

**NSF REU in Integrated Nanomanufacturing – an
Introduction to Prof BROWN'S Laboratory and the
project **Biom mineralization****

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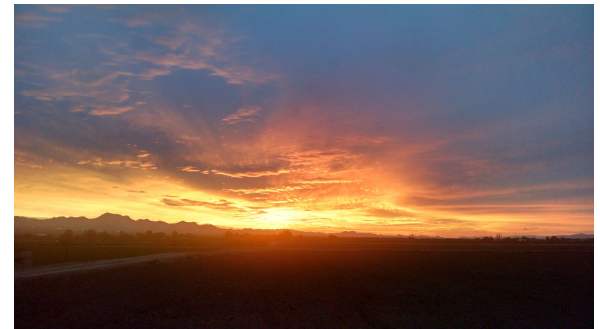
Brief overview of presentation

- Introducing myself
- Background – high school to college
- Previous research experience
- This summer's research laboratory
- Expectations for summer research accomplishments
- Positive and negative experiences so far

Introducing myself

- From Pima AZ
- Going to College at Eastern Arizona College (Rising Junior)
- Major- Engineering... materials, mechanical(energy)
- REU

REU
2016



Influencing Factors for choosing your field

- Why Engineering?



- What has become my focus...

This Summer's Research Experience

- Mesoscale Soft Matter Group
 - Lab--903B
- Biomineralization in Drops
- Summer goals.
- What attracted me to an REU program?
- What are my expectations for the program?
- Grad school or finding a job in industry?

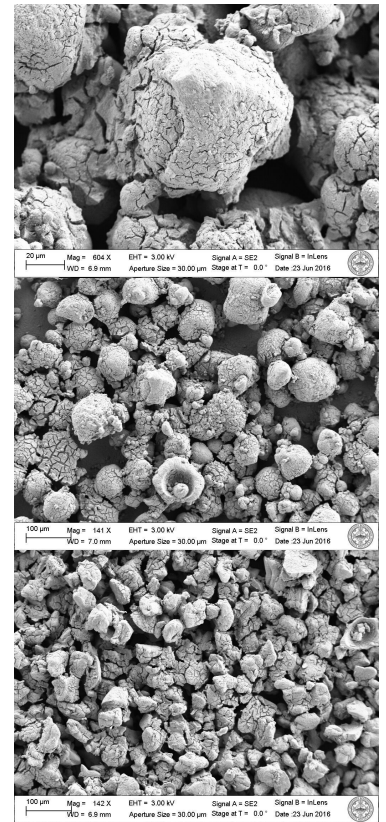
PROJECT GOAL-- Biomineralization of PLA

- PLA (poly lactic acid)-- newly popular commercial biodegradable material used for 3D printing.
 - Reasonably good mechanical and optical properties.
- Modification of PLA
 - Biomineralization
 - Using a solution of Urea, CaCl_2 , Urease
 - CaCO_3
 - Common mineral
 - Shells, Calcite, Limestone



WHAT HAS HAPPENED SO FAR

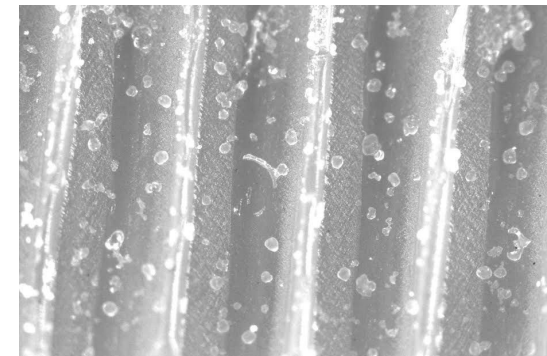
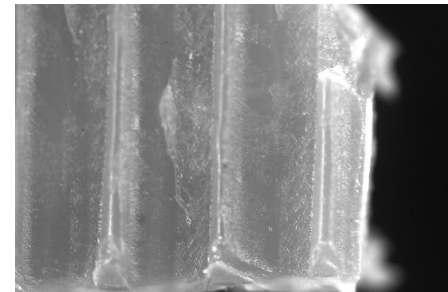
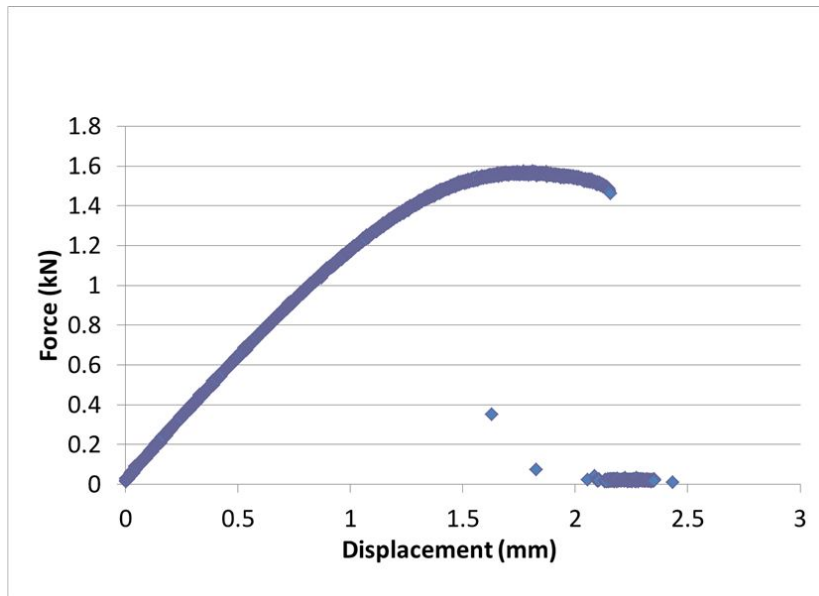
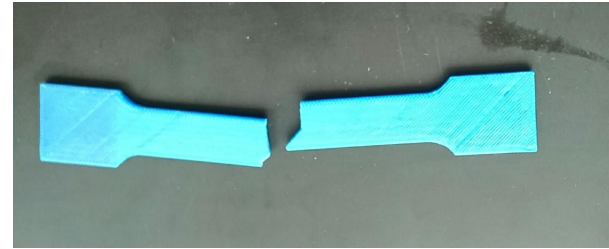
- We have been able to create calcium carbonate.
- Ran a few tests with different variables.
- Things don't always turn out as you expect...
 - Analyze and solve problems that arise.
- Different methods of treating PLA
 - Polymer PEG
 - Amounts of Urease
 - Addition of Urease



Sample	100 uL Urease	200 uL Urease	300 uL Urease	400 uL Urease
CaCO3 weight	80.3 mg	117.83 mg	171.8 mg	356.4 mg

NEXT STEPS

- Test untreated and treated PLA
- Measure tensile strength
- We will continue variations of treatments on the PLA.



After 4 weeks, what are the highlights (positives) and the lowlights

- Positive learning experience.
 - Learning software and machines
 - Research experience
 - Working on projects with others
- First few days.
- Overall feeling now.

Questions?

Thank you.