

The challenges in Chagas disease are frustratingly plentiful, both from an operational standpoint – how to make use of the accessible resources and tools in the field to prevent new infections or treat existing ones - as well as from a research perspective.

The Chagas Disease Research Agenda outlined below is meant to serve as a starting point for collecting community input and ultimately for establishing a list of focus areas for future work in Chagas disease. Establishing some priority areas may help guide where existing resources go and may even help attract new resources for research and implementation. Although this starting list reflects some of the discussions involved in the generation of an editorial piece ([Tarleton, Reithinger, Urbina, Kitron and Gurtler. "The Challenges of Chagas Disease - Grim Outlook or Glimmer of Hope?"](#)), it is just a rough starting point with big gaps to be filled. Please send feedback and suggestions through the Contact Us feature of the Chagas Disease Foundation [website](#). Perhaps with some interchange, a cohesive set of priorities which most of the community can agree on will emerge.

Research Agenda

I. Operational and Intervention Issues

A. Diagnostics

1. Development of sensitive, specific and affordable serological tests that is rigorously tested using sera from a broad range of infected subject – not just from individuals who are positive on multiple existing tests.
2. Additional research and validation of parasite detection diagnostics (PCR, culture, xenodiagnosis, biomarker detection) and development of recommendations on the utility of such assays in clinical and research settings.
3. Development of a reliable confirmatory diagnostic for blood screening
4. integration of diagnostic tools into the assessment of treatment and control programs

B. Drugs

1. Identification of appropriate “druggable” targets in *T. cruzi* and prioritization of pathways for the development of new drugs
2. Development of rigorous and uniform methodology for assessing drug efficacy
3. High-throughput in vitro drug testing systems
4. in vivo models with standardized outcome measurements that are relevant to projected drug use plans (e.g. treatment of established and chronic infections)
5. Encouragement of more transparency in the drug development and testing process by establishment of a database for information on drug target priorities, compounds tested and their efficacy, compound availability and contact information.

6. Development of recommendations for treatment of chronic cases in adults using existing drugs, including collection of data on adverse effects
7. Determination and resolution of impediments to access to drugs.

C. Vector Control

1. Inventory vector species, and the geographic distributions and life histories of each
2. Further investigation of transmission dynamics and the contribution of vectors and hosts to infection levels in humans
3. Assess and document insecticidal resistance
4. Development of standardized methods for documenting infestations levels
5. integration of geographic information systems for determining patterns of transmission
6. Further develop control strategies that are not dependent on insecticide spraying (e.g. use of bed nets, dog collars, vaccination of domestic animals, etc.
7. Develop house/building and landscaping improvement plans to limit vector infestation
8. Design integrated and sustainable control strategies specific for regional transmission conditions and integrating the available community support

D. Prevention of transmission by other modes

1. Aggressive treatment of infected women prior to child-bearing years
2. Improved implementation of standardized testing of donated bloods and tissues
3. Improved education and risk notification for prevention of oral infection
4. Uniform policy and tests for detection and treatment of congenital cases

II . Basic Science Issues

A. Immunology

1. Effect of treatment on immunological memory and resistance
2. Effect of length of infection on immune control and resistance
3. Generation of initial immune response – innate immunity and prevention of establishment of infection
4. Identification and role of parasite-associated molecular patterns in immune control
5. Immune evasion

B. Vaccines

1. Identification of vaccine candidates and target responses
2. Evaluation of large gene family members (e.g. trans-sialidases) as vaccine candidates
3. Use of avirulent live vaccines - including for domestic reservoirs

4. Host targets for vaccine implementation (including the logistics and ethics of human vaccination)
 5. Therapeutic and transmission-blocking vaccines
 6. Integration into overall control strategies
- C. 'omics
1. Establishment of a curated and community supported database of 'omics data
 2. Completion of assembly of core chromosomes
 3. Comparative genomics of multiple strains
 4. Improved stage-specific transcriptome, proteome, glycome and metabolome analysis
- D. Cell Biology and Biochemistry
- E. Pathology
1. Role of immune responses in disease severity
 2. Role of parasite genetic variation in disease severity/pathology – especially regional differences
 3. Role of re-infection/exposure on disease severity
- F. Research tools
1. Improved genome manipulation tools (knock-out and insertion vectors, regulatable systems)