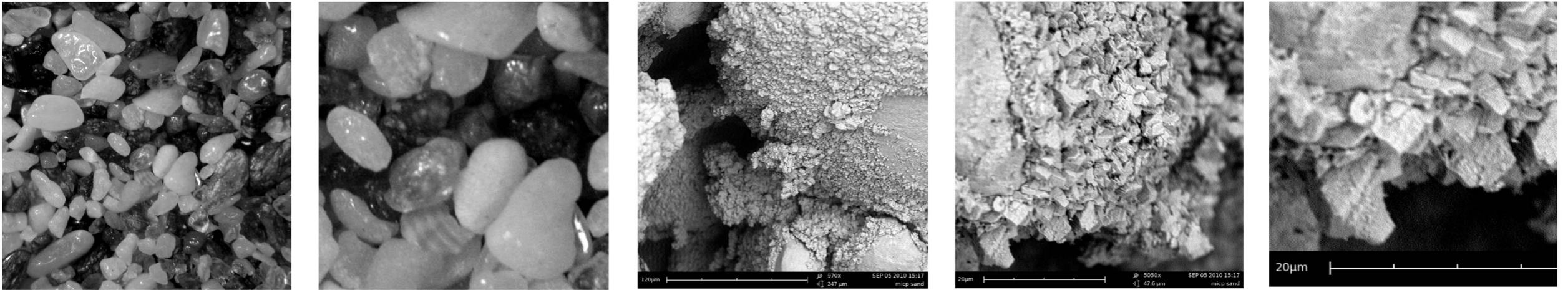
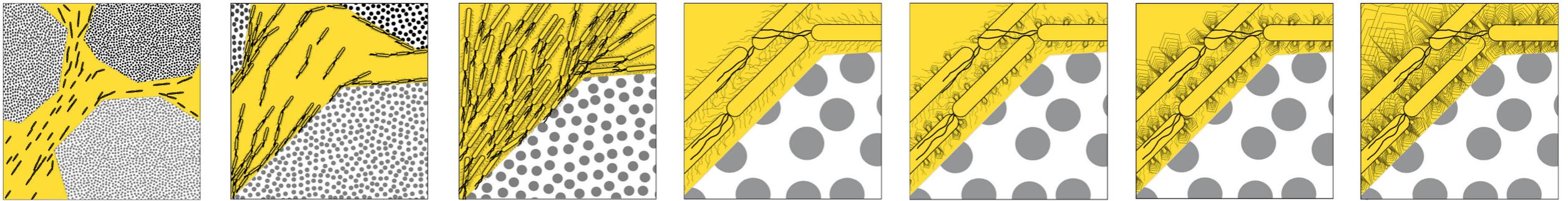


Group 3: Biomaterials and self-building habitats

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- _ urease producing bacteria can be grown efficiently in a range of temperatures
- _ micp coatings retard water absorption
- _ locally sourced sand and aggregate material reduces the weight of materials requiring delivery to the site.
- _ biomanufacturing eliminates need for costly expendable formwork
- _ micp exhibits potential self-healing properties
- _ the material does not shrink during curing, a common problem in concrete construction
- _ cementation can be evidenced in less that 24 hours, depending on cell, urea, and CaCl₂ concentrations
- _ micp can work with a variety of aggregates [results include: sand, glass, and various stone.]

Ginger Krieg

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Current capabilities:

	Mission ideas:	Needed capabilities	Required research & technology development.
5 years	Biobricks - explore earth applications and alternative construction/binders	sustainable sources of Ca and urea	
15 years	co-cultivation with photosynthetic & nitrogen fixing organisms. Surface modifications	Giant 3D patterning device	
30 years	Self-patterning bio matrix and super-composite formation for new properties	toolkit for rejigging matrices	
> 30 years	Application on Mars/Lunar surface	Water, urea, Ca sources	

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Current capabilities:

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	Mission ideas	Needed capabilities	Required research & technology development
5 years			

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	Mission ideas	Needed capabilities	Required research & technology development
15 years			

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	Mission ideas	Needed capabilities	Required research & technology development
30 years			

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	Mission ideas	Needed capabilities	Required research & technology development
> 30 years			