



## The PDP model: MMV

FAPESP-RSC-MMV-DNDI

Frontiers in Science on Neglected Diseases  
Thursday, 13-14<sup>th</sup> November 2014, FAPESP

---

Paul Willis Director Drug Discovery

Defeating Malaria Together

**MMV**   
Medicines for Malaria Venture



## OUR MISSION

To reduce the burden of malaria in disease-endemic countries by discovering, developing and facilitating delivery of new, effective and affordable antimalarial drugs.

**60 people**  
Swiss-based

**300 partners**  
Americas | 89  
Africa | 67  
Europe | 79  
Asia and Oceania | 70

**37 products  
in pipeline**  
Research | 16  
Transational science | 9  
Development | 2

# PDPs – the new route to drug development



With the support of our donors, MMV brings together academic and pharmaceutical partners adding its own scientific expertise to make antimalarial research bear fruit.

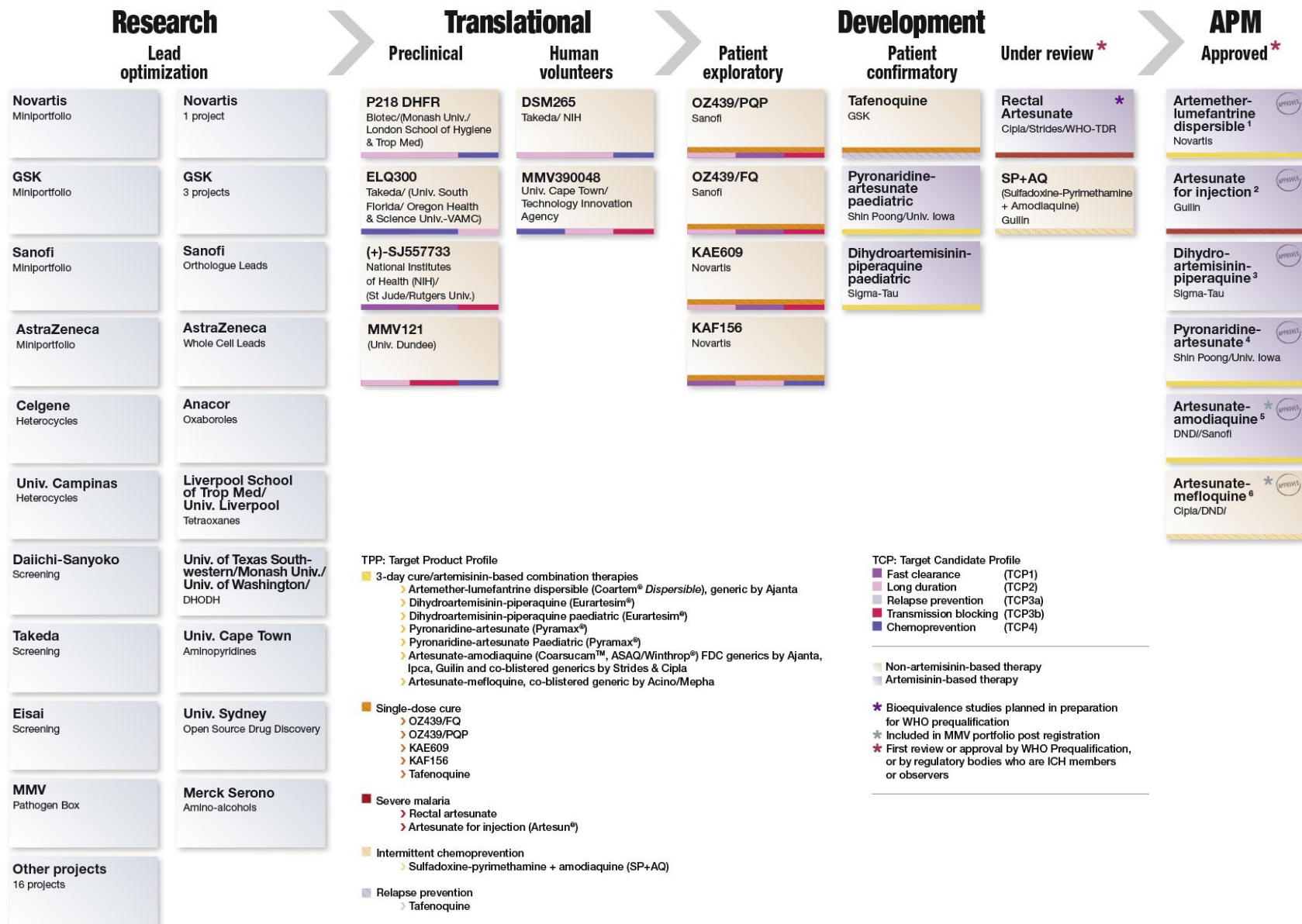
- Academic research and clinical trial sites
- Pharmaceutical research
- New medicines malaria

