Molecular Dimensions

MemAdvantage™ MD1-71

An additive screen developed exclusively for membrane proteins.
This screen targets all alpha helical types of Prokaryotic and Eukaryotic membrane proteins.

Developed by Simon Newstead and Joanne Parker from University of Oxford, UK.

MD1-71 is presented as a 96 x 1 mL in a deep-well SBS block.

Features of MemAdvantage™:

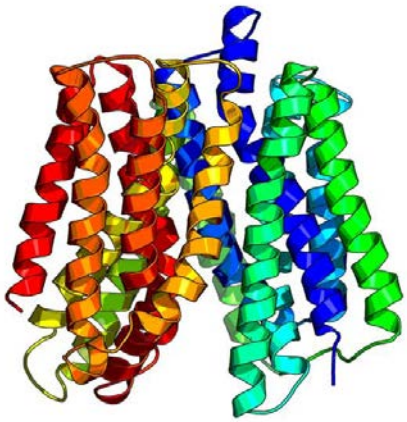
- A rational and intelligently designed additive screen targeted specifically for membrane proteins.
- Allows easy screening of 96 different additives (12 different classes of the following: polyalcohols, detergents, multivalent salts, non-volatile organics etc.) found to be the most successful* in membrane protein crystallization.
- Particularly suited for Prokaryotic and Eukaryotic alpha helical membrane proteins.
- For initial screening or optimization screening.
- Ready-to-use deep-well block.

MemAdvantage™ was developed from the identification of successful additives (using data mining) currently used in the crystallization of membrane proteins. It contains a novel set of chemicals presented as a 96-format screen for implementation in robotic screening pipelines. The kit is designed to help test the effect of 96 different compounds on membrane protein crystal growth.

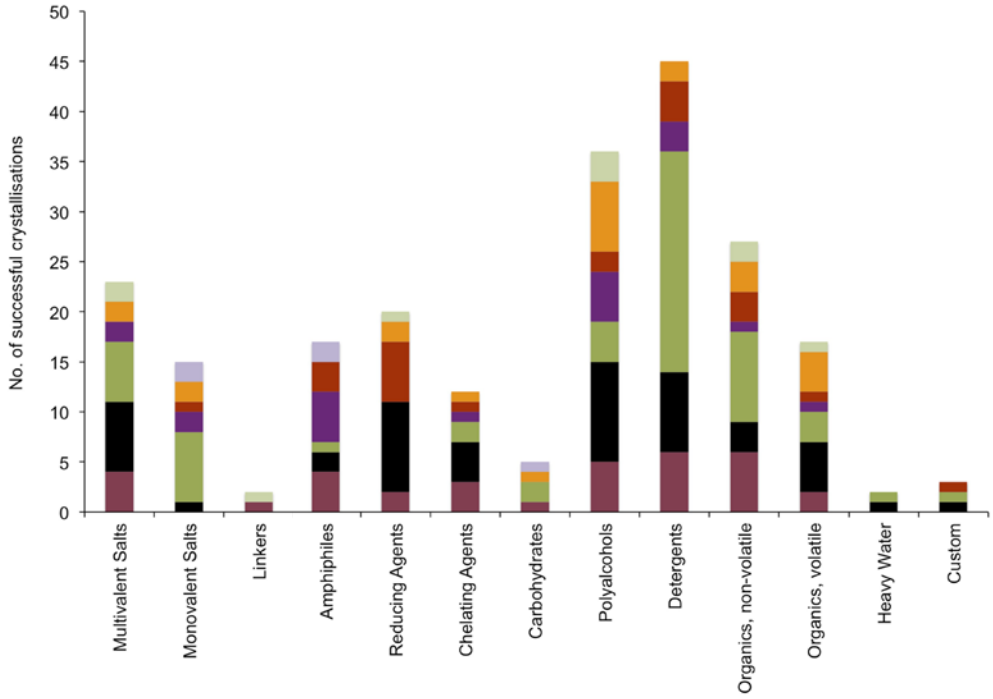
Detergent selection is a critical parameter for growing well-ordered, well diffracting crystals and with so many choices of detergents/ligands to choose it can be both time consuming and expensive to investigate all possibilities.

MemAdvantage™ takes the most successful ligands, detergents, multivalent salts, polyalcohols, non-volatile organics, organics, amphiphiles and puts them all together in one easy-to-use additive screen.

