Department of Biomedical Engineering
COLLEGE OF ENGINEERING AND APPLIED SCIENCE

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: March 1, 2010

The Department of Biomedical Engineering is pleased to offer the following research project for the summer of 2010. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be and, if possible, develop a timetable for the twelve-week research period.

PROJECT TITLE: MECHANICAL PROPERTIES OF ACUTELY FORMED THROMBUS ON THE GUGLIEMI DETACHABLE COILS (GDC).

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Project Description

The goal of our research is to understand the factors involved in aneurysms recurrence for the patients treated by coil embolization. Aneurysms treated by coil embolization are filled to varying degrees with thrombus and GDC coils. The leading theory on the recurrence of aneurysms thus treated connects the high shear stress in the blood vessels wall to aneurysm enlargement. Finite Element Analysis (FEA) shows that wall stress reductions effected by aneurysm occlusion are a function of the mechanical properties of the filling material, expressed by its modulus of elasticity (E) – Young's Modulus. Materials with E of 10-1000 KPa reduce apical wall stress by 35%-100% for the completely occluded aneurysms. The objective of the summer WISE project will be to investigate the role of coil mechanical properties and aneurysm strength within a laboratory setting. Two types of experiments will be performed: 1) investigate the aneurysm filling capabilities of a number of GDC coils of different Young's Modulus; 2) Experimental measurements on the aneurysms thus filled to determine the wall shear stress.