# MMV's key R&D achievements

- **Coartem® Dispersible:** co-developed with Novartis is the first affordable, high-quality paediatric ACT
- **Artesun®:** (injectable artesunate) MMV supported Guilin to become the first company to obtain WHO prequalification of this life-saving treatment for severe malaria
- **Tafenoquine** entered Phase III trials in April 2014 – taking it closer to becoming the only new drug to treat relapsing malaria in over 60 years.
- **Eurartesim®** co-developed with Sigma-Tau is a high-quality ACT that provides longer and better protection from new malaria infections.
- **Pyramax®** co-developed with Shin Poong is the only ACT specifically approved to treat the two main species of malaria parasite.
- **9 new compounds** targeting malaria eradication, progressed from discovery to active preclinical or clinical development, are being researched in 16 locations.



# MMV Portfolio – 2nd quarter 2014



# Malaria R&D challenges

- Better medicines for uncomplicated malaria
  - Tackling resistance to first-line antimalarials
  - Ensuring safety of new medicines
  - Aiming for a single-dose cure
- Medicines for vulnerable populations
  - Formulations for children
  - Protecting pregnant women
  - Scaling-up treatment for severe malaria
- Medicines for malaria elimination/eradication
  - Stopping relapse (*P. vivax*)
  - Blocking transmission

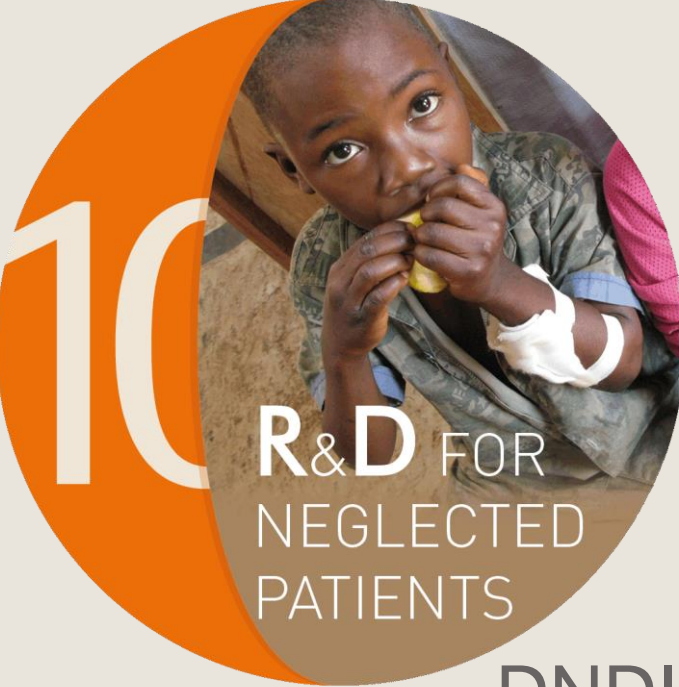


Photographer: Vivian Zanatta

# Secrets to MMV's success...

- **A global partnership network:** over 300 public and private partnerships in more than 50 countries, since inception.
- **Catalytic ability:** connecting and coordinating the research of global R&D experts.
- **In-house scientific expertise:** providing in-depth and broad ranging scientific expertise.
- **Vantage view of the portfolio:** supervising the whole portfolio to ensure the most efficient allocation of funds.
- **A virtuous circle:** Using funding to leverage further private sector assets.

