

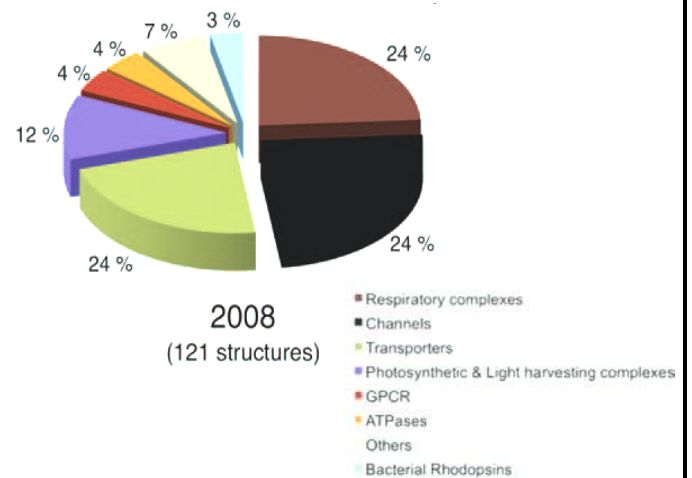
MemGold™ MD1-39

MemGold* is based on crystallization conditions data mined from the Protein Data Bank and is a rationalized sparse matrix screen containing 96 conditions covering a range of pH, PEGs and salt additives.

MD1-39 is presented as 96 x 10 mL conditions.

Features of MemGold:

- Data mined from 300 crystallization conditions.
- Covers conditions for approximately 121 α -helical type membrane proteins.
- Addresses the diversity of membrane proteins studied, with many more transporters and channels and both α - and β -types.

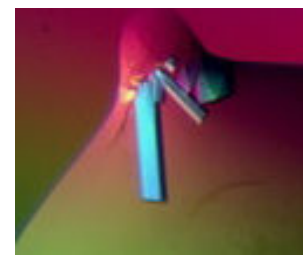
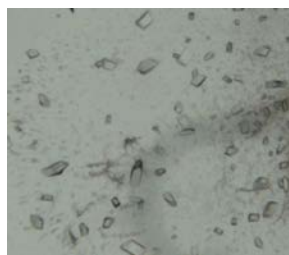


Introduction

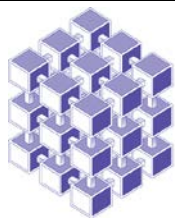
Recent years have seen a steady increase in the number of membrane protein structures solved and there are now (2008) approximately 130 different membrane protein structures in the PDB and over 300 crystallization conditions. The diversity of proteins has increased, with many more transporters and channels now in the database and a good number of both α - and β - types.

Work by Dr. Simon Newstead in the group of Prof. So Iwata at Imperial College, London (2004-2009), produced a new sparse matrix screen for membrane proteins, called MemGold. MemGold is based on the conditions mined from the PDB and contains 96 conditions covering a range of pH, PEGs and salt additives.

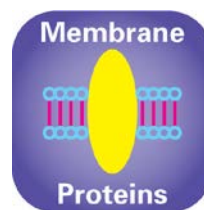
MP families. The proportion of structures belonging to each of the eight MP families in the database is shown. Bacterial rhodopsins (blue), GPCR (red), channels (black), transporters (green), photosynthetic and light harvesting complexes (purple), ATPases (orange), respiratory complexes (brown), others (DsbB-DsbA oxidase, intramembrane proteases, membrane-associated proteins in eicosanoid, and glutathione metabolism [MAPEG]) (olive).



Success stories: Crystals of Membrane proteins grown with MemGold screens



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Formulation Notes:

MemGold 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.

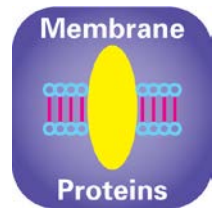
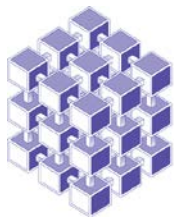
Enquiries regarding MemGold formulation, interpretation of results or optimization strategies are welcome. Please e-mail, fax or phone your query to Molecular Dimensions.

