anatrace

We set our standards high. So you can, too.

anatrace

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MINI CATALOG

DETERGENTS | LIPIDS | CUSTOMS | HIGHER STANDARDS

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	MOLECULAR BIOLOGY	EXTRACTION	PURIFICATION	PROTEIN MANIPULATION & STABILIZATION	CRYSTALLIZATION
	Understanding what new tools you need is important to us. Add your suggestions in the column below. Please e-mail us your suggestions at brian_german@anatrace.com				
TOOLS			» Loose affinity resins » 1-step batch spin columns (SelfSeal) » FliQ (unpacked FPLC columns) » HiFliQ (pre-packed FPLC columns) » Rapid SDS-PAGE Stains (Coomassie substitute)	» Ultrafiltration protein concentrator » Mini clarification spin columns	» Microlytic Crystal Former
DETERGENTS & LIPIDS		» DDM » LM NG	» DM » OG	» Amphipol » GDN » OG NG » Fos-Choline® Class » Deuterated Detergents	» LDAO » NG » Alkyl Pegs » LCP » CHS
KITS		» Analytic Extractor	» Proteus Spin Column Kits (FlowGo Advantage)	» Analytic Selector	» Analytic Crystallizer
SCREENS					» Microlytic MCSG » Microlytic Top96 » Microlytic PurePEGs-96

CUSTOM CHEMISTRY AND MODULAR **GENE-TO-STRUCTURE CRO SERVICES**

The Story of Anatrace Resins

Delivering high quality products begins with using the gold standard as your benchmark. With a reputation earned in the early foundation of protein purification, Qiagen resins have been labeled the industry standard for quality. Naturally, when building purification products, we looked to these premier products and discovered a group of protein scientists and chemists, who formally worked at a gold standard company, building an innovative new startup company which concentrated on purification products. Their simple goal was to continue building the very best resins available for scientists worldwide.

Anatrace®, the specialty chemical company who brought you the first high purity version of Dodecyl Maltoside, continues to be a small company who delivers innovation. Our partnership with the finest resin chemists has resulted in us offering the best performing affinity resins. We're seriously committed to developing and supplying the industry's finest high-purity products. Setting the standards high.

Reducing agents for Ni and Co Resins:

Reducing agents such as DTT and β-ME turn resins brown by irreversibly reducing the nickel ions. Our next generation resins are significantly more tolerant to reducing agents, allowing you to purify proteins that require higher concentrations of DTT or β-ME for stability.

The metal chelating agent, EDTA, is useful in protein purification to inhibit metalloproteases; however, EDTA will strip the nickel or cobalt ions from the resin causing a large decrease in protein binding. Our next generation resins have an EDTA tolerance of 1.5 mM, allowing you to use EDTA in the purification of your protein.

Reducing Agents:
DTT—tolerant up to 10 mM
β-ME—tolerant up to 20 mM

Chelating Agents:
EDTA—tolerant up 1.5 mM

Denaturants:
Urea—tolerant up to 8 M
Guanidinium Hydrochloride—tolerant up to 6 M

Organic Solvents:
Ethanol—tolerant up to 100%
Methanol—tolerant up to 100%
Acetonitrile—tolerant up to 30%

Detergents:
All commonly used detergents such as DM, DDM, Fos-Choline, and OG are compatible.

pH:
2-14

Super Nickel (Ni-IDA and Ni-NTA) Resin

PART NO.	UNIT SIZE
SUPER-NINTA25	25 ml
SUPER-NINTA100	100 ml

- Gold standard for His-tag protein purification
- Our Ni-NTA resin has the highest tolerance for reducing agents such as DTT or β-ME
  - Some Ni-IMAC resins tend to turn brown after applying reducing agents
- Very high reproducibility
  - Matrix consists of 7.5% cross-linked agarose
  - Extremely homogeneous in size

Features:
Specificity: His-Tag
Matrix: 6% cross-linked agarose (IDA) or 7.5% cross-linked agarose (Ni-NTA)
Binding capacity: 10 mg/ml (IDA), 70 mg/ml (Ni-NTA)
Bead size range: 45-165 µm (IDA), 32-60 µm (Ni-NTA)
Maximum pressure: 42 psi (IDA), 72 psi (Ni-NTA)
Stability/storage:
- pH 2-12 (IDA); pH 2-14 (Ni-NTA)
- Equilibration buffer (short-term)
- 20% Ethanol at 2-8°C (long-term)

Super Cobalt (Co-NTA) Resin

PART NO.	UNIT SIZE
SUPER-CONTA25	25 ml
SUPER-CONTA100	100 ml

- Highly specific polyhistidine tag protein purification
- Developed for optimal protein interaction
  - Highly porous
  - Very stable
  - Flow rates of up to 6 ml/min (optimal 0.5-2 ml/min)
- Homogeneous for high degree of reproducibility
  - Matrix consists of 7.5% cross-linked agarose

Features:
Specificity: His-Tag
Matrix: 7.5% cross-linked agarose
Binding capacity: 30 mg/ml
Bead size range: 32-60 µm
Maximum pressure: 72 psi
Stability/storage:
- pH 2-14
- Equilibration buffer (short-term)
- 20% Ethanol at 2-8°C (long-term)

Super Glutathione Agarose Affinity Resin

PART NO.	UNIT SIZE
SUPERGLU25	25 ml
SUPERGLU100	100 ml

- Designed for purification of GST fusion proteins
- Compatible with all prokaryotic and eukaryotic expression systems
- Yields high degree of reproducibility between individual purification runs
- Very homogeneous matrix consists of 7.5% cross-linked agarose

Features:
Specificity: Glutathione-S-Transferase (GST Tag)
Matrix: 7.5% cross-linked agarose
Binding capacity: 10 mg/ml
Bead size range: 32-60 µm
Maximum pressure: 72 psi
Stability/storage:
- pH 2-14
- Equilibration buffer (short-term)
- 20% Ethanol at 2-8°C (long-term)

HiFliQ FPLC Columns

Pre-charged Nickel-NTA and Cobalt-NTA Agarose Resin

Challenge:

Using the ÄKTA™ Protein Purification Systems and tired of being locked into HiTrap Columns?

The 1-Step Batch Mini Spin Column Solution:
Pre-charged with Nickel-NTA and Cobalt-NTA Agarose Resin, HiFliQ FPLC Columns are a perfect substitute for HiTrap Columns.

Nickel (Ni) Resin

PART NO.	PRODUCT	UNIT SIZE
HiFliQ1-NiNTA-1	1 ml HiFliQ Ni-NTA Column	1 x 1 ml
HiFliQ5-NiNTA-1	5 ml HiFliQ Ni-NTA Column	1 x 5 ml
HiFliQ1-NiNTA-5	1 ml HiFliQ Ni-NTA Column	5 x 1 ml
HiFliQ5-NiNTA-5	5 ml HiFliQ Ni-NTA Column	5 x 5 ml

Cobalt Resin

PART NO.	PRODUCT	UNIT SIZE
HiFliQ1-CoNTA-1	1 ml HiFliQ Co-NTA Column	1 x 1 ml
HiFliQ5-CoNTA-1	5 ml HiFliQ Co-NTA Column	1 x 5 ml
HiFliQ1-CoNTA-5	1 ml HiFliQ Co-NTA Column	5 x 1 ml
HiFliQ5-CoNTA-5	5 ml HiFliQ Co-NTA Column	5 x 5 ml

Powered by gold standard resins, our fast and reliable affinity purification columns have a high binding capacity at the right price. Anatrace HiFliQ columns are pre-packed and ready-to-use with pre-charged Nickel-NTA and Cobalt-NTA agarose resin for affinity purification of histidine tagged recombinant proteins by immobilized metal ion affinity chromatography (IMAC).

Innovate using products from the company that sets their standards high:

- DTT-tolerant Ni-NTA and Co-NTA
- Pre-packaged in 1 ml and 5 ml columns
- For use with FPLC (ÄKTA), peristaltic pumps, and syringes
- Compatible with all common chromatography instruments
- Can be used with a wide range of reducing agents, detergents, and other buffer additives

HiFliQ FPLC Columns are available in 1 ml and 5 ml column sizes with high binding capacity and minimal ion leakage. These columns are compatible with all common chromatography HPLC and FPLC instruments (including ÄKTA FPLC's), and low pressure pumps and syringes using an appropriate adaptor.

