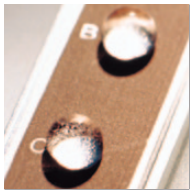

SELDI TECHNOLOGY

ProteinChip® Arrays and Reagents

- Fast protein analysis on the ProteinChip SELDI system
- Compatible with the Lucid Proteomics System™
- ProteinChip array surface chemistries for multi-conditional profiling
- High-throughput applications
- Reproducible results
- Smaller sample volumes than most detection methods

Sophisticated Tools for Differential Expression Profiling

Introduction

Bio-Rad Laboratories, Inc. offers all the consumables you need to generate data from both the ProteinChip surface-enhanced laser desorption/ionization (SELDI) system and the Lucid Proteomics System, which uses the autoflex, ultraflex, and ultrafleXtreme series of matrix-assisted laser desorption/ionization time-of-flight (MALDI TOF and TOF/TOF) mass spectrometers from Bruker Daltonics. The family of products consists of ProteinChip arrays, buffers, and matrices. These products are designed to work together to deliver optimal results.

ProteinChip Arrays

ProteinChip arrays are at the core of SELDI technology. These unique arrays are available with a variety of surface chemistries that allow you to selectively capture and analyze specific classes of proteins from complex biological samples while simultaneously removing detergents and salts.

Each ProteinChip array consists of a metal base with eight spots that are coated with a particular surface chemistry and are defined by hydrophobic barriers for sample retention. When 12 ProteinChip arrays are aligned in a ProteinChip cassette, the active chemistry spots conform to the SBS standard microplate footprint and are thus compatible with robotics systems and multichannel pipetting devices.

ProteinChip arrays are available with 12 different surface chemistries, including chemically treated surfaces (cationic, anionic, metal affinity, hydrophobic, and hydrophilic) and reactive surfaces that can be coupled with biologically relevant molecules (such as antibodies or receptors) for specific interaction with proteins of interest. This wide selection lets you analyze a sample on several different surfaces under different conditions. Because molecules bind through specific chemical interaction with the array surfaces, you often can learn about a protein's chemical properties by using a variety of array chemistries.

See Table 1 for details about ProteinChip arrays and the surface chemistries they offer.

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Table 1. ProteinChip array selection guide.

Array	Surface Chemistry	Purpose	Applications
Strong Anion Exchange			
Q10	Cationic, quaternary ammonium groups that interact with the negative charges on the surface of target proteins, for example, aspartic or glutamic acid	Capture of molecules that have negative surface charges	• Selective analysis of proteins with low isoelectric points (pIs) • Biomarker discovery
Weak Cation Exchange			
CM10	Weak anionic carboxylate groups that interact with the positive charges on the surface of the analyte, for example, lysine, arginine, or histidine	Capture of molecules that have positive surface charges	• Selective analysis of proteins with high pIs • Biomarker discovery
Immobilized Metal Affinity Capture (IMAC)			
IMAC30	Nitrilotriacetic acid (NTA) groups that chelate metal ions. Proteins applied to the array surface may bind to the chelated metal ion through histidine, tryptophan, cysteine, and phosphorylated amino acid residues	Capture of molecules that bind polyvalent metal ions, such as nickel, copper, zinc, iron, and gallium	• Analysis of metal-binding, phosphorylated, or polyhistidine (His)-tagged proteins • Biomarker discovery
Hydrophobic/Reverse-Phase			
H50	Methylene chains that closely mimic the characteristics of C6 to C12 alkyl chromatography media	Capture of large proteins through hydrophobic or reverse-phase interactions	• Protein profiling • Purity determination • Rapid protein analysis • Biomarker discovery • Calibration with proteins of known molecular weight (MW)
H4*	Active spots contain chains of 16 methylene groups that bind proteins through reverse-phase chemistry. Binds proteins abundant in alanine, valine, leucine, isoleucine, phenylalanine, tryptophan, or tyrosine	Capture of smaller proteins and peptides through hydrophobic and reverse-phase interactions	• Purity determination • Rapid protein/peptide analysis • Biomarker discovery
Normal Phase			
NP20	Silicon dioxide, which allows proteins to bind via serine, threonine, or lysine residues	General protein binding surface; recommended for hydrophilic proteins	• Rapid protein analysis • Purity determination • Verification of the presence or absence of a molecule • Calibration with peptides or proteins of known MW
Preactivated Surface			
PG20 PS10 PS20 RS100	Precoupled with recombinant protein G Reactive acyl imidazole moieties Epoxy groups Reactive acyl imidazole moieties on a hydrogel backbone	Covalent immobilization of biomolecules for subsequent specific capture of proteins from complex samples	• Analysis of antibody-antigen, receptor-ligand, protein-protein interactions
SEND ID**	Chains of 18 methylene groups (C18) that bind peptides through reverse-phase chemistry; matrix is integrated into the array surface	Analysis of peptides resulting from tryptic digestion of proteins	• Peptide mass fingerprinting
Nonreactive Surface			
Au	Gold provides a nonreactive surface for general protein analysis (limited reusability)	Recommended for purified samples	• Rapid protein analysis • Calibration with peptides or proteins of known MW

* Array lacks the hydrophobic coating needed for sample containment; a hydrophobic PAP pen can be used to manually create the barrier.
** SEND, surface-enhanced neat desorption.