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

References.

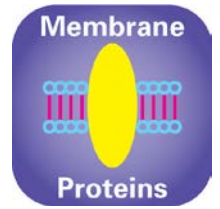
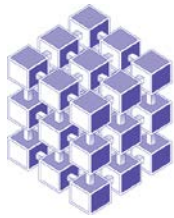
Newstead, S., Ferrandon, S., Iwata, S. Protein Science 2008, 17(3) "*Rationalizing alpha-helical membrane protein crystallization*".

* Developed by Dr. S. Newstead (So Iwata lab), 2004-2009, Imperial College, London and manufactured under licence by Molecular Dimensions Ltd.



MemGold Conditions 1-48 (Box 1) MD1-39

Tube #	Conc.	Salt	Conc.	Buffer	pH	Conc.	Precipitant
1-1	2.2 M	Ammonium sulfate	0.08 M	Sodium citrate	5.2		
1-2	1.2 M	Sodium citrate tribasic dihydrate	0.01 M	Tris	8.0		
1-3			0.015 M	Tricine	8.5	24 % w/v	PEG 4000
1-4	0.36 M	Sodium chloride	0.015 M	Sodium phosphate	7.0	9.9 % w/v	PEG 4000 0.1 % w/v Sodium azide
1-5	0.3 M	Sodium chloride	0.01 M	Tris	8.0	27.5 % w/v	PEG 4000
1-6			0.225 M	MES/Bis-Tris	6.6	6.6 % w/v	PEG 6000
1-7	0.1 M	Ammonium sulfate	0.1 M	HEPES	7.5	12 % w/v	PEG 4000 22 % v/v Glycerol
1-8	0.01 M	Magnesium sulfate heptahydrate	0.02 M	MES	6.5	7.7 % w/v	PEG 1500
	0.02 M	Sodium chloride					
	0.02 M	Calcium chloride dihydrate					
1-9	2.5 M	Ammonium sulfate	0.05 M	HEPES	7.5		
1-10	1.1 M	Sodium citrate tribasic dihydrate	0.0665 M	HEPES	7.5		
1-11	3.3 M	Ammonium sulfate	0.15 M	Potassium phosphate	6.5		
1-12	0.1 M	Magnesium acetate tetrahydrate	0.1 M	Sodium citrate	5.8	14 % w/v	PEG 5000 MME
1-13	0.1 M	Sodium chloride	0.02 M	Sodium citrate	5.6	11 % w/v	PEG 3350
1-14	0.1 M	Sodium chloride	0.02 M	Sodium citrate	5.6	5.5 % w/v	PEG 3350
1-15	0.05 M	Calcium chloride dihydrate	0.1 M	Tris	8.2	32 % v/v	PEG 400
	0.05 M	Barium chloride dihydrate					
1-16	0.05 M	Sodium chloride	0.1 M	Sodium phosphate	6.2	16 % w/v	PEG 4000
1-17	0.1 M	Magnesium chloride hexahydrate	0.03 M	Tris-HCl	8.2	19 % w/v	PEG 4000
1-18	0.2 M	Sodium chloride	0.025 M	HEPES	7.5	13 % w/v	PEG 4000
1-19			0.1 M	HEPES	7.5	11 % w/v	PEG 3350
1-20	0.1 M	Sodium chloride	0.02 M	KMES	6.7	6.6 % w/v	PEG 4000
1-21	0.1 M	Potassium chloride	0.02 M	Tris	7.0	20 % w/v	PEG 4000
1-22	0.05 M	Magnesium chloride hexahydrate	0.1 M	Sodium cacodylate	6.7	6.6 % w/v	PEG 3350 0.1 % w/v Sodium azide
1-23	0.2 M	Potassium chloride	0.1 M	Sodium citrate	5.5	37 % v/v	Pentaerythritol propoxylate (5/4 PO/OH)
1-24			0.1 M	Tris	8.0	5.5 % w/v	PEG 4000
1-25	0.1 M	Sodium chloride	0.02 M	Tris	7.0	7.7 % w/v	PEG 4000
1-26	0.1 M	Magnesium chloride hexahydrate	0.1 M	Tris	7.5	22 % v/v	PEG 400
1-27	0.04 M	Sodium chloride	0.04 M	Tris	8.0	27 % v/v	PEG 350 MME
1-28	0.05 M	Sodium chloride	0.1 M	Sodium citrate	6.0	22 % v/v	PEG 400
	0.02 M	Magnesium chloride hexahydrate					
1-29			0.1 M	Sodium acetate	5.5	8.8 % w/v	PEG 2000 MME
1-30			0.4 M	Ammonium acetate	8.0	13 % w/v	PEG 2000 MME
1-31			0.02 M	Bis-Tris	7.0	15 % w/v	PEG 2000
1-32	0.1 M	Sodium chloride	0.02 M	Tris	7.5	11 % w/v	PEG 1500
	0.1 M	Magnesium chloride hexahydrate					
1-33	0.1 M	Sodium chloride	0.1 M	HEPES	8.0	11 % w/v	PEG 1500
	0.1 M	Magnesium chloride hexahydrate					
1-34	0.2 M	Sodium acetate trihydrate	0.1 M	HEPES	7.0	22 % w/v	PEG 3000
	0.2 M	Potassium chloride					
1-35	0.02 M	Nickel(II) sulfate hexahydrate	0.01 M	HEPES	7.0	33 % v/v	Jeffamine® M-600
1-36	0.15 M	Sodium chloride	0.1 M	Tris	8.0	13 % w/v	PEG 6000
1-37	0.2 M	Calcium chloride dihydrate	0.1 M	HEPES	7.5	53 % v/v	PEG 400
1-38	0.05 M	Magnesium acetate tetrahydrate	0.05 M	Sodium acetate	5.0	28 % v/v	PEG 400
1-39			0.05 M	HEPES	7.5	22 % w/v	PEG 4000
1-40	0.2 M	Calcium chloride dihydrate	0.1 M	Tris-HCl	8.0	44 % v/v	PEG 400
1-41	0.05 M	Magnesium acetate tetrahydrate	0.05 M	Sodium acetate	5.4	24 % v/v	PEG 400
1-42	0.2 M	Calcium chloride dihydrate	0.1 M	MES	6.5	26 % v/v	PEG 350 MME
1-43	0.1 M	Potassium chloride	0.1 M	Tris	8.5	39 % v/v	PEG 400
1-44	0.05 M	Magnesium chloride hexahydrate	0.1 M	Glycine	9.0	22 % v/v	PEG 400
1-45	0.1 M	Ammonium sulfate	0.1 M	Glycine	3.8	28 % v/v	Triethylene glycol (TEG)
1-46	0.15 M	Sodium formate	0.1 M	HEPES	7.2	18 % w/v	PEG 3350
1-47			0.2 M	Sodium acetate	6.8	8.8 % w/v	PEG 6000
1-48	0.2 M	Potassium chloride	0.1 M	MES	6.5	18 % w/v	PEG 6000

