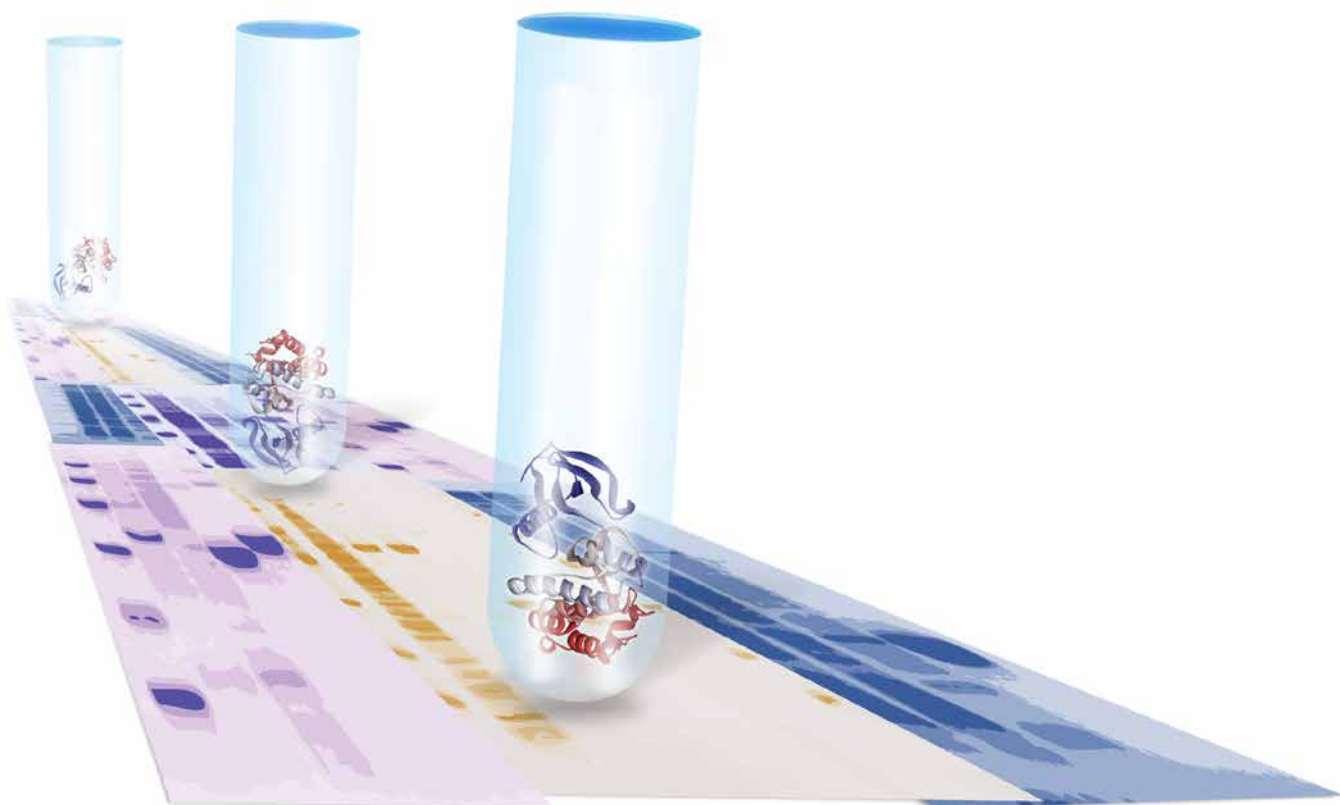




Protein sample preparation

Selection Guide



Protein sample preparation workflows

Almost all protein samples need further preparation after collection. The quality of sample preparation is crucial to get the best possible analytical results.

This selection guide helps you find the appropriate methods and products to obtain proteins for further studies, in scales from nanograms to milligrams of purified protein. Three separate workflows are available for different sources of target protein: recombinant proteins, antibodies, and proteins from natural sources. These workflows are further refined and adapted to suit different number of samples, from a few to many such as in screening applications.

In sample preparation, all the targeted protein from the initial biological source must be transferred into a homogeneous solution. This can be performed either with preserved biological activity or, if required, in denatured state. The initial preparations include operations such as sample collection, stabilization, and extraction.

After the initial preparation, a second step is often needed to selectively capture the target protein using enrichment or purification methods. For the study of proteins in plasma and serum, depletion of high-abundant proteins is often needed to be able to analyze low-abundant proteins.

Sample preparation also includes removal of interfering nonprotein contaminants present in the initial source, amendment of noncompatible buffer compositions, and adjustment of the total protein concentration and volume.

Our products address most parts of the sample preparation process for extraction, stabilization, and enrichment/purification of target molecules. A range of products is available, covering any scale and throughput of protein sample preparations: Mag Sepharose™, MultiTrap™, SpinTrap™, GraviTrap™, HiTrap™, and HiPrep™ are different formats for reliable enrichment, screening, and small-scale purification of any target proteins. All formats are based on the established GE Healthcare chromatography media, which offer efficient protocols resulting in high enrichment factor, purity, and recovery of your target proteins.

Our protocols are optimized to suit typical situations. If needed, critical steps can be easily refined following the product guidelines in the product instructions.

About the selection guides

Three different work flows, for different sources of target proteins, are available:

- Recombinant proteins
- Antibodies
- Proteins from natural sources

Each workflow contains three separate schemes: purifications in microgram to milligram scale, nanogram to microgram scale, or for screening purposes.

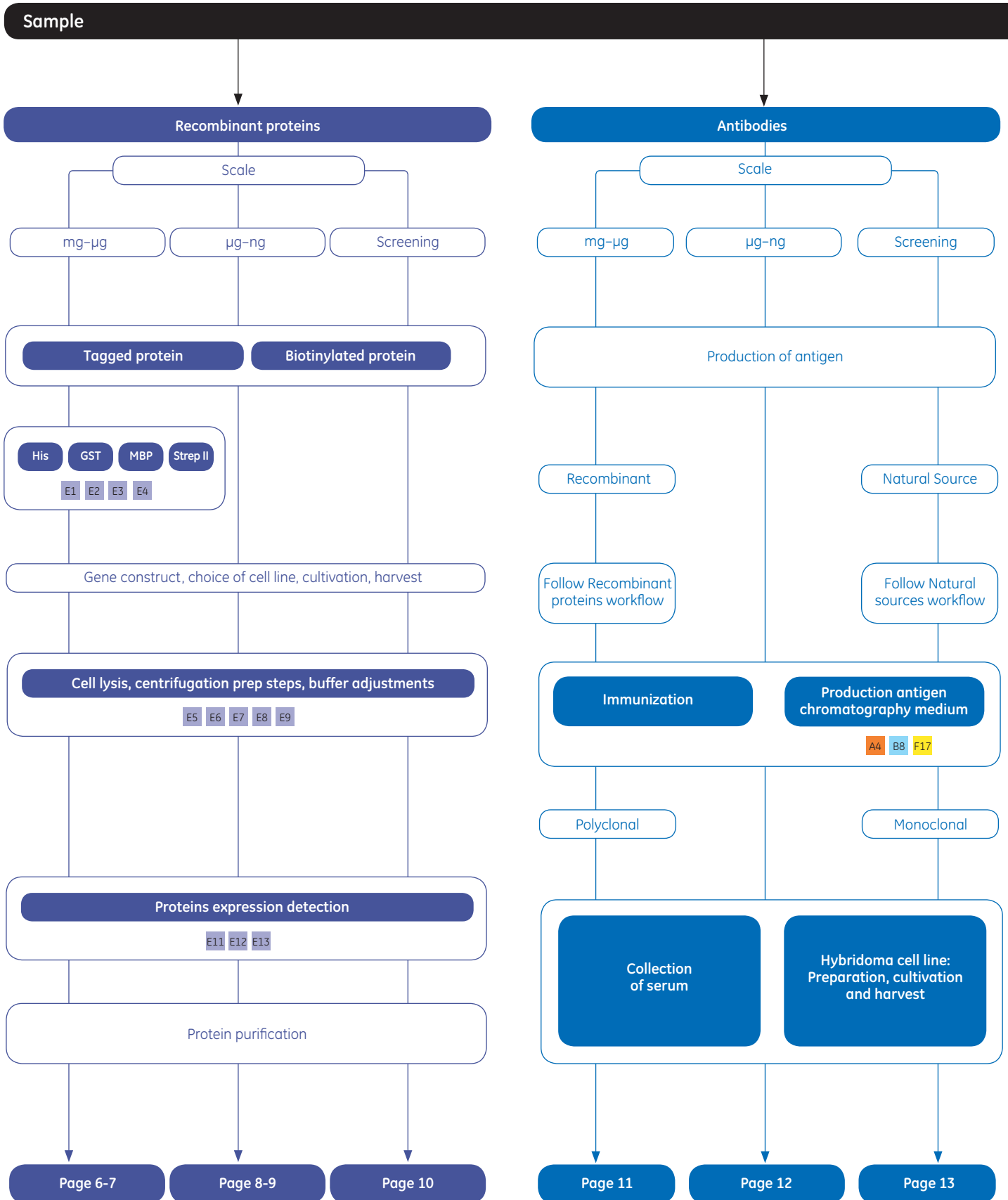
At the bottom of each track, reference is given to spreads with more detailed workflows for each source and scale. All of these spreads contains two workflows, one for few, and one for many samples.