Specifications:

ITEM	HIFLIQ1-NINTA	HIFLIQ1-CONTA	HIFLIQ1-GSTC
Column Volume	1 ml and 5 ml	1 ml and 5 ml	1 ml and 5 ml
Resin	Ni-NTA	Co-NTA	Glutathione Agarose
Binding Capacity	1 ml = 50-75 mg 5 ml = 250-300 mg	1 ml = 40-50 mg 5 ml = 250-300 mg	1 ml = 10 mg 5 ml = 50 mg
DTT Compatibility	Up to 10 mM	Up to 10 mM	
EDTA Compatibility	Up to 1.5 mM	Up to 1.5 mM	
Base Matrix	7.5% cross-linked agarose	7.5% cross-linked agarose	7.5% cross-linked agarose
Mean Bead Size	32-60 µm	32-60 µm	40 µm
Recommended Flow Rate column size dependent	1 to 5 ml/min	1 to 5 ml/min	1 to 5 ml/min
Max Operation Pressure	0.5 MPa	0.5 MPa	0.5 MPa
Dimensions	1 ml = 15 mm D x 80 mm H 5 ml = 23 mm D x 80 mm H	1 ml = 15 mm D x 80 mm H 5 ml = 23 mm D x 80 mm H	1 ml = 15 mm D x 80 mm H 5 ml = 23 mm D x 80 mm H
Column Construction	Polypropylene	Polypropylene	Polypropylene
Inlet Port	10-32 Female	10-32 Female	10-32 Female
Outlet Port	10-32 Male	10-32 Male	10-32 Male
Storage	20% Ethanol	20% Ethanol	20% Ethanol

Reducing agents for Ni and Co Resins:

Reducing agents such as DTT and β-ME turn resins brown by irreversibly reducing the nickel ions. Our next generation resins are significantly more tolerant to reducing agents, allowing you to purify proteins that require higher concentrations of DTT or β-ME for stability.

The metal chelating agent, EDTA, is useful in protein purification to inhibit metalloproteases; however, EDTA will strip the nickel or cobalt ions from the resin causing a large decrease in protein binding. Our next generation resins have an EDTA tolerance of 1.5 mM allowing you to use EDTA in the purification of your protein.

Reducing Agents:
DTT—tolerant up to 10 mM
β-ME—tolerant up to 20 mM

Chelating Agents:
EDTA—tolerant up 1.5 mM

Denaturants:
Urea—tolerant up to 8 M
Guanidinium Hydrochloride—tolerant up to 6 M

Organic Solvents:
Ethanol—tolerant up to 100%
Methanol—tolerant up to 100%
Acetonitrile—tolerant up to 30%

Detergents:
All commonly used detergents such as DM, DDM, Fos-Choline, and OG are compatible.

pH:
2-14

Challenge:

Solubilizing and stabilizing your membrane protein is always the primary challenge. Detergents usually pay a role in overcoming this task, but using detergents can create a whole new query. What to do with the excess detergent left in the solution?

Removal of excess detergents usually means adding additional, complicated steps to your purification protocol, including dialysis and/or chromatography methods (*e.g.* ion exchange, SEC).

The DetEx Mini Spin Column Solution:

The DetEx Mini Spin Column is designed to rapidly and effectively remove excess detergents using weak anion exchangers. It is simple to use and requires only a micro centrifuge.

- Optimized for membrane proteins with pI between 4-8
- Complete detergent exchange/removal
- Fast—removal and exchange of free detergent micelles in 10 minutes
- Generates concentrated protein free of detergent micelles

Applications:

1. Used in the final purification step prior to crystallization trials to ensure that free detergent micelles are removed from the sample. Removal of excess detergents has been shown to increase the likelihood of protein crystallization.
2. It is a simple method for small scale detergent exchange. The DetEx Columns allow for quick and easy exchange of membrane proteins into new detergents for crystallization trials.

Features:

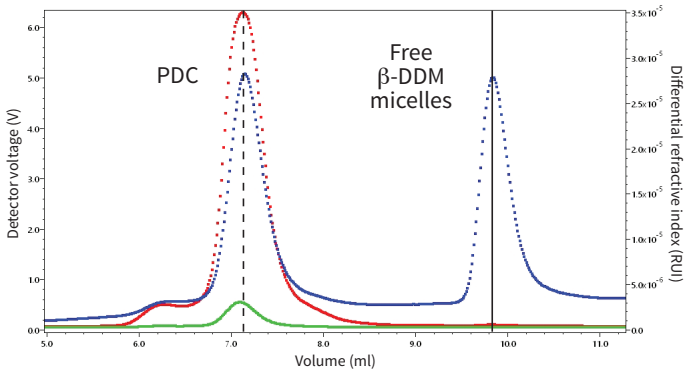
- Weak anion exchanger for binding membrane proteins with pI <8
- Column bed volume: 0.2 ml
- Max sample loading volume: 0.4 ml
- Typical protein binding capacity: 2 mg
- Elution in a small volume (minimum volume 50 µl)

PART NO.	PRODUCT	COLUMN CAPACITY	NO. SPIN COLUMNS
PAL-MINI-4	DetEx Mini Spin Column Trial Pack	2 mg	4
PAL-MINI-20	DetEx Mini Spin Column Mini Kit	2 mg	20

To illustrate the effectiveness of the DetEx Mini Spin Columns, we ran a series of experiments using size exclusion chromatography coupled with a multi detector to track membrane protein, free detergent, and MP/detergent micelle concentrations.

In the graph below (Sample 1), we ran a sample containing the membrane protein, Photosystem II (PSII), solubilized in Anatrace n-Dodecyl β-D-Maltoside (β-DDM). The UV detector graphed in green shows the presence of the MP. In blue are the results from the refractive index measurements. As one would expect, there are two peaks. The first corresponding to the position of the protein (Protein-Detergent Complex), and second peak is the free detergent micelles. Light scattering measurement shown in red confirms the prescience of the Protein-Detergent Complex. The sample has excess detergent in the form of free detergent micelles.

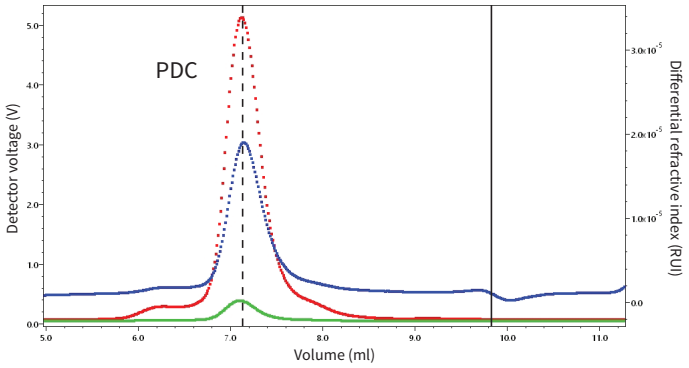
Sample 1. MP prior to detergent removal.



In the second graph (Sample 2) the free detergent was removed using the DetEx Mini Spin Columns. The second refractive index peak which corresponded to the free micelle has been completely removed. Only the Protein-Detergent Complex is left in the sample.

Results demonstrate that the DetEx Mini Spin Columns efficiently remove excess β-DDM micelles from the concentrated MP sample while keeping Protein-Detergent Complex intact.

Sample 2. MP after free detergent removal using a DetEx Mini Spin Column.



1-Step Batch Spin Columns

With SelfSeal™ membrane technology

Challenge:

- Is your lab currently doing expression testing and/or small scale purification trials?
- Are you tired of watching liquid drips from columns at different speeds?
- Are you ready to consider an alternative to gravity (variable drip-feed) slow chromatography?

Take greater control of your protein preps!

