

September, 2007 - Jessica Epstein, Chemistry

Research Tip

This year I developed a project to study ethanol production from various sugar sources. I was fortunate to recruit a couple of bright and enthusiastic students from my organic chemistry course.

The idea for my project started with the acute chest pain I experienced after filling up the gas tank on my Honda Civic (my relatively efficient little car still costs me a fortune in fuel). I noticed the small sign on the gas dispenser '10% ethanol.' I wondered, why not 40% or more? At this time my organic students were learning about fractional distillation, a process where liquids are separated based on different boiling points. My initial idea was for the students to ferment their own ethanol from sugar and then collect the ethanol by distillation. As the project evolved, they fermented ethanol from corn and eventually grass clippings.

For me, as a chemist, my project must be practical and topical. As a scientist at a small college, my research needs to seamlessly blend in with my teaching responsibilities. Furthermore, the techniques must be accessible to the undergraduate students conducting them. A topical project allows me to gather the interest of others. My students clearly grasp the importance of their work and experience a sense of pride in contributing to a much needed body of knowledge. Furthermore, the topic is accessible to reviewers at granting institutions who are not necessarily chemists. For example, while many chemists find *polycyclic aromatics* riveting, many other people can hardly stay awake through the name.

I have also adjusted some of my research habits since graduate school and my postdoctoral fellowship. While in the past, research was my full time job, now it is only part of my job. A few habits help me to multitask: writing ideas down before they are forgotten, soliciting ideas and help from colleagues and writing a skeleton paper.

Ideas come at the strangest times, so I carry with me a small notebook to write down ideas when they come. And they come anywhere from the drug store to the doctor's waiting room. My colleagues are also a tremendous resource and sometimes a few minutes of brainstorming with one of them can help me solidify ideas or greatly simplify a complex procedure. Finally, I like to begin writing a paper before the research is complete. This skeleton paper has an abstract, introduction, procedure and results along with figures. At this point, I start to see what is missing and where we need to focus our efforts in the laboratory.

My thesis advisor used to tell me that a nice piece of research tells a little story. I wish you all luck in your research endeavors.