Clinical Trials of a Plague Vaccine in China

Jingxin Li
Jiangsu Province Center for Disease Prevention and Control

Plague vaccine used in a phase 2a trial

Formulation: natural F1 protein (F1) and recombinant V protein (rV) at a ratio of 1:1

Buffer: saline

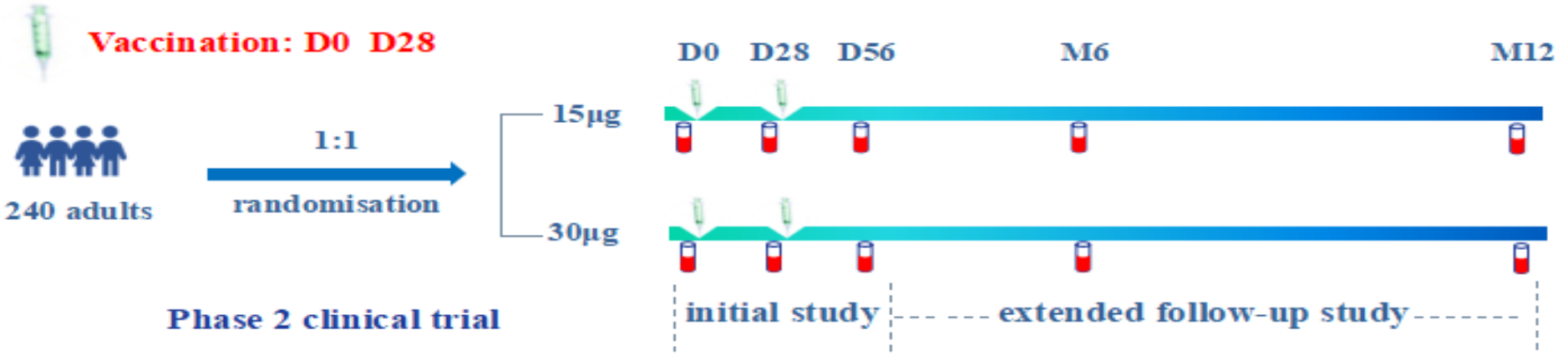
Adjuvant: aluminum

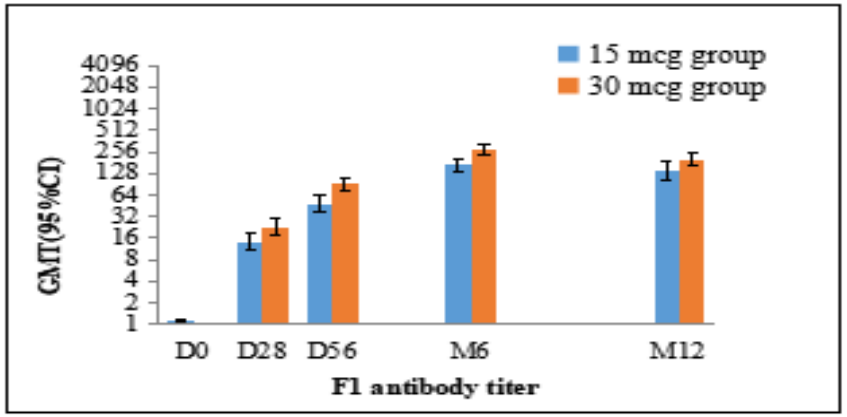
Manufacturer : Lanzhou Institute of Biological Products Co., Ltd.

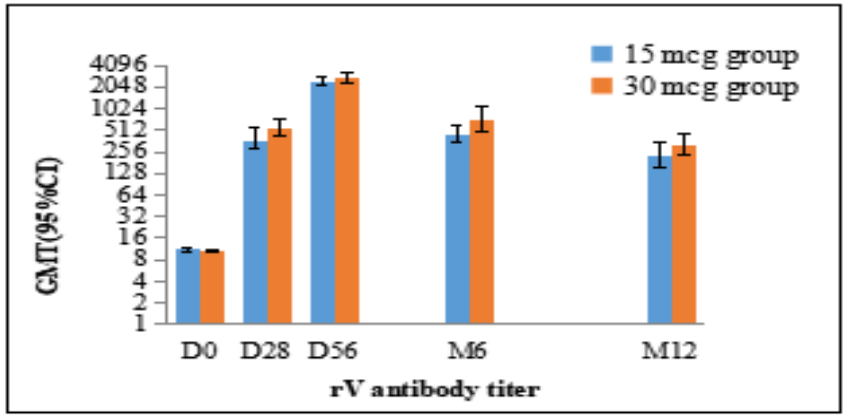
- **rV antigen was expressed in E. coli.**
- **F1 was extracted and purified from a live attenuated Y. pestis strain**