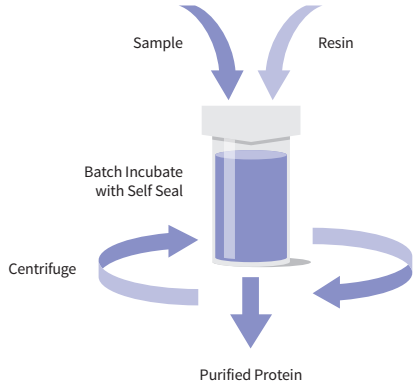
Our 1-Step Batch Mini and Midi Plus Spin Columns Solution:

- Small scale protein purification
- Batch mixing your cell lysate with the resin of your choice
- SelfSeal membrane technology retains the resin and sample in the batch incubation chamber, preventing any leakage into the collection tube
- When the column is spun, the pores of the membrane dilate and the filtered eluate is collected in the bottom of the centrifuge tube.

PART NO.	PRODUCT	UNIT SIZE
GEN-1SBM-40	1-Step Batch Mini Spin Column Pack	40 units
GEN-1SBM-100	1-Step Batch Mini Spin Column Pack	100 units
GEN-1SB08P	1-Step Batch Midi Plus Spin Column Pack (8 pc)	1 pack

Features:

- **Mode of action**—No mess. Batch incubation and centrifugation in one
- **Mini & Midi Plus**—< 0.2 µm SelfSeal PVDF membrane
- **Midi**—18 µm polyethylene sinter with retentate end cap
- **Sample volume**—0.6 ml (Mini)—20 ml (Midi and Midi plus



Quick Coomassie Stain

Fast • Sensitive • Safe

Speed up your polyacrylamide gel staining with Quick Coomassie Stain. No need for time consuming pre-washing and destaining. Quick Coomassie Stain develops protein gels in as little as 15 minutes in one step.

PART NO.	PRODUCT	NUMBER OF GELS
GEN-QC-STAIN-1L	Quick Coomassie Stain, 1 L	Sufficient for 40 gels if used only once
GEN-QC-STAIN-3L	Quick Coomassie Stain, 3 x 1 L	Sufficient for 120 gels if used only once

- **Rapid**—No pre-washing. No destaining.
- **High Resolution**—Sharp protein bands that you would expect with traditional Coomassie staining.
- **Linear Range**—Very low background enabling accurate quantitation of proteins.
- **Durable**—Reusable up to 3 times! Also Mass Spec compatible.
- **Shelf-Life**—1 year at room temperature. No precipitate forms over time so no shaking required.

Realtime Stain

Instant • Real-time • Unique

Directly visualize your protein band separation in real time during electrophoresis with Realtime Coomassie Stain

PART NO.	PRODUCT	NUMBER OF GELS	NUMBER OF LANES
GEN-RT-STAIN-200	Realtime Stain (0.2 ml)	Sufficient for 4 gels	40
GEN-RT-STAIN-2000	Realtime Stain (2 ml)	Sufficient for 40 gels	400

- **Save time**—NO Coomassie post staining required.
- **Instant**—Immediately determine presence or absence of your band.
- **Unique**—Behaves like Coomassie with NO background.

Realtime Stain speed is convenient for routine applications and protein production. However, for analytical or investigative purposes, we recommend using Quick Coomassie Stain.

Alkyl PEG Detergents

The Anatrace Alkyl PEG detergent line is made up of lipophilic chains between 8 and 12 carbons long. In any screening library, alkyl PEG products should be used in conjunction with OG, DM, and DDM.

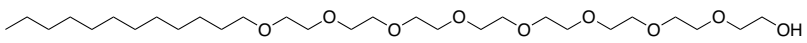
PART NO.	ALKYL HEAD/PEG TAIL	PRODUCT
T350	C_8E_4	Tetraethylene Glycol Monooctyl Ether, Anagrade
P350	C_8E_5	Pentaethylene Glycol Monooctyl Ether, Anagrade
H350	C_8C_6	Hexaethylene Glycol Monooctyl Ether, Anagrade
P340	$C_{10}E_5$	Pentaethylene Glycol Monodecyl Ether, Anagrade
H360	$C_{10}E_6$	Hexaethylene Glycol Monodecyl Ether, Analytical Grade
O330	$C_{12}E_8$	Octaethylene Glycol Monododecyl Ether, Anagrade
O330A	$C_{12}E_8$	Octaethylene Glycol Monododecyl Ether, Analytical Grade

New Alkyl Pegs

PART NO.	ALKYL HEAD/PEG TAIL	PRODUCT
T330	C_6E_3	Triethylene Glycol Monohexyl Ether, Anagrade
T340	C_6E_4	Tetraethylene Glycol Monohexyl Ether, Anagrade
P360	C_6E_5	Pentaethylene Glycol Monohexyl Ether, Anagrade
P370	C_7E_5	Pentaethylene Glycol Monoheptyl Ether, Anagrade
H375	$C_{12}E_6$	Hexaethylene Glycol Monododecyl Ether, Anagrade
H370	$C_{12}E_7$	Heptaethylene Glycol Monododecyl Ether, Anagrade

Things You Should Know

- Lipid mimetic
- More similar to a lipid than to a detergent, which leads to improved crystallization in some proteins
- Difference between Anapoe® and standard version Alkyl PEG detergents:
  - Some Alkyl PEG detergents are made on an industrial scale leading to lower purity and varying tail lengths in the product.
  - Anapoe detergents are cleaned up to reduce peroxides but not increase purity.
  - Standard Alkyl PEG detergents are manufactured to be homogenous or very high purity.
  - For crystallization trials, standard Alkyl PEG detergents should be preferred over Anapoe versions.

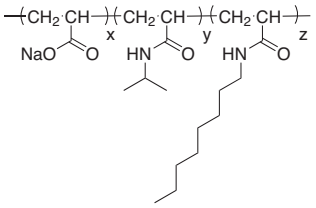


$C_{12}E_8$, part nos. O330 and O330A

Amphipol A8-35

Amphipathic polymer for maintaining solubilized membrane proteins in detergent-free solutions

PART NO.	UNIT SIZE
A835	50 mg
	100 mg
	500 mg



X = 0.35, Y = 0.25, Z = 0.40

Things You Should Know

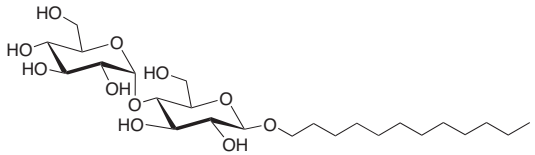
- Molecule is an amphipathic polymer, not a detergent
- Very good stabilizer of MP
- Useful for Cryo EM studies
- Used in the first structure solved by Cryo EM [a mammalian TRP channel (TRPV1)]

Anagrade vs. Sol-Grade

Please refer to our product catalog and website for a full listing of Anatrace Anagrade and Sol-Grade detergents.

Things You Should Know

- Difference in grade is based on purity and α anomer content
- The Anatrace purity specification measures the percentage of a specific molecule in the material. The molecule can be both α and β anomer.
- When working with membrane proteins, the β anomer is preferred. For this reason, understanding the percentage of the α anomer is vital.
- Sol-Grade
  - Purities are generally around 98% pure for the specific molecule (both α and β anomers).
  - The α anomer content is less than 5%.
- Anagrade
  - Purities are generally around 99% pure for the specific molecule (both α and β anomers).
  - The α anomer content is less than 2%.



n-Dodecyl–β–D-Maltopyranoside, available in both Sol-Grade and Anagrade forms.

Anapoe Detergents

Industrial grade detergents are often a nonspecific mixture of closely related molecules. This may vary from lot-to-lot and may also contain other additives and contaminants that can result in undesirable effects during protein extraction. One such contaminant is peroxide. Biochemically speaking, peroxides oxidize the sulfhydryl groups in the protein tertiary structure and interfere with natural protein folding. These levels build as the product sits on the research shelf in your lab.

