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## Conditioned Surfaces for In Situ Molecular Array Synthesis

Array technologies allow scientists to perform large-scale, quantitative, biological analyses such as biomarker discovery, immunomonitoring, epitope mapping and so on. In situ synthesized arrays have advantages in feature density, and sensitivity, however, quality and reliability rely on the quality and consistency of the synthesized molecules. A critical component in in situ synthetic procedures is the preparation of the surface upon which in situ synthesis is performed. The ideal surface would be largely functionally inert, have equally available attachment groups, and have an attachment matrix that is stable to the synthetic process. However, this is not often the case; the first synthetic steps may see a different surface in some respect than the later synthetic steps.

Researchers at Arizona State University have developed methods for making in situ synthesized peptide or other microarrays such that an ideal surface is presented to significantly enhance sequence attachment. The methods developed for improving the surface preparation of peptide or other microarrays includes a series of preconditioning steps similar to the synthetic steps actually used to make the microarrays, but that do not synthesize the final, functional molecules. Utilizing these methods, arrays can be made which have enhanced sensitivity and reduced nonspecific binding/interference.

These methods allows complex solutions to interact with the surface in such a way that the specific molecular recognition aspects of the interaction dominate, rather than

nonspecific attraction.

### Potential Applications

- Surface preconditioning for in situ molecular array synthesis
  - o Diagnostic arrays
  - o Arrays for selection of specific ligands or targets
  - o Arrays for potential drug development
  - o Arrays for epitope mapping

- o Arrays for biomarker discovery
- o Arrays of sensor molecules

#### Benefits and Advantages

- Increases the fraction of the observed signal that is informative
- Enables specific molecular interactions in complex solutions and reduces nonspecific attractions
- Increased sensitivity
- Certain preconditioning procedures decrease the tendency of the surface to cause denaturation of antibodies in the blood
- Preconditioning has a positive effect on the ability to synthesize and/or detect cognate binding of an antibody to its epitope

For more information about the inventor(s) and their research, please see [Dr. Woodbury's directory webpage](#)