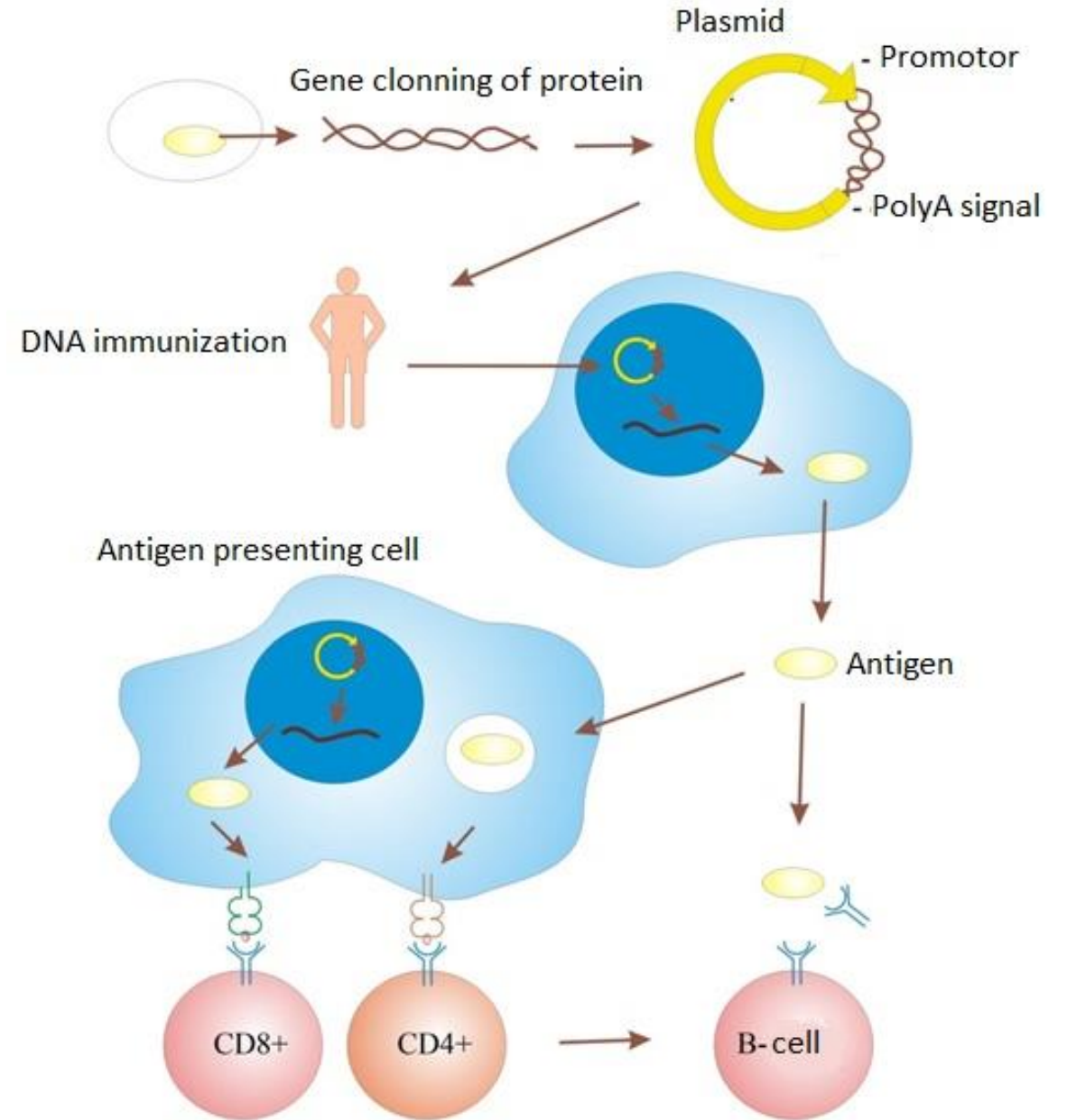
BUT:

- Minor adverse reaction
- Cold chain
- Expensive



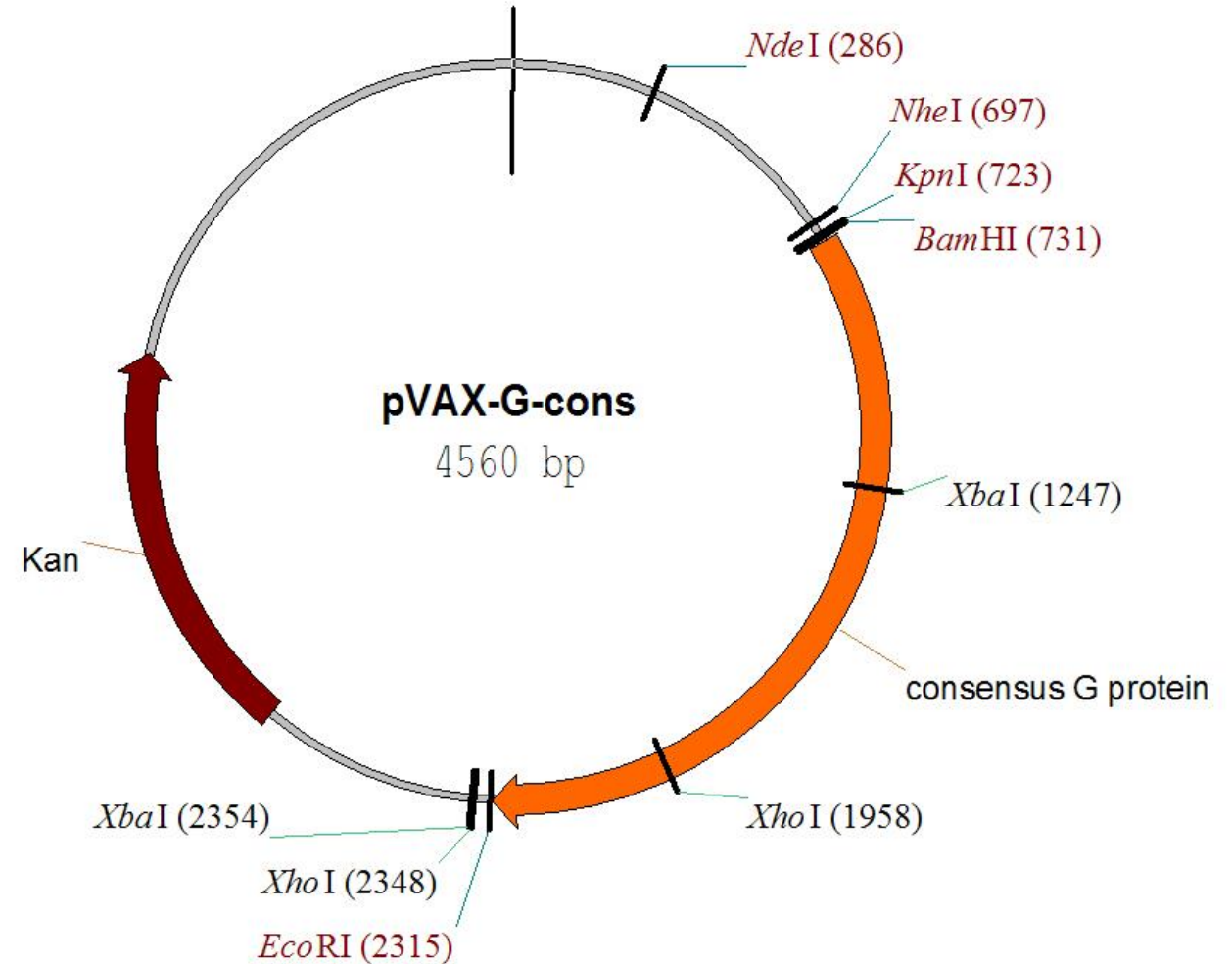
DNA vaccines

- Safety
- Wide range of manipulation
- High immunogenicity
- Cellular and humoral immune response
- Low cost production