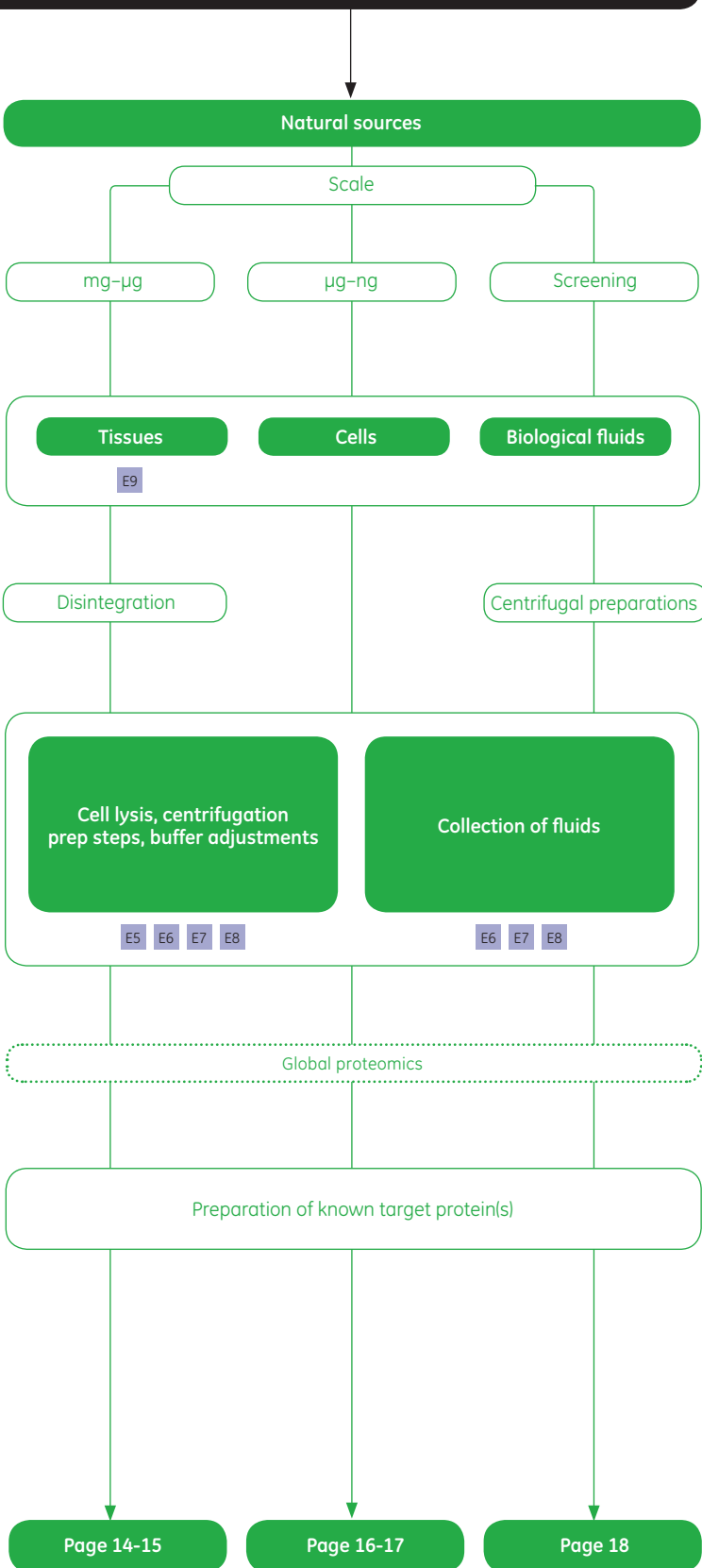
In these workflows, suitable products are indicated with numbers. A list of all products corresponding to the numbers can be found on page 23, Ordering information for products is found at the end of the Selection guide.

To use this Selection guide, start on pages 4-5, where the three workflows are found.



Sample preparation for analytical purposes





Product index

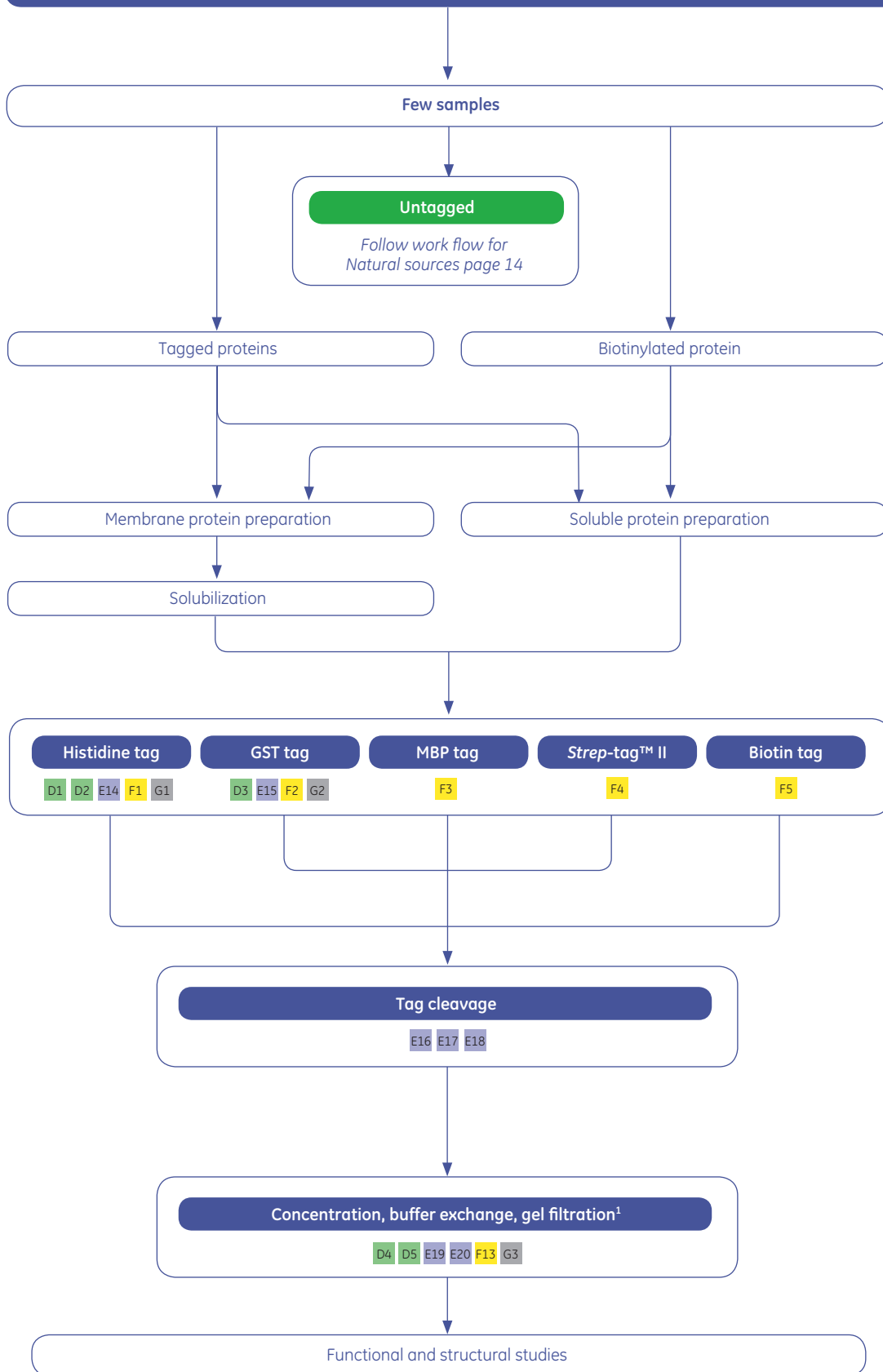
- A4 NHS Mag Sepharose
- B8 NHS HP SpinTrap
- E1 *E. coli* B121
- E2 pGEX vector
- E3 MK13K07 Helper Phage
- E4 GST vector primer for sequencing
- E5 Yeast Protein Extraction Buffer Kit
- E6 Mammalian Protein Extraction Buffer
- E7 Protease Inhibitor Mix
- E8 Nuclease Mix
- E9 Sample Grinding Kit
- E11 Anti-His Ab
- E12 Anti-GST Ab
- E13 GST Detection Module
- F17 HiTrap NHS-activated HP

For complete product index see page 23.

