

high throughput process optimization

96 column-block format

PuraPlate™



High throughput process development has become an essential element in the design and development of modern downstream processes. This technique shortens development time and increases the process knowledge available during the early phase of a development program.

PuraPlate was developed as a convenient tool for use in high throughput optimization of chromatographic processes and are manufactured exclusively by ProMetic BioSciences Ltd (PBL), in a controlled environment to ISO 9001 quality standard, to meet the requirements of our customers in the BioPharmaceutical industry.

PuraPlate products are available pre-filled with PBL's commercially available range of adsorbents and provide a quick and effective platform for process optimization by enabling parallel screening of process conditions. Optimum conditions identified by PuraPlate can be applied to conventional chromatography columns for scale-up.

Each PuraPlate comprises 96 individual columns, each containing 0.25 mL of adsorbent and is operated under gravity with buffer/sample loading performed either manually using single or multi-channel pipettes or by automated liquid handling systems.

KEY BENEFITS

- Extensive range of PBL products available
- Universally applicable platform
- Proven technology (used by PBL for custom programs)
- Quick and effective platform for process optimization
- Minimal feedstock application
- Scalability to conventional chromatography columns
- Robust and stable adsorbents
- High purity, chemically defined ligand structures
- Highly reproducible batch-to batch manufacture to ISO 9001 standard

ADVANTAGES

PROVEN TECHNOLOGY

The PuraPlate platform has been used extensively by PBL for quick and effective process optimization. As an example Fabsorbent™ F1P HF PuraPlate was used to investigate a range of elution buffers in order to identify an optimized elution strategy for the selective recovery of Fab and F(ab')₂ fragments bound from an *E.coli* lysate. The PuraPlate format significantly reduced the amount of feedstock required, allowed multiple conditions to be evaluated in parallel and was successfully scaled-up to conventional chromatography columns (see Figures 4 and 5).

UNIVERSALLY APPLICABLE

PuraPlate is easy to use operating under gravity without the need of either vacuum or centrifugation for sample collection. All buffer/sample loading can be performed either manually using single or multi-channel pipettes or by an automated liquid handling system (Figure 1). Buffer/sample applications are collected into 2 mL deep well collection plates (Figure 2) which can then be analyzed using high throughput analytical techniques.

RAPID PROCESS OPTIMIZATION

PuraPlate products can be utilized to generate a large volume of data quickly and effectively, whilst minimizing feedstock applications, for either process optimization (e.g. load, wash and elution strategies - varying pH, conductivity and additives) or adsorbent recycling and stability (e.g. Clean in Place (CIP) strategies - investigating numerous solvents, detergents and denaturants). Optimum conditions can then be scaled-up directly to conventional chromatography columns.

ADSORBENT STABILITY

Most PBL adsorbents supplied in PuraPlate format are stable across a very wide pH range (pH 2.0 – pH 14.0) and are resistant to most chemical treatments including denaturants (urea, guanidine hydrochloride), detergents (Triton, SDS) and thiol reducing agents.

PURAPLATE AVAILABILITY

PuraPlate is available from PBL containing either a single adsorbent (96 columns, 0.25 mL CV) or multiple adsorbents (custom designed to suit customer requirements e.g. 8 columns x 10 different Mimetic Ligands™, 0.25 mL CV) see Figure 3 for further information.

PURAPLATE OPTIONS

FIGURE 1

PuraPlate operation performed using an automated liquid handling system.



FIGURE 2

Schematic for PuraPlate sample application (e.g. load, wash, elution and CIP strategies).

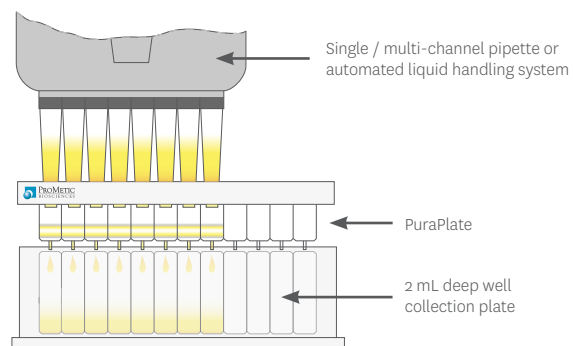
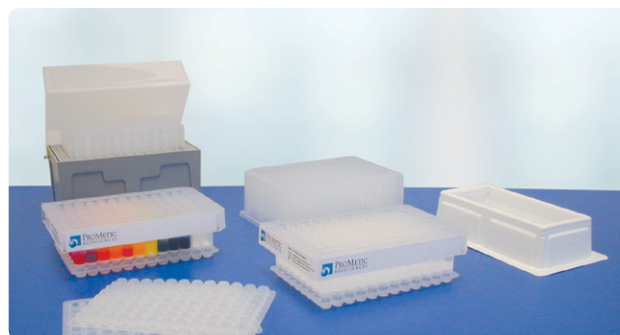


FIGURE 3

Single and multiple adsorbent PuraPlate options.