Dose	Antigen / formulation
15.0μg	15.0μg F1 antigen、15.0μg rV antigen, 1.0ml
30.0μg	30.0μg F1 antigen、30.0μg rV antigen, 1.0ml

Immunogenicity results after two dose vaccination in the phase 2a trial





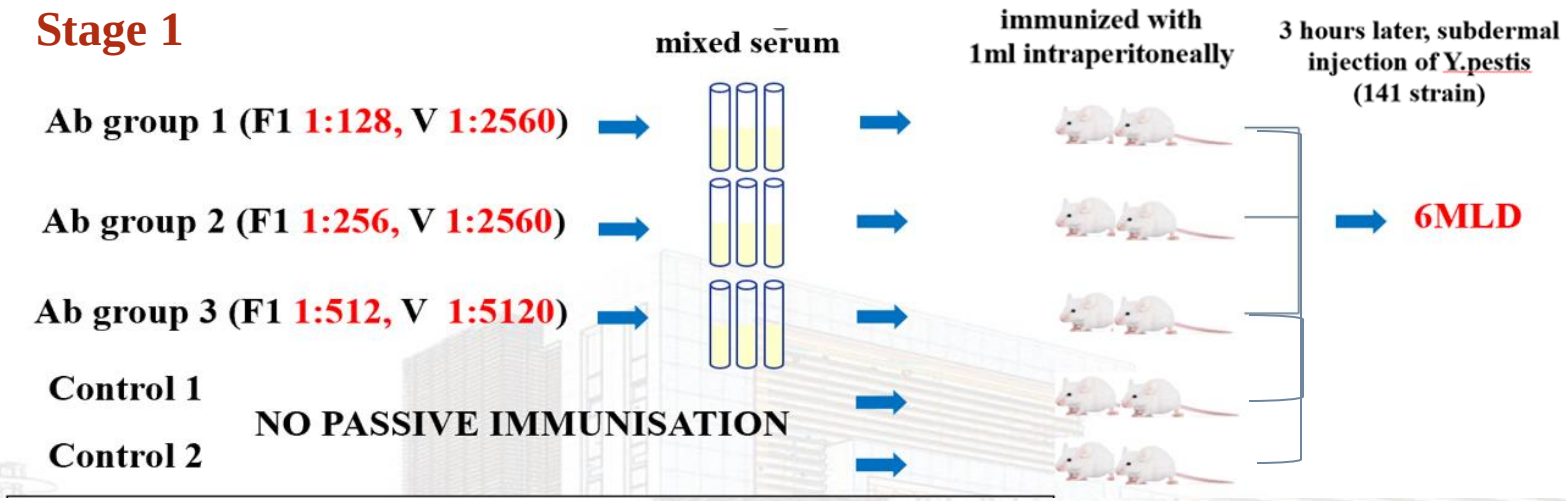


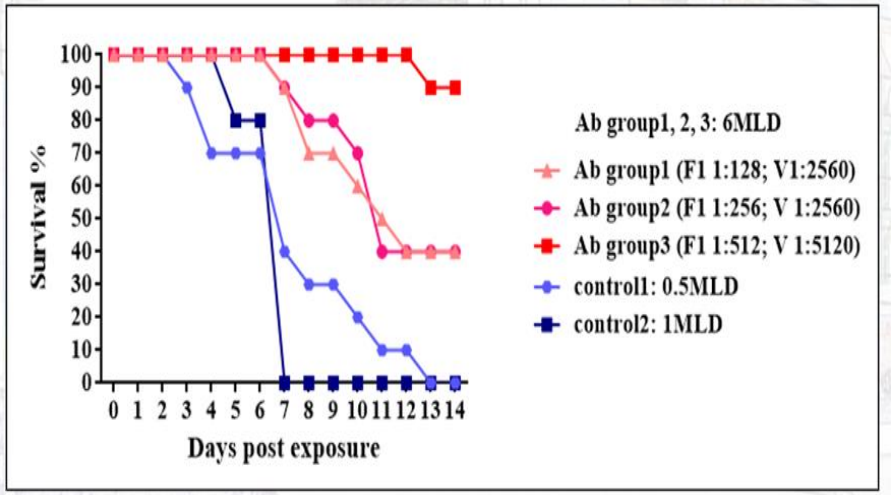
Conclusions:

