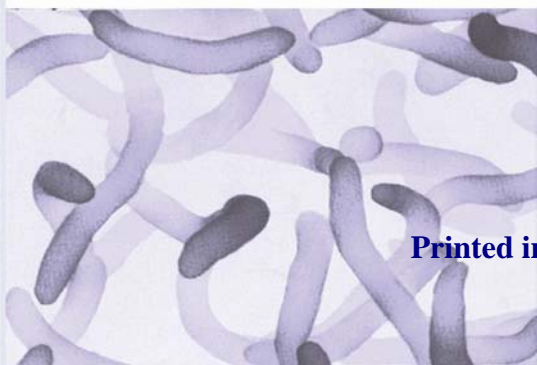
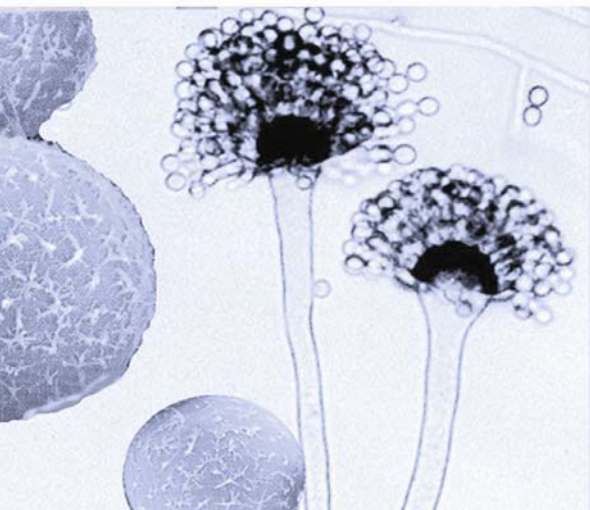


BiOLOG

Phenotype MicroArray™ Product Guide



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Patented Technology

Phenotype MicroArrays™ and their use are covered by U.S. Patent Nos. 5,627,045, 6,046,021, 6,387,651, 6,436,631, 6,472,201, 6,686,173, 6,696,239, and 6,727,076, as well as pending applications, all owned by Biolog, Inc. and the OmniLog® instrument is covered by U.S. Patent No. 6,271,022, owned by Biolog, Inc.

The purchase price paid for the Phenotype MicroArray™ technology by end users grants them a non-transferable, non-exclusive license to use Phenotype MicroArrays™ for internal research only. Internal research only means that the Phenotype MicroArray™ technology is excluded from resale or use for the making or selling, either directly or indirectly of any commercial product or service. A separate commercial license is available from Biolog, Inc. for commercial uses or applications.

Proprietary Trademarks

OmniLog is a registered trademark and Phenotype MicroArray is a trademark of Biolog, Inc. Microsoft and Windows are registered trademarks of Microsoft Corporation.

Ordering Information:

For customer service, contact us at:

Phone: 800-284-4949
Address: 21124 Cabot Boulevard
Hayward, CA 94545
U.S.A.
Email: csorders@biolog.com

Table of Contents

Product Description	1
OmniLog® Systems	4
Phenotype MicroArray™ (PM) Panels and Accessories – Mammalian Cells	4
Dye Mixes and Inoculating Fluids for PM Mammalian Panels	4
Phenotype MicroArray™ Panels and Accessories – Microbial Cells	5
Biolog Prepared Plated Media	5
Other Prepared Plated Media	5
Dye Mixes and Inoculating Fluids for PM Microbial Panels	6
Phenotype MicroArray™ Services	6
Disposable Hardware	6
Ordering Information	7
Terms & Conditions	7
Service Contract Options	7

Product Description

The Phenotype MicroArray™ (PM) system and software were developed by the same experts at Biolog that pioneered modern phenotypic identification of bacteria and fungi. Using much of what was learned from our identification work we expanded the technology to provide extremely detailed phenotypic testing of cells for genomics, drug development, toxicology, cell fingerprinting, and other research applications.

Phenotype MicroArray™ panels of up to 1,920 phenotypic tests have been developed for:

- Gram negative bacteria
- Gram positive bacteria
- Yeast and filamentous fungi
- Mammalian cells

The OmniLog® PM System

Generates a kinetic response curve for all assays simultaneously and monitors, either directly or indirectly, most known aspects of cell function.

The range of phenotypes analyzed includes:

- 1) Nutrient uptake and transport functions
- 2) Catabolism of carbon, nitrogen, phosphorus, and sulfur
- 3) Biosynthesis of small molecules
- 4) Biosynthesis of polymeric macromolecules
- 5) Formation of cellular structures
- 6) Cellular respiratory functions
- 7) Stress and repair functions
- 8) Other cellular properties

Phenotype MicroArrays™ allow researchers, for the first time, to analyze hundreds to thousands of cellular phenotypes simultaneously in an efficient and standardized format. The OmniLog PM System analyzes, in vitro, a cell's response to a drug or genetic change by comprehensively scanning cellular phenotypes and detecting changes.

