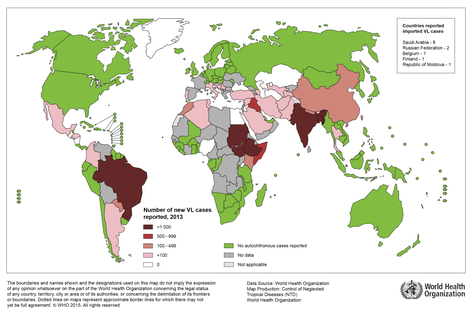
Leishmania parasites: masters in survival

INSTITUTE OF TROPICAL MEDICINE ANTWERP

Experimental Parasitology Unit

LEISHMANIA: A FASCINATING EUKARYOTIC PARASITE

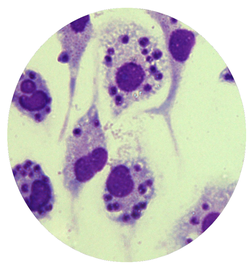
Status of endemicity of visceral leishmaniasis, worldwide, 2013



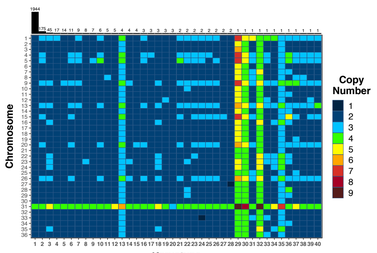
Leishmania is the etiological agent of leishmaniasis

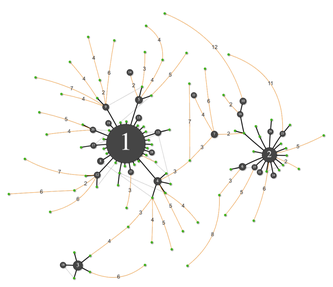
- Cutaneous, mucocutaneous and visceral forms, asymptomatic infections
- Need for new, less toxic and more efficient drugs
- Need to understand the parasite to identify novel potential drug targets

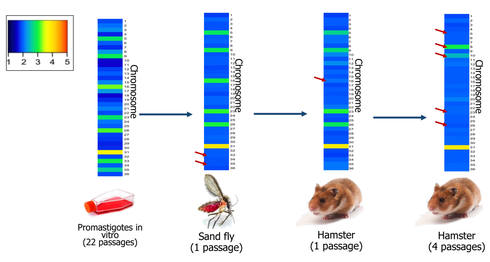
A dixenous Protozoan parasite…



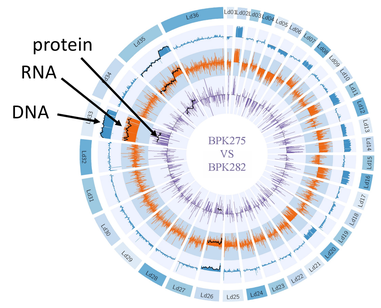
…with unstable genome and unprecedented level of aneuploidy mosaicism



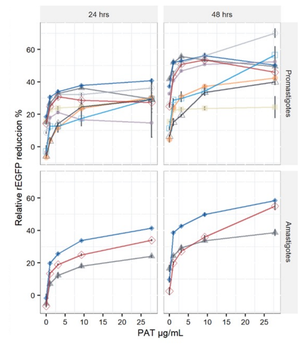


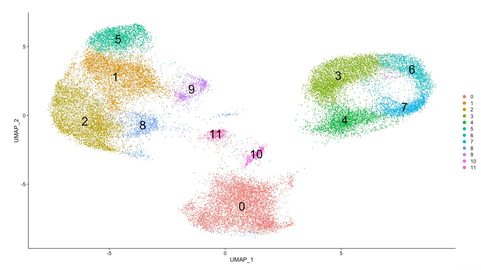


…with a unique molecular biology



…with unique adaptive skills, such as quiescence and persistence





OUR RESEARCH

Our laboratory is constituted by a unique multidisciplinary staff and is focused on understanding *Leishmania'*s adaptive skills. Our domains of expertise include:

i) genome instability, response to drugs and quiescence
ii) single-cell genomics and transcriptomics
iii) parasite reverse genetics
iv) molecular and cellular biology
v) bioinformatics

QUIESCENCE AND DRUG TOLERANCE

We study the phenomenon of quiescence in *L. donovani* to address the following questions:

1. What are the molecular characteristics of *L. donovani* quiescent cells?
2. Can we find positive transcriptional biomarkers of quiescence in *L. donovani*?
3. Can we identify drivers and regulators of transition to quiescence?
4. Can quiescence provide drug tolerance to *Leishmania*?

Techniques:

i) molecular biology and parasitology
ii) gene overexpression, gene editing via the Crispr/Cas9 system
iii) confocal imaging
iv) flow cytometry
v) single cell transcriptomics

ANEUPLOIDY AND GENOME INSTABILITY

We study aneuploidy in *Leishmania donovani* to address the following questions:

1. What are the molecular mechanisms that control aneuploidy turnover?
2. Does (mosaic) aneuploidy play a role in *Leishmania* adaptation to sandfly and mammalian host environments?

Techniques:

i) molecular biology and parasitology
ii) confocal imaging and flow cytometry
iii) single cell genomics

CONTACT DETAILS

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