# Small Molecule Inhibitors of *Trypanosoma cruzi*, Causative Agent of Chagas Disease

*Howard University researchers have identified a family of compounds that potentially provide improved efficacy against Trypanosoma cruzi, the causative agent of Chagas disease.*


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**Inventors**

Dr. Oladapo Bakare et al.

**Benefits / Features**

Family of compounds exhibit improved toxicity versus cultured *T. cruzi* and increased selectivity when compared with its toxicity toward fibroblasts.

**Potential Commercial Applications**

Current treatments for Chagas disease are lengthy and exhibit unacceptable side effects. Numerous incentive programs exist for development of new Chagas therapies.

**Stage of Development**

Provisional US patent application filed. *In vitro* activity and selectivity assays and preliminary *in vivo* mouse toxicity tests have been performed. Additional compounds in the family continue to be characterized.

**Status**

Seeking development & licensing partners

## Background

Chagas disease, while endemic to the western world, is caused by parasites of the genus *Trypanosoma*, which have a global distribution. Chagas disease afflicts predominantly poor regions of Central and South America and has therefore been targeted by the World Health Organization and National Institutes of Health as a neglected tropical disease. Chagas remains latent for up to 20 years but eventually causes symptoms such as gastric dysfunction and potentially fatal cardiac complications. Benznidazole and nifurtimox are the accepted treatments but have profound side effects, require 60-90 days of administration, and have no effect during the chronic phase of the disease. No new therapies have been developed in 40 years and both drugs now face parasitic resistance. Therefore new Chagas disease therapeutics are needed.

## Description of Technology

Howard University researchers have demonstrated that a select group of imido-substituted 1,4-naphthoquinone compounds display improved toxicity against cultured *T. cruzi* epimastigotes. Multiple compounds have several-fold higher toxicity than nifurtimox, as well as more benign activity against mouse fibroblasts; in fact, multiple compounds in this family display selectivity indices 2- to 20-fold better than nifurtimox. These compounds have been subject to preliminary toxicity profiling *in vivo* in mice, but further study is needed. Therefore the compounds identified by Dr. Bakare and colleagues may be good candidates to provide prophylaxis or treatment of infections caused by *T. cruzi*.

## Opportunity

The method of treating Chagas disease with imido-substituted 1,4-naphthoquinone derivatives is available for licensing or as a collaborative research project. Characterization of additional members of this compound family continues. Researchers are seeking further small animal studies, to be performed at Howard University or by an interested company. Dr. Bakare is available for more discussions about his technology under NDA.