

Mentor

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Funding Sources

National Science Foundation

The Department of Energy



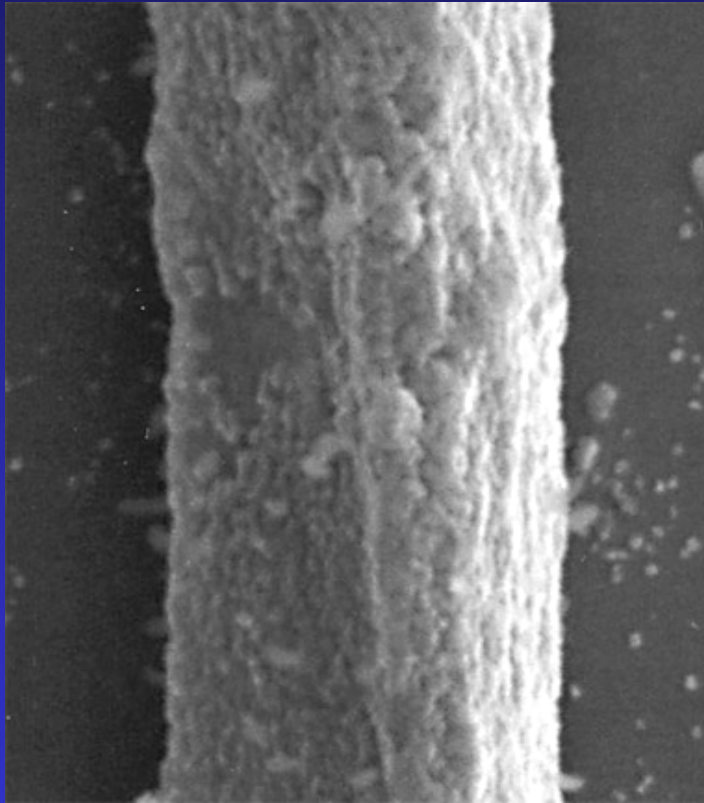
Overview

- ❖ Preparation of aqueous zinc oxide precursors (zinc citrate, zinc nitrate, and zinc propionate)
- ❖ Investigation of catalysis of precursors in the presence of silicatein filaments
- ❖ Biomimic silicatein's catalytic site with functionalized self-assembled monolayers on gold
- ❖ Characterization of products

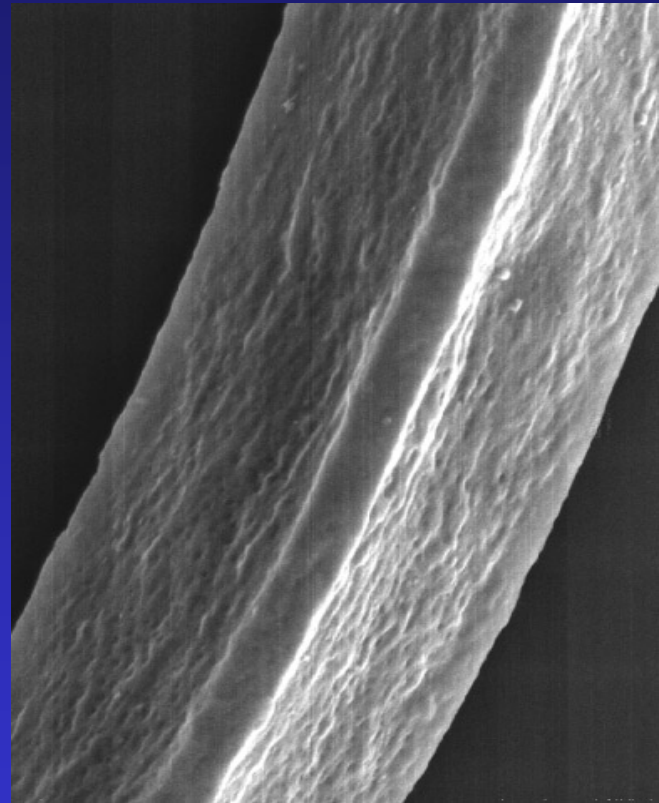
Zinc Oxide Synthesis Experiment

- ❖ Prepared aqueous precursors (zinc nitrate, zinc propionate, zinc citrate)
- ❖ Precursors were mixed with native and denatured (95°C, 90 min) protein filaments at 16°C for 24 hours
- ❖ Samples were centrifuged and washed 4 times to remove unreacted precursors

