Molecular Dimensions

Soluble Proteins

MD1-75

Super2 Combo Value Pack

(MD1-29 & MD1-37)

Molecular Dimensions

Soluble Proteins

PACT *premier*™ MD1-29

PACT *premier* is a pH, Anion, Cation crystallization trial devised to test pH within a PEG/Ion screen environment.

MD1-29 contains 96 x 10 mL reagents.

Features of PACT *premier*

- A modern, comprehensive PEG/ion screen.
- This 96-well screen is really 3 screens in one:
  - 24-well pH/PEG screen
  - 24-well cation/PEG screen
  - 48-well anion/PEG screen

Rationale for a new PEG/Ion screen

The first step in crystallization is often to reach for a commercially available "sparse matrix" kit, and hope that one of the conditions produces something that looks harvestable, or optimizable. If no obvious leads come out of the screen, it is hard to learn anything from the negative (precipitate and clear) results.

There are a few screens that try to test crystallization space in a more rational manner – for example, the Clear Strategy Screen and The Solubility Tool Kit.

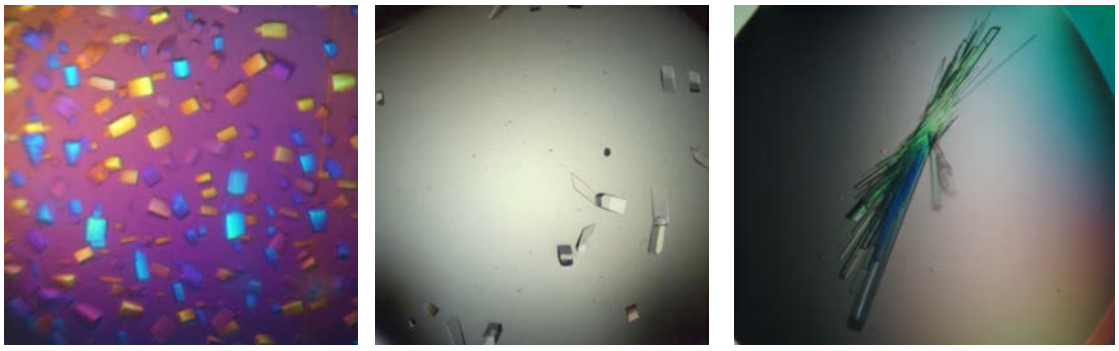
Traditional PEG/Ion screens provide a logical test of seven cations and eleven anions using PEG 3350 as the precipitation agent. However, the user has no control over pH and hence cannot determine the affect of one cation or anion over another.

For this reason the PEG/ION/pH (PACT) screen has been developed to systematically test the effect of pH, anions and cations, using PEG as the precipitant. This screen has been implemented very successfully at the Netherlands Cancer Institute (NKI), and at the Oxford Protein Production Facility (OPPF).

PACT *premier*

pH/PEG screen

This consists of four broad range buffer systems (1) versus PEG 1500. These buffers allow one to scan the pH range from 4 to 9, without changing the chemistry of the system, so effectively isolating the effect of pH from the effect of the buffer that causes the change in pH.



Protein crystals grown successfully with PACT *premier*.

PACT *premier*

Cation/PEG screen

This is made up of six cations (all with chloride counter ions) that are combined with PEG 6000 at four different pHs: Acetate pH 5 , MES pH 6 , HEPES pH 7 and Tris pH 8 . The cations tested are Na^+, NH_4^+, Li^+, Mg^{2+}, Ca^{2+} and Zn^{2+}. The zinc ion is tested at lower concentration than the other cations in the screen (0.01 M *vs.* 0.2 M)

Anion/PEG screen

This is made up of 12 anions, with either sodium or potassium counter ions, which are tested at 0.2 M against PEG 3350. The anions include fluoride, bromine, iodide, thiocyanate, nitrate, formate, acetate, sulfate, tartrate, phosphate, citrate and malonate. The phosphate solution is tested at a concentration of 0.02 M. Chloride is not included here as it is the counter ion in the cation screen. Three sets of reagents are tested at pH 6.5, 7.5, and 8.5 with the Bis-Tris-Propane buffer system whilst one set of reagents is tested without buffering.

References:

(1)Newman *et al* (2005). Towards rationalization of crystallization screening for small- to medium-sized academic laboratories: the PACT/JCSG+ strategy. *Acta Cryst*. **D61**, 1426-1431.