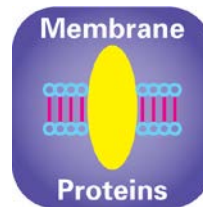
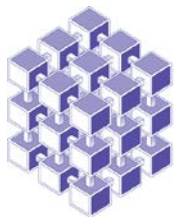


MemGold

Conditions 1-48 (Box 2)

MD1-39

Tube #	Conc.	Salt	Conc.	Buffer	pH	Conc.	Precipitant
2-1	0.22 M	Sodium citrate tribasic dihydrate	0.1 M	Tris	8.0	35 % v/v	PEG 400
2-2			0.1 M	Sodium acetate	4.5	17 % v/v	PEG 400
2-3	1.0 M	Lithium sulfate	0.02 M	Tris	8.5	1.8 % w/v	PEG 8000
2-4			0.02 M	Tris	7.5	22 % v/v	PEG 500 MME
2-5	0.05 M	Sodium chloride	0.02 M	Glycine	10.0	33 % w/v	PEG 1000
2-6	0.2 M	Magnesium chloride hexahydrate	0.1 M	Tris	8.5	25 % w/v	PEG 4000
2-7	0.2 M	Magnesium chloride hexahydrate	0.1 M	Sodium cacodylate	6.5	31 % w/v	PEG 2000
2-8			0.64 M	Sodium acetate	4.6	18 % w/v	PEG 3350
2-9	0.1 M	Sodium chloride	0.1 M	Tris-HCl	8.0	33 % v/v	PEG 400
		0.1 M Cadmium chloride hemi(pentahydrate)					
2-10			0.1 M	BICINE	8.9	31 % w/v	PEG 2000
2-11	0.05 M	Sodium sulfate	0.05 M	Tris	8.5	35 % v/v	PEG 400
	0.05 M	Lithium sulfate					
2-12	0.1 M	Sodium chloride	0.05 M	Glycine	9.5	33 % v/v	PEG 300
2-13	0.3 M	Magnesium nitrate hexahydrate	0.1 M	Tris	8.0	23 % w/v	PEG 2000
2-14	0.12 M	Lithium sulfate	0.02 M	Tris	7.5	20 % v/v	PEG 300
			0.1 M	Sodium citrate	5.0		
2-15	0.1 M	Sodium chloride	0.12 M	Tris	9.4	20 % v/v	PEG 400
2-16	0.2 M	Sodium chloride	0.1 M	HEPES	7.0	22 % v/v	PEG 500 MME
2-17	0.1 M	Sodium chloride	0.1 M	Tris	8.0	21 % v/v	PEG 400
	0.325 M	Sodium acetate trihydrate					
2-18	0.02 M	Sodium citrate tribasic dihydrate	0.08 M	Sodium phosphate	6.2	18 % w/v	PEG 2000
2-19	0.02 M	Potassium nitrate	0.03 M	Potassium citrate	6.5	7.7 % w/v	PEG 4000
2-20	0.1 M	Sodium chloride	0.1 M	Tris	8.5	30 % w/v	PEG 2000 MME
	0.005 M	Magnesium chloride hexahydrate					
2-21	0.2 M	Calcium chloride dihydrate	0.1 M	HEPES	7.0	33 % v/v	PEG 400
2-22	0.1 M	Calcium chloride dihydrate	0.1 M	Tris	6.5	13 % w/v	PEG 2000 MME
2-23	0.2 M	Ammonium sulfate	0.02 M	Sodium acetate	4.0	33 % v/v	PEG 200
	0.02 M	Sodium chloride					
2-24	0.07 M	Sodium chloride	0.05 M	Sodium citrate	4.5	22 % v/v	PEG 400
