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Rapid Protein Array Fabrication Utilizing Host Derived Proteins

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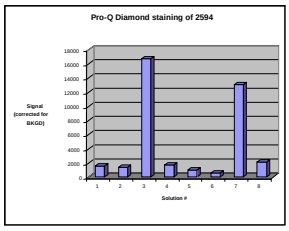
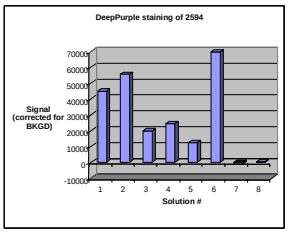
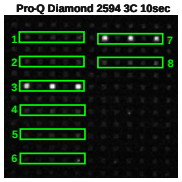
The protein chip is recognized as the next tool in drug discovery and proteomics; however advances in protein chip technology have been hindered due to the heterogeneity of proteins themselves. Additionally, there is the constraining issue of the limited supply of purified proteins for protein array fabrication. Taken together, these issues significantly impact the development of high density protein arrays for both basic biological and applied diagnostic sciences. In order to circumvent the most significant barrier to protein array fabrication (limited quantities of functional content), we propose combining new two-dimensional liquid phase separation techniques (PF2D) for fractionating functionally active proteins with subcellular isolation, leading to comprehensive, proteome-scale functional protein arrays. Initial experiments without subcellular isolation putatively identified outer membrane proteins of Yersinia pestis. The addition of subcellular isolation prior to PF2D fractionation will greatly decrease the complexity of the whole cell lysate affording nearly homogenous protein fractions.

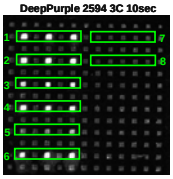
The resultant fractionated proteins are then deposited onto Argonne National Laboratory's gel element biochips, a biochip platform that addresses both probe denaturation and steric hindrance issues typically associated with planar array substrates. The use of fractionated proteins, expressed by the host organism offers rapid content generation while maintaining post-tanslational modifications







Solution list		Phosphorylated
1.	Bovine gamma globulin	-
2.	Bovine serum albumin	-
3.	Ovalbumin	+
4.	RNase B	-
5.	Soybean trypsin inhibitor	-
6.	Avidin	-
7.	Phosvitin	+
8.	Bacteriorhodopsin	-



Argonne Innovation BIO 2006

Array fabrication

Gel drops with immobilized probes

Innovation Corridor: Proteomics

Tuesday, April 11, 1:00 PM - 4:00 PM

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