Formulation Notes

PACT *premier* 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 **PACT-*premier*** 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

PACT *premier*- when used together with JCSG *plus* as a primary screening strategy is an extremely powerful and successful combination, (i.e. a combination of a modern sparse matrix approach and an information yielding systematic trial).

Molecular Dimensions

Soluble Proteins

PACT *premier* Conditions 1-48 (Box 1) MD1-29

Tube #	Conc.	Salt	Conc.	Buffer	pH	Conc.	Precipitant
1-1			0.1 M	SPG	4.0	25 % w/v	PEG 1500
1-2			0.1 M	SPG	5.0	25 % w/v	PEG 1500
1-3			0.1 M	SPG	6.0	25 % w/v	PEG 1500
1-4			0.1 M	SPG	7.0	25 % w/v	PEG 1500
1-5			0.1 M	SPG	8.0	25 % w/v	PEG 1500
1-6			0.1 M	SPG	9.0	25 % w/v	PEG 1500
1-7	0.2 M	Sodium chloride	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000
1-8	0.2 M	Ammonium chloride	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000
1-9	0.2 M	Lithium chloride	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000
1-10	0.2 M	Magnesium chloride hexahydrate	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000
1-11	0.2 M	Calcium chloride dihydrate	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000
1-12	0.01 M	Zinc chloride	0.1 M	Sodium acetate	5.0	20 % w/v	PEG 6000
1-13			0.1 M	MIB	4.0	25 % w/v	PEG 1500
1-14			0.1 M	MIB	5.0	25 % w/v	PEG 1500
1-15			0.1 M	MIB	6.0	25 % w/v	PEG 1500
1-16			0.1 M	MIB	7.0	25 % w/v	PEG 1500
1-17			0.1 M	MIB	8.0	25 % w/v	PEG 1500
1-18			0.1 M	MIB	9.0	25 % w/v	PEG 1500
1-19	0.2 M	Sodium chloride	0.1 M	MES	6.0	20 % w/v	PEG 6000
1-20	0.2 M	Ammonium chloride	0.1 M	MES	6.0	20 % w/v	PEG 6000
1-21	0.2 M	Lithium chloride	0.1 M	MES	6.0	20 % w/v	PEG 6000
1-22	0.2 M	Magnesium chloride hexahydrate	0.1 M	MES	6.0	20 % w/v	PEG 6000
1-23	0.2 M	Calcium chloride dihydrate	0.1 M	MES	6.0	20 % w/v	PEG 6000
1-24	0.01 M	Zinc chloride	0.1 M	MES	6.0	20 % w/v	PEG 6000
1-25			0.1 M	PCTP	4.0	25 % w/v	PEG 1500
1-26			0.1 M	PCTP	5.0	25 % w/v	PEG 1500
1-27			0.1 M	PCTP	6.0	25 % w/v	PEG 1500
1-28			0.1 M	PCTP	7.0	25 % w/v	PEG 1500
1-29			0.1 M	PCTP	8.0	25 % w/v	PEG 1500
1-30			0.1 M	PCTP	9.0	25 % w/v	PEG 1500
1-31	0.2 M	Sodium chloride	0.1 M	HEPES	7.0	20 % w/v	PEG 6000
1-32	0.2 M	Ammonium chloride	0.1 M	HEPES	7.0	20 % w/v	PEG 6000
1-33	0.2 M	Lithium chloride	0.1 M	HEPES	7.0	20 % w/v	PEG 6000
1-34	0.2 M	Magnesium chloride hexahydrate	0.1 M	HEPES	7.0	20 % w/v	PEG 6000
1-35	0.2 M	Calcium chloride hexahydrate	0.1 M	HEPES	7.0	20 % w/v	PEG 6000
1-36	0.01 M	Zinc chloride	0.1 M	HEPES	7.0	20 % w/v	PEG 6000
1-37			0.1 M	MMT	4.0	25 % w/v	PEG 1500
1-38			0.1 M	MMT	5.0	25 % w/v	PEG 1500
1-39			0.1 M	MMT	6.0	25 % w/v	PEG 1500
1-40			0.1 M	MMT	7.0	25 % w/v	PEG 1500
1-41			0.1 M	MMT	8.0	25 % w/v	PEG 1500
1-42			0.1 M	MMT	9.0	25 % w/v	PEG 1500
1-43	0.2 M	Sodium chloride	0.1 M	Tris	8.0	20 % w/v	PEG 6000
1-44	0.2 M	Ammonium chloride	0.1 M	Tris	8.0	20 % w/v	PEG 6000
1-45	0.2 M	Lithium chloride	0.1 M	Tris	8.0	20 % w/v	PEG 6000
1-46	0.2 M	Magnesium chloride hexahydrate	0.1 M	Tris	8.0	20 % w/v	PEG 6000
1-47	0.2 M	Calcium chloride dihydrate	0.1 M	Tris	8.0	20 % w/v	PEG 6000
1-48	0.002 M	Zinc chloride	0.1 M	Tris	8.0	20 % w/v	PEG 6000