This new capability of measuring the complete system-wide response of a living cell to a drug or genetic alteration can be an important complement to data obtained from molecular methods such as DNA microarrays and proteomic analyses.

The PM technology is covered by many patents. Commercial and non-commercial licenses are granted when these products are purchased (see page ii for details).

OmniLog® Incubator-Reader



OmniLog with PM Panels in the OmniLog Shelves
Capacity 50 Standard MicroPlates

Specifications

Size	53 cm (21 in) W 81 cm (32 in) H 58 cm (23 in) D
Power	100 to 240VAC, 50 to 60 Hz
Operating Humidity Range	20% to 80% non-condensing
Operating Temp Range	18° to 28°C
Incubation Humidity Range	Ambient
Incubation Temp Range	22° to 45°C in the tray chamber during full capacity incubation and reading operation
Incubation Temp Consistency	+/- 2°C in the tray chamber

OmniLog® PM

Suite of Programs

OmniLog PM software contains a suite of algorithms that work in conjunction with the OmniLog reader and Biolog's PM panels. These programs allow you to display kinetic PM panel data recorded by the OmniLog reader, manage and analyze the data, export it in a variety of raw and processed forms, and generate reports.

Software Functions

- Drives the OmniLog reader
- Guides loading and reading PM panels
- Creates a kinetic data file for each PM panel for use in the other program modules

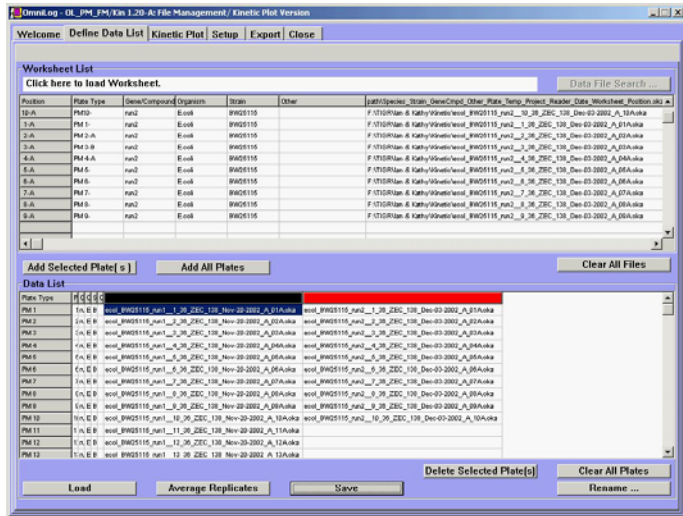
File Management/Kinetic Analysis

- Assembles PM panel data files into data lists
- Displays kinetic plots of the data

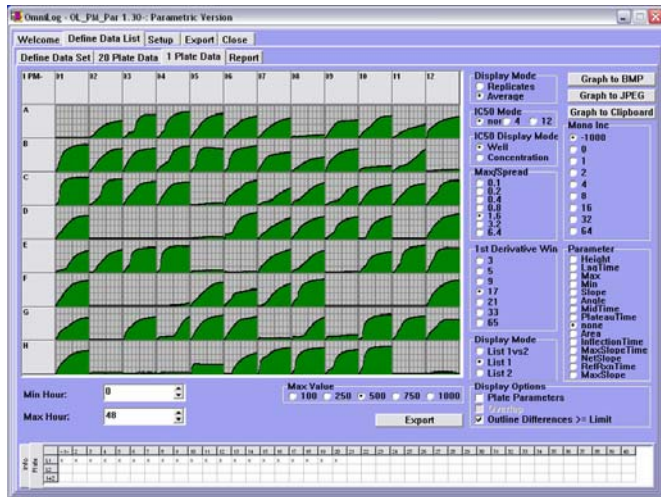
Parametric Analysis

- Extracts data lists from the File Management/Kinetic Analysis module
- Calculates parameters from the PM kinetic data.
- Allows comparison of two data lists
- Allows exporting of data to bioinformatics programs for further analysis.

