VypVaxDuo Vaccine for Plague

Proxima Concepts

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Starting point

• GMP seed stocks (rF1+rV)- consistent, scaled-up production
  – No requirement for biocontainment
  – Non-hazardous, less expensive, mobile production

• rF1+rV has been used safely in >160 individuals

• rF1+rV/alhydrogel - rapid, long lasting IgG response

• Macaques immunised (day 1,21) with 80µg rF1+rV/alhy had 100% survival vs. 4.3x10^4 cfu (>10 LD_{50}) aerosolised *Y.pestis* Co92 at d.56

• Macaques immunised (day 1,21) with 40µg rF1+rV/alhydrogel had long-lasting immunity>1year
Functional immunity maintained in macaques for >1 year


Passive transfer of immune macaque sera collected 53 weeks later protects mice against Y.pestis challenge (10MLD)
Clinical development of VypVaxDuo for Plague

- Designed for use in resource-poor settings
- Sub-cutaneous priming dose
- Oral booster dose (to be self-administered)
- Benefits are:
  - Induces both systemic & mucosal immunity
  - No requirement for cold chain – stable at 40°C for 29 weeks/40°C & 75%RH for 6 weeks
  - Formulations comprise dry powder (s.c.prime) and capsule (oral boost)
  - Priming dose given by trained medic/paramedic/nurse
  - Booster self-administered under guidance from local health coordinator
  - Proof-of-concept testing completed
  - Now entering clinical development

Simple, safe, efficacious vaccine
Platform formulation technologies

• CaP-Protein Coated MicroCrystal (PCMC) (Univ. of Strathclyde) (Jones et al, 2013)
  – For injected priming dose (sub-cutaneous/intra-dermal)
  – Presented as dry powder-simple rehydration prior to use

• Vaxcine formulation (Proxima) (Domingos et al 2008)
  – For single oral booster dose
  – Micellar nanoparticles dispersed in mineral oil
  – Presented as hard gelatin capsule for self administration
Oral Immunisation

Hydrophobic carrier in hard gelatin capsule

Gut lymphoid immune system (Peyers patch)

Oil droplet

Antigen

Amphiphile sheath

Immunostimulant
VypVaxDuo provides rapid protection (Balb/c)

Immunisation on d.0,21;
By d.35 serum IgA>100ng/ml

Efficacious at $2 \times 10^4$ MLD *Y.pestis* Co92 (25 d. after booster)

Moore et al, *MS in press*
Stability after 29 weeks at 40°C