Institut Pasteur
Plague Vaccine Candidate

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- WHO Plague Vaccine consultation
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The Institut Pasteur Plague Vaccine Candidate

A live-attenuated *Yersinia pseudotuberculosis*  

**Aim**

Development of a new vaccine to protect against bubonic and pneumonic plague caused by F1+ or F1- *Yersinia pestis* strains

**Strategy**

A live, oral, attenuated *Y. pseudotuberculosis*, producing F1

**Rational**

*Y. pseudotuberculosis* = *Y. pestis*’ ancestor, genetically >95% identical  
Less virulent, stable genome  
Multiple molecular targets

**Abbreviated target product profile**

Indication/target efficacy: ≥ 80% against bubonic and pneumonic plague  
Target Population: 9 months and older  
Immunization strategy: One dose, oral  
Presentation: Liquid or enteric coated capsules (TBD)
VTnF1: *Y. pseudotuberculosis* (ΔHPI, ΔpsaA, ΔyopK), F1⁺
Highly efficacious after single oral dose

**ONE** oral dose protects mice 100% against bubonic plague and 80% pneumonic plague by F1+ and F1- *Yersinia pestis*

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**Y. pestis** CO92 challenge (high dose)

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Naïve</th>
<th>VTnF1</th>
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</thead>
<tbody>
<tr>
<td>Bubonic challenge</td>
<td>0/14</td>
<td>14/14</td>
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<tr>
<td>Pneumonic challenge</td>
<td>0/14</td>
<td>11/14</td>
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</tbody>
</table>

Immunization: 10⁸ CFU oral
Challenge 28 days post immunization

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Correlates of protection and status

Immunogenicity:

- VTnF1 Induces long-lasting antibody and cellular responses to multiple targets
- Both humoral and cellular responses alone are sufficient for protection

Correlates of protection (bubonic plague):

- anti-F1 IgG level (most stringent)
- anti-Yops IgG level

Next steps:

- Correlates of protection for F1-lacking *Y. pestis*
- Non-human primate challenge study
- GMP, Phase I (funding to be secured)
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