**MMV wishes to increase collaborations  
with Brazilian scientists**



# DNDI – A PRODUCT DEVELOPMENT PARTNERSHIP (PDP) FOR NEGLECTED DISEASES

*Charlie Mowbray*  
Head of Drug Discovery  
cmowbray@dndi.org

**DNDi**

Drugs for Neglected Diseases *initiative*

Frontiers in Science on Neglected Diseases  
Thursday, 12-14 November 2014  
FAPESP Headquarters, Sao Paulo, Brazil



# Vision & Objectives

## □ Vision:

A collaborative, patients' needs-driven, virtual, non-profit drug R&D organisation to develop new treatments against the most neglected communicable diseases



## □ Objectives:

- Deliver **11 to 13 new treatments by 2018** for sleeping sickness, Chagas disease, leishmaniasis, malaria, paediatric HIV and specific helminth infections
- Establish a **robust pipeline** for future needs
- Use and strengthen existing **capacity in disease-endemic countries**
- **Model: A Product Development Partnership (PDP)**

# Responding to the Needs of Patients Suffering from Neglected Diseases...



Malaria



Leishmaniasis



Paediatric HIV



Sleeping Sickness (HAT)



Chagas Disease



Filaria

- Published Target Product Profiles to meet patients' needs  
See: [www.dndi.org](http://www.dndi.org)

# 6 New Treatments Developed Since 2007

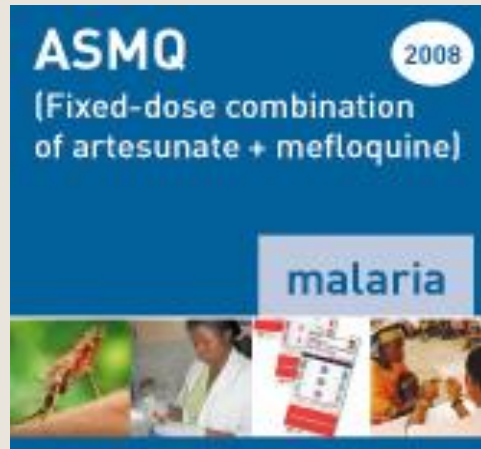
**ASAQ** 2007  
(Fixed-dose combination of artesunate + amodiaquine)

malaria

A poster for ASAQ (2007) featuring a brown background. It includes a mosquito, a person in a white coat, and a box of medicine. The text describes it as a fixed-dose combination of artesunate and amodiaquine for malaria.

**ASMQ** 2008  
(Fixed-dose combination of artesunate + mefloquine)

malaria

A poster for ASMQ (2008) featuring a blue background. It includes a mosquito, a person in a white coat, and a box of medicine. The text describes it as a fixed-dose combination of artesunate and mefloquine for malaria.

**NECT** 2009  
(Nifurtimox-eflornithine combination therapy)

sleeping sickness stage 2

A poster for NECT (2009) featuring a teal background. It includes a mosquito, a person in a white coat, and bottles of medicine. The text describes it as nifurtimox-eflornithine combination therapy for sleeping sickness stage 2.

