Abstract

Highly Sensitive Bioluminescence Imaging Models for Chagas Disease Drug Discovery [†]

John M. Kelly *, Amanda F. Francisco, Shiromani Jayawardhana, Martin C. Taylor and Michael D. Lewis

London School of Hygiene and Tropical Medicine, London WC1E 7HT, UK;
amanda.francisco@lshtm.ac.uk (A.F.F.); shiromani.jayawardhana@lshtm.ac.uk (S.J.);
martin.taylor@lshtm.ac.uk (M.C.T.); michael.lewis@lshtm.ac.uk (M.D.L.)

* Correspondence: john.kelly@lshtm.ac.uk

[†] Presented at the 1st Molecules Medicinal Chemistry Symposium, Barcelona, Spain, 8 September 2017.

Published: 17 October 2017

Chagas disease is caused by the insect-transmitted protozoan *Trypanosoma cruzi*, and is the most important parasitic infection in Latin America. As a result of migration, it is also emerging as a public health issue in non-endemic regions, particularly in the US and Europe. Infections with *T. cruzi* are life-long, and lead to cardiomyopathy in 20–30% of cases. A causal link between cardiac infection and pathology has been difficult to establish because of a lack of robust methods to detect scarce focally distributed parasites within tissues. By combining highly sensitive bioluminescence imaging and fluorescence technology, we have developed procedures which have allowed us to track infection dynamics, quantify tissue-specific parasite loads, and provide new insights into parasite biology in predictive murine models. These approaches have identified the gut as the major reservoir site during chronic infections. In this presentation, we review the parameters of the imaging systems and describe how these experimental models can be incorporated into drug-development programmes as a valuable tool for assessing efficacy against both acute and chronic *T. cruzi* infections.

Acknowledgments: We acknowledge funding from the British Heart Foundation and the Drugs for Neglected Diseases Initiative (DNDi).

Author Contributions: All authors contributed to design of the study. Experiments were performed by AFF, SJ, MCT and MDL. JMK wrote the abstract.

Conflicts of Interest: The authors declare no conflicts of interest.

© 2017 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).