

## Progress Report 11: April 20 to April 26, 2007

### MALDI-MSI Tissue Coating Device

Client: Dr. Amy Harms, Ph.D., Biotechnology Center

Advisor: Professor Brenda Ogle, Biomedical Engineering

Team Members: Laura Piechura (Leader)  
Kellen Sheedy (Communicator)  
Holly Liske (BWIG)  
Jenna Spaeth (BSAC)

#### Problem Statement

Matrix-assisted laser desorption/ionization mass spectrometric imaging (MALDI-MSI) is an imaging method that allows for label-free spatial analysis of biological tissue samples. This technology can be used to identify and quantify proteins, monitor protein biomarkers, and sequence polypeptide chains, techniques that can be applied to proteomic analysis of disease formation. However, sample preparation methods, especially with regard to the application of the matrix tissue coating, are difficult to control but require accuracy and precision. A device must be developed to apply a fine, uniform coating of light-absorbing compounds in order to simplify the sample preparation process. The goal is to provide a reliable tool to enhance the MALDI-MSI technique in order to speed and simplify potentially life-saving research.

#### Last Week's Goals

- On Friday, April 20, we will meet during class time to begin construction of our prototype. Specifically, we will begin cutting the plastic to the specific sized required, and plan our progress for the remaining two weeks. However, most of the final decisions will be reserved for when the bands arrived and we can better map out the components of the conveyor.

#### Summary of Accomplishments

- On Friday, April 20, we met to begin construction of the prototype. However, as the conveyor components had not yet arrived, we were limited to diagramming the cuts we will make in the 48" x 48" sheet of polyester, and we decided not to make these cuts until we were certain that the conveyor system would function in side the space allotted.
- Consequently, we decided to create a cardboard mock-up of the plastic enclosure, to be used for decision-making before the box has been assembled. Construction of the mock-up was also begun on April 20.
- Continued research was conducted into a potential spray or lacquer we could apply to the polyester to make it more chemical-resistant. Without treatment, it is compatible with most of the components of the matrix, with the exception of acetonitrile and benzoic acid.

#### This Week's Goals

- On Thursday, April 26, Laura and Holly will meet with Professor Jim Barner of the Electrical and Computer Engineering Department to discuss building custom-made time-delay relays. Plans for the relays have been obtained from a book, but hopefully discussion with Professor Barner will facilitate their construction.
- On Friday, April 27, we will meet to continue construction of the prototype, with the goal of completing the prototype by Sunday, April 29. However, this goal is contingent upon the assumption that the conveyor components will arrive from smallparts.com at some point prior to Friday.
- By Tuesday, May 1, we will have conducted preliminary testing of the finished prototype in our client's lab, if her schedule permits it. Also, by Tuesday, May 1, we will have completed the poster for our presentation, and will turn it in to College Library to have it printed.
- On Wednesday, May 2 and Thursday, May 3, we will meet to practice our presentation in front of our poster and make any final adjustments to the prototype.

