

TO: Earl Swallow, Chair
Faculty Development Committee

FR: Paul Arriola
Ammar Haq
Department of Biology

RE: Student Showcase Grant

Introduction:

Please accept this letter of application for a Student Showcase Grant to support the work of Ammar Haq, a student in the Department of Biology. Ammar and I have been working together on a project supported by a Summer Collaborative Research Grant from the Center for the Health Professions. The project has centered on evaluating the effects of the heavy metal, cadmium on the growth and development of the mustard plants (*Brassica juncea*).

Ammar and I have been working since June of 2007 developing the methods and conducting a greenhouse study where mustard plants were grown in the presence of varied concentrations of cadmium. We have harvested all of our plants and have begun the analysis of the data that were collected throughout the summer and fall terms of 2007. Although the full analysis has yet to be completed, we have discovered that in some of the key indicators of plant growth, there are significant differences among the plants that follow the predictions of our proposal. As one might expect, the plants that received the higher levels of cadmium exposure seemed to suffer the greatest reductions in growth.

The problem that Ammar and I currently face is that we have no way to quantify the amount of cadmium that the plants actually have taken up. A laboratory assay that makes use of the light spectrophotometer that we had hoped to use is not sensitive enough to quantify the amounts of metal that we suspect are in the plant leaves. However, the Department of Chemistry has graciously offered us the opportunity to use their Atomic Absorption spectrophotometer, which does have the sensitivity that we require. The only problem we now face is that the chemistry department does not possess the cadmium lamp attachment that we would need for our analysis. Our request is for the funds to purchase a cadmium lamp for the AA Spectrophotometer so that Ammar can finish his work with the mustard plants.

Title of Presentation:

The Environmental and Ecological Consequences of Cadmium on *Brassica juncea* L.

This presentation will be given at the Student Showcase as well as the ACCA Student symposium to be held at Lewis University in the spring.

Itemized Budget:

Cd lumina hollow cathode lamp for Atomic Absorption (PerkinElmer #N3050115)
Cost to Elmhurst College #395.10 (as per Amy Schoeder on 11/08/07)

Benefits to Student and Faculty Member:

The benefit of this purchase is very straight forward; it will allow Ammar to complete his investigation. Without this portion of the analysis it will be difficult to conclusively link cadmium exposure to growth deficiency. We have come to realize that without these data the experiment will provide only circumstantial evidence that the cadmium was hurting the plants. If this is the case, then Ammar will fail to reject his null hypothesis, which amounts to inconclusive results and a rather mundane presentation.

A second benefit is that purchase of the lamp will provide both Ammar and I the opportunity to learn how to use a new piece of equipment. It also gives me the opportunity to continue to emphasize the importance of breadth and interdisciplinary cooperation in science to one of our students. Kimberly Lawler-Sagarin has agreed to help us perform the analysis.

Finally, we will leave the new Cd lamp with the chemistry department so that they can continue to use it in the classes where they deem appropriate. Surely having another analytical tool in a course like physical chemistry would be a benefit.