# Fabrication, Characterization and Application of Physicochemically Modified Silicon Substrates as Protein Microarrays

**10:00 AM, Tuesday, March 17, 2009**
**Room 100 (Dean's Conference Room), ST II**

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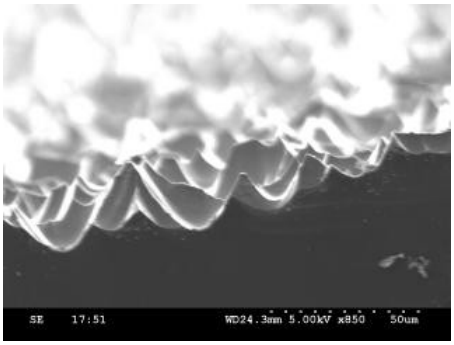
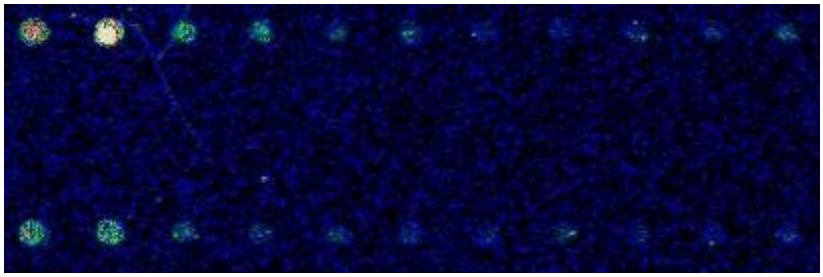
Protein microarrays enable high throughput screening of proteins within cells. One limitation of protein-based molecular profiling is the lack of a PCR-like intrinsic amplification system for proteins that makes DNA-based research so successful. Enhancement of protein microarray sensitivities is an important goal, because many molecular targets are of low abundance. The ideal array substrate will have a high protein binding affinity and low intrinsic signal.

To date, nitrocellulose-coated glass has provided an effective substrate for protein binding in the microarray. As fluorescent systems, such as quantum dots, are explored as potential reporter agents, the intrinsic fluorescent properties of nitrocellulose-coated glass slides limit the ability to image microarrays.

Silicon, with low intrinsic autofluorescence, is explored as a potential microarray surface. Native silicon has low binding potential for proteins. Through titrated reactive ion etching and chemical modification, reactive groups have been added to the surfaces. This approach was successful in transforming native silicon into a protein-binding substrate comparable to nitrocellulose. Nanotechnology helped out pathologists.



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Jasper Nijdam is currently an assistant research professor in the physics department at The George Washington University. Previously, he worked at The Ohio State University Comprehensive Cancer Center as a post-doc on nanotechnological solutions for cancer, and on the fabrication of a glucose sensor in the department of physics at Georgetown University. He got his PhD degree in the MESA+ Research Institute from the University of Twente in the Netherlands, on the subject of anisotropic wet-chemical etching, a technique used in the fabrication of many MEMS-devices. He started of his career as a chemistry student at the University of Nijmegen, also in the Netherlands.