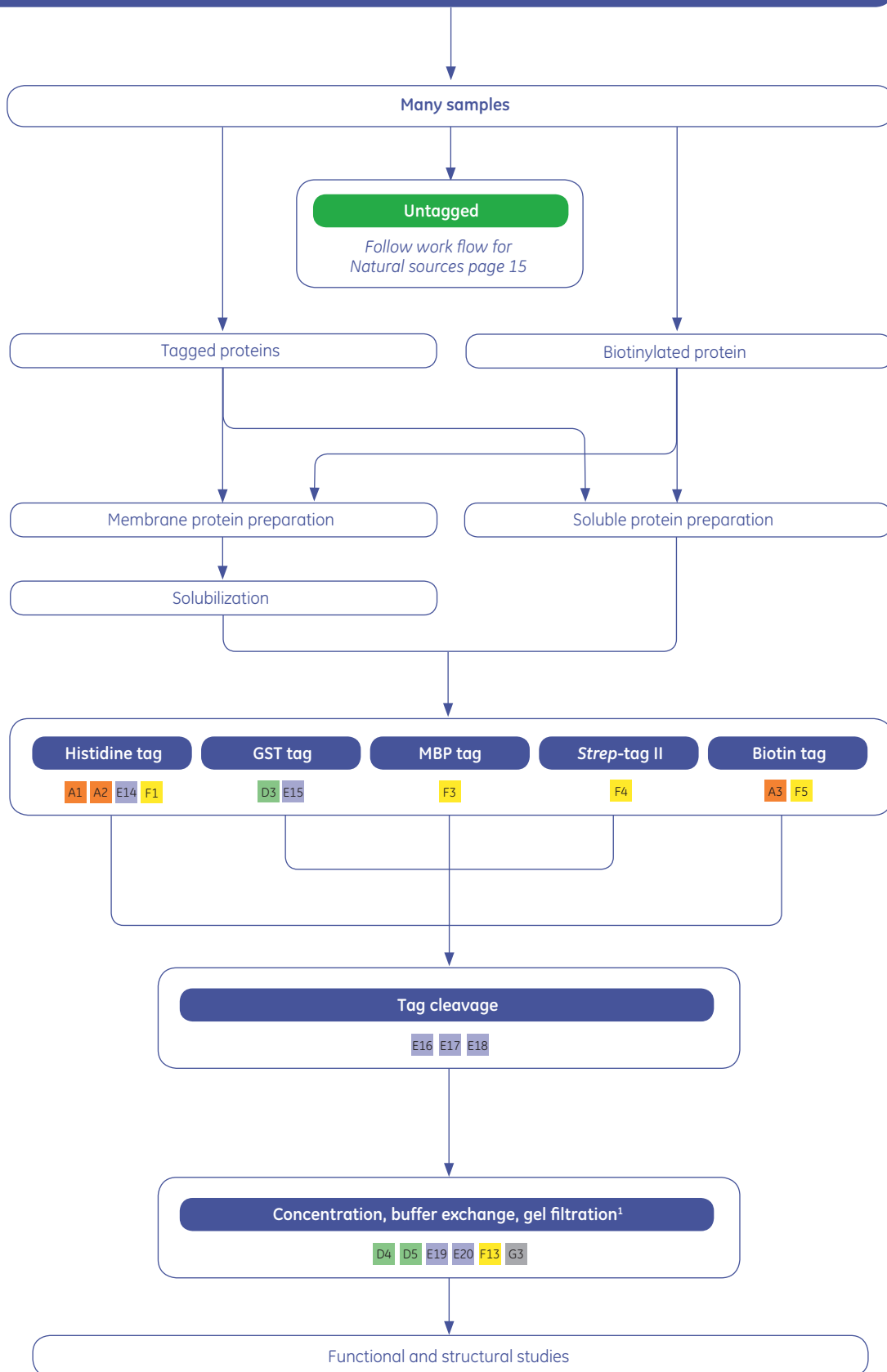
Recombinant proteins

Microgram to milligram scale

Numbers of samples



¹ Column format is volume dependent



Product index

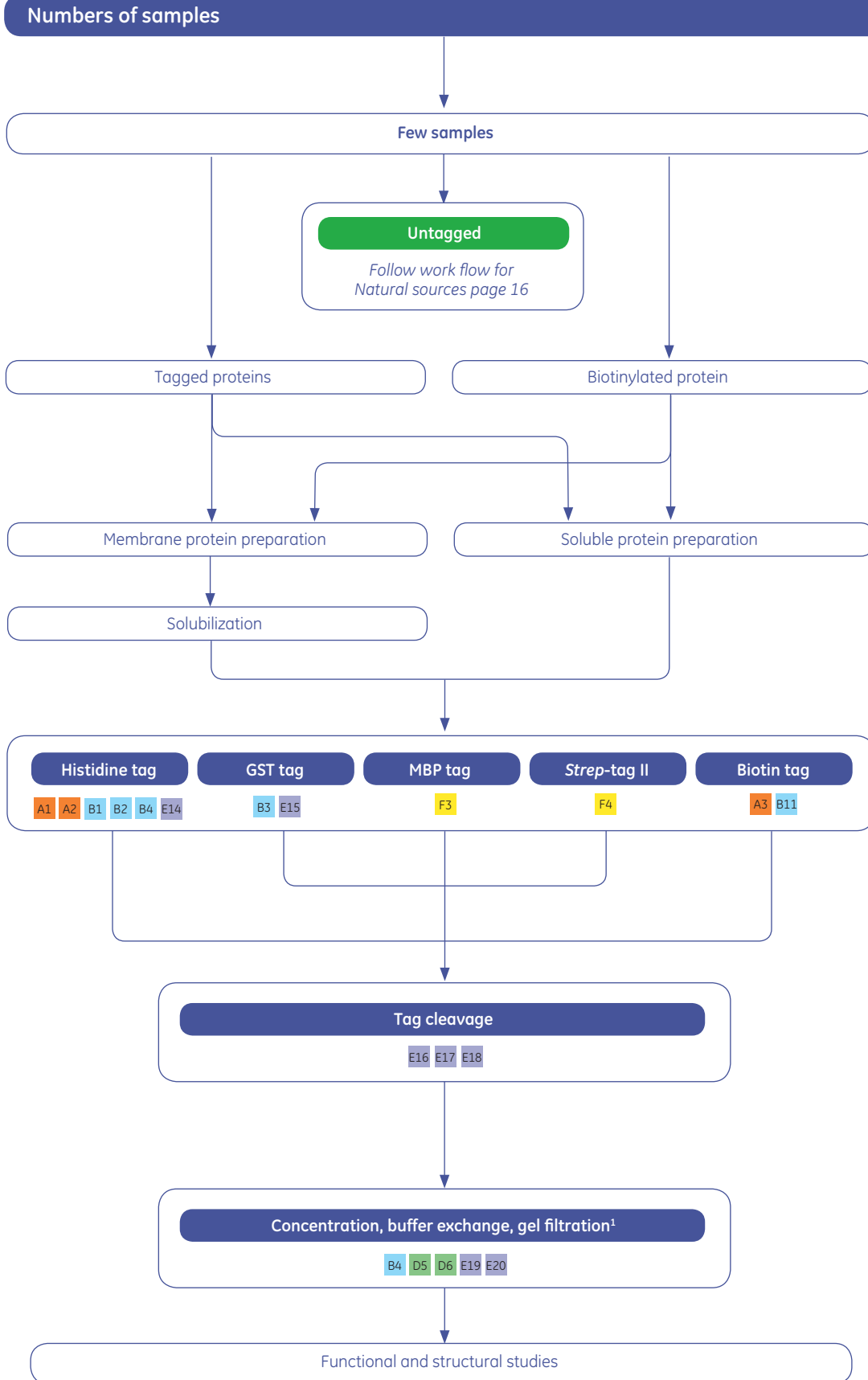
A1	His Mag Sepharose Ni
A2	His Mag Sepharose excel
A3	Streptavidin Mag Sepharose
D1	His GraviTrap
D2	His GraviTrap TALON
D3	GST GraviTrap
D4	PD-10 Desalting Columns
D5	PD MidiTrap
E14	His Buffer Kit
E15	GST Buffer Kit
E16	PreScission Protease
E17	Thrombin
E18	Factor Xa
E19	Vivaspin
E20	Mini Dialysis Kit
F1	HisTrap
F2	GSTrap
F3	MBPTrap HP
F4	StrepTrap HP
F5	HiTrap Streptavidin HP
F13	HiTrap Desalting
G1	HisPrep FF 16/10
G2	GSTPrep FF 16/10
G3	HiPrep 26/10 Desalting

For complete product index see page 23.

