Overview of PfSPZ Studies in Tanzania and Africa

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Ifakara Health Institute, Bagamoyo
SWISS TPH, IFAKARA HEALTH INSTITUTE (IHI) & SANARIA ESTABLISH COLLABORATION January 2011, Tanzania
Inauguration of Phase I Clinical Trial centre, In Bagamoyo
Objectives

**Primary:**
Demonstrate that intradermal administration of PfSPZ Challenge is safe, well tolerated, and induces *P. falciparum* parasitemia in all recipients.

**Secondary**
Compare the success rate of CHMI
- Dose (10,000 PfSPZ) given in 2 (50 µL) each
- Dose (25,000 PfSPZ), in 4 (10µL) each

**Exploratory:**
Differences in immune responses of African adult volunteers infected by PfSPZ Challenge to those of *P. falciparum* naïve Dutch adults similarly infected.
Inoculation Took Place On March 5, 7 and 9 2012
Safe and well tolerated
## PfSPZ CHALLENGE TANZANIA/KENYA

<table>
<thead>
<tr>
<th>Study Site</th>
<th>Dose (PfSPZ)</th>
<th>Route</th>
<th>Injection Volume</th>
<th># +ve</th>
<th>% +ve</th>
<th>Prepatent Period (d)</th>
<th>Lot Used</th>
<th>Lot Age</th>
</tr>
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<tbody>
<tr>
<td>IHI</td>
<td>10,000</td>
<td>ID</td>
<td>2 × 50 µL</td>
<td>11/12</td>
<td>92%</td>
<td>15.4</td>
<td>031611-02</td>
<td>12 mo.</td>
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EDCTP funded CHMI consortium led by Bernhards Ogutu and Secretariat hosted by Creates.

**Consortium members**

**Africa**
- Kilifi-Kemri Kenya
- MRT- Mali
- Lambarene Gabon
- Manhica
- Mozambique
- Kintampo Ghana
- CRNFP Burkina Faso
- NIH-Eq.Guinea

**Europe**
- Swiss TPH Switzerland
- Tubingen Germany
- Barcelona Spain
- Nijmegen Netherlands
- Oxford- UK
- EVI- Germany

**USA**
- University of Maryland
- VRC NIH Sanaria
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<td>13.5</td>
<td>031611-02</td>
<td>12 mo.</td>
</tr>
<tr>
<td>KEMRI</td>
<td>25,000</td>
<td>IM</td>
<td>2 × 50 µL</td>
<td>3/4</td>
<td>75%</td>
<td>12.3</td>
<td>071112-02</td>
<td>10 mo.</td>
</tr>
<tr>
<td>KEMRI</td>
<td>75,000</td>
<td>IM</td>
<td>2 × 50 µL</td>
<td>4/4</td>
<td>100%</td>
<td>12.5</td>
<td>071112-02</td>
<td>10 mo.</td>
</tr>
<tr>
<td>KEMRI</td>
<td>125,000</td>
<td>IM</td>
<td>2 × 50 µL</td>
<td>20/20</td>
<td>100%</td>
<td>12.0</td>
<td>071112-02</td>
<td>10 mo.</td>
</tr>
</tbody>
</table>
Important outcome of PfSPZ Challenge Studies IHI, KEMRI

- High level of infection in Africans
- Training, Logistics, Experience working with PfSPZ
- Training, Logistics, Experience conducting CHMI
- Established foundation for Conducting vaccine studies with PfSPZ Vaccine and PfSPZ-Cvac Trials
- PfSPZ Vaccine Planned For 2014
  - Tanzania (January)
  - Equatorial Guinea (March)
    (IHI Team work with EG Team)
Design of PfSPZ (IV) Vaccine

Phase 1, dose escalation, randomized controlled trial to evaluate the safety and immunogenicity of intravenously administered attenuated Plasmodium falciparum sporozoite vaccine (PfSPZ Vaccine) in Tanzanian adults
Objectives

1. Demonstrate that intravenous (IV) administration of PfSPZ Vaccine (in 3 escalating doses) is safe and well tolerated in all adult Tanzanian recipients.

2. Demonstrate that IV administration of PfSPZ Vaccine results in increased antibody and cellular responses in all adult Tanzanian recipients.

3. Build capacity for the conduct of further Phase I and Phase II trials with whole parasite vaccines.
## Basic design of PfSPZ Vaccine

<table>
<thead>
<tr>
<th>Group</th>
<th>Subjects</th>
<th>Dose SPZ x $10^5$</th>
<th>Total Dose SPZ x $10^5$</th>
<th>Dose Schedule (in weeks)*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>0.3, 1.35, 2.7</td>
<td>4.35</td>
<td>X X X</td>
<td>Safety Group</td>
</tr>
<tr>
<td>2A</td>
<td>20</td>
<td>1.35</td>
<td>6.75</td>
<td>X X X X X</td>
<td>CHMI#1, CHMI#2 Standard Dose Group</td>
</tr>
<tr>
<td>2B</td>
<td>4</td>
<td>Normal Saline</td>
<td></td>
<td>X X X X X</td>
<td>CHMI#1, CHMI#2 Control Group 2</td>
</tr>
<tr>
<td>3A</td>
<td>20</td>
<td>2.7</td>
<td>13.5</td>
<td>X X X X X</td>
<td>CHMI#1, CHMI#2 High Dose Group</td>
</tr>
<tr>
<td>3B</td>
<td>4</td>
<td>Normal Saline</td>
<td></td>
<td>X X X X X</td>
<td>CHMI#1, CHMI#2 Control Group 3</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
<td>2.7</td>
<td>13.5</td>
<td>X X X X X</td>
<td>CHMI#2 High Dose 6 months efficacy Group</td>
</tr>
<tr>
<td>5A</td>
<td>8</td>
<td>No Vaccination</td>
<td></td>
<td></td>
<td>CHMI#2 Control 2nd Challenge Group 2</td>
</tr>
<tr>
<td>5B</td>
<td>8</td>
<td>No Vaccination</td>
<td></td>
<td></td>
<td>CHMI#2 Control 2nd Challenge Group 3</td>
</tr>
<tr>
<td>Total</td>
<td>49 Vaccinees</td>
<td></td>
<td></td>
<td></td>
<td>Total Vaccinees: 73</td>
</tr>
<tr>
<td></td>
<td>24 Controls</td>
<td></td>
<td></td>
<td></td>
<td>Total Controls: 73</td>
</tr>
</tbody>
</table>
Acknowledgements

All Volunteers
Collaborators
1. Ifakara Health Institute
2. Swiss TPH
3. Sanaria
4. RUNMC, Netherlands
5. UMD

Funding, Tanzania Trial (s)
1. COSTECH, Tanzania
2. IHI
3. Swiss TPH

Funding, Kenya Trial
- EDCTP