

## AFFINITY / PURIFICATION / SOLUTIONS

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Welcome to our second quarter edition of BioPurification Quarterly™! We hope you like the new crisp clean style of the newsletter. You'll see the same consistent branding across our other marketing communications platforms; brochures, trade show booth, etc.

Having trouble with endotoxin in your protein expression system? In this issue of BioPurification Quarterly Dr. Dev will discuss the development of a new affinity adsorbent for the capture of endotoxin. Dr. Dev explains the current field of endotoxin removal methods as well as describing ProMetic BioSciences Ltd's ("PBL") new developmental product for endotoxin removal. In addition we're pleased to announce the availability of PBL's affinity adsorbents in Atoll's MiniChrom and MaxiChrom pre-packed columns.

Thanks again and we hope you enjoy the newsletter!

## news

## PBL's Comprehensive Range of Affinity Adsorbents are Now Available from Atoll GmbH

PBL's [bioseparation technologies](#), affinity adsorbents and [Mimetic Ligand™](#) purification platform are used by numerous pharmaceutical and biotechnology companies (from research to large scale regulated manufacturing processes), making PBL a key supplier to the global life sciences industry. The extensive range of PBL adsorbents can be used to purify a wide variety of proteins and now adsorbent selection and method development has been made even easier by the availability of PBL adsorbents pre-packaged in Atoll columns.

[Atoll GmbH's](#) vast client-base includes research and process development scientists in the biotechnology and diagnostic industries. Atoll GmbH provides these customers with a diverse range of reliable and user-friendly chromatographic screening, method development, validation and (disposable) production tools - specifically configured, using [MediaScout®](#) technology, to meet stringent customer needs and packed with all types of separation media.



MediaScout®  
MiniChrom

### [MediaScout® MiniColumn](#)

- High Throughput Resin Screening tools in 96-well format

### [MediaScout® MiniChrom](#)

- Ready-to-use columns packed with any separation material

### [MediaScout® ValiChrom](#)

- Purpose designed columns for down-scale process validation

### [MediaScout® MaxiChrom](#)

- Disposable and totally incinerable chromatography columns

[Order pre-packed columns from Atoll GmbH](#)

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## The Use of High Throughput Screening Technologies in Custom Adsorbent Development Programs

The [Custom Adsorbent Development programs](#) offered by PBL have progressed in recent times to take advantage of some PBL's latest technologies.

[PuraPlate™](#) products manufactured and supplied by PBL are blocks containing 96 mini columns (0.25mL) packed with your PBL adsorbent of choice. PuraPlate™ column blocks incorporate top and bottom frits and may be operated by gravity flow or used in combination with robotic liquid handling systems. The flow-through fractions (collected in a deep-well plate) can be used directly in microplate detection assays. These exceptionally flexible products are designed for high-throughput process optimization. PuraPlate™ products are available from PBL for use in your own laboratory and contain columns packed with individual or selected combinations of PBL's standard affinity adsorbents.



Mimetic® Screening  
PuraPlate™

PuraPlate™ technology also forms a key component of the [Custom Adsorbent Development](#) programs offered by PBL. When combined with our high-throughput ligand synthesis platform we use PuraPlate™ technology for:

Adsorbent Optimization - an adsorbent can be quickly optimized in terms of ligand density and ligand presentation (spacer arm) to give maximum performance for purification of the target protein from the selected feedstock. The use of PuraPlate™ technology allows simultaneous screening of, for example, different ligand density/ spacer arm combination's of candidate ligands (in duplicate or triplicate) and in combination with high-throughput microplate assay techniques enables fast data generation and rapid identification of the optimal adsorbent construction for the target application.

Chromatography Development - The use of PuraPlate™ technology to optimize chromatography conditions offers many benefits over the traditional and often laborious process of operating a single column over many cycles including:

- The ability to screen multiple equilibration, load, wash, elution and sanitization conditions

- simultaneously
- Rapid analysis of column fractions using high throughput assays
- Generation of data comparable to that obtained using larger-scale columns

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## Ask Dr. Dev - An Adsorbent for Endotoxin?

*Question- Dear Dr. Dev, I am having problems removing residual endotoxin from my purified protein products - can you suggest a solution?*

Answer- Endotoxins (lipopolysaccharides, LPS) derived from the cell membrane of Gram negative bacteria are commonly encountered impurities, especially in the case of recombinant protein products produced in *E. coli*. According to most pharmacopoeias the maximum permitted level of endotoxin for intravenous products is 350 endotoxin units (EU) per 70kg adult per hour. One EU approximates to 100-120pg of *Escherichia coli* endotoxin. Bacterial endotoxin elicits a variety of pathophysiological effects and its removal to below the threshold level continues to be a major challenge for biopharmaceutical products produced in Gram negative bacteria to the strong association of endotoxin with many proteins.



Dr. Dev Baines, PBL  
Technical Director

While a number of endotoxin removal techniques have been described, methods based on selective adsorption are generally the most effective for the removal of LPS from biological products. Many of the adsorbents investigated for this purpose are strongly positively charged and bind negatively charged endotoxin molecules by non-specific ion-exchange interactions. Such adsorbents include cation-exchangers, immobilized amino acids (for example, L-histidine or poly-L-lysine) and ligands such as polymyxin B. However, the use of such adsorbents is limited to proteins with a net positive charge otherwise significant product losses are encountered. Polymyxin B is a toxic antibiotic and ligand leakage from these adsorbents is of significant concern.

PBL has identified a novel, non-toxic and highly stable synthetic affinity ligand for the capture and removal of residual endotoxin from biological products and we are currently in the latter stages of product development. The specific ligand has high affinity for endotoxin and is covalently attached to our proprietary near mono-disperse 6% cross-linked agarose bead - PuraBead® 6XL. Non-specific binding of protein is very low and since this adsorbent is resistant to high pH it can be easily be regenerated by washing with NaOH. [Evaluate this product?](#) [Question for Dr. Dev?](#)

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## events

### Upcoming Events

#### [The 14th Recovery of Biological Conference](#)

Date: August 1-6

Venue: The Resort at Squaw Creek in Lake Tahoe, California

#### [BioProcess International Conference and Exhibition](#)

Date: September 20-24

Venue: Rhode Island Convention Center, Providence Rhode Island

#### [Miniaturisation - Micro Scale Bioprocess Development](#)

Date: September 20, 2010

Venue: BioPark Hertfordshire, Welwyn Garden City, Hertfordshire AL7 3AX, UK

#### [HTPD 2010 High Throughput Process Development](#)

Date: October 4-7, 2010

Venue: Andel's Hotel, Kraków, Poland

#### [La Jolla Biotech Day - Spotlight on Science](#)

Date: December 1, 2010

Venue: Marriott Hotel La Jolla, La Jolla, CA 92037

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## resources

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