COMMON POLYOXYETHYLENE DETERGENTS	ANAPOE VERSION	PART NO.	UNIT SIZE
Tween® 20	Anapoe-20	APT020	50 ml (50 ampules/1 ml each)
Brij®-35	Anapoe-35	APB035	50 ml (5 ampules/10 ml each)
Brij-58	Anapoe-58	APB058	100 ml (10 ampules/10 ml each)
Tween 80	Anapoe-80	APT080	500 ml (screw cap bottle)
$C_{10}E_6$	Anapoe-$C_{10}E_6$	APO106	
$C_{10}E_9$	Anapoe-$C_{10}E_9$	APO109	
$C_{12}E_8$	Anapoe-$C_{12}E_8$	APO128	
$C_{12}E_9$	Anapoe-$C_{12}E_9$	APO129	
$C_{12}E_{10}$	Anapoe-$C_{12}E_{10}$	AP1210	
$C_{13}E_8$	Anapoe-$C_{13}E_8$	APO138	
Nonidet P40 Substitute	Anapoe-NID-P40	APND40	
Triton® X-100	Anapoe-X-100	APX100	
Triton X-114	Anapoe-X-114	APX114	
Triton X-305	Anapoe-X-305	APX305	
Triton X-405	Anapoe-X-405	APX405	

Things You Should Know

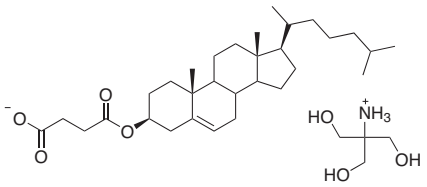
- Anatrace Anapoe reagents are crafted and purified using chromatography to contain less than 20 µM of equivalent peroxide.
- Supplied as a 10% aqueous solution, and then stored under argon for stability
- Stored under Argon to prevent oxidation

Cholesteryl Hemisuccinate Tris Salt

PART NO.	UNIT SIZE
CH210	1 gm
	5 gm
	25 gm
	100 gm

Things You Should Know

- Useful when working with GPCRs
- CHS + LM NG has been shown to easily exchange MP into LCP
- CHS + DDM commonly used for extracting membrane proteins

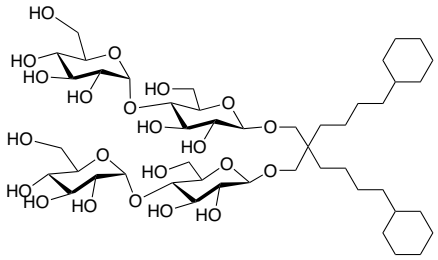


Cymal Class Products

PART NO.	PRODUCT	UNIT SIZE
C321	CYMAL®-1, Anagrade	1 gm
C322	CYMAL-2, Anagrade	5 gm
C323	CYMAL-3, Anagrade	25 gm
C324	CYMAL-4, Anagrade	
C324G	CYGLU®-4, Anagrade	
C325	CYMAL-5, Anagrade	
C325S	CYMAL-5, Sol-Grade®	
C326	CYMAL-6, Anagrade	
C326LA	CYMAL-6, Anagrade	
C326S	CYMAL-6, Sol-Grade	
C327	CYMAL-7, Anagrade	
C327S	CYMAL-7, Sol-Grade	
NG325	CYMAL-5 Neopentyl Glycol	500 mg
NG326	CYMAL-6 Neopentyl Glycol	1 gm
NG327	CYMAL-7 Neopentyl Glycol	5 gm

Things You Should Know

- Stabilize membrane proteins more effectively during crystallization with cyclic carbon tails
- CYMAL-6/CYMAL-7 used to crystallize Kv1.2-Kv2.1 paddle K+ channel (PDB: 2R9R)
- In combination with $C_{12}E_8$, used to crystallize plasma membrane proton pump (PDB: 3B8C)



CYMAL-6 Neopentyl Glycol, part no. NG326

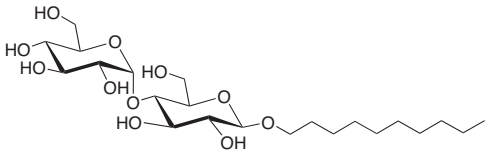
n-Decyl–β–D-Maltopyranoside, Anagrade

[n-Decyl–β–D-Maltoside / Decyl Maltoside / DM]

PART NO.	UNIT SIZE
D322	1 gm
	5 gm
	25 gm

Things You Should Know

- One of the big three detergents used for extraction, purification, and crystallization
- DDM/DM has been used in the extraction of over 80% of eukaryotic membrane protein structures
- DM is used to crystallize two-pore K+ channel TRAAK (PDB: 3UM7)



Deuterated Detergents

NMR studies of membrane and other hydrophobic/lipophilic proteins often require the use of a lipid or lipid-like detergent to maintain solubility and stability. However, this can create NMR signal interference from the increased concentration of hydrogen atoms added by the densely packed detergent. By replacing the hydrogen atoms in the detergent with a per deuterated equivalent, you can silence the interference and make it easier to resolve the protein structure.

PER DEUTERATED TAIL	
F308PDT	Fos-Choline-12, Per Deuterated Tail

PER DEUTERATED HEAD	
F304PDH	Fos-Choline-10, Per Deuterated Head
F306PDH	Fos-Choline-11, Per Deuterated Head
F308PDH	Fos-Choline-12, Per Deuterated Head
F312PDH	Fos-Choline-14, Per Deuterated Head

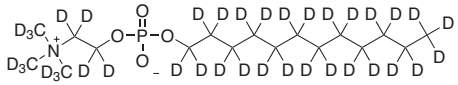
SEMI DEUTERATED HEAD	
F304SDH	Fos-Choline-10, Semi Deuterated Head
F306SDH	Fos-Choline-11, Semi Deuterated Head
F308SDH	Fos-Choline-12, Semi Deuterated Head
F312SDH	Fos-Choline-14, Semi Deuterated Head

DEUTERATED	
F308D	Fos-Choline-12, Deuterated
F312D	Fos-Choline-14, Deuterated
O311T	n-Octyl-d17-β-D-Glucopyranoside
O311D	n-Octyl-d17-β-D-Glucopyranoside-d7
D310T	n-Dodecyl-d25-β-D-Maltopyranoside

PART NO.	PRODUCT	UNIT SIZE
F304PDH	Fos-Choline-10, Per Deuterated Head	100 mg
F304SDH	Fos-Choline-10, Semi Deuterated Head	500 mg
F306PDH	Fos-Choline-11, Per Deuterated Head	1 gm
F306SDH	Fos-Choline-11, Semi Deuterated Head	
F308D	Fos-Choline-12, Deuterated	
F308PDH	Fos-Choline-12, Per Deuterated Head	
F308PDT	Fos-Choline-12, Per Deuterated Tail	
F308SDH	Fos-Choline-12, Semi Deuterated Head	
F312D	Fos-Choline-14, Deuterated	
F312PDH	Fos-Choline-14, Per Deuterated Head	
F312SDH	Fos-Choline-14, Semi Deuterated Head	
D310T	n-Dodecyl-d25-β-D-Maltopyranoside	100 mg
O311T	n-Octyl-d17-β-D-Glucopyranoside	250 mg
O311D	n-Octyl-d17-β-D-Glucopyranoside-d7	500 mg

Things You Should Know

- Used primary in NMR studies
- Deuterated hydrogen atoms are NMR silent
- Anatrace offers fully deuterated, deuterated head, and deuterated tail products



Fos-Choline-12, Deuterated, part no. F308D

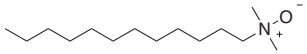
n-Dodecyl-N,N-Dimethylamine-N-Oxide, Anagrade

[Lauryldimethylamine-N-Oxide / LDAO / DDAO / N,N-Dimethyl-1-Dodecanamine-N-Oxide]

PART NO.	UNIT SIZE
D360	1 gm
	5 gm
	25 gm

Things You Should Know

- One of the five detergents responsible for crystallizing ~50% of the known MP structures
- Used to crystallize the first structure of a potassium channel, KcsA (PDB: 1BL8)



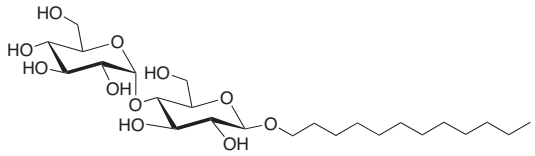
n-Dodecyl–β–D-Maltopyranoside, Anagrade

[n-Dodecyl–β–D-Maltoside / Lauryl Maltoside / Dodecyl 4-O–α–D-Glucopyranosyl–β–D-Glucopyranoside / DDM / LM]

PART NO.	UNIT SIZE
D310	1 gm
	5 gm
	25 gm

Things You Should Know

- One of the big three detergents used for extraction, purification, and crystallization
- Sometimes used with Cholesterol and CHS
- DDM/DM has been used in the extraction of over 80% of eukaryotic membrane protein structures
- DDM +/- CHS is a good detergent choice for LCP experiments



Fos-Choline Class Products

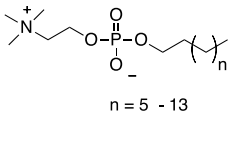
Lipids are commonly used by researchers to stabilize membrane proteins. However, the common challenge with working with lipids is their high cost and lack of solubility in water.