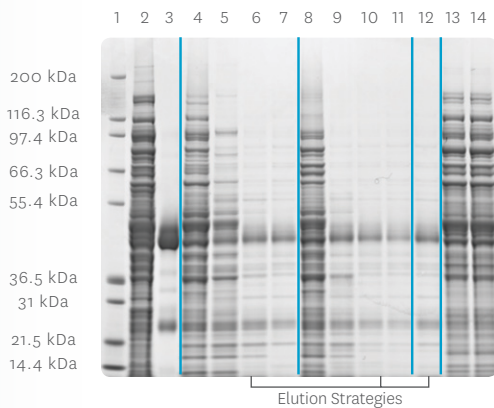
APPLICATIONS

FABSORBENT F1P HF PURAPLATE

The Fabsorbent F1P HF PuraPlate (96 x 0.25 mL CV) was used to investigate a range of elution buffers at varying pH in order to identify an elution strategy for the selective recovery of Fab fragments bound from an *E.coli* lysate (Figure 4).

FIGURE 4

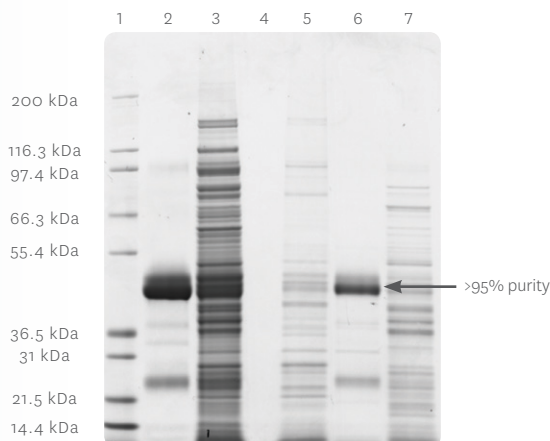
Non-reduced SDS-PAGE of elution samples from the Fabsorbent F1P HF PuraPlate investigation. Lane 1: Molecular weight marker; Lane 2: Load; Lane 3: Purified Fab; Lanes 4 to 7: sodium acetate buffer (pH 3.5 to pH 5.0); Lanes 8 to 11: sodium citrate buffer (pH 3.0 to pH 4.5); Lane 12: Tris-acetate buffer (pH 4.5); Lane 13: glycine buffer (pH 9.0); Lane 14: Tris buffer (pH 9.0).



One promising elution identified from the PuraPlate investigation (50 mM sodium acetate, pH 4.5) was successfully scaled-up onto a conventional chromatography column (4 mL CV, 1 cm diameter, 5 cm bed height) using Fabsorbent F1P HF (Figure 5).

FIGURE 5

Non-reduced SDS-PAGE of samples from scale-up column run using Fabsorbent F1P HF. Lane 1: Molecular weight marker; Lane 2: Purified Fab; Lane 3: Load; Lane 4: blank; Lane 5: flow through; Lane 6: elution (sodium acetate, pH 4.5); Lane 7: strip (sodium citrate, pH 3.0).

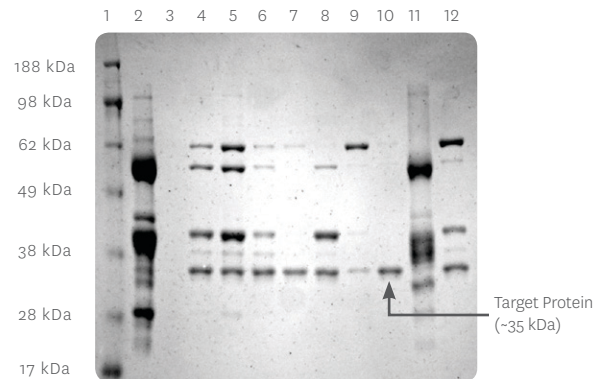


MIMETIC LIGAND SCREENING PURAPLATE

The Mimetic Ligand Screening PuraPlate (containing Mimetic Red®, Mimetic Orange®, Mimetic Yellow®, Mimetic Green® and Mimetic Blue® adsorbents, 8 x 0.25 mL CV each) was used to identify a lead candidate for the capture and purification of lactate dehydrogenase (LDH) from rabbit muscle extract, pH 7.0 (Figure 6).