Molecular Dimensions

Soluble Proteins

PACT *premier* Conditions 1-48 (Box 2) MD1-29

Tube #	Conc.	Salt	Conc.	Buffer	pH	Conc.	Precipitant
2-1	0.2 M	Sodium fluoride				20 % w/v	PEG 3350
2-2	0.2 M	Sodium bromide				20 % w/v	PEG 3350
2-3	0.2 M	Sodium iodide				20 % w/v	PEG 3350
2-4	0.2 M	Potassium thiocyanate				20 % w/v	PEG 3350
2-5	0.2 M	Sodium nitrate				20 % w/v	PEG 3350
2-6	0.2 M	Sodium formate				20 % w/v	PEG 3350
2-7	0.2 M	Sodium acetate trihydrate				20 % w/v	PEG 3350
2-8	0.2 M	Sodium sulfate				20 % w/v	PEG 3350
2-9	0.2 M	Potassium sodium tartrate tetrahydrate				20 % w/v	PEG 3350
2-10	0.02 M	Sodium/potassium phosphate				20 % w/v	PEG 3350
2-11	0.2 M	Sodium citrate tribasic dihydrate				20 % w/v	PEG 3350
2-12	0.2 M	Sodium malonate dibasic monohydrate				20 % w/v	PEG 3350
2-13	0.2 M	Sodium fluoride	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-14	0.2 M	Sodium bromide	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-15	0.2 M	Sodium iodide	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-16	0.2 M	Potassium thiocyanate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-17	0.2 M	Sodium nitrate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-18	0.2 M	Sodium formate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-19	0.2 M	Sodium acetate trihydrate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-20	0.2 M	Sodium sulfate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-21	0.2 M	Potassium sodium tartrate tetrahydrate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-22	0.02 M	Sodium/potassium phosphate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-23	0.2 M	Sodium citrate tribasic dihydrate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-24	0.2 M	Sodium malonate dibasic monohydrate	0.1 M	Bis-Tris propane	6.5	20 % w/v	PEG 3350
2-25	0.2 M	Sodium fluoride	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-26	0.2 M	Sodium bromide	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-27	0.2 M	Sodium iodide	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-28	0.2 M	Potassium thiocyanate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-29	0.2 M	Sodium nitrate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-30	0.2 M	Sodium formate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-31	0.2 M	Sodium acetate trihydrate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-32	0.2 M	Sodium sulfate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-33	0.2 M	Potassium sodium tartrate tetrahydrate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-34	0.02 M	Sodium/potassium phosphate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-35	0.2 M	Sodium citrate tribasic dihydrate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-36	0.2 M	Sodium malonate dibasic monohydrate	0.1 M	Bis-Tris propane	7.5	20 % w/v	PEG 3350
2-37	0.2 M	Sodium fluoride	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350
2-38	0.2 M	Sodium bromide	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350
2-39	0.2 M	Sodium iodide	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350
2-40	0.2 M	Potassium thiocyanate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350
2-41	0.2 M	Sodium nitrate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350
2-42	0.2 M	Sodium formate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350
2-43	0.2 M	Sodium acetate trihydrate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350
2-44	0.2 M	Sodium sulfate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350
2-45	0.2 M	Potassium sodium tartrate tetrahydrate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350
2-46	0.02 M	Sodium/potassium phosphate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350
2-47	0.2 M	Sodium citrate tribasic dihydrate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350
2-48	0.2 M	Sodium malonate dibasic monohydrate	0.1 M	Bis-Tris propane	8.5	20 % w/v	PEG 3350

Abbreviations:
HEPES; N-(2-hydroxyethyl)-piperazine-N'-2-ethanesulfonic acid, **MES**; 2-(N-morpholino)ethanesulfonic acid, **PEG**; Polyethylene glycol, **Tris**; 2-Amino-2-(hydroxymethyl)propane-1,3-diol, **SPG buffer**; Succinic Acid, Phosphate, Glycine, **MIB buffer**; Malonic acid, Imidazole, Boric acid, **PCTP buffer**; Propionic acid, Cacodylate, Bis-tris propane, **MMT buffer**; Malic acid, MES, Tris.