- ✓ Easy to Use    ✓ Affordable    ✓ Field-Adapted    ✓ Non-Patented

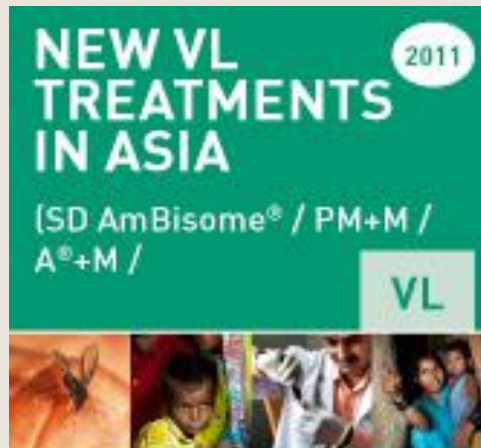
**SSG&PM** 2010  
(Sodium stibogluconate & paromomycin combination therapy)

VL

A poster for SSG&PM (2010) featuring a purple background. It includes a mosquito, a person in a white coat, and a box of medicine. The text describes it as sodium stibogluconate and paromomycin combination therapy for VL.

**NEW VL TREATMENTS IN ASIA** 2011  
(SD AmBisome® / PM+M / A®+M /)

VL

A poster for NEW VL TREATMENTS IN ASIA (2011) featuring a green background. It includes a mosquito, a person in a white coat, and a box of medicine. The text lists treatment options: SD AmBisome®, PM+M, and A®+M for VL.

**Benznidazole** 12.5 mg  
Pediatric dosage form of benznidazole

Chagas disease

A poster for Benznidazole (2011) featuring a green background. It includes a mosquito, a person in a white coat, and a box of medicine. The text describes it as a 12.5 mg pediatric dosage form of benznidazole for Chagas disease.