Actual size.

ProteinChip Buffers

ProteinChip buffers enhance productivity and ensure reproducibility. Premade ProteinChip buffers are optimized for use with a variety of ProteinChip arrays. These buffers and buffer sets are subject to stringent quality specifications to ensure reproducible results. Many buffers also include an antimicrobial preservative to ensure reliable performance. See Table 2 for a guide to buffer selection.

Table 2. ProteinChip buffer selection guide.

Buffer	Associated ProteinChip Array	Buffer Composition	Purpose
ProteinChip CM high-stringency buffer	CM10	50 mM HEPES, pH 7.0, antimicrobial preservatives, 200 ml	Relatively high pH of buffer imparts an overall net negative charge on some proteins, resulting in fewer proteins binding to the ProteinChip CM10 array, that is, higher stringency
ProteinChip CM low-stringency buffer	CM10	0.1 M sodium acetate, pH 4.0, antimicrobial preservatives, 200 ml	Relatively low pH of buffer imparts an overall net positive charge on more proteins in a sample, resulting in more proteins binding to the ProteinChip CM10 array
ProteinChip IMAC buffer set	IMAC30	IMAC charging solution — 0.1 M cupric sulfate solution, 30 ml IMAC neutralizing solution — 0.1 M sodium acetate, pH 4.0, 30 ml IMAC binding buffer — 0.1 M sodium phosphate, 0.5 M sodium chloride, pH 7.0, 200 ml	Buffers are used sequentially: The first charges the ProteinChip IMAC array with copper, the second neutralizes the array, and the third (a low-stringency binding buffer that allows maximal binding of proteins to the surface) is used to bind the sample to the array All IMAC buffers contain antimicrobial preservatives
ProteinChip H50 buffer	H50	10% acetonitrile, 0.1% trifluoroacetic acid, antimicrobial preservatives, 200 ml	Proteins less hydrophobic relative to this binding buffer will not bind to the ProteinChip H50 array surface while proteins more hydrophobic will bind to the array surface; this low- to moderate-stringency buffer allows maximal binding of proteins to the surface
ProteinChip Q buffer	Q10	50 mM Tris-HCl, pH 9.0, antimicrobial preservatives, 200 ml	High pH of buffer imparts an overall negative charge on some proteins in a sample, resulting in more proteins binding to the ProteinChip Q10 array

ProteinChip Matrices

ProteinChip matrices are essential components of successful ProteinChip SELDI and Lucid Proteomics System experiments. In traditional MALDI mass spectrometry, matrix is applied in an organic solvent that solubilizes many proteins on the array surface. As the solvent evaporates, the proteins co-crystallize with the matrix. The crystals absorb laser energy and generate the ionized proteins detected by both systems.

Bio-Rad offers three ProteinChip matrix products for detecting proteins and peptides. These matrices are manufactured in a controlled environment to ensure optimal performance in ProteinChip SELDI and

Lucid Proteomics System processes and are tested for salt and other contamination that could interfere with results. General guidelines for choosing matrices are based on the MW and chemical nature of the analyte but there are no absolute rules. See Table 3 for a ProteinChip matrix selection guide.

Table 3. ProteinChip matrix selection guide.

Matrix	Molecular Name	Purpose
CHCA	Alpha-cyano-4-hydroxycinnamic acid	For small molecules <30 kD
SPA	Sinapinic acid	For larger proteins and peptides 10–150 kD
EAM-1	Proprietary formulation	For desorption and ionization of difficult-to-detect proteins, such as glycosylated proteins, and for proteins 15–50 kD

ProteinChip Cassette–Compatible Bioprocessor

Most ProteinChip arrays are packaged in 12-array cassettes that can be conveniently transferred to a ProteinChip cassette–compatible bioprocessor. The ProteinChip bioprocessor allows samples to be handled in a standard 96-well format, is compatible with liquid handling equipment, and is used for convenience, throughput, reproducibility, and improved detection limits. After processing, simply remove the cassette from the bioprocessor to add ProteinChip matrix.

Compatibility with the Lucid Proteomics System

ProteinChip SELDI consumables are compatible with the Lucid Proteomics System. With the Lucid Proteomics System, you can perform top-down profiling experiments and bottom-up identification on one platform with the MALDI TOF or TOF/TOF autoflex, ultraflex, and ultrafleXtreme instruments from Bruker Daltonics. For more information, please contact your Bio-Rad or Bruker representative, or visit **www.lucidproteomics.com**.