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

Ordering details:

Catalogue Description		Catalogue Code
PACT *premier*	(96 x 10 mL kit)	MD1-29
PACT *premier* HT-96	(96 x 1 mL)	MD1-36
PACT *premier Eco Screen*	(96 x 10 mL kit)	MD1-29-ECO
PACT *premier* HT-96 *Eco Screen*	(96 x 1 mL)	MD1-36-ECO
Green Screens		
PACT *premier* Green Screens	(96 x 10 mL kit)	MD1-55
PACT *premier* HT-96 Green Screens	(96 x 1 mL)	MD1-52
Single Reagents		
PACT *premier*	(100 mL)	MDSR-29 - tube number
PACT *premier* HT-96	(100 mL)	MDSR-36 - well number
PACT *premier* Green screen	(100 mL)	MDSR-55 - tube number
PACT *premier* Green screen HT-96	(100 mL)	MDSR-52 - well number

For PACT *premier*™ stock reagents visit our Optimization page on our website.

Molecular Dimensions

Soluble Proteins

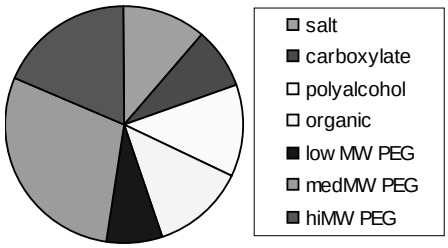
JCSG-*plus*™ MD1-37

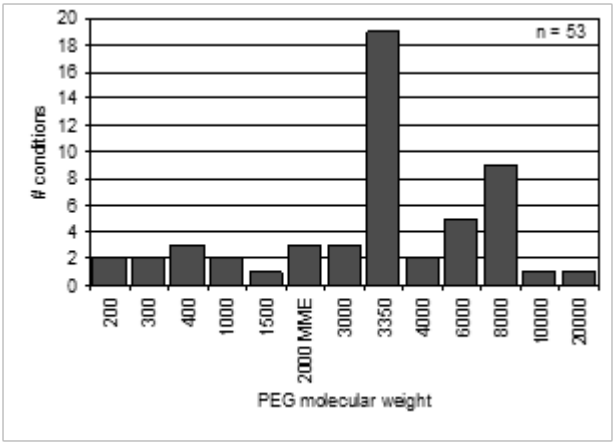
JCSG-*plus* is the screen of choice for initial screening experiments.
The most complete sparse matrix screen available today.

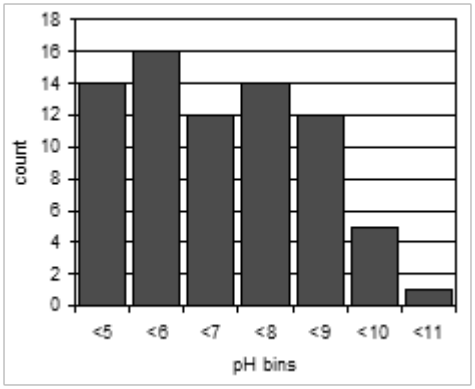
MD1-37 is presented as 96 x 10 mL conditions.

Features of JCSG-*plus:*

- Optimized sparse matrix screen.
- Reduced redundancy.
- Screens classic PEG and salt conditions.
- Access more areas of crystallization space.
- Neutralised organic acids: Formate, acetate, citrate, succinate, malate, malonate.
- More organic and polyalcohol conditions
- Precipitant synergy.
- Wide pH range 4.0 – 10.0.







Analysis of precipitants used in JCSG-plus

Introduction

Commercially available sparse matrix screens are devised using conditions based on previously successful crystallization conditions. Since increasing numbers of researchers now use commercially available sparse matrix screens, the same sub-sets of conditions are used repeatedly. A number of structural genomics initiatives have published results of data-mining exercises using internally consistent datasets and analysing negative results as well as positive hits. The results have been startling!