2-25	0.2 M	Ammonium sulfate	0.1 M	Sodium acetate	4.6	28 % v/v	PEG 500 MME
2-26			0.05 M	Glycine	9.0	55 % v/v	PEG 400
2-27	0.1 M	Magnesium chloride hexahydrate	0.1 M	Tris	8.5	33 % v/v	PEG 400
	0.1 M	Sodium chloride					
2-28	0.05 M	Citric acid				19 % w/v	PEG 1000
	0.1 M	Lithium sulfate					
	0.05 M	Sodium phosphate dibasic dihydrate					
2-29	0.2 M	Magnesium chloride hexahydrate	0.025 M	Sodium citrate	4.0	33 % v/v	PEG 400
	0.1 M	Potassium chloride					
2-30	0.05 M	Zinc acetate dihydrate	0.05 M	MES	6.1	11 % w/v	PEG 8000
2-31	0.3 M	Magnesium nitrate hexahydrate	0.1 M	Tris	8.0	22 % w/v	PEG 8000
2-32	0.1 M	Sodium chloride	0.1 M	MES	6.5	33 % v/v	PEG 400
						4 % v/v	Ethylene glycol
2-33	0.05 M	Sodium chloride	0.1 M	Sodium citrate	5.5	26 % v/v	PEG 400
2-34	0.1 M	Lithium sulfate	0.1 M	Glycine	9.3	30 % v/v	PEG 400
2-35	0.15 M	Potassium citrate tribasic monohydrate				22 % w/v	PEG 6000
	0.05 M	Lithium citrate tribasic tetrahydrate					
	0.1 M	Sodium phosphate monobasic monohydrate					
2-36	0.001 M	Zinc sulfate heptahydrate	0.05 M	HEPES	7.8	28 % v/v	PEG 600
2-37	0.1 M	Sodium chloride	0.1 M	Sodium phosphate	7.0	33 % v/v	PEG 300
2-38	0.1 M	Sodium chloride	0.05 M	BICINE	9.0	33 % v/v	PEG 300
2-39	0.05 M	Zinc acetate dihydrate	0.1 M	Sodium cacodylate	6.0	6.6 % w/v	PEG 8000
						6 % v/v	Ethylene glycol
2-40	0.2 M	Lithium sulfate	0.1 M	Sodium citrate	3.5	28 % v/v	PEG 400
2-41	0.1 M	Sodium chloride	0.1 M	Tris	7.5	11 % w/v	PEG 4000
2-42	0.05 M	Lithium sulfate	0.1 M	Tricine	7.4	7 % w/v	PEG 3000
2-43	0.2 M	Calcium chloride dihydrate	0.1 M	MES	6.5	33 % v/v	PEG 400
2-44	1.0 M	Sodium chloride	0.1 M	Sodium citrate	6.0	28 % w/v	PEG 4000
2-45			0.1 M	HEPES	7.5	11 % w/v	PEG 4000
2-46	0.002 M	Zinc sulfate heptahydrate	0.08 M	HEPES	7.0	25 % v/v	Jeffamine® ED-2003
2-47	0.001 M	Cadmium chloride hemi(pentahydrate)	0.1 M	MES	6.5	30 % v/v	PEG 400
	0.03 M	Magnesium chloride hexahydrate					
2-48	3.0 M	Sodium chloride	0.1 M	Bis-Tris propane	7.0		