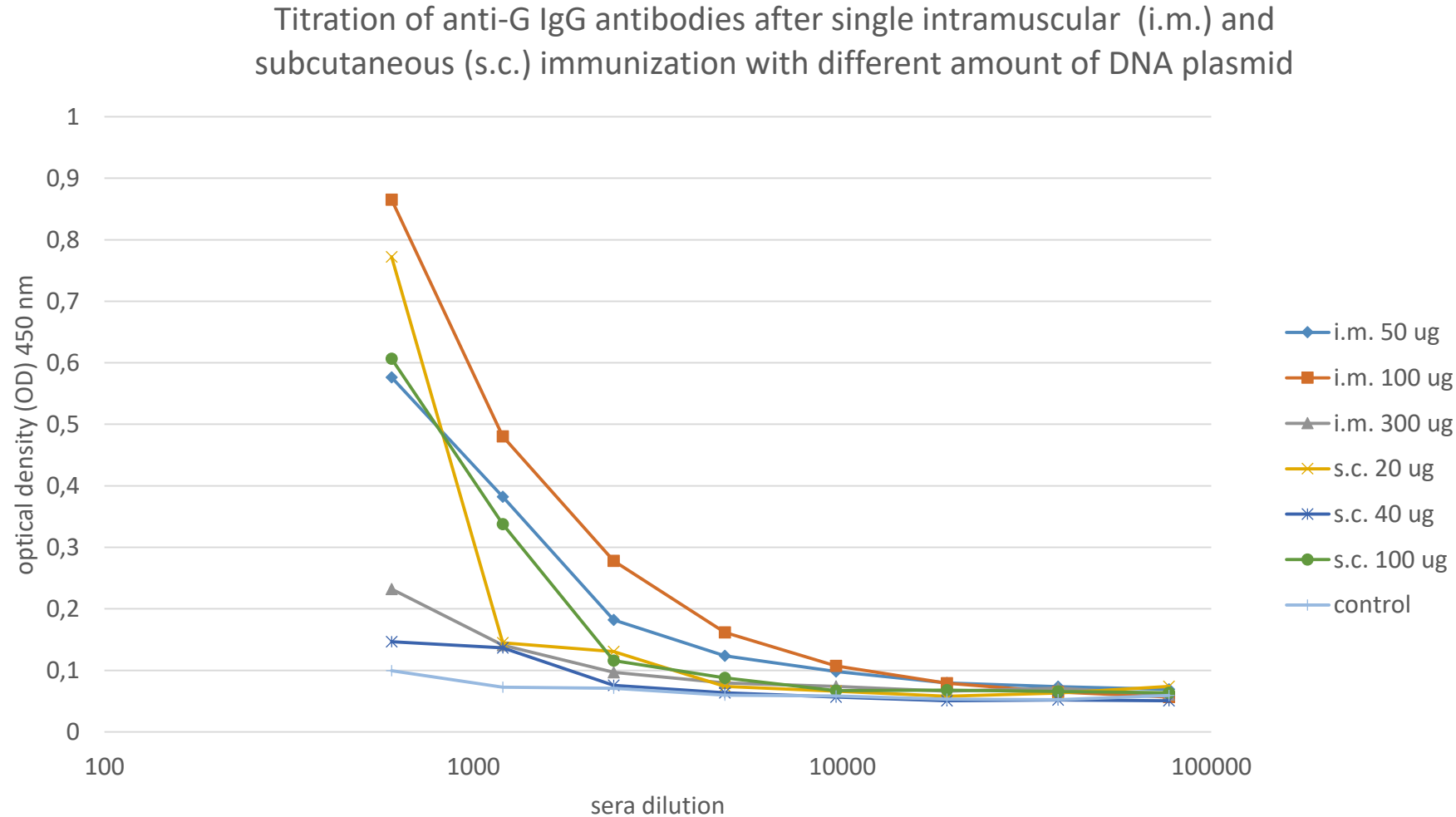
Construction of plasmid

- Glycoprotein (G protein) was used as antigen
- 127 sequences of glycoprotein of rabies virus registered in Russia were aligned
- Consensus amino acid sequence was created
- Codon-optimized gene encoding consensus G was integrated into pVax vector