Members of the Joint Centre for Structural Genomics analysed the crystallization of over 500 different proteins against commercially available sparse matrix screens totalling 480 conditions, compiled to sample a wide range of precipitant, buffer, additive and pH. The **core screen (JCSG)** was developed when data mining revealed massive redundancy between clusters of conditions in commercial screens, particularly where high molecular weight PEGs are used as precipitants (1). Using a novel algorithm, members of the JCSG identified *"conditions most essential for promoting crystal formation for the most diverse set of proteins.* **JCSG+ supersedes the JSCG Core Screen and Index screens.**

In-filling the optimized screen

The second issue to come to light was that even extensive suites of sparse matrix screens represent incomplete coverage of crystallisation space – 480 conditions failed to crystallise 15% of the target proteins.

The **JCSG-*plus*** screen is supplemented with additional conditions to provide a more complete coverage of crystallisation space and improved chemical complementarity (2).

i. In-filling the pH profile

ii. introduce conditions using neutralised organic acids as the precipitant (3)

iii. expanded range of organic and polyalcohol conditions

iv. precipitant synergy

Usage

JCSG-*plus* is designed for the rapid, efficient screening for crystallization leads of a new protein or preparation. In the first instance, drops should be set-up using equal volumes of protein solution and reagent. Protein samples should be in a minimal solvent system containing a low concentration of buffer. Starting protein concentrations should be between 5 mg/ml and 40 mg/ml. Protein concentration can be varied in subsequent rounds depending on initial results.

The conditions in JCSG-*plus* are compatible with all commonly used crystallisation methods, sitting drop, hanging drop, sandwich drop, microbatch, vapour microbatch and microdialysis.

The JCSG-*plus* sparse matrix screen is highly effective when used alongside a systematic screen such as PACT-*premier*. The two screens provide a thorough exploration of crystallization conditions and the unique design of PACT-*premier* facilitates rational interpretation of results from both itself and JCSG-*plus* assisting the design of subsequent experiments.

Formulation Notes:

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

50% Stock solutions of Jeffamine are adjusted to pH 7.0 using HCl prior to inclusion in the reagents. 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 JCSG-*plus* 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.

1. Page *et al* (2003). Shotgun crystallization strategy for structural genomics: an optimized two-tiered crystallization screen against the *Thermotoga maritima* proteome. *Acta Cryst*. **D59**, 1028-1037
2. Newman *et al* (2005). Towards rationalization of crystallization screening for small- to medium-sized academic laboratories: the PACT/JCSG+ strategy. *Acta Cryst*. **D61**, 1426-1431
3. McPherson *et al* (2001). A comparison of salts for the crystallisation of macromolecules, *Protein Science* **10**, 418422
4. Crystallization of Nucleic Acids and Proteins, Edited by A. Ducruix and R. Giegé, The Practical Approach Series, Oxford Univ. Press, 1992
5. Protein Crystallization Techniques Strategies & Tips, Edited by Terese Bergfors, IUL 1999
6. Methods and Results in the Crystallization of Membrane Proteins, Edited by So Iwata, IUL 2003.

Hints & Tips:

The JCSG-*plus* sparse matrix screen is highly effective when used alongside a systematic screen such as PACT-*premier*. The two screens provide a thorough exploration of crystallization conditions and the unique design of PACT-*premier* facilitates rational interpretation of results from both itself and JCSG-plus assisting the design of subsequent experiments.