- 30 ug formulation elicited higher level of antibodies than 15 ug formulation
- F1 and rV antibody in both groups are robust by month 12

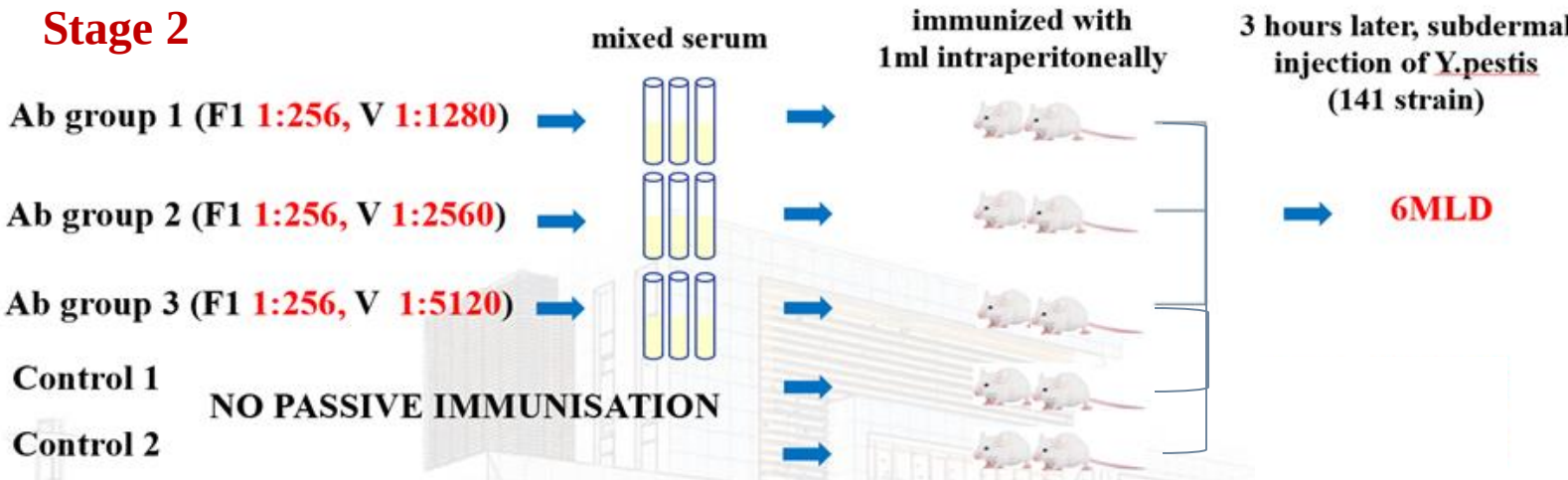
Animal rule of immunized serum from the phase 2a trial