Anatrace scientists answered the challenge and developed innovative Anatrace Fos-Cholines. This class of lipid-like surfactants has the basic properties of lipids—namely their ability to stabilize membrane proteins—combined with the characteristics of a water-soluble molecule. Anatrace offers several modified derivatives of popular Fos-Cholines. These modified derivatives enhance stability and solubility outside of the native lipid bi-layer. This way you can be sure that the stabilizer is firmly attached to your protein.

The Fos-Choline detergents have been successfully used in membrane protein studies by NMR[1-3]. Short chain phospholipids, such as dihexanoylphosphatidylcholine (DHPC), have been used to solubilize and reconstitute integral membrane proteins. These compounds form water-soluble micelles in solution and have been shown to maintain native protein structure and function when used in membrane protein purification protocols[4-6].

Fos-Cholines employ charged amine and phosphate groups in combination with an alkyl chain to produce a zwitterionic surfactant. This unique architecture is water-soluble and capable of both stabilizing and keeping membrane proteins soluble in aqueous solutions. This surfactant also produces micelles and is able to extract membrane proteins from cellular membranes.

ROOT	PRODUCT	ANAGRADE	SOL-GRADE	DEUTERATED
F300	Fos-Choline-8	√	√	
F302	Fos-Choline-9	√	√	
F304	Fos-Choline-10	√	√	√
F306	Fos-Choline-11	√	√	√
F308	Fos-Choline-12	√	√	√
F310	Fos-Choline-13	√	√	



n = 5, octyl phoscholine
n = 6, nonyl phoscholine
n = 7, decyl phoscholine
n = 8, undecyl phoscholine
n = 9, dodecyl phoscholine
n =10, tridecyl phoscholine
n = 11, tetredecyl phoscholine
n = 13, hexadecylphoscholine

Fos-Choline

(Continued on next page.)

Fos-Choline Class Products (continued)

PART NO.	PRODUCT	UNIT SIZE
F300	Fos-Choline-8, Anagrade	1 gm
F300F	Fos-Choline-8, Fluorinated, Anagrade	5 gm
F300S	Fos-Choline-8, Sol-Grade	25 gm
F302	Fos-Choline-9, Anagrade	
F302S	Fos-Choline-9, Sol-Grade	
F304	Fos-Choline-10, Anagrade	
F304S	Fos-Choline-10, Sol-Grade	
F306	Fos-Choline-11, Anagrade	
F306S	Fos-Choline-11, Sol-Grade	
F308	Fos-Choline-12, Anagrade	
F308S	Fos-Choline-12, Sol-Grade	
F310	Fos-Choline-13, Anagrade	
F310S	Fos-Choline-13, Sol-Grade	
F312	Fos-Choline-14, Anagrade	
F312S	Fos-Choline-14, Sol-Grade	
F314	Fos-Choline-15, Anagrade	
F314S	Fos-Choline-15, Sol-Grade	
F316	Fos-Choline-16, Anagrade	
F316S	Fos-Choline-16, Sol-Grade	
FCI09	Fos-Choline-ISO-9, Anagrade	
FCI11	Fos-Choline-ISO-11, Anagrade	
FCU110	Fos-Choline-Unsat-11-10	
F304PDH	Fos-Choline-10, Per Deuterated Head	100 mg
F304SDH	Fos-Choline-10, Semi Deuterated Head	500 mg
F306PDH	Fos-Choline-11, Per Deuterated Head	1 gm
F306SDH	Fos-Choline-11, Semi Deuterated Head	
F308D	Fos-Choline-12, Deuterated	
F308PDH	Fos-Choline-12, Per Deuterated Head	
F308PDT	Fos-Choline-12, Per Deuterated Tail	
F308SDH	Fos-Choline-12, Semi Deuterated Head	
F312D	Fos-Choline-14, Deuterated	
F312PDH	Fos-Choline-14, Per Deuterated Head	
F312SDH	Fos-Choline-14, Semi Deuterated Head	

Things You Should Know

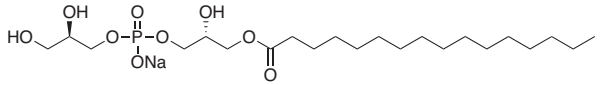
- Harsher detergent, very well suited for extraction
- Very good at stabilizing MP
- Top choice for NMR studies
- Often used as a positive control for extraction trials
- Not typically suitable for crystallization experiments

References:

1. Evanics, F., *et al.* (2006) *J. Am. Chem. Soc.*, **128**, 8256-8264.
2. Hwang, P.M., *et al.* (2002) *Proc Natl Acad Sci USA*, **99**, 13560-13565.
3. Oxenoid, K. and Chou, J. J. (2005) *Proc Natl Acad Sci USA*, **102**, 10870-10875.
4. Hauser, H. (2000) *Biochim Biophys Acta* **1508**, 164-181.
5. Fernandez, C., *et al.* (2001) *FEBS Lett.* **504**, 173-178.
6. Mandal, A., *et al.*(2006) *Biochim Biophys Acta.* **1760**, 20-31.

Fos-Choline Derivatives

PART NO.	PRODUCT	UNIT SIZE
C508	Cyclofos™-2, Anagrade	1 gm
C510	Cyclofos-3, Anagrade	5 gm
C512	Cyclofos-4, Anagrade	25 gm
C514	Cyclofos-5, Anagrade	
C516	Cyclofos-6, Anagrade	
C518	Cyclofos-7, Anagrade	
L412	LysoFos® Choline Ether 12, Anagrade	0.5 gm
L414	LysoFos Choline Ether 14, Anagrade	1 gm
L416	LysoFos Choline Ether 16, Anagrade	
L312	LysoFos Glycerol 12, Anagrade	0.5 gm
L314	LysoFos Glycerol 14, Anagrade	1 gm
L316	LysoFos Glycerol 16, Anagrade	



LysoFosGlycerol 16, Anagrade, part no. L316

GDN

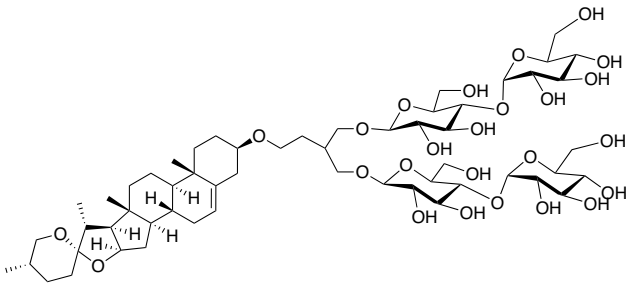
PART NO.	UNIT SIZE
GDN101	500 mg
	1 gm
	5 gm

Things You Should Know

- Digitonin drop in substitute
- Non-toxic/synthetic
- ~3/5 the cost of Digitonin
- Digitonin was used in the extraction of M2 muscaninic acetylcholine receptor (PDB: 3UON)
- Mild detergent compared to DDM—effective in maintaining membrane proteins in a functional state[1]

Reference:

1. Thomas, J. A. and Tate, C. G. (2014) *J. Mol. Biol.* **426**(24), 4139-4154.



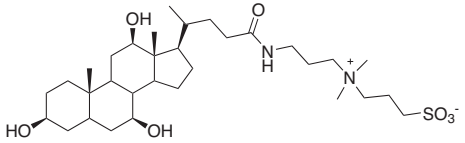
General Purpose Laboratory Detergents

In addition to our specialty surfactants and high-purity detergents, we offer a range of common detergents that are perfect for initial protein extraction and a host of other molecular biology applications. Please refer to our product catalog and website for a full listing of Anatrace general purpose laboratory detergents.