Result from SEM (Scanning Electron Microscope) Analyses of Filaments



Zinc oxide + native filaments



Zinc oxide + denatured filaments

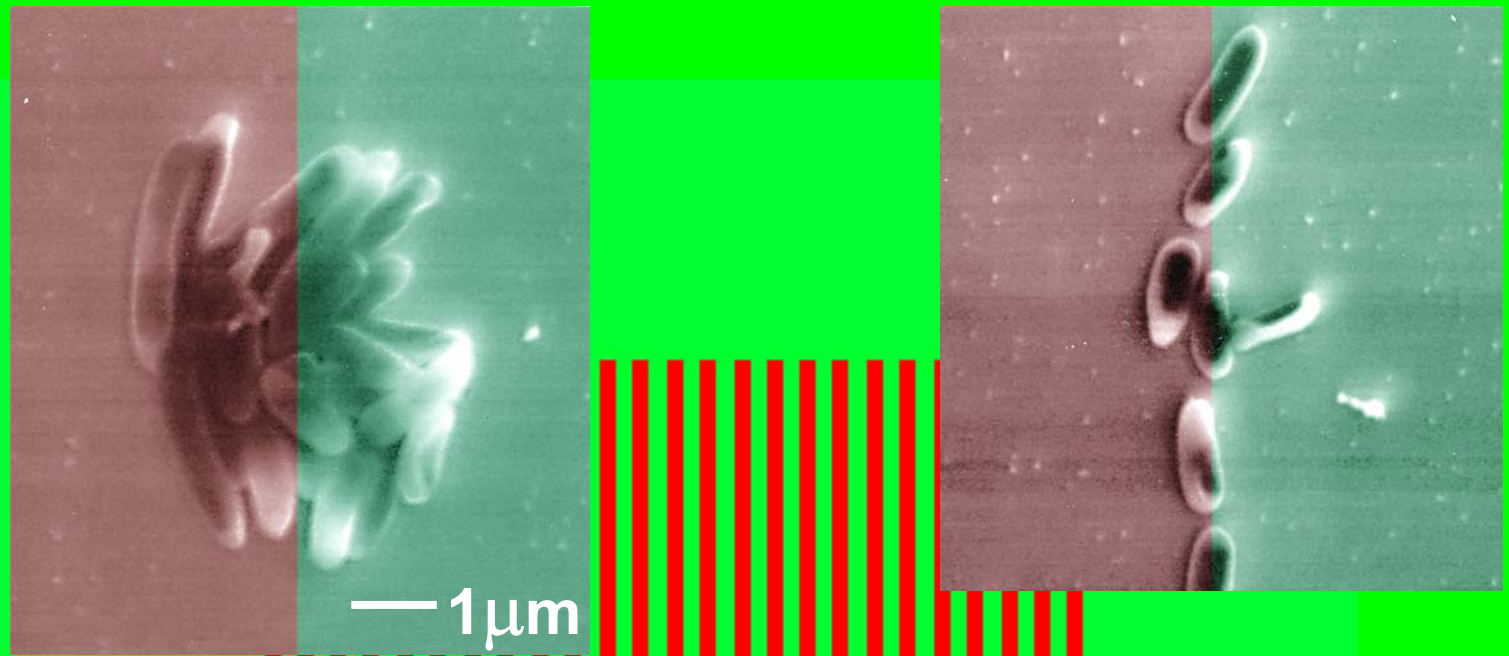


Soft Lithography : General Techniques

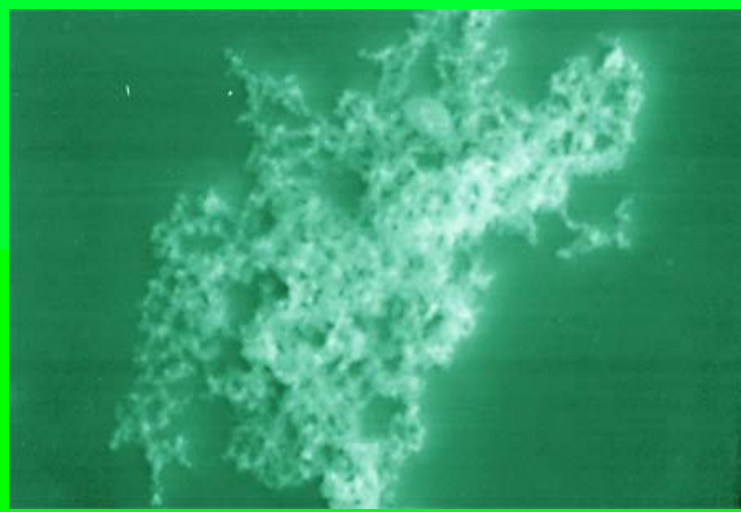


Hydroxyl Ink

Hydroxyl



Imidazole



Future Work

- ❖ Repeat reaction between SAMs and different semiconductor precursors
- ❖ Analyze crystal structure and shape of base catalyzed vs. SAM and silicatein catalyzed zinc oxide precursors

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