Ordering Information

Catalog #	Description
ProteinChip Arrays	
C57-30075	**ProteinChip CM10 Arrays**, A–H format, 12
C57-30078	**ProteinChip IMAC30 Arrays**, A–H format, 12
C57-30080	**ProteinChip Q10 Arrays**, A–H format, 12
C57-30028	**ProteinChip H4 Arrays**, A–H format, 12
C57-30065	**ProteinChip H50 Arrays**, A–H format, 12
C57-30043	**ProteinChip NP20 Arrays**, A–H format, 12
C55-30058	**ProteinChip PG20 Array**, A–H format
C55-30044	**ProteinChip PS10 Arrays**, A–H format, 12
C57-30045	**ProteinChip PS20 Arrays**, A–H format, 12
C55-30082	**ProteinChip RS100 Arrays**, A–H format, 6
C57-30081	**ProteinChip SEND ID Arrays**, A–H format, 12
C55-30033	**ProteinChip Gold Array**, A–H format
C70-00069	**ProteinChip Array Assortment Pack**, includes 3 each of H50, CM10, IMAC30, and Q10 ProteinChip arrays
K20-30003	**ProteinChip CM Kit**, includes 12 ProteinChip CM10 arrays, ProteinChip CM low-stringency buffer
K20-30001	**ProteinChip H50 Kit**, includes 12 ProteinChip H50 arrays, ProteinChip H50 buffer
K20-30002	**ProteinChip IMAC Kit**, includes 12 ProteinChip IMAC30 arrays, ProteinChip IMAC buffer set
C20-10001	**ProteinChip Array Reaction Tubes**, 50
C20-10002	**ProteinChip Array Forceps**, 1 pair
ProteinChip Buffers	
K20-00001	**ProteinChip H50 Buffer**, 200 ml
K20-00005	**ProteinChip H50 Buffer**, 1 L
K20-00003	**ProteinChip CM Low-Stringency Buffer**, 200 ml
K20-00007	**ProteinChip CM Low-Stringency Buffer**, 1 L
K20-00004	**ProteinChip CM High-Stringency Buffer**, 200 ml
K20-00010	**ProteinChip Q Buffer**, 200 ml
K20-00002	**ProteinChip IMAC Buffer Set**, includes 30 ml IMAC charging solution, 30 ml IMAC neutralizing solution, 200 ml IMAC binding buffer
K20-00006	**ProteinChip IMAC Binding Buffer**, 1 L
K20-00008	**ProteinChip IMAC Charging Solution**, 200 ml
K20-00009	**ProteinChip IMAC Neutralizing Solution**, 200 ml
ProteinChip Matrices	
C30-00001	**ProteinChip CHCA Matrix**, 5 mg/vial, 20
C30-00002	**ProteinChip SPA Matrix**, 5 mg/vial, 20
C30-00003	**ProteinChip EAM-1 Matrix**, 5 mg/vial, 20
C30-00004	**ProteinChip Matrix Kit**, includes 6 vials each CHCA, EAM-1, and SPA matrices
ProteinChip Cassette–Compatible Bioprocessor	
C50-30011	**ProteinChip Cassette–Compatible Bioprocessor**, includes ProteinChip array forceps, cassette hold-down frame, 12 blank ProteinChip arrays
C50-30012	**ProteinChip Cassette–Compatible Bioprocessor Reservoirs**, 5
C50-30013	**ProteinChip Cassettes**, empty, hold 12 ProteinChip arrays, 5

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Web site *www.bio-rad.com* ***USA*** *800 424 6723* ***Australia*** *61 2 9914 2800* ***Austria*** *01 877 89 01* ***Belgium*** *09 385 55 11* ***Brazil*** *55 31 3689 6600* ***Canada*** *905 364 3435* ***China*** *86 20 8732 2339* ***Czech Republic*** *420 241 430 532* ***Denmark*** *44 52 10 00* ***Finland*** *09 804 22 00* ***France*** *01 47 95 69 65* ***Germany*** *089 31 884 0* ***Greece*** *30 210 777 4396* ***Hong Kong*** *852 2789 3300* ***Hungary*** *36 1 459 6100* ***India*** *91 124 4029300* ***Israel*** *03 963 6050* ***Italy*** *39 02 216091* ***Japan*** *03 6361 7000* ***Korea*** *82 2 3473 4460* ***Mexico*** *52 555 488 7670* ***The Netherlands*** *0318 540666* ***New Zealand*** *0508 805 500* ***Norway*** *23 38 41 30* ***Poland*** *48 22 331 99 99* ***Portugal*** *351 21 472 7700* ***Russia*** *7 495 721 14 04* ***Singapore*** *65 6415 3188* ***South Africa*** *27 861 246 723* ***Spain*** *34 91 590 5200* ***Sweden*** *08 555 12700* ***Switzerland*** *061 717 95 55* ***Taiwan*** *886 2 2578 7189* ***United Kingdom*** *020 8328 2000*