1078-92-324 **Javier Arsuaga*** (jarsuaga@sfsu.edu), San Francisco, CA 94132, **Yuanan Diao**, University of North carolina, Charlotte, NC , and **Kenneth Hinson**, San Francisco State University, San Francisco, CA. *The role of DNA condensation on formation of minicircle networks in trypanosomes.*

Trypanosomes are the cause of deadly diseases in many third world countries. A distinctive feature of these organisms is the three dimensional organization of their mitochondrial DNA into maxi and minicircles. In some of these organisms minicircles are conned into a small disk shaped volume and are topologically linked, forming a gigantic linked network. The origins of such a network as well as of its topological properties are mostly unknown. In this talk we propose a new model for the formation of the DNA network based purely on the density of minicircles. We introduce a simple mathematical model in which a collection of randomly oriented minicircles are spread over a polygonal grid. We present analytical and computational results showing that a nite positive critical percolation density exists, that the probability of formation of a highly linked network increases exponentially fast when minicircles are conned, and that the mean minicircle valence (the number of minicircles that a particular minicircle is linked to) increases linearly with density. When these results are interpreted in the context of the mitochondrial DNA of the trypanosome they suggest that DNA density/confinement plays a key role on the formation of the linked network. (Received December 12, 2011)