Team Genes to Fuels – Library Award Essay

The University of Maryland’s information resources and library services were crucial to the strength and success of our Gemstone project. When Genes to Fuels first formed in May 2008, we had just the slightest notion of what we wanted to do with our project. The Gemstone program, and our team librarian Bob Kackley, provided us with resources to help us decide. We knew we wanted to work on algal biofuels, but to refine our focus, we needed to know the current state of the technology and industry. We looked at several applications, including algae being used in wastewater treatment, as well as being grown and harvested from natural water sources. Finally, a Japanese article obtained through the Interlibrary Loan system led us to investigate phytohormones as a possible way to boost production of biofuels from algae. The literature held no information on the effects these chemicals, so we decided to look study them.

The literature review further showed that our original goal- to influence the algae to produce these chemicals themselves- was unfeasible given time and budget constraints, so we decided track the effects of simply introducing phytohormones into the algae’s environment. Our inspiration originated from the hypothesis that algae and plants are evolutionarily related and could have similar biological pathways that would possibly respond to phytohormones in the same way. Using our literature review in conjunction with a bioinformatics analysis, we were able to narrow down the list of phytohormones to use in our project. All in all, we would not have been able to properly define our project, much less move forward and perform our experiments, without extensive knowledge regarding algal biofuels.

We obtained our sources from a variety of locations; mainly, we used the online catalogue and databases to locate appropriate journal articles and books. When we first started our literature review, we created an outline of the topics and subtopics to include, such as overview of other alternative energies, existing knowledge about nutrient manipulation of C. reinhardtii, and known phytohormone effects in plants and algae. From there, we distributed the topics among team members and used key word searches, topical searches, and cross-referencing to find relevant sources in journals and books. We wanted to avoid using mainstream websites or journals that were not peer-reviewed in order to maintain the high-quality of our research, and oftentimes we asked our mentor Dr. Kahn and our team librarian Mr. Bob Kackley to check over our sources and information. Specifically, we greatly used the databases Academic Search Premier and Web of Science to find suitable journal articles, and also located many useful
references in the library stacks via the online catalogue search. Whenever we could not locate the source we wanted via the numerous journal subscriptions from the university or the libraries on campus, we requested them through Interlibrary Loan. In total we have over 200 citations for our project, all organized with RefWorks and Endnote.

Before we even formed a group and project idea, the Gemstone curriculum required us to undertake a research project in the previous semester. In this course, considerable focus was given to teaching the basics of using the university’s library system for research. Veteran Gemstone librarian Jim Miller of the ESPL delivered a lecture dedicated to this topic, and it was through this contact that many of us became familiar with the system. When we just formed our group and were looking for a sharper focus for our project, the preliminary literature review, coupled with our mentor’s suggestions, led us to scale back our research question to something both manageable and novel, as described previously. Later, Mr. Kackley’s suggestion to start searching multiple databases simultaneously greatly streamlined our research, and ultimately saved us a lot of time.

During the course of our research process, we picked up on some important lessons. Besides learning the value of services like Inter-Library Loan and the Research Port, we now have a sense of how quickly emergent scientific fields update and expand their knowledge. We have also gathered a healthy appreciation for jargon: it may be daunting for outsiders to handle, but it lets the informed make a concise representation of their methods and findings. Finally, we learned that looking up articles that are cited in later articles can often lead to useful data (likewise, to go in the opposite direction, the Google Scholar feature “cited by” is fantastic). Like any other skill, researching literature needs practice to master, and we feel this project has given us plenty.