Selection of DNA immunization protocol

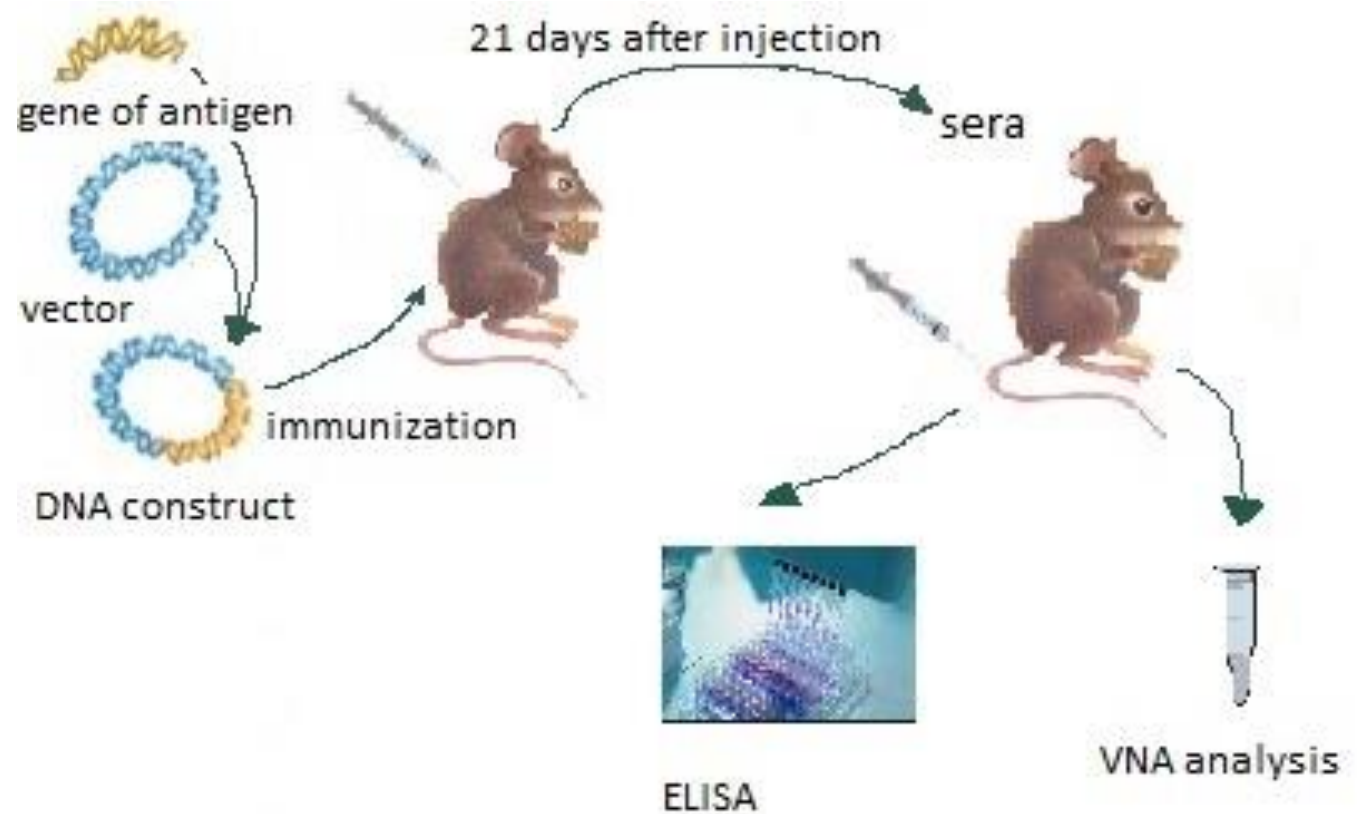
- BALB/c mice were immunized intramuscularly or subcutaneously with plasmid pVax-G-cons
- 21 days after sera were collected and analyzed by ELISA