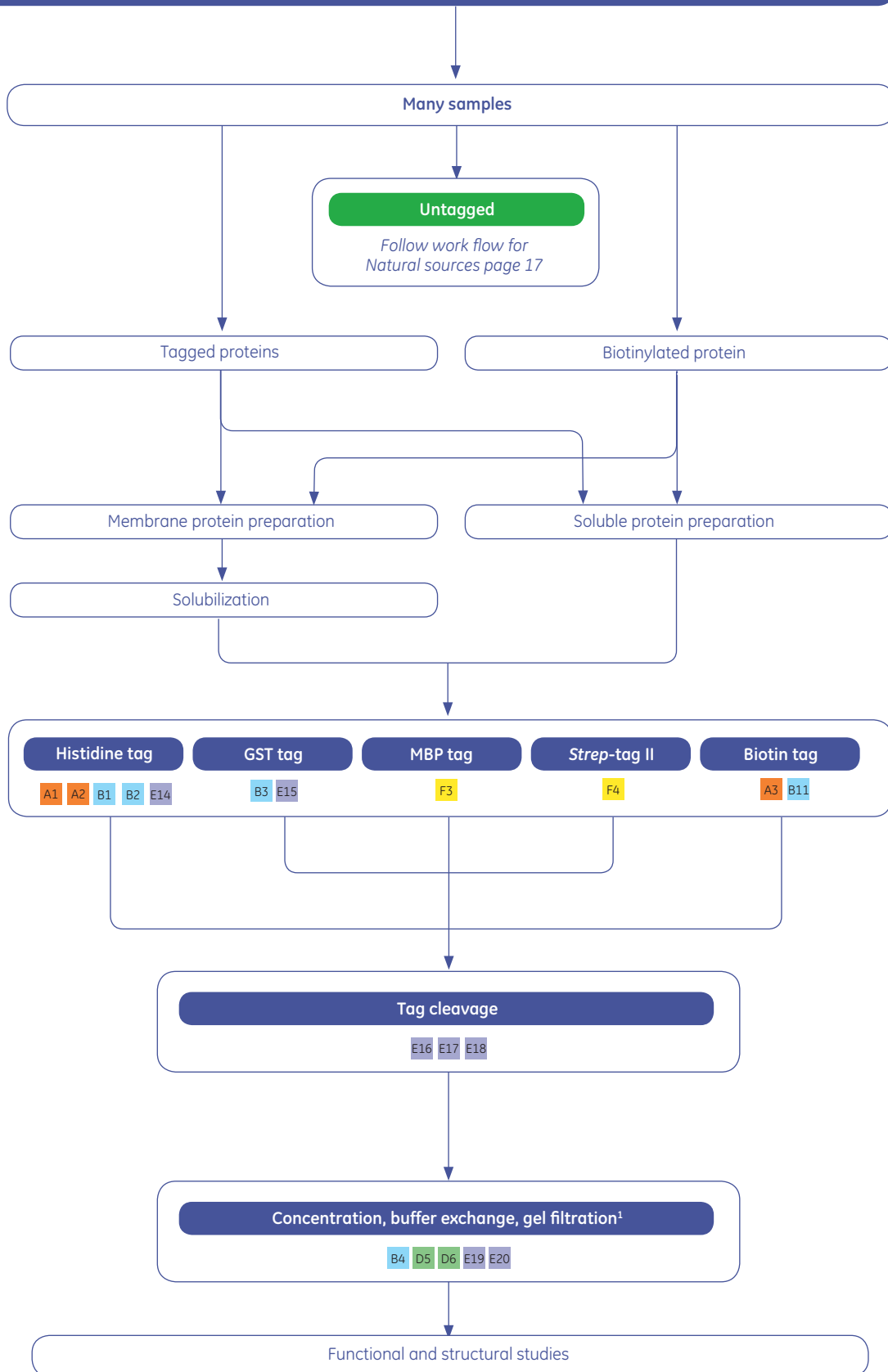
¹ Column format is volume dependent

Recombinant proteins

Nanogram to microgram scale



¹ Column format is volume dependent



Product index

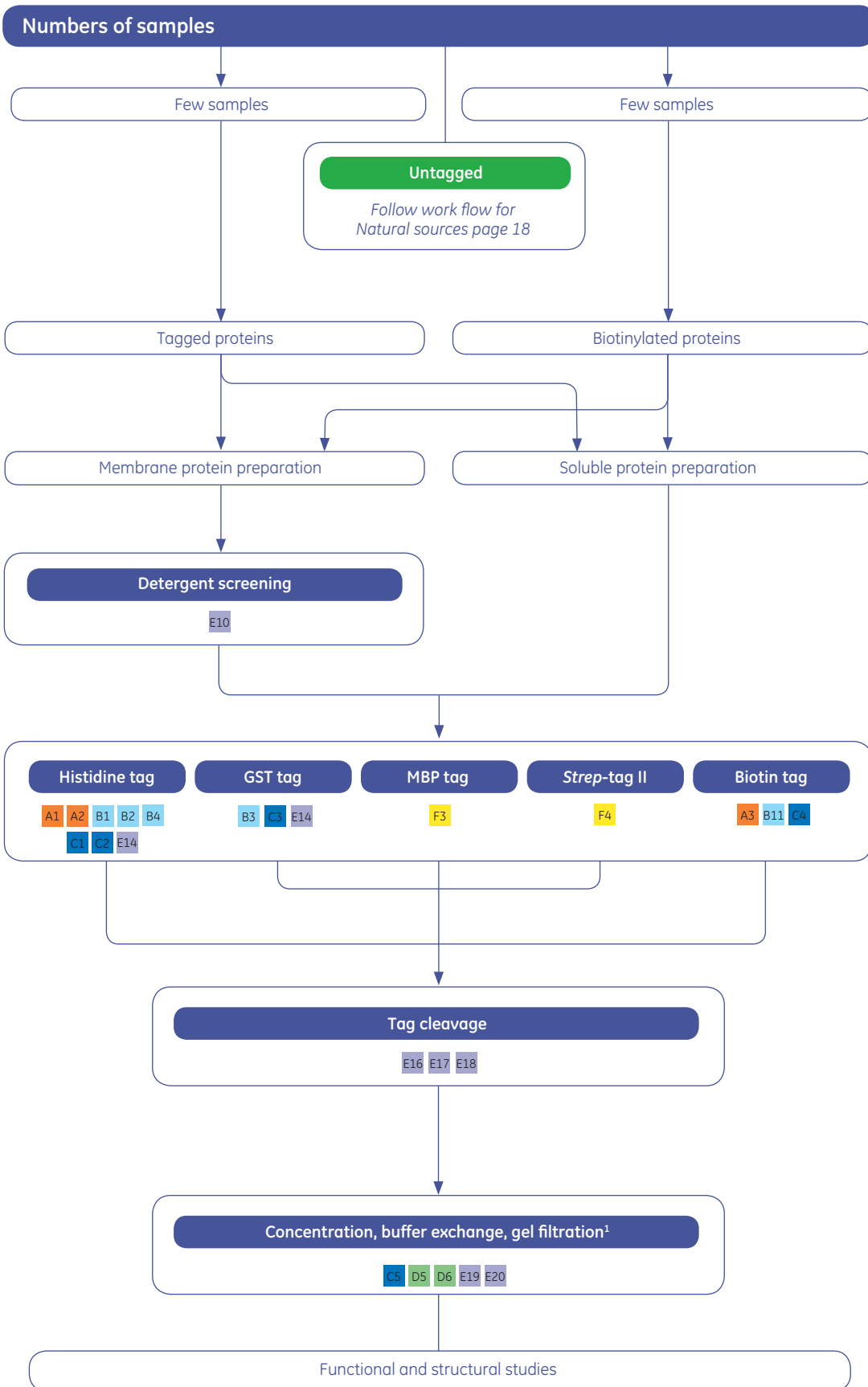
- A1 His Mag Sepharose Ni
- A2 His Mag Sepharose excel
- A3 Streptavidin Mag Sepharose
- B1 His SpinTrap
- B2 His SpinTrap TALON
- B3 GST SpinTrap
- B4 His SpinTrap Kit
- B11 Streptavidin HP SpinTrap
- D5 PD MidiTrap
- D6 PD MiniTrap
- E14 His Buffer Kit
- E15 GST Buffer Kit
- E16 PreScission Protease
- E17 Thrombin
- E18 Factor Xa
- E19 Vivaspin
- E20 Mini Dialysis Kit
- F3 MBPTrap HP
- F4 StrepTrap HP

For complete product index see page 23.

¹ Column format is volume dependent

Recombinant proteins

Screening

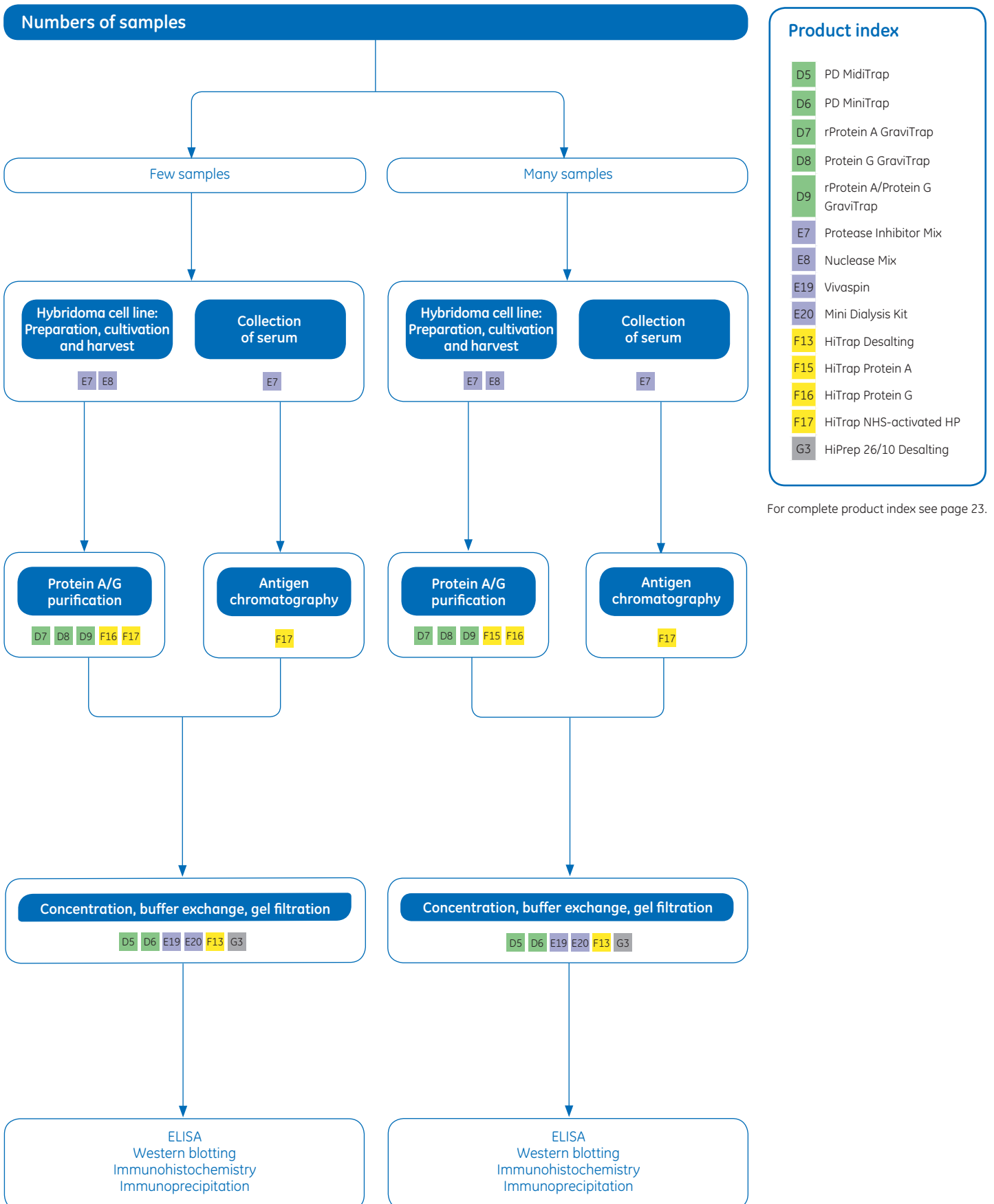


For complete product index see page 23.