PART NO.	PRODUCT	UNIT SIZE
AZ308	Anzergent® 3-8, Analytical Grade	5 gm
AZ310	Anzergent 3-10, Analytical Grade	25 gm
AZ312	Anzergent 3-12, Analytical Grade	100 gm
AZ314	Anzergent 3-14, Analytical Grade	
AZ316	Anzergent 3-16, Analytical Grade	
AZ318	Anzergent 3-18, Analytical Grade	
C316S	CHAPS, Sol-Grade	
D380	Deoxycholic Acid, Sodium Salt, Anagrade	
I1003	IPTG	
ND195	NDSB-195	
B300	Big Chap, Analytical Grade	1 gm
D352	n-Decyl-N,N-Dimethylglycine, Anagrade	5 gm
D350	n-Dodecyl-N,N-Dimethylglycine, Anagrade	25 gm
D350S	n-Dodecyl-N,N-Dimethylglycine, Sol-Grade	
T305	n-Tetradecyl-N,N-Dimethylglycine, Anagrade	
B310	Big Chap, Deoxy, Analytical Grade	1 gm 5 gm
B035	Brij 35	100 gm 500 gm 1 kg 5 kg
C316	CHAPS, Anagrade	1 gm 5 gm 10 gm 25 gm
C317	CHAPSO, Anagrade	1 gm 5 gm 5 x 10 ml 25 gm
S1010S	Cholic Acid, Sodium Salt	10 gm 25 gm 100 gm 500 gm
ND256	NDSB-256	5 gm 25 gm 100 gm
NIDP40	Nonidet P40 Substitute	500 ml 1 lt
T1001	Triton X-100	500 ml
T1003	Tween 20	1 ga
T1004	Tween 80	

Things You Should Know

- Cost efficient detergents which are made on an industrial scale
- Considered heterogeneous because they contain mixtures of varying tail lengths
- Useful in some cases for extraction and even purification, but should not be your first choice because of purity and harshness of the detergents
- Most popular
  - CHAPS, Anagrade
  - CHAPSO
  - NDSB-256
  - Nonidet P40



CHAPS, Anagrade, part no. C316

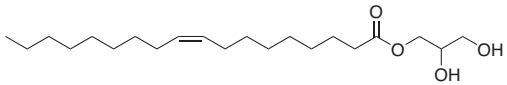
Lipidic-Cubic Phase (LCP) Products

Crystallization is usually the bottleneck in membrane protein work. Temperature, salt and detergent concentrations all affect the crystallization process. Determining the conditions necessary to crystallize one protein provides very little insight into the conditions needed to crystallize another. The process is truly more of an art than a science.

Lipidic Cubic Phase (LCP) promises to remove the crystallization bottleneck. The Anatrace LCP product range includes both monoolein and monopalmitolein products. Both molecules have the ability in aqueous solution to self-assemble into a lattice structure. Conceptually, the lattice is comprised of a quasi lipid phase and channels. While the quasi lipid component suspends proteins and is chemically similar to a lipid bi-layer, the channels allow water-soluble material to pass through the lattice.

The multi-layered lattice structure itself acts as a trap and constrains any membrane protein which slips or diffuses into it. Inside of the lattice, proteins can diffuse laterally through the structure and this process helps separate out water-soluble impurities which affect crystallization. Once proteins are suspended in the lattice, the aqueous solution is allowed to evaporate, and the trapped proteins eventually reach the needed supersaturated state. At this point, the lattice structure contributes one last important service. The LCP limits protein movement and creates the order needed for crystal growth to begin.

PART NO.	PRODUCT	MAG NUMBER	UNIT SIZE
LCP16	MonoPalmitolein	9.7	100 mg
LCP18	MonoOlein	9.9	500 mg 1 gm



MonoOlein, part no. LCP18

NG Class Products

Conventional detergents like DDM, DM, and OG have been indispensable for labs studying membrane proteins for over 20 years. Now Anatrace offers an alternative that could improve protein structural stability and increase the likelihood of crystallization. The Anatrace NG class detergents are modeled after the most popular alkyl glycoside detergents. Architecturally, the difference lies where the carbon attaches to the ether linkage. The design converts the carbon from a standard, secondary bonding configuration to a quaternary configuration with two sugar head groups and two alkyl chains bonded to it.

This distinctive design gives the Anatrace NG detergents unique benefits and characteristics compared to conventional derivatives like DDM, DM, and OG:

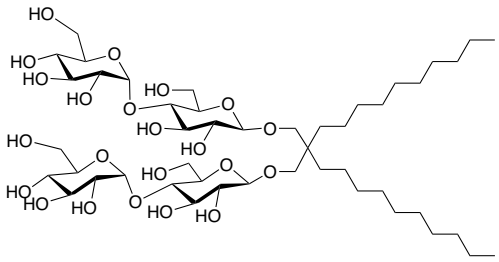
- Lower CMC values
- Increased protein stability after dilution below CMV values
- Stabilization of the first ligand bound GPCR leading to its structure

As with other detergents, our NG class detergent performance will vary with each membrane protein. To see which works the best for your research, we recommend you run parallel experiments with your current conventional detergent and the corresponding new Anatrace NG detergent. Simply use the same concentration and protocol, and then compare the results.

PART NO.	PRODUCT	COMPARABLE CONVENTIONAL DETERGENT	UNIT SIZE
NG310	Lauryl Maltose Neopentyl Gycol	Dodecyl Maltoside (Prod. No. D310)	1 gm
NG311	Octyl Glucose Neopentyl Glycol	Octyl Glucoside (Prod. No. O311)	5 gm
NG322	Decyl Maltose Neopentyl Gycol	Decyl Maltoside (Prod. No. D322)	25 gm
NG325	CYMAL-5 Neopentyl Glycol	CYMAL-5, Anagrade (Prod. No. C325)	500 mg
NG326	CYMAL-6 Neopentyl Glycol	CYMAL-6, Anagrade (Prod. No. C326)	1 gm
NG327	CYMAL-7 Neopentyl Glycol	CYMAL-7, Anagrade (Prod. No. C327)	5 gm
NG321	Decyl Glucose Neopentyl Glycol	Decyl Glucoside, Anagrade (Prod. No. D321)	
NG318	Lauryl Glucose Neopentyl Glycol	Dodecyl Glucoside, Anagrade (Prod. No. D318)	

Things You Should Know

- NG is used to crystallize Cytochrome b561 protein (PDB: 4O64)
- LM NG + CHS has been shown to easily exchange MP into LCP (LMNG +/- CHS is good for LCP)
- OG NG vast improvement in extraction
- LMNG used to crystallize mouse claudin-15 tight junction protein (PDB: 4P79)
- LMNG used to crystallize b2AR-G protein complex (PDB: 3SN6)



Lauryl Maltose Neopentyl Glycol, part no. NG310

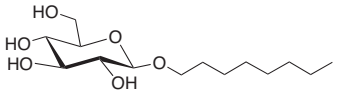
n-Octyl–β–D-Glucopyranoside, Anagrade

[n-Octyl–β–D-Glucoside / OG / Octyl Glucoside]

PART NO.	UNIT SIZE
O311	1 gm
	5 gm
	25 gm

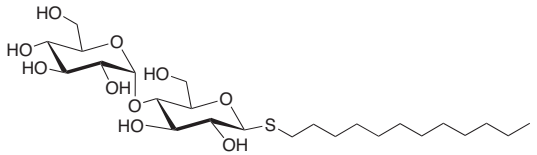
Things You Should Know

- One of the big three detergents used for extraction, purification, and crystallization
- Harsher then DDM and DM
- Used in the purification and crystallization of the 1.8Å structure of human aquaporin 4 (PDB: 3GD8)
- OTG is used in the crystallization of b1 adrenergic receptor (PDB: 2VT4)



