New anti-malarial drug discovery projects with Japanese Partners

Paul Willis, Senior Director Drug Discovery
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Defeating Malaria Together
A child dies every 2 minutes

3.2 billion people at risk\(^1\)

Devastating economic impact in countries that can least afford it\(^2\)

Children and pregnant women disproportionately affected\(^1\)

Resistance to current medicines

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1. WHO World Malaria Report 2016
A foundation of ~80 people working towards the same mission, to reduce the burden of malaria in disease-endemic countries by DISCOVERING, DEVELOPING and DELIVERING new, effective and affordable antimalarial drugs.
Objectives and Goals:
Screening/HTLP Platform: GHIT funding to deliver Early Lead (Start of Lead Optimisation Program)

Exciting opportunity to collaborate with Japanese Partners
Access to novel chemical structures and new drug discovery expertise

GOAL: Deliver the next generation of antimalarial drugs
Impact on Global Health
Enhanced discovery efforts over the next decade are critical for an eradication agenda over the next 25 years

To reach aspirational targets…,
… an innovative drug pipeline will be a critical enabler

Today 2020 2030 2040

Millions of people infected

WHO Global technical strategy
• ≥90% reduction in malaria mortality and incidence

Aspiration to Action
• Total malaria eradication

Discovery
• Next ~5–10 years are critical for discovering drugs to address remaining gaps towards malaria eradication

Development
Requires ~10–15 years post-discovery

SOURCE: WHO Global Technical Strategy 2016-2030; From Aspiration to Action report

2015 2020 2025 2030 2040

Today 2020 2030 2040

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Partnerships: Screening For High Value Hits

Compounds screened ‘blinded’ at MMV centres of Excellence

- Libraries of compounds from Japanese Institutes
- Screening results returned to Japanese Partner
- Partner decides which structures they are prepared to disclose to MMV
- MMV advice on novel series and portfolio fit
- Joint Decision on GHIT Hit to Lead Funding Application
Partnerships: GHIT MMV Projects

Projects A

Japanese Partner

- Medicinal Chemistry Synthesis
- Biology
- Drug Metabolism

MMV: malaria lifecycle assays

Projects B

Japanese Partner
- Med Chem, Drug Discovery advice

Indian CRO
- Synthesis

Australian Universities
- Biology and Drug Metabolism

MMV: Medicinal chemistry
- Malaria lifecycle assays

Flexibility: Configure project based on needs
# Activities and Results

## Lead Generation

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<tr>
<th>Target Platform</th>
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<th>Hit-to-Lead</th>
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## Product Development

- **Validated Hit**: Early Lead

- **Univ. Melbourne**
  - Takeda Boston
  - Kitasato
  - Daiichi-Sankyo
  - Mitsubishi Tanabe
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## Product Development

8 Projects
Progressed screening hits to hit to lead programs

- **Eisai**
- **Takeda**
- **Mitsubishi Tanabe**
- **Sumitomo Dainippon**
- **Daiichi-Sankyo**
- **Novare**
- **Natural Products**
- **OP Biofactory**

**Validated Hit**

**Early Lead**
Activities and Results

**Lead Generation**
- Target Platform
- Screening
- Hit-to-Lead

- IMC Bikakken
- Kitasato
- Eisai
- Daiichi-Sankyo
- Novare
- Natural Products
- OP Biofactory
- Takeda Boston

**Product Development**
- Lead Optimisation

- Takeda
- Eisai
- Mitsubishi Tanabe
- Sumitomo Dainippon
- Daiichi-Sankyo

2 Partners now progressed to lead optimisation

Validated Hit | Early Lead | Candidate Selection
Lessons Learned

- Strategy validated: successful progression of projects
- `Blinded` screening encourages initial collaboration
- Each Project configured according to needs
- Expertise of Japanese institutions highly valued
  - Drug discovery and series specific expertise
- Assess to MMV screening centers and expertise is key
- MMV Partner meeting: great sharing of knowledge
- Challenge: Work to improve screening turnaround times
Comments

• New focus on malaria eradication projects
  • Blood stage PLUS chemoprotection, transmission blocking, anti-hypnozoite activity

• Strong portfolio of GHIT funded MMV projects

• GHIT and Japanese Partners, working with MMV will play leading role in new era of anti-malarial drug discovery

• Thanks to all Scientific Partners and Funding bodies