Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Detecting the gravitational sensitivity of *Paramecium caudatum* using magnetic forces[1] KARINE GUEVORKIAN, JAMES M VALLES JR., Brown University — Under normal conditions, *Paramecium* cells regulate their swimming speed in response to the pN level mechanical force of gravity. This regulation, known as gravikinesis, is more pronounced when the external force is increased by methods such as centrifugation. Here we present a novel technique that simulates gravity fields using the interactions between strong inhomogeneous magnetic fields and cells. We are able to achieve variable gravities spanning from $10\times g$ to $-8\times g$; where g is earth's gravity. Our experiments show that the swimming speed regulation of *Paramecium caudatum* to magnetically simulated gravity is a true physiological response. In addition, they reveal a maximum propulsion force for paramecia. This advance establishes a general technique for applying continuously variable forces to cells or cell populations suitable for exploring their force transduction mechanisms.

[1]Supported by NASA OBPR under NAG3-2882. Experiments performed at National High Magnetic Field Laboratory.

Karine Guevorkian
Brown University

Date submitted: 11 Jan 2006 Electronic form version 1.4