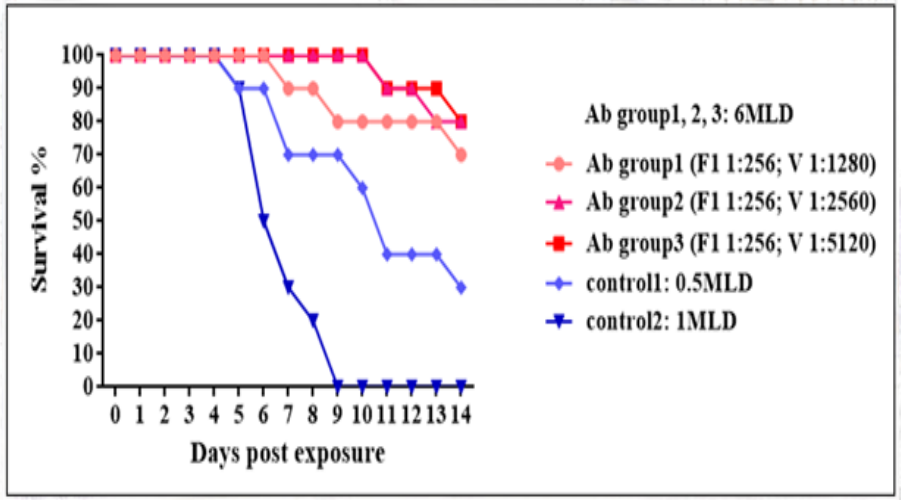
Stage 1





Stage 2

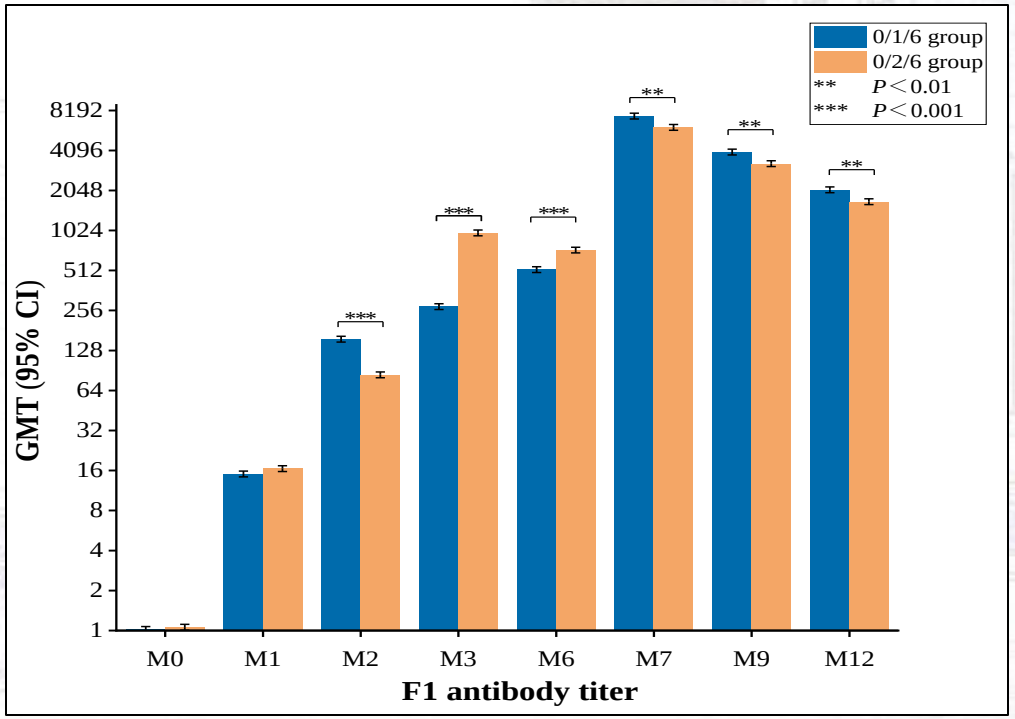


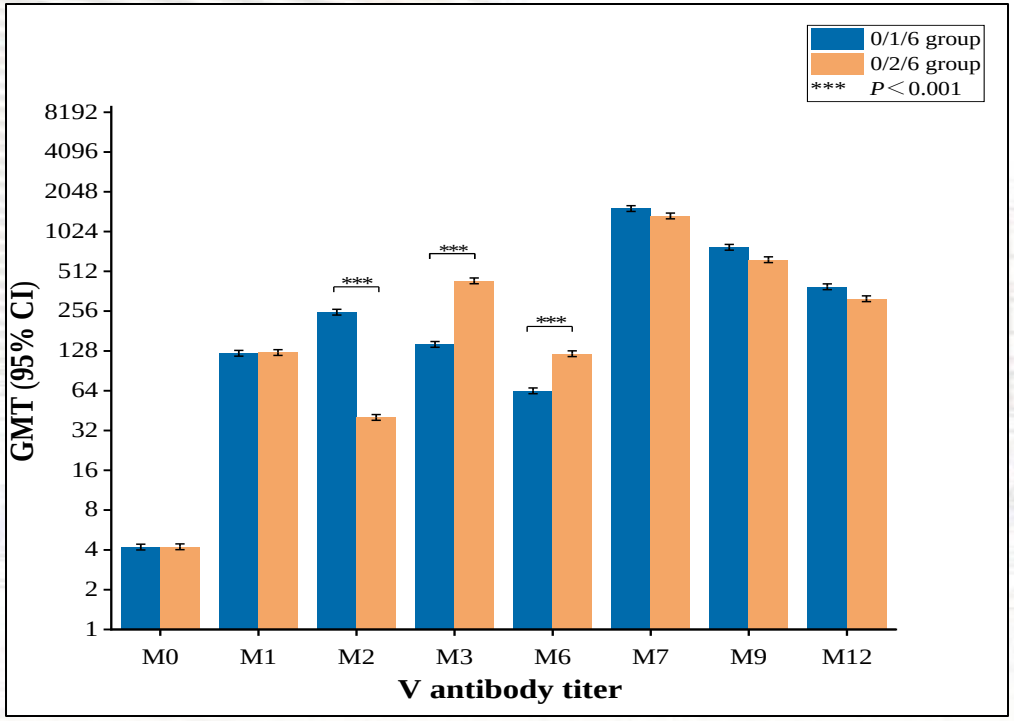


Plague vaccine in a Phase 2b trial

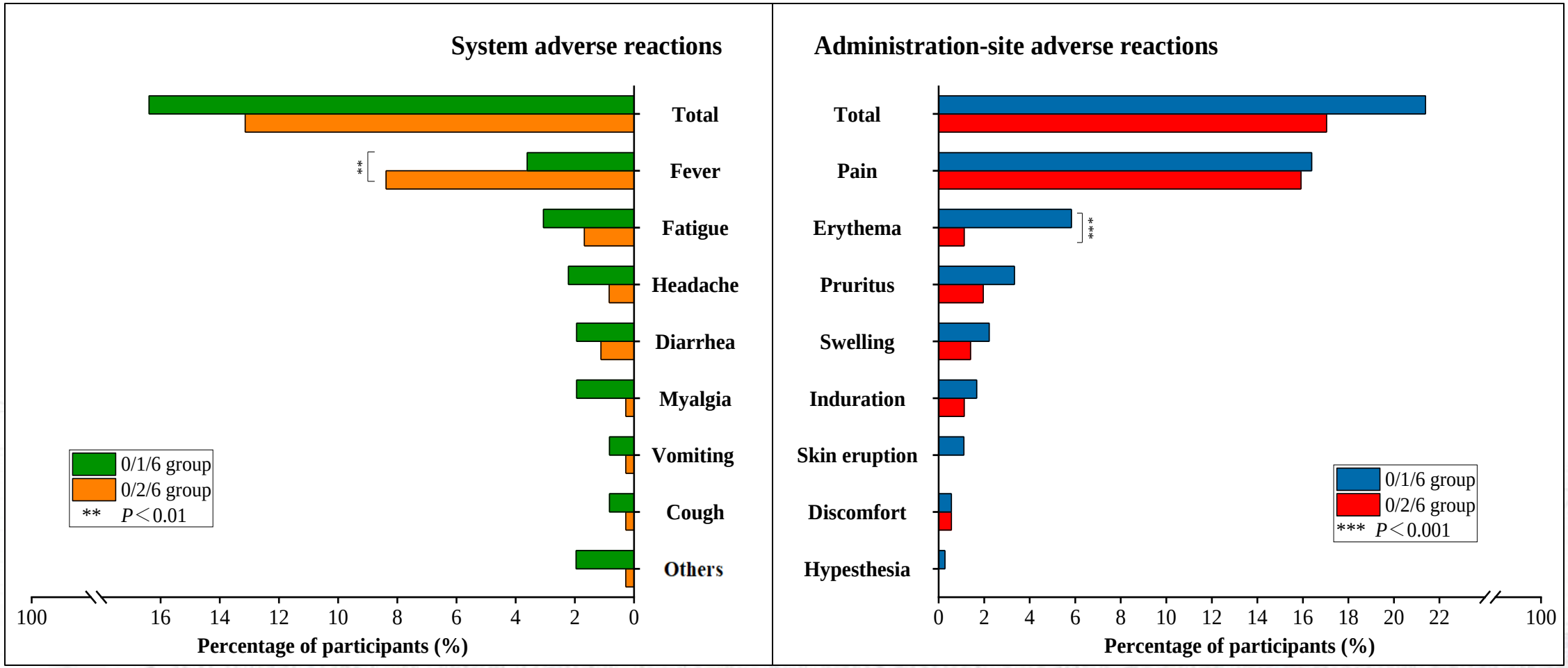
30.0μg F1 and 30.0μg rV antigen, 1.0ml/dose

➢ **F1 and V antibody GMT after the vaccination**





Safety profile of the plague vaccine



- The safety profiles of the vaccination regimens (M 0/1/6 and M 0/2/6) were similar. Most of adverse reactions observed in this study were mild, the incidence of grade 3 adverse reactions were low.
- The most common injection-site adverse reaction was injection-site pain, and the most common systemic adverse reaction was fever.

