

Progress Report 10: April 13 to April 19, 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)
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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 13, we will use our class time to make decisions about the quantity of plastic we need to order for our polypropylene encasing, the length and specifications of the belts we'll need for the conveyor, and send this information to our client.
- In addition, we'll conduct additional testing with the air compressor or air tank if it has arrived, create a more detailed timeline as to when we'd like each individual component of our prototype fabricated by, perhaps divide into specialized teams to complete these tasks, and begin construction with the parts that we have and those that arrive throughout the week.
- If enough of the parts arrive within the week for us to create a rough mock-up of the prototype, we may take a trip to the hardware store to begin purchasing the smaller hardware required to assemble the final design.

Summary of Accomplishments

- On April 13, we met with Professor Ogle and watched our recorded midsemester presentation. The exercise proved very helpful as group members critiqued their own performance, as well as received input from Dr. Ogle and the rest of the group. Hopefully this activity will result in an improved final presentation. Also, we met as a group to decide the ideal size of the enclosure for our prototype, and as we experienced difficulty locating a ¼" sheet of clear polypropylene, we instead decided to order polyester, which was readily available without color, and devise a way to coat the plastic with a substance to increase the chemical compatibility of the enclosure. With these decisions, we formulated an order for a 48" x 48" sheet of polyester plastic and the bands needed to assemble the conveyor.
- In addition, on Sunday, April 15, Kellen, Holly, and Laura took a trip to Home Depot and found screws for assembling the enclosure, hinges for the doors of the enclosure, and plastic adhesive to fuse the polyester together.
- On Monday, April 16, the order was placed by our client, and we were given notification on Tuesday, April 17 that our plastic had arrived from McMaster-Carr.

