# Technology  Workshops

## Tuesday

| 10:30-11:00 am » Thimble Shoals Room | 10:30-11:00 am » Chesapeake Bay Room |
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| EXPRESSION SYSTEMS | PALL Life Sciences |
| **11:00-11:30 am » Thimble Shoals Room** | **11:00-11:30 am » Chesapeake Bay Room** |
| NANOSIGHT | Refine TECHNOLOGY |
| **11:30-12:00 noon » Thimble Shoals Room** | **11:30-12:00 noon » Chesapeake Bay Room** |
| ALFA WASSERMANN Separation Technologies | New Brunswick an eppendorf company |

**Thera Mulvania, PhD** • Expression Systems

### *Optimizing the Baculovirus Expression System*

**ABSTRACT**: Expression Systems is dedicated to supplying and servicing the cell culture and bio-industrial markets with innovative cell culture media formulations and supporting technical services. Expression Systems' portfolio is grounded by well-characterized, superior-performing protein-free insect cell culture media. For the X-ray crystallographer, Expression Systems provides a variety of amino acid deficient formulations of ESF 921. Unique to Expression Systems is an Animal Free Formulation, ESF AF, that supports the growth of a variety of insect cell lines, including Spodoptera, Trichoplusia and Drosophila lines. Industry concerns of the potential of contamination from animal-sourced components led Expression Systems to develop a companion product, the Tni PRO™ cell line. Tni PRO™ cells were derived from Trichoplusia ni embryos in ESF AF, have never seen exogenous animal or animal-derived components, are traceable to the source and are robust producers of recombinant protein.

Expression Systems Technical Services are supported by an interest in better understanding the baculovirus expression vector system (BEVS). To that end, Expression Systems has developed tools for better characterization of the components of BEVS, most notably a flow cytometric based titering assay. This assay is provided as a service by Expression Systems and is also available as a kit. Expression Systems performs a variety of contract services including cloning your gene of interest into an appropriate vector, cotransfections to produce high titer baculovirus stock, expression optimization, and protein production and purification. Expression Systems now offers the BestBac kit to get you started in successful gene expression using BEVS. This kit is designed to make gene expression is easy as possible. The kit contains a choice of viral backbone, transfer vectors, transfection medium and controls. Expression Systems is offers a GMP contract manufacturing facility as well as GMP manufacturing of cell culture media. Expression Systems offers a variety of products and services to help your company utilize the potential of the baculovirus expression vector system.

**Loe Hubbard** • Pall Life Sciences

## *Small Scale Bioreactor Technology for Early Stage Process Development*

**ABSTRACT**: In the current research climate of tight timelines, limited resources and budget constraints, the need for robust high throughput solutions has increased. The Micro24 microbioreactor pairs full process monitoring and control with the ability to run 24 simultaneous experiments in a minimal footprint. With both cell culture and microbial functionality, this instrument seeks to revolutionize selection and process development. The increased design space allows researchers to execute shorter timelines, increase understanding and evaluate a larger number of process variables. This workshop will introduce attendees to the technology by providing a capability overview, hands on demonstrations and applications examples.

**Jim Munhall** • Nanosight

## *A New Methodology for Visualizing Viruses, Measuring Their Titer in Minutes, and Determining the Degree of Sample Aggregation*

**ABSTRACT**: Measurement of viral titer and sample aggregation is a ubiquitous requirement in vaccine development, phage therapeutics and gene therapy. Nano Particle Tracking Analysis (NTA) is a new methodology which provides total viral titer in minutes and real time measurement of sample aggregation. The ability to measure these parameters at key points throughout the downstream purification process allows manufacturers to monitor and optimize the sample purification.

The technique images viruses individually in liquid suspension (as small as 25nm) and then calculates their size from their Brownian motion on a virus-by-virus basis. By individually counting and sizing the viruses, a high resolution number vs size distribution is generated which relates the number of virus monomer to aggregates.

Operating under light scatter, the technique is inherently non-specific and hence suited to working in purified samples. It can also work under fluorescence mode where the virus capsids or DNA is labelled to allow distinction of virus from cell debris making the technique suitable for working in crude harvest materials.

The technique is designed to work alongside traditional technologies such as infectivity assays, as these assays provide valuable, yet limited information. Infectivity assays have no ability to pick up aggregation within a sample and do not give a measure of total viruses within a sample. When this data set is merged with the NTA data, the user can monitor infective vs non-infective viruses vs sample aggregation to better understand the quality of a viral preparation.

The technique works with most virus types as small as 25nm and does not require the virus to be infectious or contain DNA to make a measurement. It is therefore suitable for measuring Virus Like Particles (VLPs) as well as inactivated and attenuated preparations.

**John Bonham-Carter, VP Sales** • Refine Technology

## *Process Intensification for Proteins and Vaccines*

**ABSTRACT**: This workshop will be an interactive discussion around the topic of how to intensify processes, with a focus on upstream and primary recovery. Ideas and case studies will be presented covering areas such as: Concentrated Perfusion, Concentrating Fed-Batch reactor productivity ten fold (from 1–2 g/L to 10–20 g/L) and removal of centrifugation/depth filtration by a UF/DF integration with the reactor. Using this integrated method, we will discuss the advantages and challenges to achieving clarification and concentration of products such as proteins and virus/VLPs (including DNA removal) directly from the reactor. Impacts on facility layout and operation (retrofit and new build) will be discussed as well as cost of goods advantages.

**Sandra Merino** • Alfa Wassermann Separation Technologies

## *Automated Ultracentrifugation Scale Up Using the Promatix 1000™*

**ABSTRACT**: Alfa Wassermann introduces the Promatix 1000™ continuous flow ultracentrifuge, a laboratory scale unit capable of fully automated gradient loading, product loading, and fractionation. Suitable for scale up and scale down of processes for: viral vaccines, viral vector therapies, and nanosphere purification. The results generated are directly scalable to the large scale KII ultracentrifuge used globally for viral vaccine manufacture.

**Richard Mirro** • Product Manager, New Brunswick Scientific

## *Overview and Updates to New Brunswick's Single-Use Bioreactor Technology*

**ABSTRACT**: New Brunswick Scientific (www.nbsc.com) will review their single-use stirred-tank bioreactor technology, including providing a sneak peek at new products soon to be released. The talk will concentrate on advantages of single-use technology, product design, and comparative results using the CelliGen® BLU. Currently offered in 5.0 and 14.0 Liter capacities, the flexible and compact system has been designed to provide the performance and advanced control capabilities of traditional stirred-tank systems, while providing all the labor and cost-savings of disposable technology.