Animal rule of immunized serum from the phase 2b trial

12 mouse / group

Mixed serum

Immunized with 1ml intraperitoneally

3 hours later, subdermal injection of Y.pestis (141 strain)

Ab group1 (**F1** 1:32/**V** 1:16)

Ab group2 (**F1** 1:128/**V** 1:64)

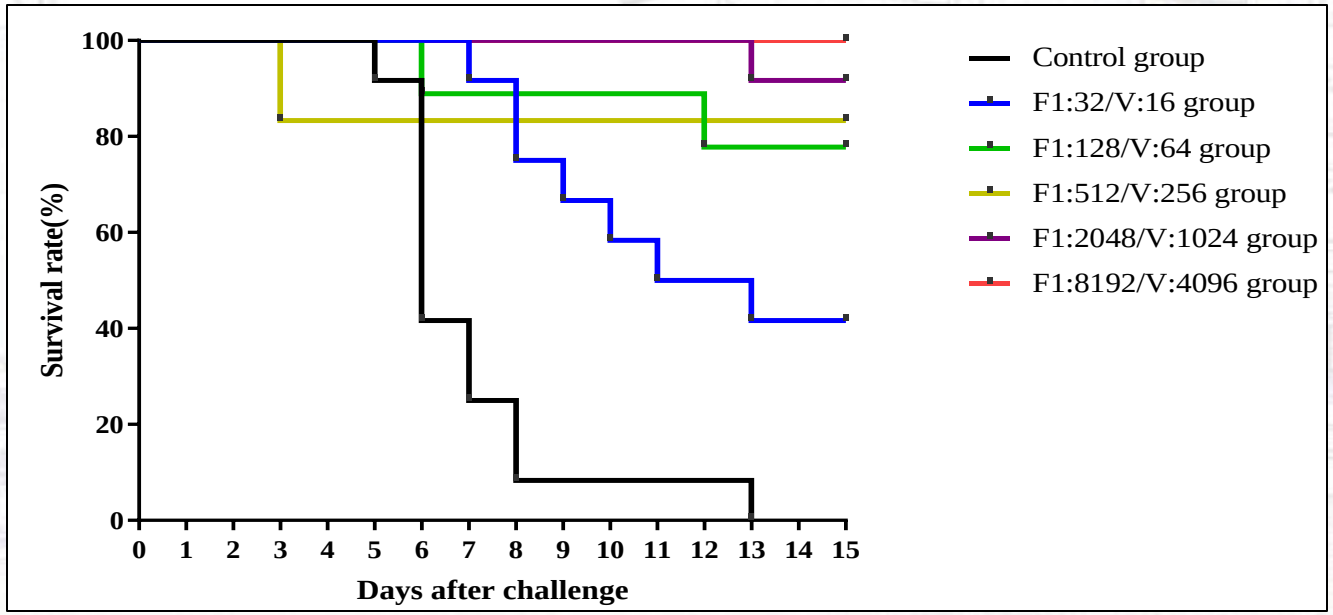
Ab group3 (**F1** 1:512/**V** 1:256)

Ab group4 (**F1** 1:2048/**V** 1:1024)

Ab group5 (**F1** 1:8192/**V** 1:4096)

Control group —— NO PASSIVE IMMUNISATION

6 MLD
(MLD = 7~10 CFU)



- **The survival rate of mice in groups 1, 2, 3, 4 and 5 was increased to 41.7%, 58.3%, 83.3%, 91.7% and 100%, respectively. While, none was survived in the control group.**
- **The survival of mice was significantly related to the levels of F1 and V antibody titers in the serum.**

Summary of the study results and the conclusion

- Both immunization regimens (M 0/1/6 and M 0/2/6) could induce high levels of F1 and V antibodies after three-dose vaccination.
- The immunization regimen (M 0/1/6) showed an advantage in the antibody persistence compared with the immunization regimen (M 0/2/6).
- Under the condition of a non-inferiority margin 0.67 for the GMT ratio, the immunization regimen (M 0/1/6) was non-inferior to the immunization regimen (M 0/2/6) .
- The incidence of adverse reactions/events after vaccination was low in both groups, and showed good safety profile.
- The immunized serum could provide significant protection against the lethal challenge in mice. The survival rate and mean survival time of mice were significantly correlated with the titers of serum F1 and V antibody.

THANK YOU!