Molecular Dimensions

Soluble Proteins

JCSG-*plus* Conditions 1-48 (Box 1) MD1–37

Tube #	Conc.	Salt	Conc.	Buffer	pH	Conc.	Precipitant
1-1	0.2 M	Lithium sulfate	0.1 M	Sodium acetate	4.5	50 % w/v	PEG 400
1-2		None	0.1 M	Sodium citrate	5.5	20 % w/v	PEG 3000
1-3	0.2 M	Ammonium citrate dibasic		None		20 % w/v	PEG 3350
1-4	0.02 M	Calcium chloride dihydrate	0.1 M	Sodium acetate	4.6	30 % v/v	MPD
1-5	0.2 M	Magnesium formate dihydrate		None		20 % w/v	PEG 3350
1-6	0.2 M	Lithium sulfate	0.1 M	Phosphate/citrate	4.2	20 % w/v	PEG 1000
1-7		None	0.1 M	CHES	9.5	20 % w/v	PEG 8000
1-8	0.2 M	Ammonium formate		None		20 % w/v	PEG 3350
1-9	0.2 M	Ammonium chloride		None		20 % w/v	PEG 3350
1-10	0.2 M	Potassium formate		None		20 % w/v	PEG 3350
1-11	0.2 M	Ammonium phosphate monobasic	0.1 M	Tris	8.5	50 % v/v	MPD
1-12	0.2 M	Potassium nitrate		None		20 % w/v	PEG 3350
1-13	0.8 M	Ammonium sulfate	0.1 M	Citrate	4.0		None
1-14	0.2 M	Sodium thiocyanate		None		20 % w/v	PEG 3350
1-15		None	0.1 M	BICINE	9.0	20 % w/v	PEG 6000
1-16		None	0.1 M	HEPES	7.5	10 % w/v	PEG 8000
						8 % v/v	Ethylene glycol
1-17		None	0.1 M	Sodium cacodylate	6.5	40 % v/v	MPD
						5 % w/v	PEG 8000
1-18		None	0.1 M	Phosphate/citrate	4.2	40 % v/v	Ethanol
						5 % w/v	PEG 1000
1-19		None	0.1 M	Sodium acetate	4.6	8 % w/v	PEG 4000
1-20	0.2 M	Magnesium chloride hexahydrate	0.1 M	Tris	7.0	10 % w/v	PEG 8000
1-21		None	0.1 M	Citrate	5.0	20 % w/v	PEG 6000
1-22	0.2 M	Magnesium chloride hexahydrate	0.1 M	Sodium cacodylate	6.5	50 % v/v	PEG 200
1-23	1.6 M	Sodium citrate tribasic dihydrate pH 6.5		None			None
1-24	0.2 M	Potassium citrate tribasic monohydrate		None		20 % w/v	PEG 3350
1-25	0.2 M	Sodium chloride	0.1 M	Phosphate/citrate	4.2	20 % w/v	PEG 8000
1-26	1.0 M	Lithium chloride	0.1 M	Citrate	4.0	20 % w/v	PEG 6000
1-27	0.2 M	Ammonium nitrate		None		20 % w/v	PEG 3350
1-28		None	0.1 M	HEPES	7.0	10 % w/v	PEG 6000
1-29	0.8 M	Sodium phosphate monobasic monohydrate	0.1 M	Sodium HEPES	7.5		None
	0.80 M	Potassium phosphate monobasic					
1-30		None	0.1 M	Phosphate/citrate	4.2	40 % v/v	PEG 300
1-31	0.2 M	Zinc acetate dihydrate	0.1 M	Sodium acetate	4.5	10 % w/v	PEG 3000
1-32		None	0.1 M	Tris	8.5	20 % v/v	Ethanol
1-33		None	0.1 M	Sodium/potassium phosphate	6.2	25 % v/v	1,2-Propandiol
						10 %v/v	Glycerol
1-34		None	0.1 M	BICINE	9.0	10 % w/v	PEG 20,000
						2 % v/v	1,4-Dioxane
1-35	2.0 M	Ammonium sulfate	0.1 M	Sodium acetate	4.6		None
1-36		None		None		10 % w/v	PEG 1000
						10 % w/v	PEG 8000
1-37		None		None		24 % w/v	PEG 1500
						20 % v/v	Glycerol
1-38	0.2 M	Magnesium chloride hexahydrate	0.1 M	Sodium HEPES	7.5	30 % v/v	PEG 400
1-39	0.2 M	Sodium chloride	0.1 M	Sodium/potassium phosphate	6.2	50 % v/v	PEG 200
1-40	0.2 M	Lithium sulfate	0.1 M	Sodium acetate	4.5	30 % w/v	PEG 8000
1-41		None	0.1 M	HEPES	7.5	70 % v/v	MPD
1-42	0.2 M	Magnesium chloride hexahydrate	0.1 M	Tris	8.5	20 % w/v	PEG 8000
1-43	0.2 M	Lithium sulfate	0.1 M	Tris	8.5	40 % v/v	PEG 400
1-44		None	0.1 M	Tris	8.0	40 % v/v	MPD
1-45	0.17 M	Ammonium sulfate		None		25.5 % w/v	PEG 4000
						15 % v/v	Glycerol
1-46	0.2 M	Calcium acetate hydrate	0.1 M	Sodium cacodylate	6.5	40 % v/v	PEG 300
1-47	0.14 M	Calcium chloride dihydrate	0.07 M	Sodium acetate	4.6	14 % v/v	2-Propanol
						30 % v/v	Glycerol
1-48	0.04 M	Potassium phosphate monobasic		None		16 % w/v	PEG 8000
						20 % v/v	Glycerol

