

Progress Report 8: March 16 to March 22, 2007

MALDI-MSI Tissue Coating Device

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

Advisor: Professor Brenda Ogle, Biomedical Engineering

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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

- We will meet with our client on Friday, March 16, to ask her to place an order for the parts we've decided to utilize in our final design.
- After many group meetings and much time spent assembling the midsemester Powerpoint, we hope to give an effective presentation detailing our work thus far for the other groups and our advisors on Friday, March 9.
- After the presentation, we will divide the components of the midsemester paper between the group members and set a date for assembling the rough draft. After editing, this paper will be submitted for grading on Wednesday, March 14, along with the Peer and Group Evaluations and our design notebooks.
- With the decisions made thus far, we will submit a list of parts to order to our client. If the parts should arrive within the week, we will begin assembly of our prototype.

Summary of Accomplishments

- On Friday, March 16, we met with our client to discuss the process for ordering parts, as well as propose our final design. From her input, we were able to amass a list of initial parts to be ordered, which included the Paasche A-AU spray gun and the DC motor.
- We sent this list to our client on Sunday, March 18, so as to leave time for further discussion of the chosen parts, and a follow-up call was conducted on Wednesday, March 21 to ensure that our parts had indeed been ordered.

The Week's Goals

- With the input provided by our client at our last meeting, we have decided to explore the option of incorporating time-delay relays into the circuitry of our conveyor system in order to minimize user-interaction. We will conduct further research into the relays with the hope of finding some less expensive options for the design.
- In addition, we will finalize more of the parts that require ordering through our client and send her another list of components to order. These items will hopefully include the valve to be incorporated into the spray gun.