Abbreviations:

Bicine; N,N-Bis(2-hydroxyethyl)glycine, **HEPES**; N-(2-hydroxyethyl)-piperazine-N'-2-ethanesulfonic acid, **KMES**; 2-(N-morpholino)ethanesulfonic acid potassium salt, **MES**; 2-(N-morpholino)ethanesulfonic acid, **MME**; Monomethylether, **PEG**; Polyethylene glycol, **Tricine**; N-[Tris(hydroxymethyl)methyl]glycine, **Tris**; 2-Amino-2-(hydroxymethyl)propane-1,3-diol, **Tris HCl**; 2-Amino-2-(hydroxymethyl)propane-1,3-diol, hydrochloride.]

Manufacturer's safety data sheets are available from our website or by scanning the QR code here:



Re-Ordering details:

Catalogue Description Code	Pack size	Catalogue
MemGold	96 x 10 mL	MD1-39
MemGold HT-96	96 x 1 mL	MD1-41
Cacodylate-free screens		
MemGold cacodylate-free	96 x 10 mL	MD1-39-CF
MemGold HT-96 cacodylate-free	96 x 1 mL	MD1-41-CF
Green screens (contain fluorescent green dye- ideal for UV)		
MemGold Green screen	96 x 10 mL	MD1-56
MemGold HT-96 Green screen	96 x 1 mL	MD1-53
Combo Packs (MemGold + MemGold2)		
MemGold Combo Value Pack	2 x 96 x 10 mL	MD1-74
MemGold HT96 Combo Value Pack	2 x 96 x 1 mL	MD1-74-HT
Single Reagents		
MemGold single reagents	100 mL	MDSR-39-tube number
MemGold HT-96 single reagents	100 mL	MDSR-41-well number

For MemGold stock solutions please visit the Optimization section on our website.