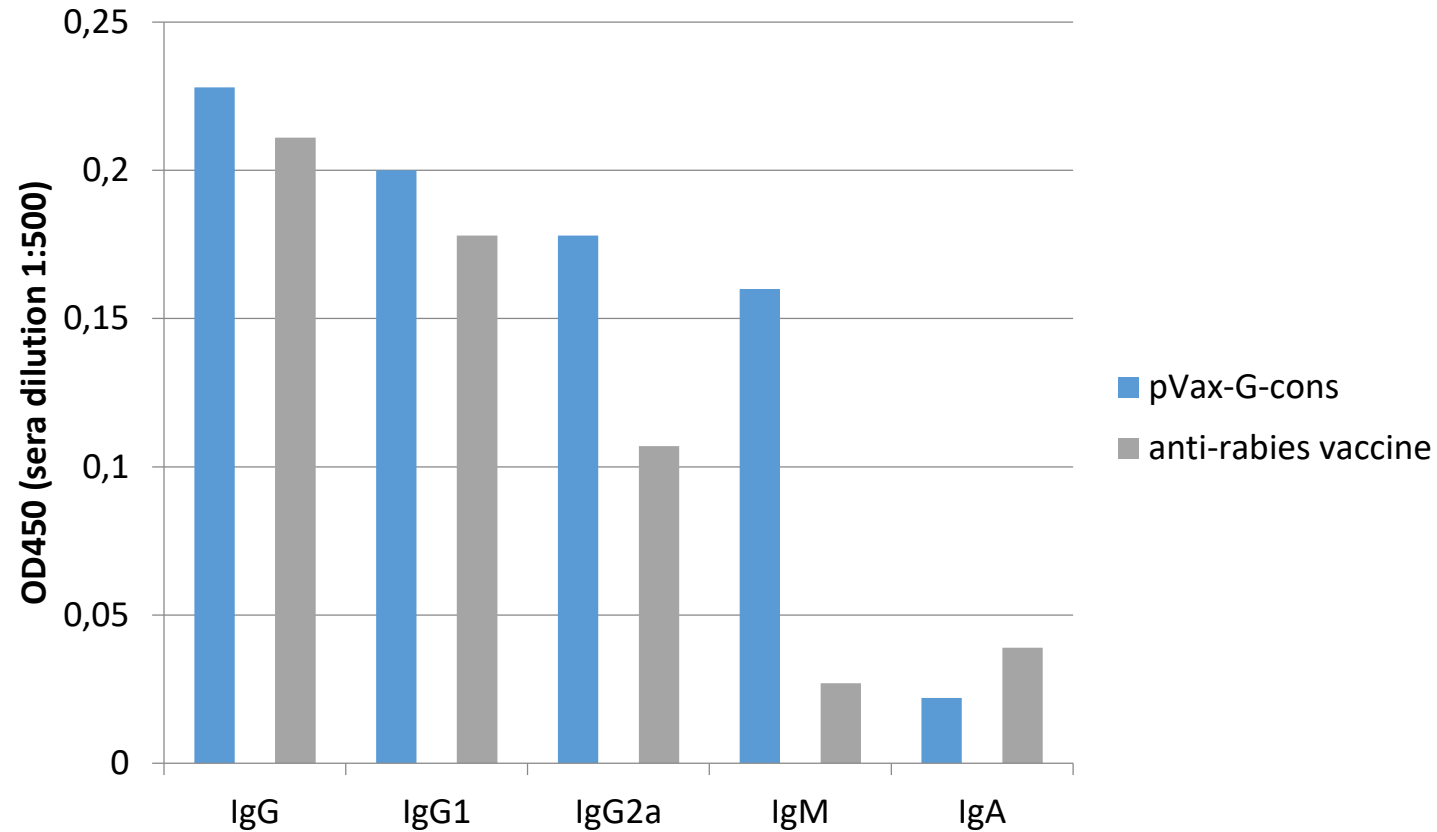
- The highest titer 1:9600 was detected in mice i.m. injected with 100 ug of plasmid

Testing of plasmid in mice

- BALB/c mice (n=8) were immunized i.m. with 100 ug of plasmid delivered in two sites
- 21 days after injection sera were collected
- Sera were analyzed for antibodies by ELISA
- Sera were analyzed for virus neutralization antibodies (VNA) by FAVN test