# DNDi Portfolio June 2014



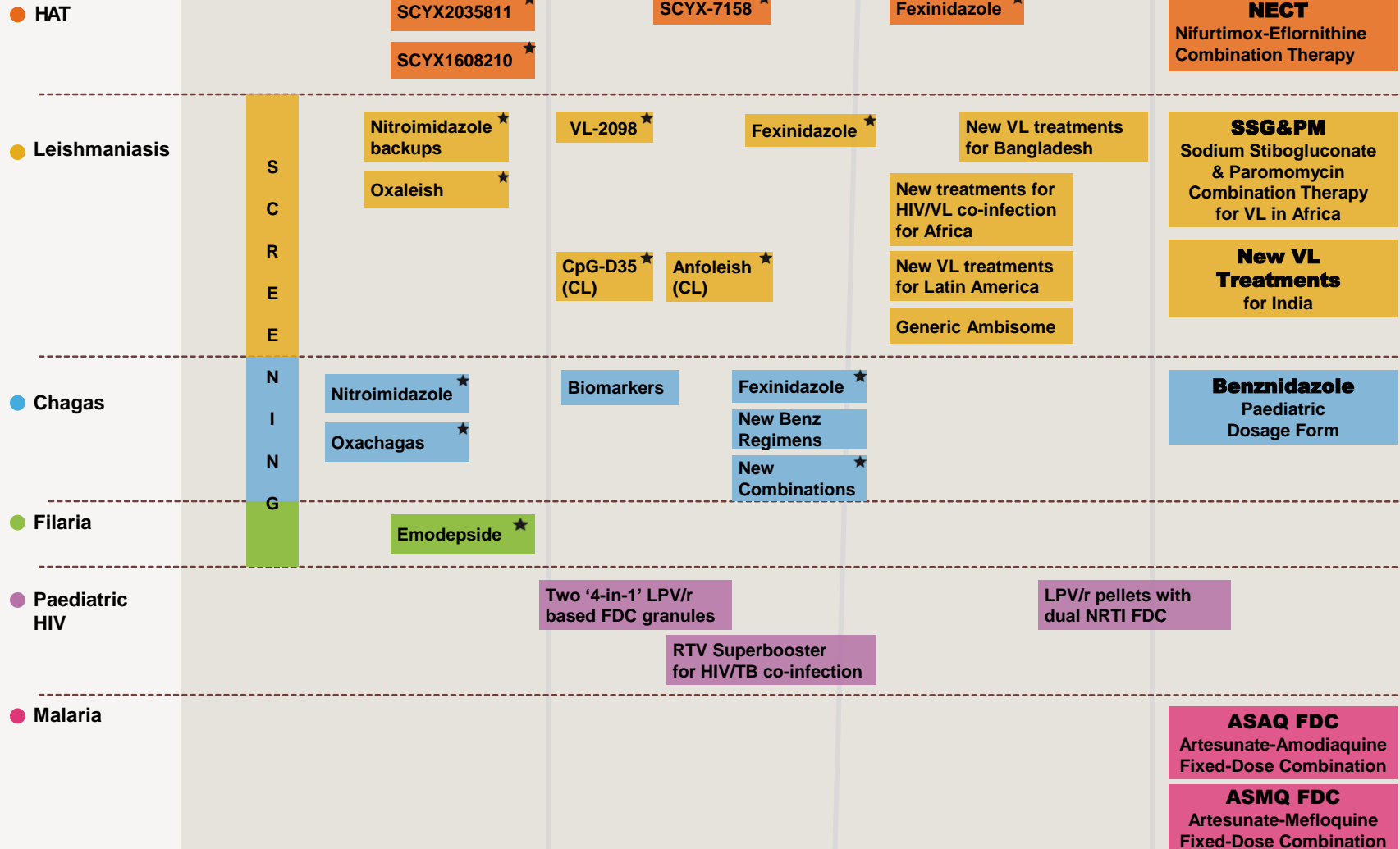
## Research

## Translation

## Development

## Implementation

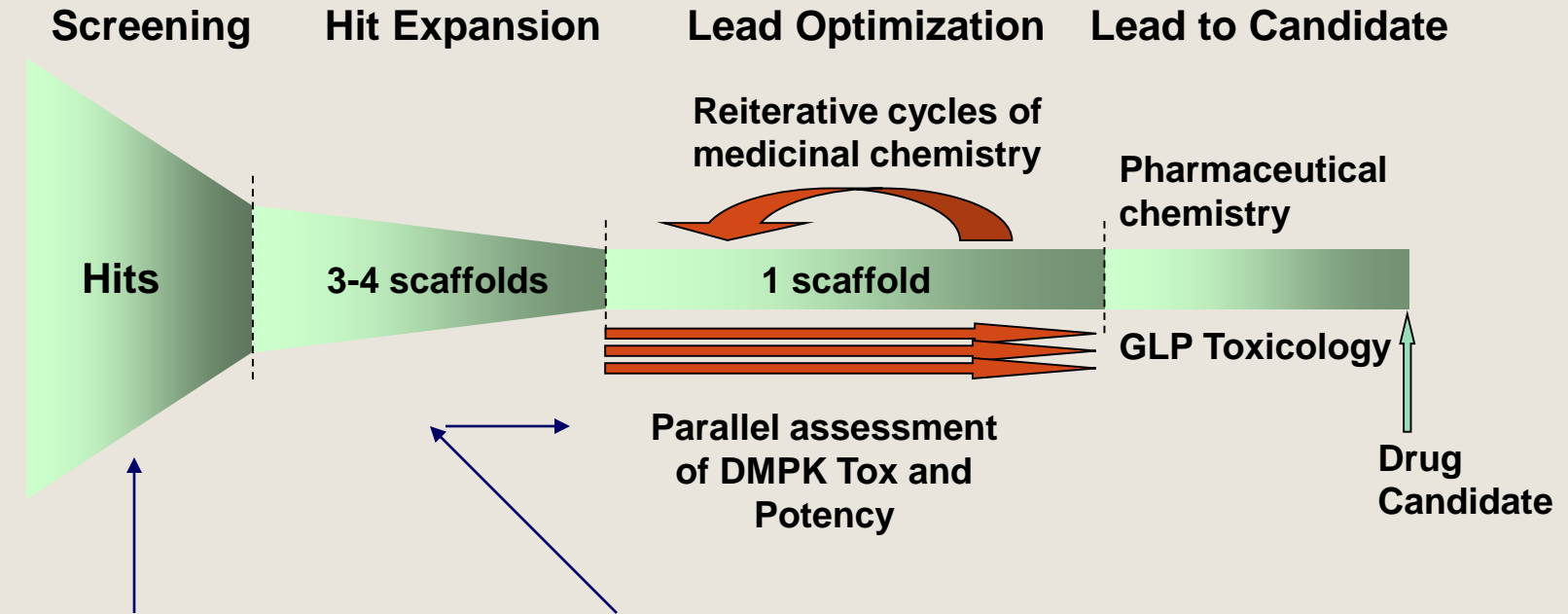
Screen    Hit to Lead    Lead Opt.    Pre-clinical    Phase I    Phase IIa/PoC    Phase IIb/III    Registration    Access



