



# Chemical Engineering



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Assistant Professor

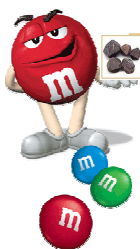
|       |                                        |      |
|-------|----------------------------------------|------|
| B.S.  | Chemical Engineering,                  | 1993 |
|       | National Taiwan University, Taiwan     |      |
| M.S.  | Chemical and Biomolecular Engineering, | 1997 |
|       | The Ohio State University, USA         |      |
| Ph.D. | Chemical and Biomolecular Engineering, | 2001 |
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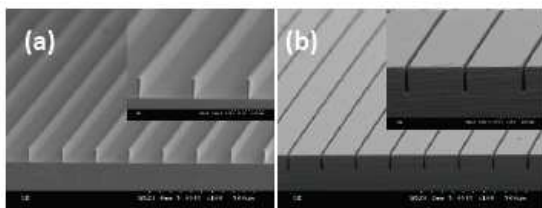
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## Micro/nanofabrication and Micro/nanofluidics Lab (M&M)

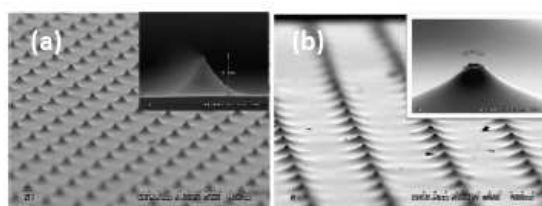


### Research Interests:

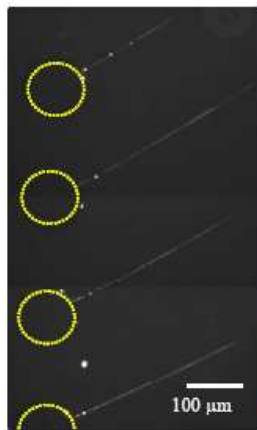
The main research themes in my lab are micro/nanofabrication, micro/nanofluidics, and BioMEMS. Besides developing novel polymer micro/nanofabrication techniques, and understanding/establishing the relationship between processing conditions, material properties and product quality, we also utilize various lithographic methods and soft lithography to fabricate micro/nanofluidic chips and micro/nanostructured templates, which are intended for not only the fluidic studies but the applications in biomedical area and nanoelectronics as well.



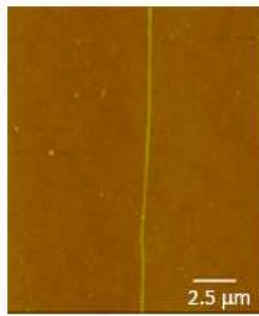
High aspect ratio (AR=8) (a) PDMS mold, and (b) PMMA replica.



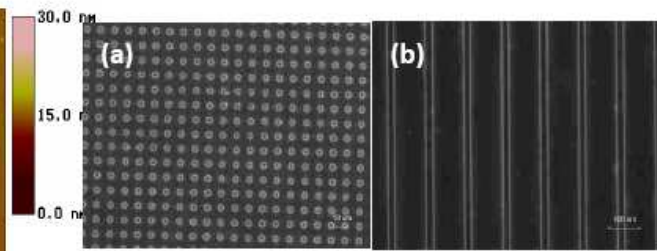
Array of (a) silicon microneedles, and (b) PMMA nanonozzles.



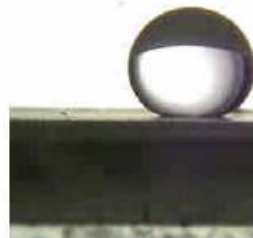
DNA nanowires



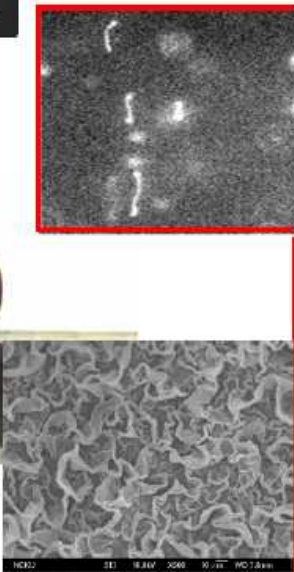
Pd nanowire.



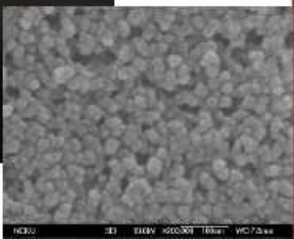
Formation of (a) nanorings, and (b) lines via capillarity



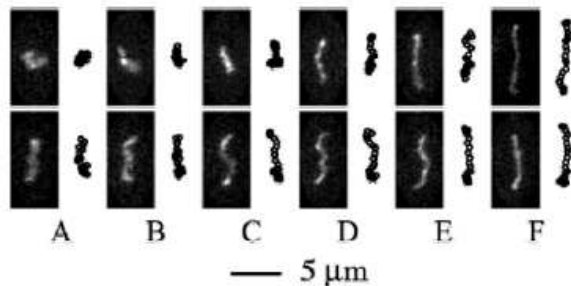
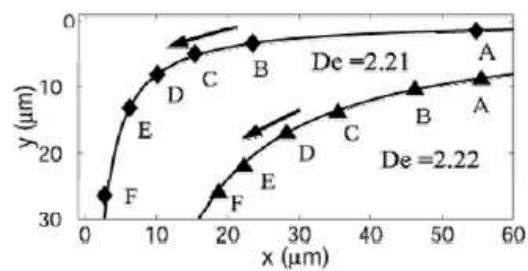
Superhydrophobicity



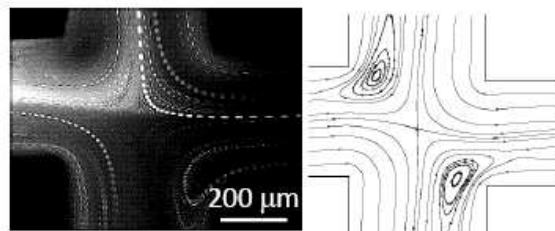
Superhydrophilicity



### Manipulation of Biomolecules



Dynamics of single DNA molecules induced by electrokinetics (around the stagnation point inside a cross-slot flow device)



Experimental and simulation results of rotation of liposome nanoparticles due to electrokinetic interactions.

If your research does not generate papers, it might just as well not have been done. “Interesting and unpublished” is equivalent to “non-existent”.

--by Prof. George M. Whitesides from Harvard University