¹ Column and 96-well plate format is volume dependent

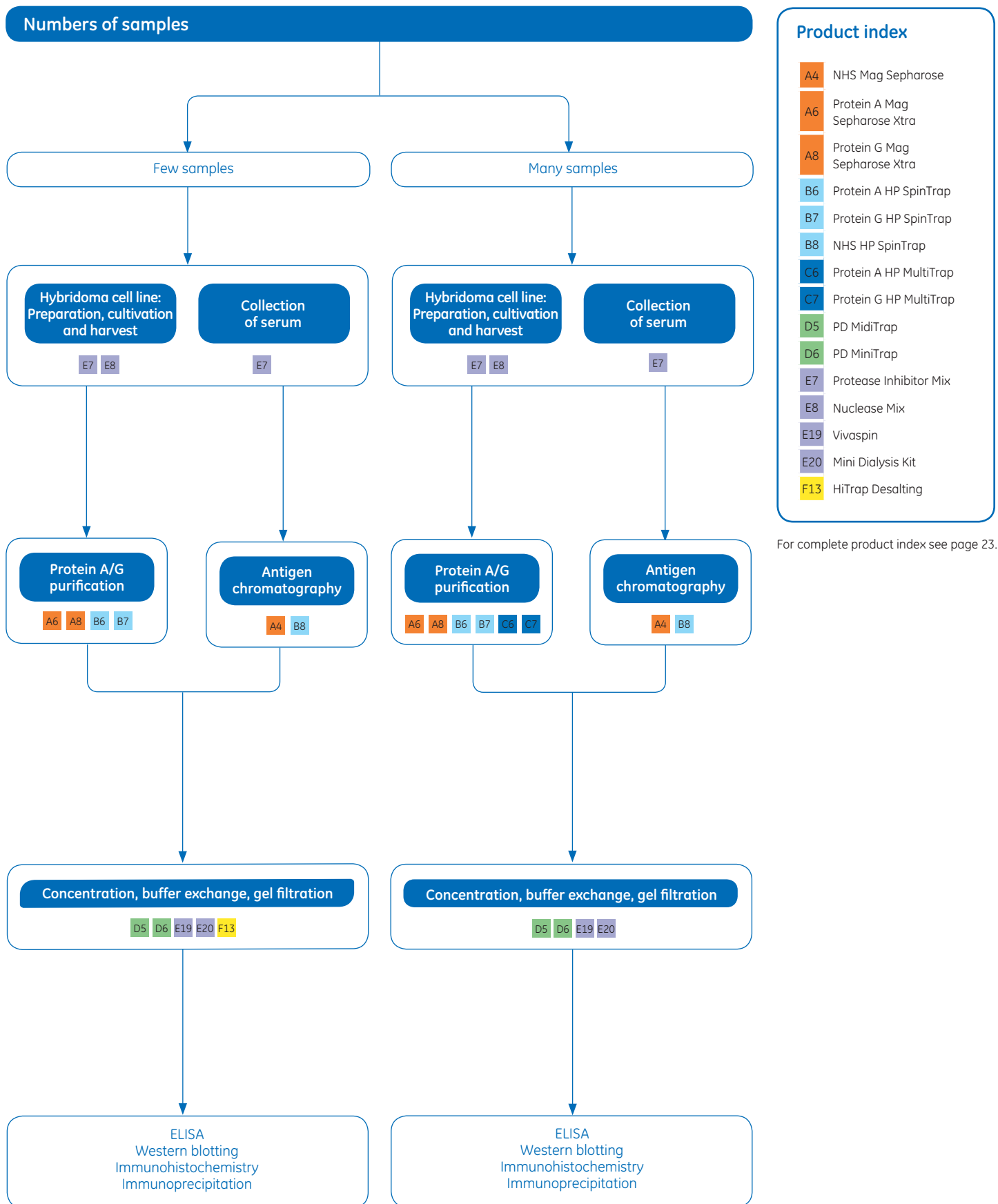
Antibodies

Microgram to milligram scale



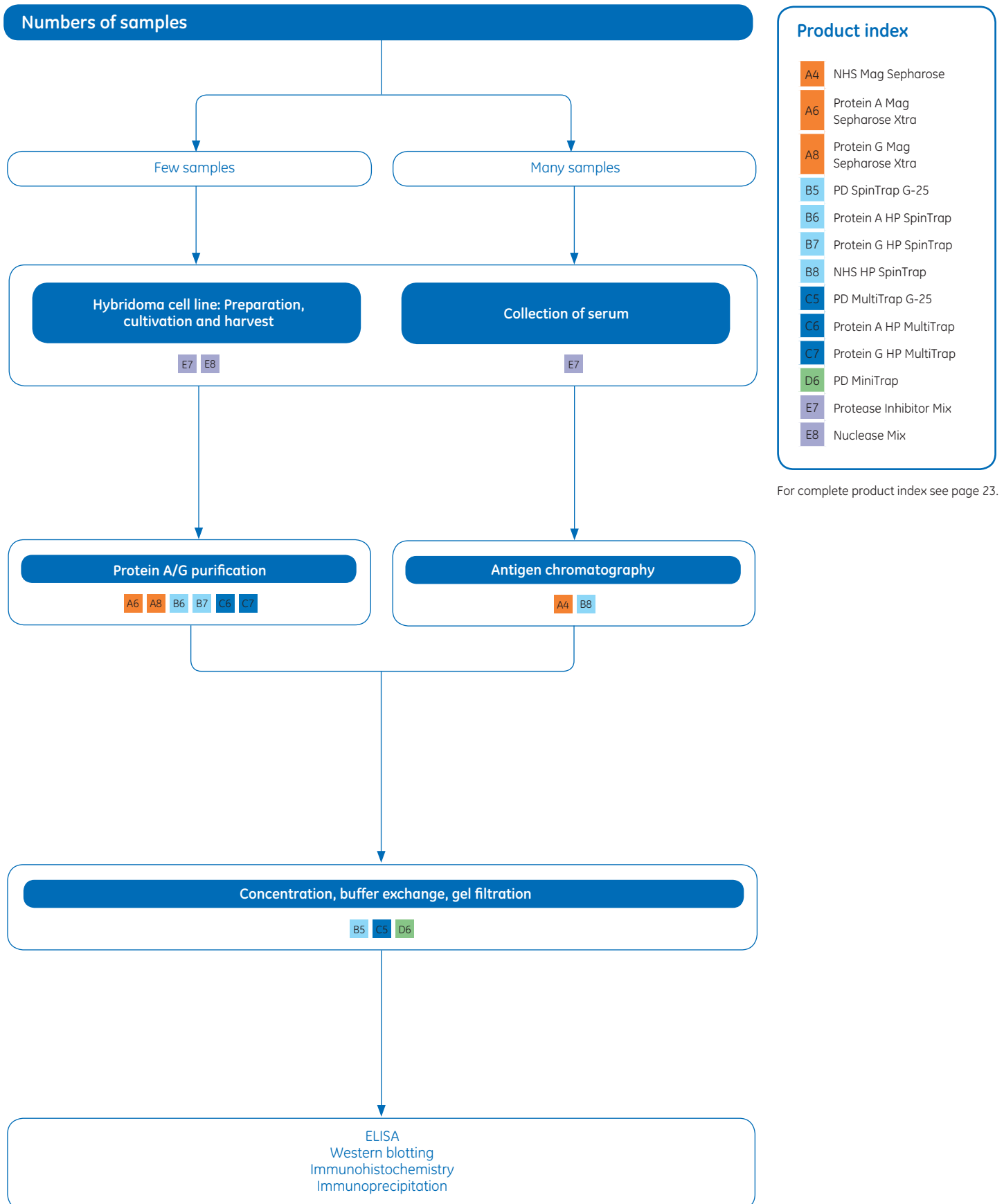
Antibodies

Nanogram to microgram scale



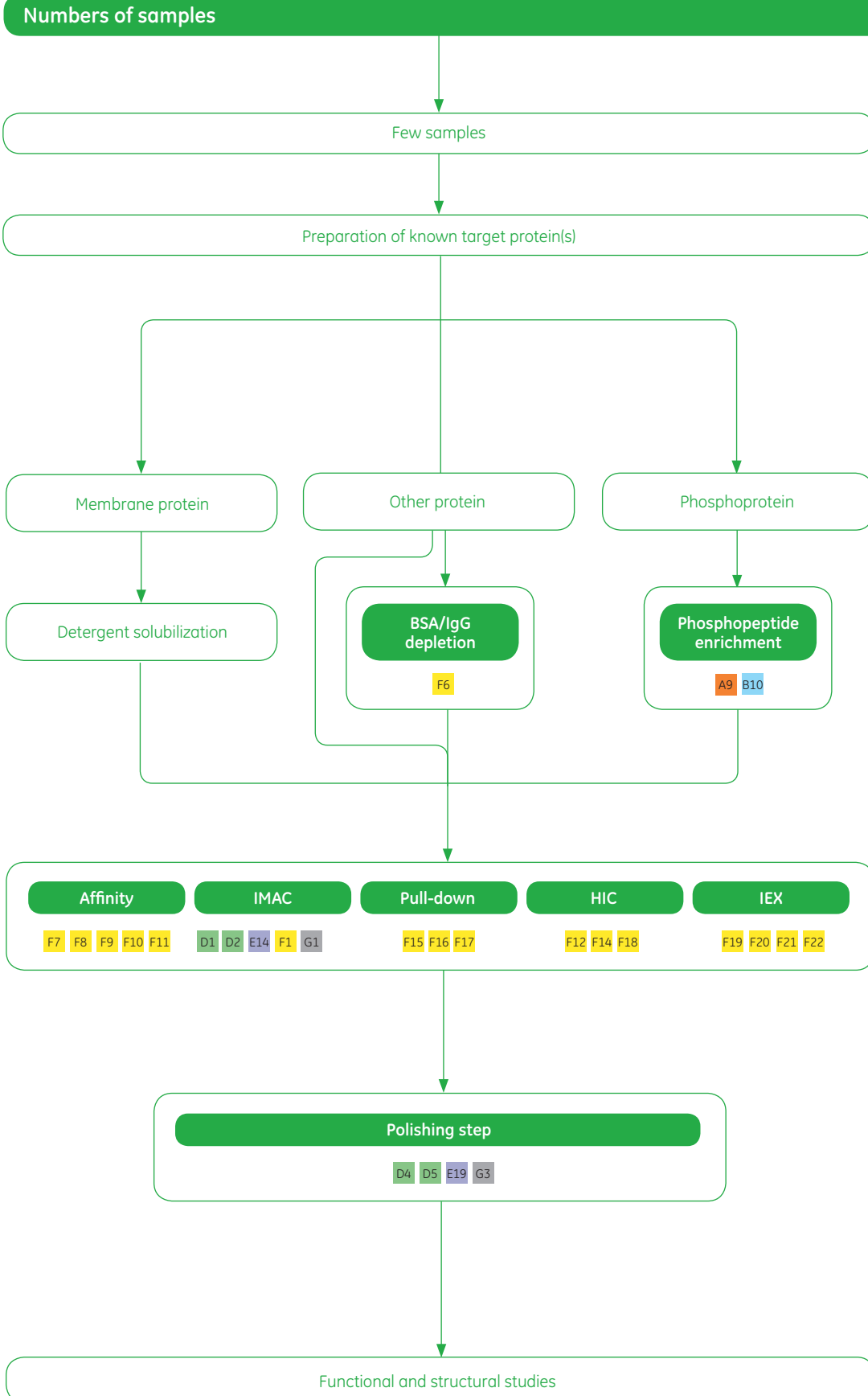
Antibody

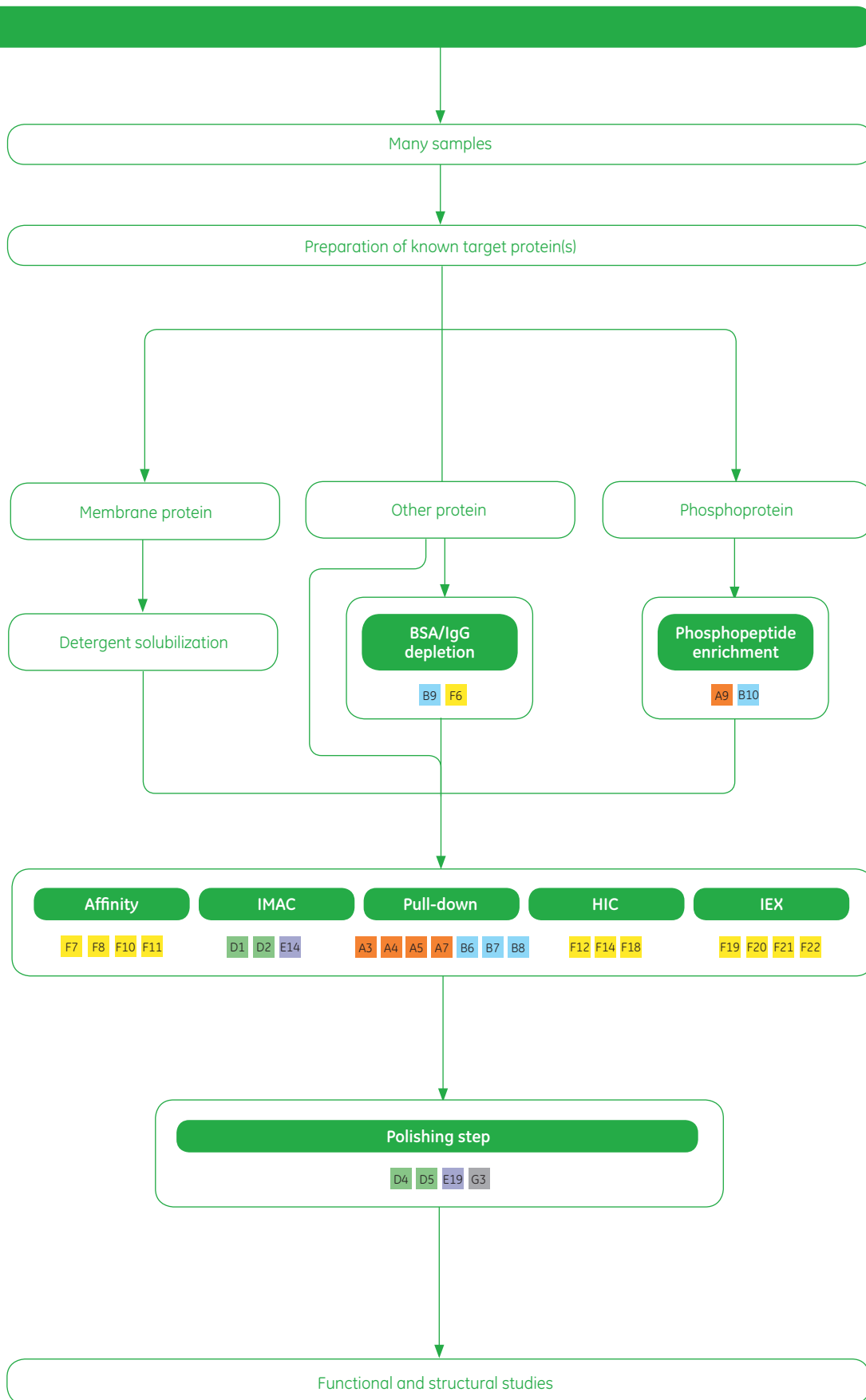
Screening



Natural sources

Microgram to milligram scale





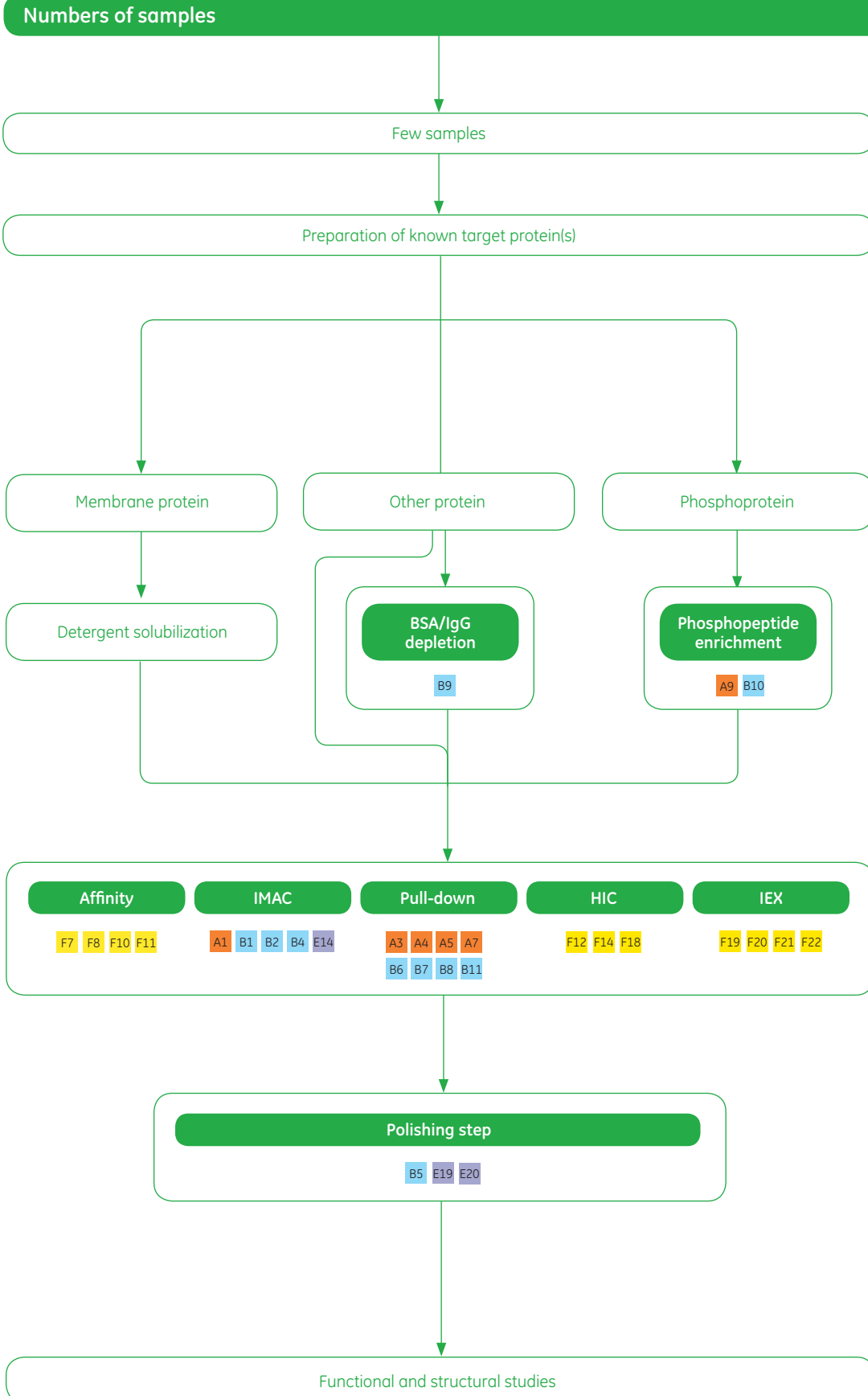
Product index

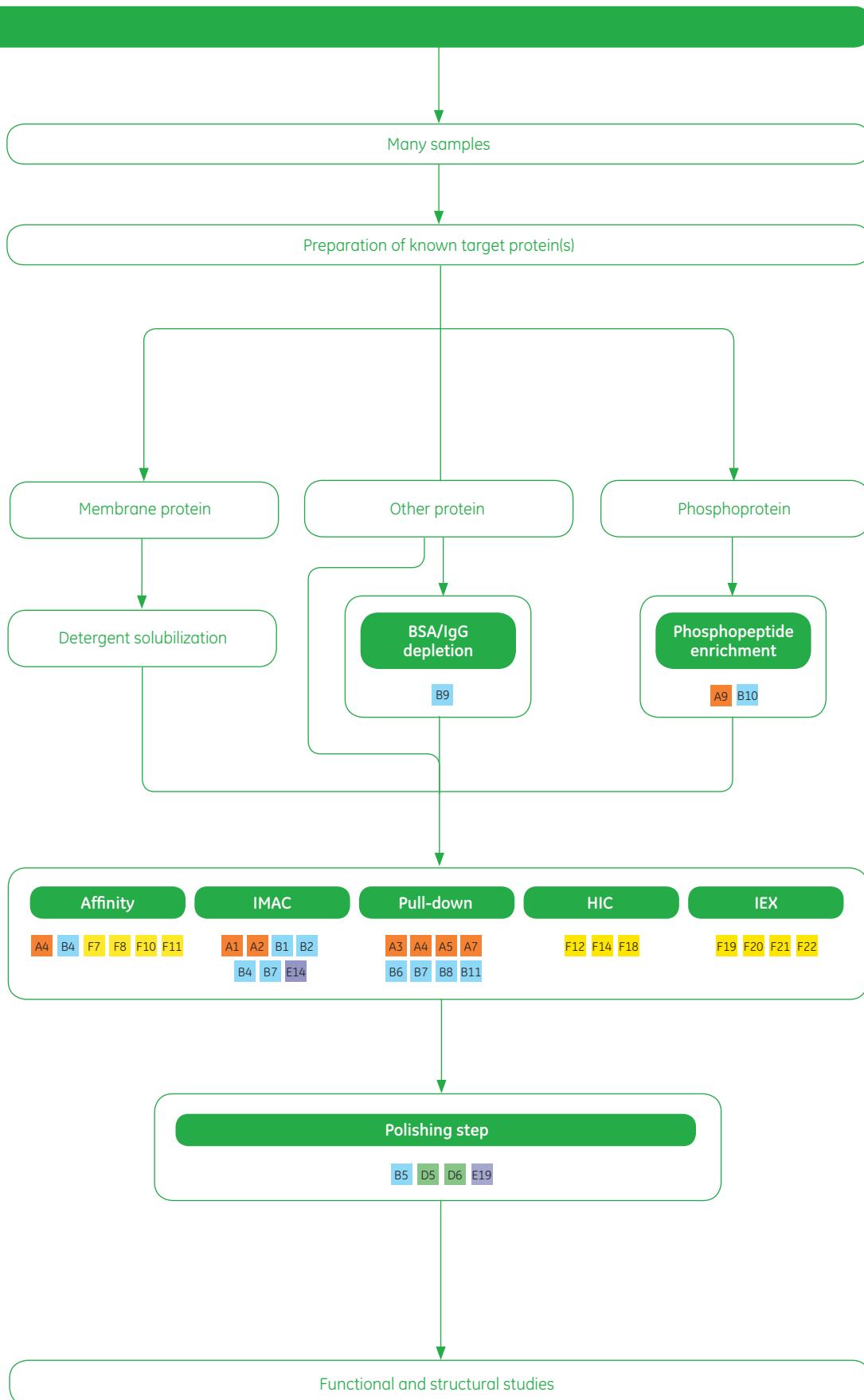
A3	Streptavidin Mag Sepharose
A4	NHS Mag Sepharose
A5	Protein A Mag Sepharose
A7	Protein G Mag Sepharose
A9	TiO ₂ Mag Sepharose
B6	Protein A HP SpinTrap
B7	Protein G HP SpinTrap
B8	NHS HP SpinTrap
B9	Albumin & IgG Depletion SpinTrap
B10	Phos SpinTrap Fe
D1	His GraviTrap
D2	His GraviTrap TALON
D4	PD-10 Desalting Columns
D5	PD MidiTrap
E14	His Buffer Kit
E19	Vivaspin
F1	HisTrap
F6	HiTrap Albumin & IgG Depletion
F7	HiTrap Blue HP
F8	HiTrap Heparin HP
F9	HiPrep Heparin FF 16/10
F10	HiTrap Benzamidine FF (high sub)
F11	HiTrap Con A HP
F12	HiTrap Butyl
F14	HiTrap Phenyl
F15	HiTrap Protein A
F16	HiTrap Protein G
F17	HiTrap NHS-activated HP
F18	HiTrap Octyl
F19	HiTrap Q
F20	HiTrap SP
F21	HiTrap DEAE FF
F22	HiTrap CM FF
G1	HisPrep FF 16/10
G3	HiPrep 26/10 Desalting

For complete product index see page 23.