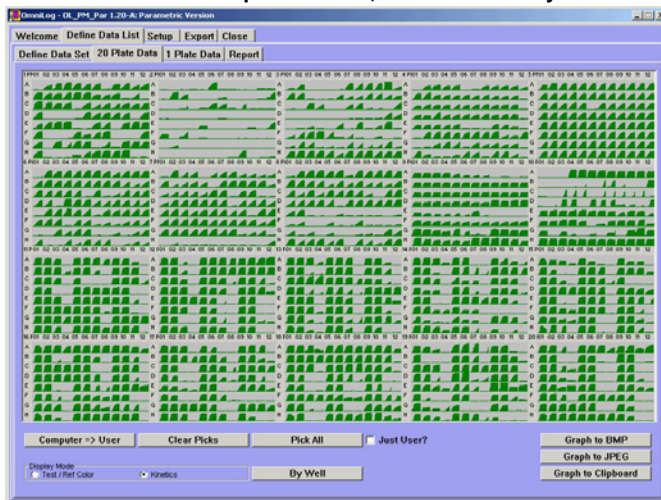
PM Data Definition Worksheet and Strain Entries



**PM Single Panel Data Display
Cellular Responses for 96 Kinetic Assays**



**PM 20 Panel Data Display
Cellular Responses for 1,920 Kinetic Assays**



OmniLog® PM

The PM suite of software will process the data gathered for each strain or cell line analyzed in the OmniLog System. The software can automatically compare two or more cell lines over hundreds to thousands of phenotypes.

Comparison of cell lines and their phenotypic responses provides very useful information. Where there are similar phenotypic responses in both cell lines the kinetic curve is yellow, unique phenotypic responses expressed by only one of the cell lines is identified by a unique color assigned to that cell line. This allows the user to rapidly review the graphic output and visually identify changes between two cell lines.

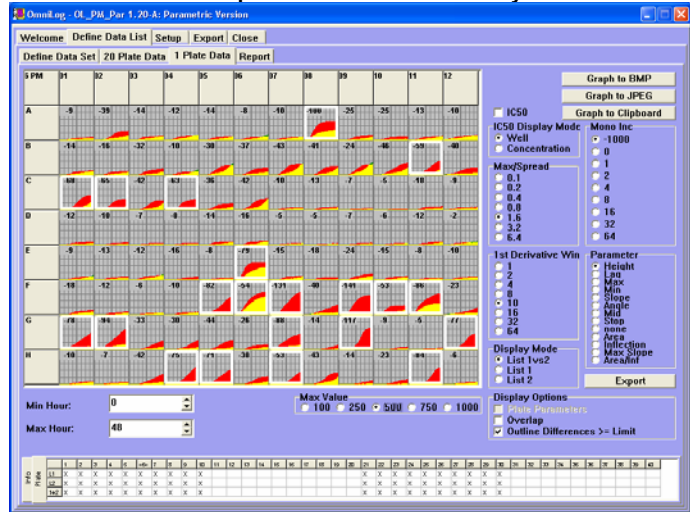
Where significant differences are found between cell lines, the software automatically highlights the difference and a report is generated listing and characterizing the phenotypic differences found.

Sample Report: Differences in Phenotypes in the PM panels discovered between two cell lines

PM Report:			
Ecol_SID_69 versus			
Ecol_SID_70			
Phenotypes Gained:			
PM20B	D03	63	Proflavine antibacterial, flavone
PM01	C06	54	L-Rhamnose C-Source, carbohydrate
PM14A	B03	126	9-Aminoacridine DNA intercalator
PM16A	C07	120	Protamine sulfate membrane, ATPase
PM07	A12	51	Lys-Phe N-source
PM11B	H05,H06,H07	554	Kanamycin protein synthesis, aminoglycoside
PM12B	C02,C03,C04	544	Paromomycin protein synthesis, aminoglycoside
PM11B	F10,F11	298	Neomycin protein synthesis, aminoglycoside
PM20B	H12	144	Oleandomycin protein synthesis, macrolide
PM13A	H07,H08	441	Monolactam wall
PM13A	D03	185	Cefuroxime wall, cephalosporin second generation
PM13A	B03,B04	426	Azocillin wall, lactam
PM13A	A04	224	Ampicillin wall, lactam
Phenotypes Lost:			
PM11B	E10,E11,E12	-547	Nalidixic acid DNA gyrase (GN), DNA topoisomerase (GP)
PM20B	D06,D07,D08	-498	Ciprofloxacin DNA gyrase (GN), DNA topoisomerase (GP)
PM11B	E05,E06,E07	-486	Enoxacin DNA gyrase (GN), DNA topoisomerase (GP)
PM13A	B11,B12	-444	Oxolinic acid DNA gyrase (GN), DNA topoisomerase (GP)
PM11B	B11,B12	-438	Ofloxacin DNA gyrase (GN), DNA topoisomerase (GP)
PM11B	H10,H11	-291	Oloxacin DNA gyrase (GN), DNA topoisomerase (GP)
PM16A	D12	-208	Cinoxacin DNA gyrase (GN), DNA topoisomerase (GP)
PM14A	D06	-62	Iodoacetate oxidation, sulphydryl
PM17A	G06	-62	Cefamandole wall, cephalosporin
Appendix:			
Carbon and Nutrient Max Read Hour: 024			
Nitrogen, Phosphorus, Sulfur Max Read Hour: 048			
Sensitivity Max Read Hour: 024			

The software also allows for export of the phenotypic data so that additional analysis can be performed – for example, clustering the phenotypic data from a number of strains or drugs.

