

## MECHANISTIC STUDY OF *TRYPANOSOMA CRUZI* TRANS-SIALIDASE USING QM/MM METHOD

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*Trypanosoma cruzi* trans-sialidase (TcTS) catalyzes the transfer of  $\alpha$ -2,3-linked sialic acid to acceptors containing terminal  $\beta$ -galactosyl residues with retention of the anomeric configuration. Via this process, the parasite that causes Chagas' disease is able to escape from the immune system of the host body. A Tyr/Glu couple acting as a nucleophile for this catalytic reaction is proposed by several experimental studies.<sup>1-3</sup> The detailed mechanism of TcTS is investigated computationally by preparing potential energy surfaces with QM/MM methods and comparing them to those prepared for *Trypanosoma rangeli* sialidase (TrSA) which can only catalyze hydrolysis despite its distinct structural similarity to TcTS. The energetic profiles of the two enzymes suggest that lifetimes of oxocarbenium intermediates differ as well as the relative reaction barriers of hydrolysis and sialyl-transfer reactions.

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