

# John A. Boezi Memorial Lectureship

## Dr. Michael Washburn

### Stowers Institute for Medical Research

Thursday, April 10, 2008  
11:30 a.m.  
101 Biochemistry

## Using Normalized Spectral Abundance Factors to Visualize Protein Complexes and Protein Interaction Networks

### Research in the Washburn Laboratory

Quantitative proteomic experimentation can now yield expression data for hundreds to thousands of proteins. Often times these datasets will be generated with the intention to discover new biology that will be followed up with focused biochemical, cell biological, or molecular biological experimentation. Spectrum counting is an appealing and relatively straightforward approach for quantitative proteomics (1-3). There are several different versions of spectral counting currently in use, but each approach has shared core characteristics. An additional important consideration for quantitative proteomic analysis is the use of replicates for statistical analysis and determining the proper statistical test to use based on the overall structure of the datasets. Our laboratory has been focused on the use of a modified form of spectral counting, named the normalized spectral abundance factor (NSAF) as the basis for quantitative proteomic analysis in combination with multidimensional protein identification technology (4). The key features of the NSAF approach is that it takes into account the length of the protein being analyzed and the total intensity of the run. We use the NSAF approach in combination with multidimensional protein identification technology (MudPIT) to analyze multiprotein complexes (5, 6). Using these approaches we have quantitatively analyzed the transcriptional regulatory complex, Mediator, to determine that unique proteins within Mediator isolate different forms of Mediator (6). More recently, we have begun analyzing large scale protein complex datasets using a novel mathematical approach to identify novel components of multiprotein complexes and devise probabilistic protein interaction networks (7).

### References

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