1073-92-140 **Javier Arsuaga*** (jarsuaga@sfsu.edu), 1600 Holloway Ave., San Francisco, CA 94116, and **Mariel Vazquez**, **Ken Hinson** and **Yuanan Diao**. *Understanding the formation of kinetoplast minicircle networks in trypanosomes.*

Trypanosoma parasites 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 confined 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 paper we quantify the effects of the confinement on the topology of such a minicircle network. We introduce a simple mathematical model in which a collection of randomly oriented minicircles are spread over a rectangular grid. We present analytical and computational results showing the existence of a critical percolation density, that the probability of forming a network that saturates the confining volume increases exponentially, the mean minicircle valence increases linearly with density. When these results are interpreted in the context of the mitochondrial DNA of the trypanosome they suggest that confinement plays a key role on the formation of the linked network. (Received July 31, 2011)