Surface Modification of PMMA Microrafcts for Antibody-Mediated Cell Capture

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Background

- Circulating tumor cells in the blood stream are related to cancer metastasis and their analysis is useful in determining patient prognosis.
- Current cell isolation techniques involve a flow-through system which can damage cells and decrease viability.
- Microraft arrays provide a less damaging method of isolating single cells and their progeny by allowing cells to grow on a removable raft.
- Coating the rafts with antibodies would allow for capture of target cells from a mixed population.

Project Goals:

- Develop method of modifying the surface of PMMA microrafts, creating functional groups for covalent bonding.
- Use covalent linker to achieve antibody attachment with long-term stability.
- Achieve efficient target cell capture.

Results

- Treatment of rafts with ammonium cerium (IV) nitrate and EDC linker shows some binding of proteins.
- Fluorescence evaluation using microscope is not sensitive enough to detect small differences.

Future Work:

- Develop a more sensitive method to determine protein binding.
- Determine stability of antibody binding.
- Evaluate efficiency of cell capture.