FIGURE 6

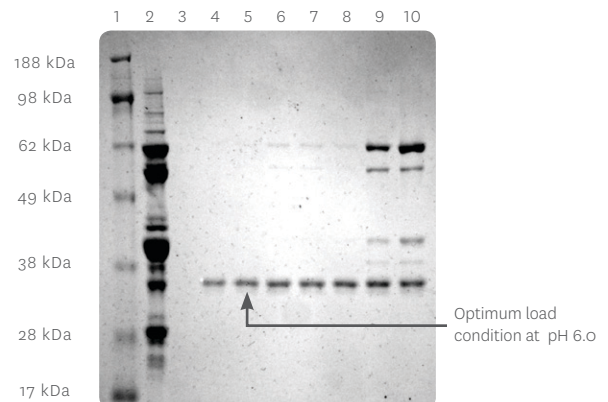
Reduced SDS-PAGE of elution samples from the Mimetic Ligand Screening PuraPlate investigation. Lane 1: Molecular weight marker; Lane 2: Load; Lane 3: blank; Lanes 4 to 5: Mimetic Red 2 and 3; Lanes 6 to 8: Mimetic Orange 1 to 3; Lanes 9 to 10: Mimetic Yellow 1 and 2; Lane 11: Mimetic Green 1; Lane 12: Mimetic Blue 1.



The Mimetic Ligand PuraPlate investigation identified Mimetic Yellow 2 A6XL (Lane 10) as the lead candidate for LDH capture and recovery. As a result, the remaining columns available on the PuraPlate (n=7) were utilized to perform a further screen to investigate varying the load from pH 5.5 to pH 8.5 for Mimetic Yellow 2 A6XL (Figure 7).

FIGURE 7

Reduced SDS-PAGE of elution samples from the Mimetic Ligand PuraPlate load investigation using Mimetic Yellow 2. Lane 1: Molecular weight marker; Lane 2: Load; Lane 3: blank; Lane 4: load, pH 5.5; Lane 5: load, pH 6.0; Lane 6: load, pH 6.5; Lane 7: load, pH 7.0; Lane 8: load, pH 7.5; Lane 9: load, pH 8.0; Lane 10: load, pH 8.5.



REGULATORY SUPPORT

PBL adsorbents are manufactured in a controlled environment to ISO 9001 quality standard and are supported by comprehensive regulatory support files.

TECHNICAL SUPPORT

PBL has many years experience in the development and application of the PuraPlate platform and can provide full technical support in the use of PuraPlate and help design specific protocols to meet your requirements.

PBL has comprehensive knowledge of the properties and applications of all its adsorbents and can provide full support for the development of new applications and their implementation for BioPharmaceutical manufacture.

PROPERTIES

Column volume	0.25 mL
Column diameter	8 mm
Bed height	5 mm
Maximum load volume per column	1 mL (per single application)
Chemical stability	All commonly used aqueous buffers and co-solvents.
Equipment supplied	1 x PuraPlate (including upper/lower seals), plus rubber teat (bulb).
Equipment required	Single/multi-channel pipette or automated liquid handling system, blotting/tissue paper, waste reservoir, sample/buffer reservoirs, 2 mL deep well collection plates.

PBL supply bulk adsorbents into developmental and regulated cGMP manufacturing processes. For more information on any PBL adsorbent and supply related matters please do not hesitate to contact us.

CONTACT US

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ORDER

Mimetic Ligand Screening PuraPlate (10 x Mimetic Ligand Adsorbents)	2210
Mimetic Red 2 A6XL PuraPlate	2209
Mimetic Red 3 A6XL PuraPlate	2211
Mimetic Orange 1 A6XL PuraPlate	2212
Mimetic Orange 2 A6XL PuraPlate	2213
Mimetic Orange 3 A6XL PuraPlate	2214
Mimetic Yellow 1 A6XL PuraPlate	2215
Mimetic Yellow 2 A6XL PuraPlate	2216
Mimetic Green 1 A6XL PuraPlate	2217
Mimetic Blue AP A6XL PuraPlate	2221
Mimetic Blue 1 P6XL PuraPlate	2234
Mimetic Blue SA P6XL PuraPlate	2220
Mimetic Blue SA HL P6XL PuraPlate	2231
MAbsorbent® A1P PuraPlate	2203
MAbsorbent A2P PuraPlate	2204
MAbsorbent A2P P6HF PuraPlate	2205
Fabsorbent F1P HF PuraPlate	2233
Aminophenylboronate A6XL PuraPlate	2207
Aminophenylboronate P6XL PuraPlate	2232
p-Aminobenzamidine A6XL PuraPlate	2206
Phenyl A6XL PuraPlate	2222
Butyl A6XL PuraPlate	2223
Hexyl A6XL PuraPlate	2224
Octyl A6XL PuraPlate	2225
Decyl A6XL PuraPlate	2226
DEAE P6HF PuraPlate	2202
SP P6HF PuraPlate	2208

For a custom designed PuraPlate containing any of the above adsorbents please do not hesitate to contact us.

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