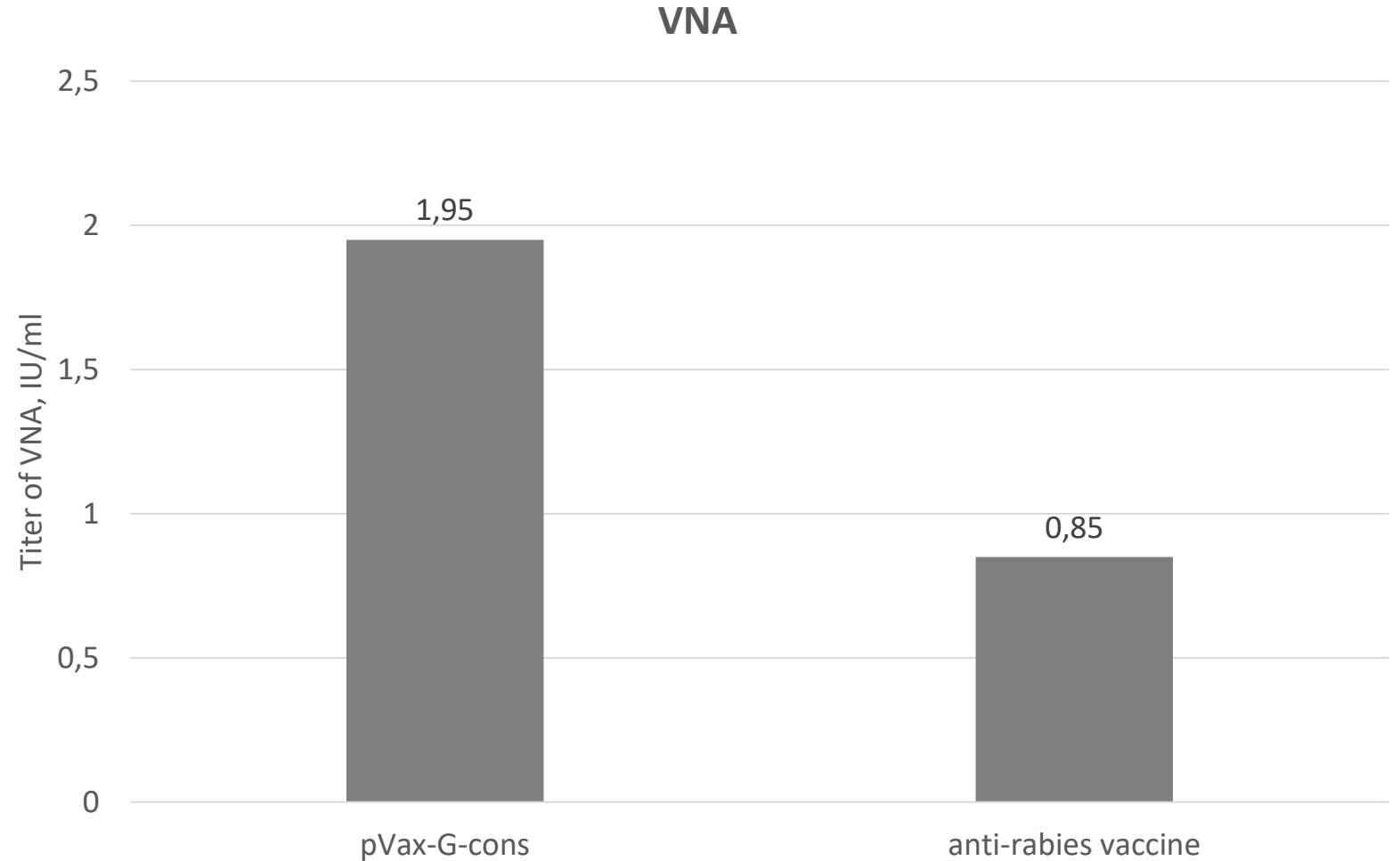
Subtypes of anti-G antibodies in i.m. immunized mice



DNA immunization elicited higher IgG1, IgG2a and IgM antibodies than commercial anti-rabies vaccine

Virus neutralization antibodies (VNA)

- Plasmid with consensus sequence of glycoprotein elicited 1,95 IU/ml titer of VNA
- Commercial anti-rabies vaccine elicited 0,85 IU/ml titer of VNA



Conclusions

- Plasmid with codon-optimized gene of consensus rabies virus glycoprotein was created.
- Optimal conditions for immunization in mice were selected
- DNA immunization is able to elicit anti-glycoprotein antibodies in mice.
- Antibodies have the virus neutralization activity

Thank you !