Hunter College of the City University of New York
Department of Biological Sciences
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Immunization with a Trypanosoma cruzi cyclophilin-19 deletion mutant protects against acute Chagas disease in mice

Infection of Trypanosoma cruzi, a causative agent of Chagas disease, is a major public health problem that affects six to eight million people in Latin America. Until now there is no effective therapeutic drugs or vaccines have been developed to cure the disease effectively. Thus there is an urgent need to develop potent chemotherapeutics or vaccine to prevent infection in humans. We investigated the effect of T. cruzi cyclophilin 19 (Cyp19), a homologue of cyclophilin A of human, and found that Cyp19 is one of the major virulence factors to cause Chagas disease. Cyclophilins are the PPIase (peptidyl-prolyl cis-trans isomerase) containing enzyme that isomerizes the prolyl-peptide bonds to help protein folding and affect multiple physiological functions. We generated the cyclophilin deletion mutant (Cyp19-/-) parasite in T. cruzi cell line to see its effect in the pathogenesis of Chagas disease. The deletion of Cyp19 from T. cruzi failed to make infection in rat heart myoblast. Furthermore, we confirmed that the inoculation of Cyp19-/- parasites in A/J, STAT1-/- and STAT4-/- mice could not able to establish the infection. Importantly, the infection of Cyp19-/- parasites in A/J mice induced immune response without developing disease. The A/J mice challenged with WT parasites after being immunized with Cyp19-/-parasites showed no infection. These results suggest that T. cruzi Cyp19 is essential to establish infection in Chagas disease and the knockout mutant of Cyp19-/- parasite may lead as a possible vaccine candidate against T. cruzi infection.

Tuesday, Oct. 10, 2023 @12:30pm
Hunter North Room 926
Host: Jayne Raper