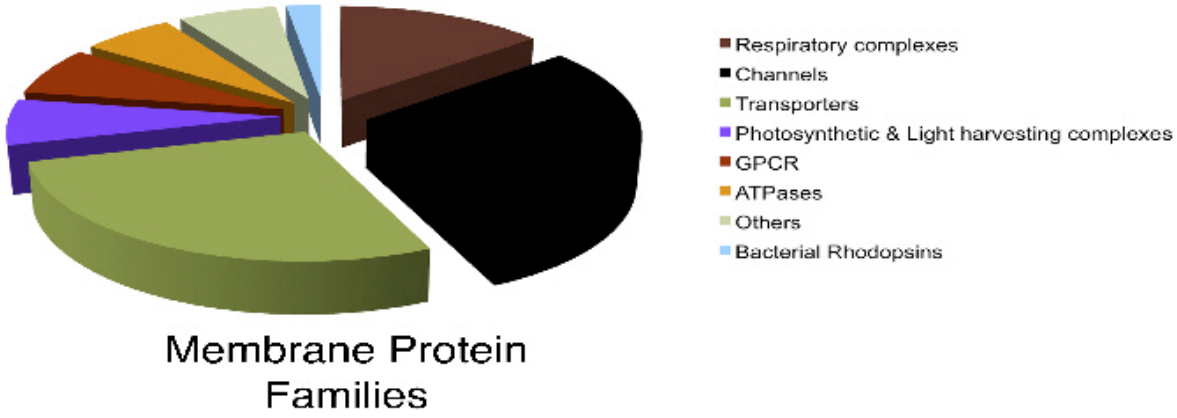
Additives may affect hydration and intermolecular interactions between protein molecules or between protein molecule and solvent and even ligands.
This kit is a screen and results may need to be interpreted with a view to designing further additive experiments using different compounds of the same type as the kit reagent that gave a promising result.



***References**:
Parker, J. and Newstead, S. '*Current trends in alpha helical membrane protein crystallization: an update*', Protein Science, 2012, *21 (9):1358-1365.*



Additives found in MemAdvantage™ and their successfulness in crystallization of membrane proteins - see pie chart below.



Molecular Dimensions

Membrane Proteins

Additive Screens

Instructions for Use:

We recommend you use a 1/10 dilution of additive to your crystallization screen. You can either place the additive straight into the mother liquor (easiest option) or pipette the screen into another plate and aspirate from this during set-up.
As the screen does contain volatiles it is recommended that the additives are placed in the mother liquor as well.

Recommended storage for MemAdvantage™ is -20°C. Allow block to equilibrate to room temperature prior to use. If any of the reagents have precipitated just warm your block up at 37°C for 20 mins.

Formulation Notes:

MemAdvantage™ reagents are formulated using ultrapure water (>18.0 MΩ) and are sterile-filtered using 0.22 μm filters. No preservatives are added.

Final pH may vary from that specified on the datasheet. Molecular Dimensions will be happy to discuss the precise formulation of individual reagents.
Individual reagents and stock solutions for optimization are available from Molecular Dimensions.

Enquiries regarding MemAdvantage™ formulation, interpretation of results or optimization strategies are welcome. Please e-mail, fax or phone your query to Molecular Dimensions.

Contact and product details can be found at www.moleculardimensions.com

Manufacturer's safety data sheets are available to download from our website.