JCSG-*plus* Conditions 1-48 (Box 2) MD1–37

Tube #	Conc.	Salt	Conc.	Buffer	pH	Conc.	Precipitant
2-1	1.0 M	Sodium citrate tribasic dihydrate	0.1 M	Sodium cacodylate	6.5		None
2-2	2.0 M	Ammonium sulfate	0.1 M	Sodium cacodylate	6.5		None
	0.2 M	Sodium chloride					
2-3	0.2 M	Sodium chloride	0.1 M	HEPES	7.5	10 % v/v	2-Propanol
2-4	1.26 M	Ammonium sulfate	0.1 M	Tris	8.5		None
	0.2 M	Lithium sulfate					
2-5		None	0.1 M	CAPS	10.5	40 % v/v	MPD
2-6	0.2 M	Zince acetate dihydrate	0.1 M	Imidazole	8.0	20 % w/v	PEG 3000
2-7	0.2 M	Zinc acetate dihydrate	0.1 M	Sodium cacodylate	6.5	10 % v/v	2-Propanol
2-8	1.0 M	Ammonium phosphate dibasic	0.1 M	Sodium acetate	4.5		None
2-9	1.6 M	Magneisum sulfate heptahydrate	0.1 M	MES	6.5		None
2-10		None	0.1 M	BICINE	9.0	10 % w/v	PEG 6000
2-11	0.16 M	Calcium acetate hydrate	0.08 M	Sodium cacodylate	6.5	14.4 % w/v	PEG 8000
						20 % v/v	Glycerol
2-12		None	0.1 M	Imidazole	8.0	10 % w/v	PEG 8000
2-13	0.05 M	Cesium chloride	0.1 M	MES	6.5	30 % v/v	Jeffamine® M-600
2-14	3.2 M	Ammonium sulfate	0.1 M	Citrate	5.0		None
2-15		None	0.1 M	Tris	8.0	20 % v/v	MPD
2-16		None	0.1 M	HEPES	7.5	20 % v/v	Jeffamine® M-600
2-17	0.2 M	Magnesium chloride hexahydrate	0.1 M	Tris	8.5	50 % v/v	Ethylene glycol
2-18		None	0.1 M	BICINE	9.0	10 % v/v	MPD
2-19	0.8 M	Succinic acid pH 7.0		None			None
2-20	2.1 M	DL-Malic acid pH 7.0		None			None
2-21	2.4 M	Sodium malonate dibasic monohydrate pH 7.0		None			None
2-22	1.1 M	Sodium malonate dibasic monohydrate	0.1 M	HEPES	7.0	0.5 % v/v	Jeffamine® ED-2003
2-23	1.0 M	Succinic acid	0.1 M	HEPES	7.0	1 % w/v	PEG 2000 MME
2-24		None	0.1 M	HEPES	7.0	30 % v/v	Jeffamine® M-600
2-25		None	0.1 M	HEPES	7.0	30 % v/v	Jeffamine® ED-2003
2-26	0.02 M	Magnesium chloride hexahydrate	0.1 M	HEPES	7.5	22 % w/v	Poly(acrylic acid sodium salt) 5100
2-27	0.01 M	Cobalt(II) chloride hexahydrate	0.1 M	Tris	8.5	20 % w/v	Polyvinylpyrrolidone
2-28	0.2 M	TMAO	0.1 M	Tris	8.5	20 % w/v	PEG 2000 MME
2-29	0.005 M	Cobalt(II) chloride hexahydrate	0.1 M	HEPES	7.5	12 % w/v	PEG 3350
	0.005 M	Cadmium chloride hemi(pentahydrate)					
	0.005 M	Magnesium chloride hexahydrate					
	0.005 M	Nickel(II) chloride hexahydrate					
2-30	0.2 M	Sodium malonate dibasic monohydrate		None		20 % w/v	PEG 3350
2-31	0.1 M	Succinic acid		None		15 % w/v	PEG 3350
2-32	0.15 M	DL-Malic acid		None		20 % w/v	PEG 3350
2-33	0.1 M	Potassium thiocyanate		None		30 % w/v	PEG 2000 MME
2-34	0.15 M	Potassium bromide		None		30 % w/v	PEG 2000 MME
2-35	2.0 M	Ammonium sulfate	0.1 M	BIS-Tris	5.5		None
2-36	3.0 M	Sodium chloride	0.1 M	BIS-Tris	5.5		None
2-37	0.3 M	Magnesium formate dihydrate	0.1 M	BIS-Tris	5.5		None
2-38	1.0 M	Ammonium sulfate	0.1 M	BIS-Tris	5.5	1 % w/v	PEG 3350
2-39		None	0.1 M	BIS-Tris	5.5	25 % w/v	PEG 3350
2-40	0.2 M	Calcium chloride dihydrate	0.1 M	BIS-Tris	5.5	45 % v/v	MPD
2-41	0.2 M	Ammonium acetate	0.1 M	BIS-Tris	5.5	45 % v/v	MPD
2-42	0.1 M	Ammonium acetate	0.1 M	BIS-Tris	5.5	17 % w/v	PEG 10,000
2-43	0.2 M	Ammonium sulfate	0.1 M	BIS-Tris	5.5	25 % w/v	PEG 3350
2-44	0.2 M	Sodium chloride	0.1 M	BIS-Tris	5.5	25 % w/v	PEG 3350
2-45	0.2 M	Lithium sulfate	0.1 M	BIS-Tris	5.5	25 % w/v	PEG 3350
2-46	0.2 M	Ammonium acetate	0.1 M	BIS-Tris	5.5	25 % w/v	PEG 3350
2-47	0.2 M	Magnesium chloride hexahydrate	0.1 M	BIS-Tris	5.5	25 % w/v	PEG 3350
2-48	0.2 M	Ammonium acetate	0.1 M	HEPES	7.5	45 % v/v	MPD