Thioglucosides and Thiomaltosides

PART NO.	PRODUCT	UNIT SIZE
D323	n-Decyl–β–D-Thioglucopyranoside, Anagrade	1 gm
D335	n-Decyl–β–D-Thiomaltopyranoside, Anagrade	5 gm
D342	n-Dodecyl–β–D-Thiomaltopyranoside, Anagrade	25 gm
H301	n-Heptyl–β–D-Thioglucopyranoside, Anagrade	
H301LA	n-Heptyl–β–D-Thioglucopyranoside, Anagrade	
N335	n-Nonyl–β–D-Thioglucopyranoside, Anagrade	
N350	n-Nonyl–β–D-Thiomaltopyranoside, Anagrade	
O314	n-Octyl–β–D-Thioglucopyranoside, Anagrade	
O314LA	n-Octyl–β–D-Thioglucopyranoside, Anagrade	
O320	n-Octyl–β–D-Thiomaltopyranoside, Anagrade	
U342	n-Undecyl–β–D-Thiomaltopyranoside, Anagrade	



n-Dodecyl–β–D-Thiomaltopyranoside, Anagrade, part no. D342

Challenge:

Finding the correct condition where a protein will crystallize is difficult.

- Each protein requires a unique set of conditions to crystallize
- The ideal conditions require testing multiple variables
  - Crystal screen + protein condition + detergent + crystallization method + protein construct
- The protein isn't always easily obtained
  - Cloning → over expression → purification requires a lot of time, funding, and energy

Many labs believe there is only one method to crystallize proteins—vapor diffusion

- First commercially available solution
- Has been the exclusive choice for 20+ years

The Microlytic Crystal Former Solution

- Free interface diffusion method for crystallization
- First commercially available capillary system in a single-use 96 well plate format
  - No complementary instrumentation required. Works with any lab automation systems
- Exploits continuous gradient which allows nucleation events to occur and infinite conditions for additional subunit crystals to collect. Much more efficient than doing hundreds of individual experiments using other technologies.
  - The results are better, larger crystals and samples more crystallization spaces (buffer/Salt/PH) in one experiment

PART NO.	PRODUCT
CF-HT2-10	High Throughput SBS Crystal Former (10 pack)
CF-O-20	Original 16-channel Crystal Former (20 pack)
CF-XL-20	Crystal Former Scale-Up (20 pack)
SSC-M-GBO	SuperCombi Crystallization Screen. Optimized for the Crystal Former.
MC-1	Mitegen Harvesting Kit (Small)

The Story of Diminishing Returns

Crystallization

Protein crystallization involves finding the correct condition for the following:

(Crystal Screen) + (Protein Condition) + (Detergent) + (Crystallization Method) + (Protein Construct)

Labs sometimes make two critical mistakes which produces diminishing returns of their time and efforts:

- Screening all the commercially available crystal screens
- Believing the crystallization method is not a variable to experiment with

All commercially available screens have some overlap with the next. Once you screen several of the commercially available screens, your rate of overlap increases, meaning each new screen is actually testing less original conditions. At some point, your time and efforts are being diminished because you are testing the same condition over and over.

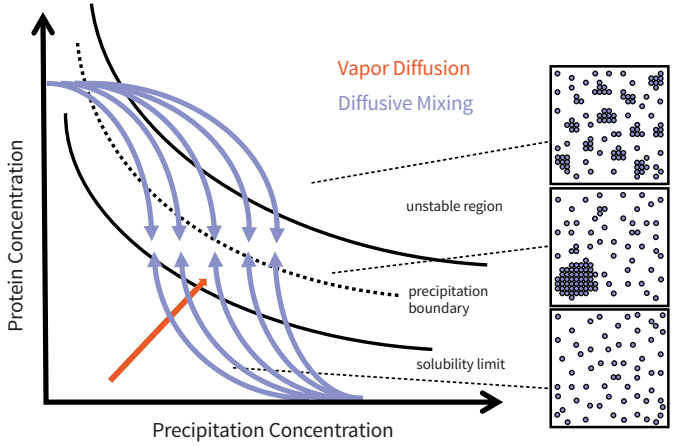
The better approach is to begin to evaluate the crystallization method early in the process. Screening your protein with vapor diffusion and the Microlytic Crystal Former in parallel with a carefully selected broad crystal screen suite is the better approach. If your first pass screen doesn't result in crystals, the solution is to try and vary the pH and the detergents (if working with a MP) or change your protein construct before attempting to increase the number of commercially available screens.

How Does the Crystal Former Return High Output Crystallization Data?

The Crystal Former comprises 96 U-shaped channels in which protein crystallization is driven by liquid-liquid diffusion. The protein sample is first loaded into the channel, which fills only by capillary action. The crystallization reagent is then loaded into the opposing inlet. Equilibration of these solutions occurs through diffusion within the microchannels, during which a complex gradient of all the mixture components is transiently established. Through this gradient, the behavior of the protein target is explored with infinite sampling.

This continuous exploration of crystallization space for a discrete condition is virtually impossible to capture in other crystallization formats and returns a tremendous amount of information on a per-trial basis, allowing the user to observe all possible experimental outcomes in a single microchannel.

EXPLORING THE PHASE DIAGRAM



The Microlytic MCSG Suite

Challenges to Initial Screening:

- There exist many commercially available screens for initial screening
- Each screen is designed with a different rationale
- Most labs keep multiple screens on hand, leading to potential issues:
  - No guidance in the differences in screen design and the coverage of crystallization space
  - No knowledge of the level of redundancy between two crystallization screens

Due to these challenges, much of crystallization screening becomes highly redundant, increasing the investment of time, money, and protein sample without a commensurate increase in crystallization outcome.

What is the Microlytic MCSG Suite?

The Microlytic MCSG Suite is the most up-to-date, initial sparse matrix screen developed by Midwest Center for Structural Genomics. As part of the Protein Structure Initiative, the Midwest Center for Structural Genomics has been instrumental in the development of rapid and cost-effective methods for protein crystallization and structure determination. The conditions of the MCSG Suite are supported by over a decade of experimental analysis and validation, and constitute the broadest coverage of crystallization space of any other commercially available screen.

Features of the MCSG Screen Include:

- Developed through extensive screening of more than 40,000 diverse proteins from both prokaryotic and eukaryotic organisms
- Derived from the most successful conditions of other commercial screens
- Arranged in order of productivity—great feature for limited protein samples
- Not chemically similar to any other commercially available screens
- The MCSG Suite comprises 384 non-redundant conditions (4 x 96) which are available in 10 ml tubes or 1.7 ml deep well blocks
- Full production reports, refills, and optimization reagents are available

The MCSG Suite Solution:

The end result is the best, first pass screening suite possible, with:

- Individual conditions selected through a data driven method to ensure conditions with high productivity potential were not accidentally excluded
- Superior organization
- The broadest coverage of crystallization space within a reasonable number of starting conditions for maximum efficiency, while maintaining applicability for more unique and difficult targets

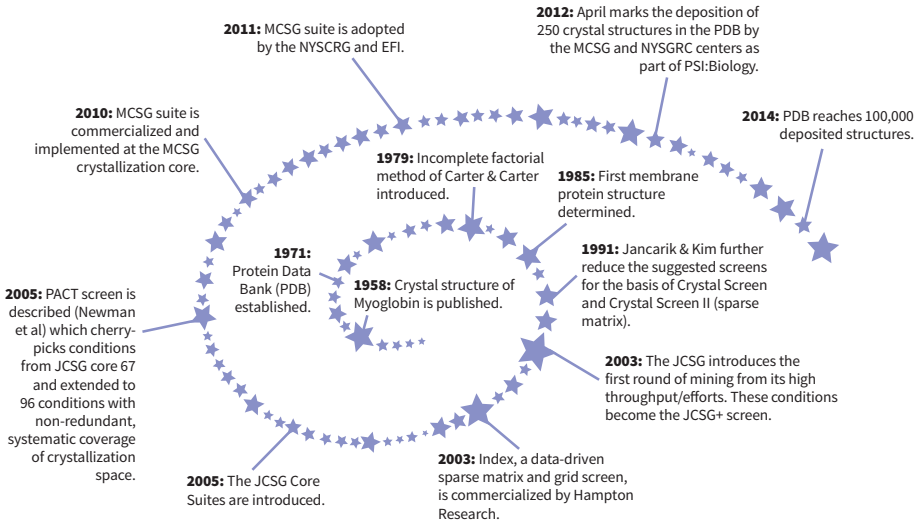
The MCSG Suite is currently used by a number of structural genomics centers, including NYSGRC, EFI, and SSGCID, and pharmaceutical companies as their first pass screening method, and has led to over 850 structures deposited in the Protein Data Bank as of March, 2015. Of the structures deposited by these structural genomics centers, 65% have been determined from crystals grown from the MCSG Suite without additional optimization. Additionally, in a recent paper by paper by Janet Newman and colleagues[1], the MCSG Suite was listed as the most successful commercial screen, by condition.

