FINAL REPORT SUMMARY	GRANT NUMBER: 3R01GM065918-07S2	
	PERIOD COVERED BY THIS REPORT	
PRINCIPAL INVESTIGATOR OR PROGRAM DIRECTOR Andrés J. García	FROM 09/30/2009	THROUGH 08/31/2010
APPLICANT ORGANIZATION Georgia Institute of Technology		
TITLE OF PROJECT (Repeat title shown in Item 1 on first page) Focal Adhesions in Cell Adhesion Strengthening		

A. Progress Toward the Achievement of the Originally Stated Aims

This administrative supplement requests equipment funds to upgrade our Nikon TE300 fluorescence microscope to a Nikon C1s scanning confocal microscope. This equipment upgrade will significant expand our imaging capabilities to provide:

- Confocal imaging of nanopatterned focal adhesions, and
- Real-time, live imaging of the cell adhesive and focal adhesion remodeling process in cells adhering to our micro/nanopatterned substrates.

This work will provide new insights into the generation of adhesive forces in cells.

The proposed system was purchased and installed, users have been trained, and the equipment is currently being used to generate new data. This administrative supplement for equipment upgrade has accelerated the tempo of scientific research by significantly expanding our imaging capabilities to analyze the structure of focal adhesions. This administrative supplement was a more appropriate mechanism of support compared to a shared instrumentation grant because we need a dedicated system for the proposed analyses. In particular, this equipment enhancement has addressed the following significant limitations that hindered progress:

1. No high numerical aperture/high power objectives (100X, 1.4NA) for focal adhesion imaging.
2. No capabilities for live cell imaging for focal adhesion kinetics.
3. Slow rastering that results in phototoxicity to cells.
4. Not enough available time for carry out these time-consuming studies.

B. List of Significant Results

1. Live microscopy of focal adhesion protein dynamics, including FRAP of vinculin-eGFP for cells in deformable substrates. Results demonstrate that adhesive forces regulate vinculin recruitment dynamics.
2. Rigorous analyses of recruitment of integrin receptors and focal adhesion proteins on micropatterned cells. These imaging analyses were not possible prior to our equipment upgrade due to imaging artifacts.
3. Analyses of adhesive protein recruitment in multi-cellular and 3-D structures.

C. List of Publications

Several manuscripts (all associated with parent grant) are in preparation.