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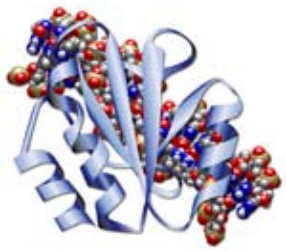
Hardening of Ordered Films of Silica Colloids



Background: Separation technologies, such as HPLC, TLC and gels, are used widely to separate biological macromolecules (including proteins and nucleic acids) for high throughput analysis. Slow separation procedures are the rate limiting steps in high throughput methodologies. Developing quick and precise separation methods that reduce the isolation time of complex macromolecules would revolutionize the world of molecular separation.

Applications:

- *Fast separation of long and short DNA for sequencing, forensics, and gene mapping*
- *Replacement of 2D PAGE gels for proteomics*
- *Replacement of chromatographic columns (eg. HPLC) for fast separation of peptides, small molecules, and ions for analysis*
- *High surface area materials for high throughput screening*
- *Substrate having 100x higher sensitivity than microarrays due to their high surface area and optical transparency*

Advantages:

- *Dramatic increase in the speed of separation*
- *After undergoing the hardening process, the material is not damaged by touch and can stand up to ultrasonic cleaning or shipping strains*
- *The silica surface may be modified according to the users need and can withstand an electric field in excess of 100 V/cm*

The Technology: A separation media utilizing silica colloids has been developed for the separation of charged chemical species, particularly biological macromolecules. The silica colloids are naturally deposited in an ordered fashion and are optically transparent, then hardened. This process results in a highly durable material that can withstand exposure to a high electric field or flow with no damage enabling quick separation of complex macromolecules. The hardened material is very resilient, retaining its shape with minimal distortion and can withstand the shipping process allowing commercial distribution for broad application.

Lead Investigator: Mary J. Wirth, Ph.D., et al., University of Arizona

Status: U.S. Provisional Patent Application Filed; Seeking Industry Partnership

Publications: "High speed electroseparations inside of silica colloidal crystals" Suping Zheng, Eric Ross, Michael A. Legg, Mary. J. Wirth. *Journal of the American Chemical Society*, 128, 9016-9017 (2006)

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Contact Nina Ossanna, Ph.D.
nossanna@arizona.edu

Office of Technology Transfer
888 N. Euclid Ave., Rm 204
PO BOX 210158
Tucson, AZ 85721-0158
520.621.5000
licenses@ott.arizona.edu

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