★New Chemical Entity (NCE); Fexinidazole (for HAT, VL, and Chagas disease) = 1 NCE



# The Science(s) of Lead Optimization



## Parasitology

- Biology / targets
- Pathology / targets
- Chemistry / targets

## Mode of Action

## Drug Discovery (Product Development)

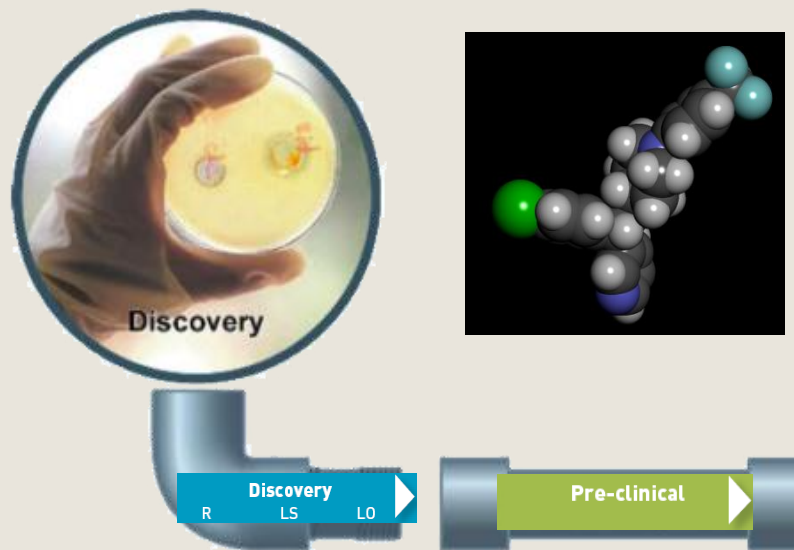
- Absorption, Distribution, Metabolism, Excretion
- Pharmacokinetics
- Toxicology
- Pharmacodynamics

# Lead Optimization Consortia

## From Hit to Potential Pre-Clinical Candidate



Research



### Key partners:

CDCO/Monash University, Epichem, Griffith University, WuXi, iThemba, Sandexis, LMPH, LSHTM, Swiss TPH, **UNICAMP**, Anacor, Pfizer, Sanofi, AbbVie, GSK

### A global network:

Australia, Belgium, **Brazil**, China, India, South Africa, Spain, Switzerland, UK, USA

- ❑ Continued evolution
  - ❑ 3 Consortia (1 in endemic country, **LOLA**)
  - ❑ Shared resources
- ❑ VL and Chagas are priority
- ❑ Access to series from Pharma
- ❑ New candidates already issued from:
  - ❑ Oxaboroles series (Anacor, USA)
  - ❑ Nitroimidazoles (Univ. of Auckland, NZ)
- ❑ Further chemical series in optimization
- ❑ Translational challenges being tackled
  - ❑ New tools/assays developed
  - ❑ Better understanding of PK/PD relationship for these diseases



THANK YOU

[www.dndi.org](http://www.dndi.org)