Natural sources

Nanogram to microgram scale





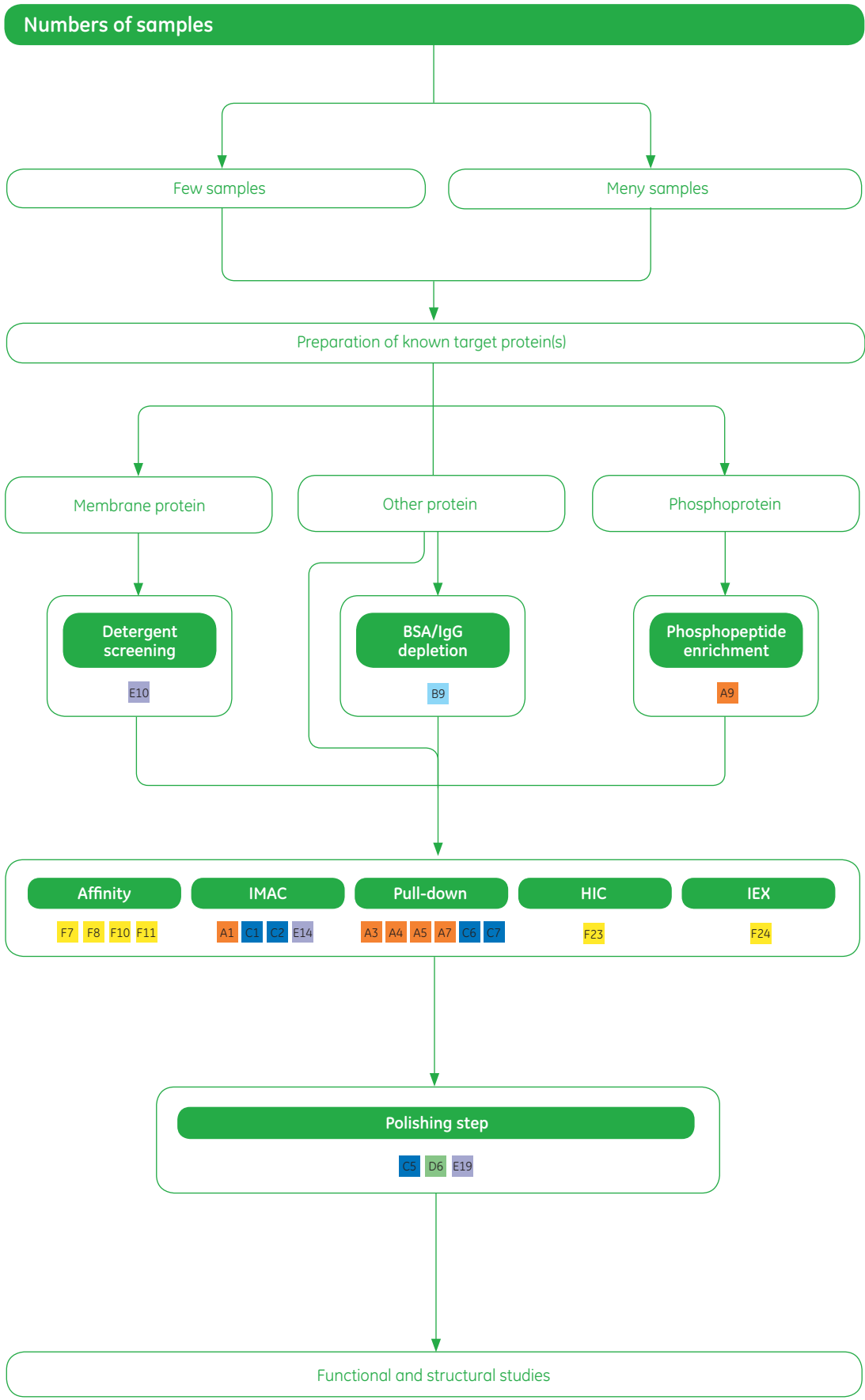
Product index

- A1 His Mag Sepharose Ni
- A2 His Mag Sepharose excel
- A3 Streptavidin Mag Sepharose
- A4 NHS Mag Sepharose
- A5 Protein A Mag Sepharose
- A7 Protein G Mag Sepharose
- A9 TiO₂ Mag Sepharose
- B1 His SpinTrap
- B2 His SpinTrap TALON
- B4 His SpinTrap Kit
- B5 PD SpinTrap G-25
- B6 Protein A HP SpinTrap
- B7 Protein G HP SpinTrap
- B8 NHS HP SpinTrap
- B9 Albumin & IgG Depletion SpinTrap
- B10 Phos SpinTrap Fe
- B11 Streptavidin HP SpinTrap
- D5 PD MidiTrap
- D6 PD MiniTrap
- E14 His Buffer Kit
- E19 Vivaspin
- E20 Mini Dialysis Kit
- F7 HiTrap Blue HP
- F8 HiTrap Heparin HP
- F10 HiTrap Benzamidine FF (high sub)
- F11 HiTrap Con A HP
- F12 HiTrap Butyl
- F14 HiTrap Phenyl
- F18 HiTrap Octyl
- F19 HiTrap Q
- F20 HiTrap SP
- F21 HiTrap DEAE FF
- F22 HiTrap CM FF

For complete product index see page 23.

Natural sources

Screening



Product index

- A1 His Mag Sepharose Ni
- A3 Streptavidin Mag Sepharose
- A4 NHS Mag Sepharose
- A5 Protein A Mag Sepharose
- A7 Protein G Mag Sepharose
- A9 TiO₂ Mag Sepharose
- B9 Albumin & IgG Depletion SpinTrap
- C1 His MultiTrap
- C2 His MultiTrap TALON
- C5 PD MultiTrap G-25
- C6 Protein A HP MultiTrap
- C7 Protein G HP MultiTrap
- D6 PD MiniTrap
- E10 Membrane Protein Purification Kit
- E14 His Buffer Kit
- E19 Vivaspin
- F7 HiTrap Blue HP
- F8 HiTrap Heparin HP
- F10 HiTrap Benzamide FF (high sub)
- F11 HiTrap Con A HP
- F23 HiTrap HIC Selection Kit
- F24 HiTrap IEX Selection Kit

For complete product index see page 23.

Ordering information

Product	Size/quantity	Code no.	Product	Size/quantity	Code no.
pGEX vectors			Buffer kits		
pGEX-4T-1	25 µg	28-9545-49	Membrane Protein Purification Kit		28-9805-82
pGEX-4T-2	25 µg	28-9545-50	His Buffer Kit		11-0034-00
pGEX-4T-3	25 µg	28-9545-52	GST Buffer Kit		28-9523-61
pGEX-5X-1	25 µg	28-9545-53	Protein A/G SpinTrap Buffer Kit		28-9135-67
pGEX-5X-2	25 µg	28-9545-54	NHS HP SpinTrap Buffer Kit		28-9135-69
pGEX-5X-3	25 µg	28-9545-55	Streptavidin HP SpinTrap Buffer Kit		28-9135-68
pGEX-2TK	25 µg	28-9546-46	Ab Buffer Kit		28-9030-59
pGEX-6P-1	25 µg	28-9546-48			
pGEX-6P-2	25 µg	28-9546-50	Protein depletion		
pGEX-6P-3	25 µg	28-9546-51	Albumin & IgG Depletion SpinTrap	10	28-9480-20
pGEX-2T	25 µg	28-9546-53	HiTrap Albumin & IgG Depletion	2 × 1 ml	28-9466-03
pGEX-3X	25 µg	28-9546-54			
pGEX -1λT EcoRI/BAP	5 µg	28-9546-56	Desalting/Buffer exchange/Cleanup		
GST vector primers for sequencing			Disposable PD-10 Desalting	30	17-0851-01
pGEX 5' Sequencing Primer		27-1410-01	PD MidiTrap G-25	50	28-9180-08
pGEX 3' Sequencing Primer		27-1411-01	PD MiniTrap G-25	50	28-9180-07
<i>E. coli</i> BL21		27-1542-01	PD SpinTrap G-25	50	28-9180-04
MK13K07 Helper Phage		27-1524-01	PD MultiTrap G-25	4 × 96 well filter plate	28-9180-06
Lysis/Protein extraction			PD MidiTrap G-10	50	28-9180-11
Sample Grinding Kit		80-6483-37	PD MiniTrap G-10	50	28-9180-10
Yeast Protein Extraction Buffer Kit		28-9440-45	HiTrap Desalting	5 × 5 ml	17-1408-01
Mammalian Protein Extraction Buffer	500 ml	28-9412-79	HiPrep 26/10 Desalting	1 × 53 ml	17-5087-01
Enzyme reguation			Superdex™ 200 5/150 GL	1 × 3 ml	28-9065-61
Protease Inhibitor Mix		80-6051-23	Mini Dialysis Kit, 1 kDa cut-off, 250 µl	1	80-6483-75
Nuclease Mix		80-6501-42	Mini Dialysis Kit, 1 kDa cut-off, 2 ml	1	80-6483-94
Detection			Mini Dialysis Kit, 8 kDa cut-off, 250 µl	1	80-6484-13
Anti-His Antibody		27-4710-01	Mini Dialysis Kit, 8 kDa cut-off, 2 ml	1	80-6484-32
Anti-GST Antibody	0.5 ml, 50 detections	27-4577-01	Protein concentration		
GST Detection Module		27-4590-01	Vivaspin™ 500 MWCO 3 000	25	28-9322-18
GST 96-well Detection Module	5 plates	27-4592-01	Vivaspin 500 MWCO 5 000	25	28-9322-23
Cleavage			Vivaspin 500 MWCO 10 000	25	28-9322-25
PreScission™ Protease		27-0843-01	Vivaspin 500 MWCO 30 000	25	28-9322-35
Thrombin		27-0846-01	Vivaspin 500 MWCO 50 000	25	28-9322-36
Factor Xa		27-0849-01	Vivaspin 500 MWCO 100 000	25	28-9322-37
HiTrap Benzamidine FF (high sub)	2 × 1 ml	17-5143-02	Vivaspin 2 MWCO 3 000	25	28-9322-40
HiTrap Benzamidine FF (high sub)	5 × 1 ml	17-5143-01	Vivaspin 2 MWCO 5 000	25	28-9322-45
			Vivaspin 2 MWCO 10 000	25	28-9322-47
			Vivaspin 2 MWCO 30 000	25	28-9322-48
			Vivaspin 2 MWCO 50 000	25	28-9322-57