[1]Fazio, Vincent J., Peat, Thomas, S. and Newman, Janet (2014) in *Acta Crystallographica Section F, Structural Biology Communications*, International Union of Crystallography, **F70**, 1303–1311.

Testimonial:

"The Almo lab handles crystallization trials for the New York Structural Genomics Research Consortium (NYSGRC, part of PSI-Biology), the Enzyme Function Initiative (EFI) as well as serves as a core facility to the Einstein community and beyond. For all of these projects we have adopted the MCSG screens as our initial screening regiment. The 384-condition screening suite covers a broad spectrum of chemical space without redundancies and has proven to be very effective in producing diffraction quality crystals, frequently without the need for further optimization. We have also found these screens have proven to be very cost effective in comparison to other commercially available screens." ~ Dr. Rafael Toro, Manager of Crystallization Operations, Almo Laboratory, AECOM

TIMELINE OF CRYSTALLIZATION SCREEN DEVELOPMENT



Crystal Screen Kits

PART NO.	PRODUCT
MCSG-1	96 Conditions, 1.7 ml each in a 96-well 2 ml deep well block
MCSG-2	96 Conditions, 1.7 ml each in a 96-well 2 ml deep well block
MCSG-3	96 Conditions, 1.7 ml each in a 96-well 2 ml deep well block
MCSG-4	96 Conditions, 1.7 ml each in a 96-well 2 ml deep well block
MCSG-1T	96 Conditions, 10 ml each in 15 ml conical tubes
MCSG-2T	96 Conditions, 10 ml each in 15 ml conical tubes
MCSG-3T	96 Conditions, 10 ml each in 15 ml conical tubes
MCSG-4T	96 Conditions, 10 ml each in 15 ml conical tubes

Challenge:

- Membrane proteins have evolved with life in membranes. These amphipathic proteins are naturally found in a lipid bilayer environment which insulates their hydrophilic core.
- To study membrane proteins, they need to be stable in water and in their functioning three-dimensional form

The Anatrace Analytic Solution:

The first commercially available kit series to address the challenges of working with Integral Membrane Proteins (IMP) and Detergents.

Detergents have been the traditional answer for removing membrane proteins from the membrane (extraction), keeping them stable/solubilized in water for crystallization.

This creates the age old problem of finding the correct detergent which will efficiently extract your membrane protein, as well as provide the necessary stability and solubility for crystallization.

Before the introduction of the Analytics product line, the work was accomplished through homebrew methods and trial and error. Just like mini preps brought simplicity and a systematic approach to DNA purification, Anatrace Analytic Kits do the same for detergent selection.

Challenge:

- Labs new to membrane proteins need assistance and support learning how to extract membrane proteins
- Established labs looking for a standardized and systematic approach to extraction trials for membrane proteins

The Analytic Extractor Kit Solution:

The quick-start kit for extracting membrane proteins.

The Analytic Extractor Kit is the first commercially available approach to standardizing membrane protein extraction and to providing a method for determining the most efficient extraction detergent from a list of eight different detergents. The kit offers a simple, reproducible, systematic approach to extracting membrane proteins that labs can adapt as their standard.

Go Beyond DDM

Evaluate eight of the most successful detergents for membrane protein extraction upfront to give each construct the best opportunity to move forward to large scale expression and purification.

Cost Effective

Purchase only what you need to identify the optimal detergent for your extraction without purchasing an excess amount of detergents not applicable to your project.

The Analytic Extractor Kit: Product No. AL-EXTRACT

Kit Contents

The Analytic Extractor Kit contains 8 detergents commonly used for solubilization and/or crystallization of IMPs from the membranes of both prokaryotic and eukaryotic cells. Working concentrations of each detergent were chosen based on their CMC.

Common Name	Full Name	Anatrace Catalog No.	CMC (% [w/v])	Provided Concentration (5X stock)	Working Concentration
Anapoe-X-100	Triton X-100	APX-100	0.015%	5%	1%
C_8E_4	Tetraethylene Glycol Monooctyl Ether, Anagradel	T350	0.25%	10%	2%
$C_{12}E_8$	Octaethylene Glycol Monododecyl Ether, Anagrade	O330	0.0048%	2.5%	0.5%
DM	n-Decyl-β-D-Maltoside, Anagrade	D322	0.087%	5%	1%
DDM	n-Dodecyl-β-D-Maltoside, Anagrade	D310	0.0087%	5%	1%
FC-12	Fos-Choline-12, Anagrade	F308	0.047%	5%	1%
LDAO	n-Dodecyl-N,N-Dimethylamine-N-Oxide, Anagrade	D360	0.023%	5%	1%
OG	n-Octyl-β-D-Glucoside, Anagrade	O311	0.53%	10%	2%

Analytic selector

Challenge:

- Until now, selecting a detergent which promotes stability of membrane proteins in aqueous conditions outside their naturally occurring cell membrane required much trial and error.
- Finding the best fit detergent for downstream applications and crystallization trials for your membrane protein.

The Analytic Selector Kit Solution:

Introducing the first commercially available kit designed to be a quantifiable starting point for selecting compatible detergents.

Wash, Elute, Spin
This simple, all-inclusive kit contains a panel of 94 detergents and components necessary to find an optimal detergent.

Broad Detergent Selection
The detergent panel samples all major detergent classes, including all detergents leading to successful structure determination of membrane proteins.

Rapid Screening
The kit accomplishes this full range of screening in only three hours—a tremendous savings when compared to traditional detergent exchange and sample characterization.

Unbiased Detection Method
Analyze your output with a variety of reproducible and quantifiable detection methods.

The Analytic Selector Kit: Product No. AL-SEL

Kit Contents:

- One detergent screening plate containing 150 µl of 94 detergents at 2X working concentration, one blank and one position for the detergent currently stabilizing the protein sample
- One 0.22 µm filter plate with receptacle plate for detergent exchange
- One receptacle plate into which the proteins and newly exchanged detergents will be eluted
- One 100 MWCO filter plate with matched receptacle plate
- One 300 MWCO filter plate with matched receptacle plate

All filter plate-receptacle plate pairs provided in this kit are compatible with centrifugation. No adaptors or vacuum manifolds are required.

Analytic crystallizer

Challenge:

- Determining the optimal membrane protein concentration for your crystallization trial.
- Finding the correct crystallization condition for membrane protein crystallization.

The Analytic Crystallizer Kit Solution:

Establishes a new paradigm for the crystallization of membrane proteins through a unique, two-step protocol.

Remove Speculation
The optimizer tool is a quick, easy approach to ensuring your protein is at an optimal concentration for crystallization trials.

Chemically Distinct
Our set of 96 conditions in the Crystallizer screen is new and dissimilar to other commercially available crystallization screens.

Keep False Positives to a Minimum
The Crystallizer Kit reduces the likelihood of detergent crystallization with its formulations that have been tailored to suit detergent behavior.

Cost Savings
Reduce costs associated with screening at suboptimal protein concentration and optimization of false positives—less protein, less time, and less money, with a greater chance of success.

The Analytic Crystallizer Kit: Product No. AL-CRYST
See User Manual for Optimizer and Crystallizer Formulations.