Abbreviations: Bis Tris; Bis-(2-hydroxyethyl)imino-tris(hydroxymethyl)methane, **CAPS**; N-Cyclohexyl-3-aminopropanesulfonic acid**, CHES**; 2-(N-Cyclohexylamino)ethane Sulfonic Acid**, HEPES;** 2-(4-(2-Hydroxyethyl)-1-piperazinyl)ethanesulfonic Acid, **Na HEPES**; 2-(4-(2-Hydroxyethyl)-1-piperazinyl)ethanesulfonic Acid Sodium Salt, **MES**; 2-(N-morpholino)ethanesulfonic acid, **MPD;** 2,4-methyl pentanediol, **PEG**; Polyethylene glycol (2K, 6K , 8K and 10K correspond to the molecular weight, in thousands of Daltons, of PEG), **TMAO:** Trimethylamine N-oxide, **Tris**; 2-Amino-2-(hydroxymethyl)propane-1,3-diol.

N.B. Jeffamine ED-2001 has been superseded with Jeffamine ED-2003. Polyvinylpyrolidone K15 is called Polyvinylpyrolidine.

Molecular Dimensions

Soluble Proteins

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

Re-Ordering details:

Catalogue Description	Pack size	Catalogue Code
JCSG-*plus*	96 x 10 mL	MD1-37
JCSG-*plus* HT-96	96 x 1 mL	MD1-40
Eco Screens		
JCSG-*plus* Eco Screen	96 x 10 mL	MD1-37-ECO
JCSG-*plus* HT-96 Eco Screen	96 x 1 mL	MD1-40-ECO
Green screens (contain fluorescent green dye- ideal for UV)		
JCSG-*plus* Green screen	96 x 10 mL	MD1-56
JCSG-*plus* HT-96 Green screen	96 x 1 mL	MD1-53
Combo Packs		
Super2 Combo Value Pack (JCSG-*plus* + PACT-*premier*)	2 x 96 x 10 mL	MD1-75
Super2 Combo HT-96 Value Pack (JCSG-*plus* HT-96 + PACT-*premier* HT-96)	2 x 96 x 10 mL	MD1-75-HT
Single Reagents		
JCSG-*plus* single reagents	100 mL	MDSR-37-tube number
JCSG-*plus* single reagents	100 mL	MDSR-40-well number

For JCSG-plus stock solutions please visit the Optimization section on our website.
ECO screens contain no cacodylate, dioxane or azide etc.