Product	Size/quantity	Code no.	Product	Size/quantity	Code no.
Protein concentration (cont.)			Antibody purification/Pull-down (cont.)		
Vivaspin 2 MWCO 100 000	25	28-9322-58	NHS Mag Sepharose	4 × 500 µl	28-9513-80
Vivaspin 6 MWCO 3 000	25	28-9322-93	NHS HP SpinTrap		28-9031-28
Vivaspin 6 MWCO 5 000	25	28-9322-94	Streptavidin Mag Sepharose	2 × 1 ml	28-9857-38
Vivaspin 6 MWCO 10 000	25	28-9322-96	Streptavidin Mag Sepharose	5 × 1 ml	28-9857-99
Vivaspin 6 MWCO 30 000	25	28-9323-17	HiTrap Streptavidin HP	5 × 1 ml	17-5112-01
Vivaspin 6 MWCO 50 000	25	28-9323-18	Streptavidin HP SpinTrap		28-9031-30
Vivaspin 6 MWCO 100 000	25	28-9323-19	Streptavidin HP MultiTrap	4 × 96 well filter plate	28-9031-31
Vivaspin 20 MWCO 3 000	12	28-9323-58	<hr/>		
Vivaspin 20 MWCO 5 000	12	28-9323-59	Other affinity chromatography methods		
Vivaspin 20 MWCO 10 000	12	28-9323-60	HiTrap Blue HP	5 × 1 ml	17-0412-01
Vivaspin 20 MWCO 30 000	12	28-9323-61	HiTrap Blue HP	1 × 5 ml	17-0413-01
Vivaspin 20 MWCO 50 000	12	28-9323-62	HiTrap Heparin HP	5 × 1 ml	17-0406-01
Vivaspin 20 MWCO 100 000	12	28-9323-63	HiTrap Heparin HP	5 × 5 ml	17-0407-03
<hr/>			HiPrep Heparin FF 16/10	1 × 20 ml	28-9365-49
Antibody purification/Pull-down			HiTrap Con A 4B	5 × 1 ml	28-9520-85
HiTrap Protein A HP	5 × 1 ml	17-0402-01	HiTrap Con A 4B	5 × 5 ml	28-9520-96
HiTrap Protein A HP	5 × 5 ml	17-0403-03	TiO ₂ Mag Sepharose	500 µl	28-9440-10
HiTrap rProtein A FF	5 × 1 ml	17-5079-01	TiO ₂ Mag Sepharose	4 × 500 µl	28-9513-77
HiTrap rProtein A FF	5 × 5 ml	17-5080-02	Phos SpinTrap Fe		28-9298-81
MAbTrap™ Kit	1 × 1 ml	17-1128-01	<hr/>		
rProtein A GraviTrap	10 × 1 ml	28-9852-54	IEX		
Protein A Mag Sepharose	1 × 500 µl	28-9440-06	HiTrap SP HP	5 × 1 ml	17-1151-01
Protein A Mag Sepharose	4 × 500 µl	28-9513-78	HiTrap SP HP	5 × 5 ml	17-1152-01
Protein A HP SpinTrap		28-9031-32	HiTrap Q HP	5 × 1 ml	17-1153-01
Protein A HP MultiTrap	4 × 96 well filter plate	28-9031-33	HiTrap Q HP	5 × 5 ml	17-1154-01
Protein A Mag Sepharose Xtra	2 × 1 ml	28-9670-56	HiTrap Q FF	5 × 1 ml	17-5053-01
Protein A Mag Sepharose Xtra	5 × 1 ml	28-9670-62	HiTrap Q FF	5 × 5 ml	17-5156-01
Ab SpinTrap		28-4083-47	HiTrap SP FF	5 × 1 ml	17-5054-01
Protein G GraviTrap	10 × 1 ml	28-9852-55	HiTrap SP FF	5 × 5 ml	17-5157-01
HiTrap Protein G HP	5 × 1 ml	17-0404-01	HiTrap DEAE FF	5 × 1 ml	17-5055-01
HiTrap Protein G HP	5 × 5 ml	17-0405-03	HiTrap DEAE FF	5 × 5 ml	17-5154-01
Protein G Mag Sepharose	500 µl	28-9440-08	HiTrap CM FF	5 × 1 ml	17-5056-01
Protein G Mag Sepharose	4 × 500 µl	28-9513-79	HiTrap CM FF	5 × 5 ml	17-5155-01
Protein G HP SpinTrap		28-9031-34	<hr/>		
Protein G HP MultiTrap	4 × 96 well filter plate	28-9031-35	HIC		
Protein G Mag Sepharose Xtra	2 × 1 ml	28-9670-66	HiTrap Phenyl FF (high sub)	5 × 1 ml	17-1355-01
Protein G Mag Sepharose Xtra	5 × 1 ml	28-9670-70	HiTrap Phenyl FF (high sub)	5 × 5 ml	17-5193-01
rProtein A/Protein G GraviTrap	10 × 1 ml	28-9852-56	HiTrap Phenyl FF (low sub)	5 × 1 ml	17-1353-01
HiTrap NHS-activated HP	5 × 1 ml	17-0716-01	HiTrap Phenyl FF (low sub)	5 × 5 ml	17-5194-01
HiTrap NHS-activated HP	1 × 5 ml	17-0717-01	HiTrap Phenyl HP	5 × 1 ml	17-1351-01
NHS Mag Sepharose	500 µl	28-9440-09	HiTrap Phenyl HP	5 × 5 ml	17-5195-01
<hr/>			HiTrap Octyl FF	5 × 1 ml	17-1359-01

Product	Size/quantity	Code no.
HIC (cont.)		
HiTrap Octyl FF	5 × 5 ml	17-5196-01
HiTrap Butyl FF	5 × 1 ml	17-1357-01
HiTrap Butyl FF	5 × 5 ml	17-5197-01
HiTrap Butyl-S FF	5 × 1 ml	17-0978-13
HiTrap Butyl-S FF	5 × 5 ml	17-0978-14
HiTrap Butyl HP	5 × 1 ml	28-4110-01
HiTrap Butyl HP	5 × 5 ml	28-4110-05

Selection Kits

HiTrap HIC Selection Kit	7 × 1 ml	28-4110-07
HiTrap IEX Selection Kit	7 × 1 ml	17-6002-33
HiTrap IEX/Capto™ Selection Kit	5 × 1 ml	28-9343-88

GST-tagged protein capture

GSTrap™ HP	5 × 1 ml	17-5281-01
GSTrap HP	5 × 5 ml	17-5282-02
GSTrap FF	5 × 1 ml	17-5130-01
GSTrap FF	5 × 5 ml	17-5131-02
GSTrap 4B	5 × 1 ml	28-4017-45
GSTrap 4B	5 × 5 ml	28-4017-48
GSTPrep™ FF 16/10	1 × 20 ml	28-9365-50
GST SpinTrap	50	28-9523-59
GST MultiTrap FF	4 × 96 well filter plate	28-4055-01
GST MultiTrap 4B	4 × 96 well filter plate	28-4055-00
GST GraviTrap	10	28-9523-60
GST Bulk Kit		27-4570-01

Histidine-tagged protein capture

HiTrap™ FF crude	5 × 1 ml	11-0004-58
HiTrap FF crude	5 × 5 ml	17-5286-01
HiTrap FF crude Kit	1 kit	28-4014-77
HiTrap HP	5 × 1 ml	17-5247-01
HiTrap HP	5 × 5 ml	17-5248-02
HiTrap FF	5 × 1 ml	17-5319-01
HiTrap FF	5 × 5 ml	17-5255-01
HiPrep™ FF 16/10		28-9365-51
His GraviTrap	10	11-0033-99
His GraviTrap Kit		28-4013-51
His GraviTrap TALON		29-0005-94
His Mag Sepharose Ni	2 × 1 ml	28-9673-88
His Mag Sepharose Ni	5 × 1 ml	28-9673-90
His Mag Sepharose Ni	10 × 1 ml	28-9799-17
His Mag Sepharose excel	2 × 1 ml	17-3721-20
His Mag Sepharose excel	5 × 1 ml	17-3721-21
His Mag Sepharose excel	10 × 1 ml	17-3721-22

Product	Size/quantity	Code no.
Histidine-tagged protein capture (cont.)		
His SpinTrap	50	28-4013-53
His SpinTrap TALON		29-0005-93
His SpinTrap Kit		28-9321-71
His MultiTrap FF	4 × 96 well filter plate	28-4009-90
His MultiTrap TALON		29-0005-96
His MultiTrap HP	4 × 96 well filter plate	28-4009-89

Strep-tag II protein purification

StrepTrap™ HP	5 × 1 ml	28-9075-46
StrepTrap HP	5 × 5 ml	28-9075-48

MBP-tagged protein purification

MBPTrap™ HP	5 × 1 ml	28-9187-78
MBPTrap HP	5 × 5 ml	28-9187-80

PreDictor™ plates

PreDictor ALEX Screening Plate	20 µl, 4 × 96 well filter plate	28-9432-89
PreDictor CIEX Screening Plate	20µl, 4 × 96 well filter plate	28-9432-91

Accessories

MagRack 6	1	28-9489-64
MagRack Maxi	1	28-9864-41
Collection Plate 500 µl V-bottom	5	28-4039-43
MiniSpin Adapter	10	28-9232-43
MidiSpin Adapter	10	28-9232-44
PD-10 Spin Adapter	10	28-9232-45

Enrichment and purification formats



Mag Sepharose para-magnetic beads are designed for simple enrichment of proteins and small-scale purification or screening. Mag Sepharose beads slurry volume can be varied in a linear manner to match capacity needs, and large sample volumes of low-expressed target protein can be enriched and concentrated. Sample volume from a few microliters to about 50 ml can be used with Mag Sepharose.



SpinTrap prepacked microspin columns enable fast small-scale enrichment, depletion, or purification of target protein using a bench top microcentrifuge. SpinTrap columns are prepacked with chromatography medium. Multiple plates samples can be processed simultaneously.



MultiTrap plates are prepacked 96-well filter plates for high-throughput processing of multiple samples; typically used for expression screening of proteins or optimization of conditions for capture and elution of target molecules. Each well is prepacked with a fixed volume of affinity chromatography medium. MultiTrap can be used manually or in automated systems, together with vacuum or centrifugation.



GraviTrap columns are prepacked gravity-flow columns for purification and clean-up of proteins and other biomolecules without the need for a purification system. GraviTrap columns are packed with 1 or 2 ml of chromatography medium, allowing capture of milligram amounts of target protein. **PD-10 Desalting Columns, PD MiniTrap™, and PD MidiTrap™** are prepacked gravity-flow columns designed for clean-up, desalting, and buffer exchange of biomolecules, allowing sample volumes between 0.1 and 3.5 ml.



HiTrap columns are prepacked 1 or 5 ml columns that can be used either with a syringe, laboratory pump, or a chromatography system. A broad range of columns is available for purification of all different kinds of proteins. Two or more columns can easily be connected in series to increase the capacity making the loading sample volume very flexible.



HiPrep 16/10 columns are prepacked 20 ml columns for use with chromatographic systems. They enable binding of high milligram to gram amounts of proteins and are useful tools for preparative purifications. The columns are available for purification of many different proteins, and a broad range of sample volumes can be loaded.

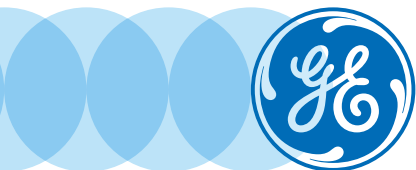
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