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Membrane Proteins

Additive Screens

MemAdvantage™ HT Rows A - D MD1-71

Well #	Reagent	Type	Conc	Units
A1	HEGA-10	Detergent	70.0	mM
A2	HEGA 11	Detergent	4.2	mM
A3	C-HEGA-11	Detergent	11.5	mM
A4	CHAPS	Detergent	60.0	mM
A5	BigCHAP, deoxy	Detergent	14.0	mM
A6	ONG (octyl glucose neopentyl glycol)	Detergent	10.2	mM
A7	DNG (decyl maltose neopentyl glycol)	Detergent	3.6	mM
A8	LNG (lauryl maltose neopentyl glycol)	Detergent	1.0	mM
A9	UDTM (n-undecyl-B-D-thiomaltopyranoside)	Detergent	2.1	mM
A10	NDM (n-nonyl-β-D-maltopyranoside)	Detergent	60.0	mM
A11	DSM (n-decyl-β-d-thiomaltopyranoside)	Detergent	9.0	mM
A12	OG (n-octyl-β-D-glucoside)	Detergent	190.0	mM
B1	DM (n-decyl-β-D-maltopyranoside)	Detergent	18.0	mM
B2	NG (n-nonyl-β-D-glycopyranoside)	Detergent	65.0	mM
B3	DDM (n-dodecyl-β-D-maltopyranoside)	Detergent	1.7	mM
B4	HTG (n-heptyl-β-D-thioglucopyranoside)	Detergent	290.0	mM
B5	LAPAO (3-laurylamido-N,N'-dimethylpropyl amino oxide)	Detergent	15.6	mM
B6	LDAO (n-dodecyl-N,N-dimethylamine-N-oxide)	Detergent	15.0	mM
B7	CYMAL®-1	Detergent	340.0	mM
B8	CYMAL®-2	Detergent	120.0	mM
B9	CYMAL®-4	Detergent	76.0	mM
B10	CYMAL®-5	Detergent	37.0	mM
B11	CYMAL®-6	Detergent	5.6	mM
B12	CYMAL®-7	Detergent	1.9	mM
C1	Fos-Choline-9	Detergent	39.5	mM
C2	Fos-Choline-12	Detergent	15.0	mM
C3	C8E4 (tetraethylene glycol monooctyl ether)	Detergent	80.0	mM
C4	C12E8 (octaethylene glycol monododecyl ether)	Detergent	0.9	mM
C5	Anzergent® 3-12	Detergent	30.0	mM
C6	OM-fluorinated (octyl maltoside flourinated)	Detergent	10.2	mM
C7	UDM (n-undecyl-β-D-maltoside)	Detergent	5.9	mM
C8	Tri DM (n-tridecyl-β-D-maltoside)	Detergent	0.3	mM
C9	sucrose monocaprate (Sucrose monodecanoate)	Detergent	25.0	mM
C10	Sucrose monododecanoate	Detergent	3.0	mM
C11	TRIPAO	Detergent	45.0	mM
C12	MERPOL® HCS surfactant	Detergent	5.0	% v/v
D1	DMG (n-dodecyl-N,N-dimethylglycine)	Detergent	15.0	mM
D2	Potassium Chloride	Monovalent	100.0	mM
D3	Potassium Fluoride	Monovalent	100.0	mM
D4	Potassium Silicate	Monovalent	100.0	mM
D5	Sodium Acetate	Monovalent	100.0	mM
D6	Sodium Azide	Monovalent	100.0	mM
D7	Sodium Chloride	Monovalent	100.0	mM
D8	Sodium Fluoride	Monovalent	100.0	mM
D9	Sodium Phosphate dibasic	Monovalent	100.0	mM
D10	Lithium Citrate tribasic tetrahydrate	Monovalent	100.0	mM
D11	Lithium Sulfate	Monovalent	100.0	mM
D12	Rubidium Chloride	Monovalent	100.0	mM

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Membrane Proteins

Additive Screens

MemAdvantage™ HT Rows E - H MD1-71

Well #	Reagent	Type	Conc	Units
E1	Ammonium Citrate tribasic	Multivalent	100.0	mM
E2	Ammonium Sulfate	Multivalent	100.0	mM
E3	Cadmium Chloride hemi(pentahydrate)	Multivalent	100.0	mM
E4	Calcium Chloride dihydrate	Multivalent	100.0	mM
E5	Chromium (III) Chloride hexahydrate	Multivalent	100.0	mM
E6	Cobalt (II) Chloride hexahydrate	Multivalent	100.0	mM
E7	Copper(II) Chloride	Multivalent	100.0	mM
E8	Gadolinium(III) Chloride hexahydrate	Multivalent	100.0	mM
E9	Magnesium Chloride hexahydrate	Multivalent	100.0	mM
E10	Magnesium sulfate heptahydrate	Multivalent	100.0	mM
E11	Manganese(II) chloride tetrahydrate	Multivalent	100.0	mM
E12	Osmium(III) Chloride hydrate	Multivalent	100.0	mM
F1	Samarium(III) chloride hexahydrate	Multivalent	100.0	mM
F2	Strontium Chloride hexahydrate	Multivalent	100.0	mM
F3	Zinc Nitrate hexahydrate	Multivalent	100.0	mM
F4	Zinc Sulfate heptahydrate	Multivalent	100.0	mM
F5	1,3-propanediol	Organic, volatile	0.2	% v/v
F6	1,4-butanediol	Organic, volatile	0.2	% v/v
F7	1-butanol	Organic, volatile	7.0	% v/v
F8	Ethanol	Organic, volatile	10.0	% v/v
F9	2-Propanol	Organic, volatile	5.0	% v/v
F10	*tert*-Butanol	Organic, volatile	10.0	% v/v
F11	Triethylammonium Phosphate	Organic, volatile	10.0	% v/v
F12	Deuterium Oxide	Heavy water	1.0	mM
G1	L-Glutathione reduced	Organic, non volatile	100.0	mM
G2	MPD	Organic, non volatile	15.0	% v/v
G3	PEG 400	Organic, non volatile	15.0	% v/v
G4	Polyvinylpyrrolidone	Organic, non volatile	5.0	% w/v
G5	Spermidine	Organic, non volatile	0.16	% v/v
G6	Taurine	Organic, non volatile	0.2	% w/v
G7	Jeffamine® M-600 pH 7.0	Organic, non volatile	10.0	% v/v
G8	PEG 600	Organic, non volatile	15.0	% v/v
G9	1,6-Hexanediol	Organic, non volatile	0.2	% w/v
G10	Dimethyl sulfoxide (DMSO)	Organic, non volatile	30.0	% v/v
G11	Foscarnet (phosphoformic acid)	Organic, non volatile	80.0	mM
G12	Glutaric Acid	Organic, non volatile	0.2	% w/v
H1	1,2,3-Heptanetriol	Amphiphiles	0.2	% w/v
H2	Benzamidine hydrochloride	Amphiphiles	20.0	% w/v
H3	Ethylene Glycol	Polyalcohol	30.0	% v/v
H4	Glycerol	Polyalcohol	30.0	% v/v
H5	EDTA	Chelating agent	100.0	mM
H6	EGTA	Chelating agent	10.0	mM
H7	sucrose	Carbohydrate	40.0	% w/v
H8	D-Trehalose	Carbohydrate	30.0	% w/v
H9	Dithiothreitol (DTT)	Reducing agent	100.0	mM
H10	2-Mercaptoethanol (β-ME)	Reducing agent	30.0	mM
H11	TCEP	Reducing agent	100.0	mM
H12	Gly-Gly-Gly	Linker	300.0	mM

Abbreviations:
MPD: 2-methyl, 2,4-pentanediol, **PEG**: Poly Ethylene Glycol, **DMSO**:Dimethyl Sulfoxide, **EDTA**: Ethylenediaminetetraacetic acid, **EGTA**: ethylene glycol tetraacetic acid, DTT: TCEP:
HEGA-10: Decanoyl-N-Hydroxyethylglucamide, **HEGA-11**; Undecanoyl-N-Hydroxyethylglucamide, **C-HEGA-11:** Cyclohexylpentanoyl-N-Hydroxyethylglucamide **CHAPS:** 3-[(3-Cholamidopropyl)-Dimethylammonio]-1-Propane Sulfonate/N,N-Dimethyl-3-Sulfo-N-[3-[[3α,5β,7α,12α)-3,7,12-Trihydroxy-24-Oxocholan-24-yl]Amino]propyl]-1-Propanaminium Hydroxide, Inner Salt**,**
BIG CHAP, deoxy: N,N'-bis-(3-D Gluconamidopropyl)Deoxycholamide, **CYMAL®-1**,: Cyclohexyl-Methyl-β-D-Maltoside, **CYMAL®-2:** 2-Cyclohexyl-1-Ethyl-β-D-Maltoside, **CYMAL®-4:** 4-Cyclohexyl-1-Butyl-β-D-Maltoside**, CYMAL®-5:** 5-Cyclohexyl-1-Pentyl-β-D-Maltoside**, CYMAL®-6:** 6-Cyclohexyl-1-Hexyl-β-D-Maltoside, **CYMAL®-7:** 7-Cyclohexyl-1-Heptyl-β-D-Maltoside, **Anzergent® 3-12**: n-Dodecyl-N,N-Dimethyl-3-Ammonio-1-Propanesulfonate / N,N-Dimethyl-1-N-(3-Sulfopropyl)-1-Dodecanaminium Hydroxide, Inner Salt, **TRIPAO**: ((3-(3 Butyl-3-Phenylheptanamido)-N,N-Dimethylpropan-1-Amine Oxide))**.**

Manufacturer's safety data sheets are available from our website.

Ordering details:

Catalogue Description	**Catalogue Code**
MemAdvantage™ (0.25mL)	MD1-70
MemAdvantage™ (1mL)	MD1-71
MemAdvantage™ single reagents	MDSR-70-well number

For MemAdvantage™ stock reagents go to Optimization on our website.