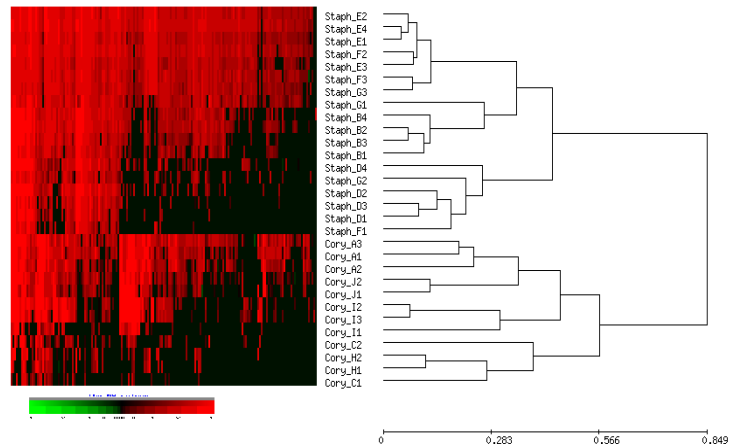
PM Single Panel Data Comparison Display Cellular Responses for 96 Kinetic Assays



PM 20 Panel Data Comparison Display Cellular Responses for 1,920 Kinetic Assays



PM Data Exported and Analyzed Cluster Analysis (Note: Clustering software is available from other vendors)



OmniLog® Systems

All OmniLog PM Systems include the OmniLog incubator/reader, computer, OmniLog Software, Windows® (English version), OmniLog User Guide, Pipettor, Turbidimeter, Microsoft Windows Operating System (English version) and a one year warranty from the date of installation.

Catalog Number	Description	Unit	Price U.S. \$
OmniLog Systems			
93171	OmniLog PM System, 110-120V	ea.	90,000.00
93182	OmniLog PM System, 220V	ea.	90,000.00
93184	OmniLog PM System, 240V	ea.	90,000.00
OmniLog Accessories			
24161D	OmniLog Software – Version 1.2 includes: File Management / Kinetic Analysis, and Parametric modules. Only for use with OmniLog PM System.	ea.	26,600.00
90936	On-site Software Validation Service includes: Validation Manual (P/N 90931)	ea.	8,000.00
90931	Validation Manual and Supplies	ea.	1,025.00
90701	OmniLog Shelves – Type “A” MicroPlate Footprint	ea.	110.00
90813	Calibration Solution, 60 ml	ea.	15.00
3501A	Electronic Pipettor (8-channel, repeating)	ea.	1349.50
3569	Pipettor Battery, Ni-Cad. 1.2V, 900mAh, Rechargeable, Matrix #6090 (2 required)	ea.	35.00
3531	Turbidimeter with Power Adapter, 110-120V	ea.	618.00
3532	Turbidimeter with Power Adapter, 220V	ea.	798.00
3585	Turbidimeter with Power Adapter, 240V	ea.	798.00
3427	Turbidity Standard, 65% T	ea.	25.00
3431	Turbidity Standard, 85% T	ea.	25.00
30311	Biolog Microplates w/ lids – Virgin polystyrene, 96 flat-bottom wells, half the volume of standard wells, low evaporation lids, gamma irradiated, plates & lids packaged separately. (sold in sets of 25)	ea.	3.50

Phenotype MicroArray™ Panels and Accessories – Mammalian Cells

	PM-M Kit¹ (partial phenotypic analysis with PM-M1 – 4)	kit	400.00	(280.00) ⁴
13191	Pre-assembled kit containing 2 each of Phenotype MicroArray™ Panels PM-M1-4. These are used to assay mammalian cell metabolism of carbon sources for a wide range of cell lines. Kit contains 2 each of PM-M1-4.			

¹ Details of the assays in the panels can be found at www.biolog.com/PM_Maps.html

PM-M Panels¹

13101	PM-M1 96 Carbon/Energy utilization assays	panel	50.00	(35.00) ⁴
13102	PM-M2 96 Carbon/Energy utilization assays	panel	50.00	(35.00) ⁴
13103	PM-M3 96 Carbon/Energy utilization assays	panel	50.00	(35.00) ⁴
13104	PM-M4 96 Carbon/Energy utilization assays	panel	50.00	(35.00) ⁴

¹ Details of the assays in the panels can be found at www.biolog.com/PM_Maps.html

Dye Mixes and Inoculating Fluids for PM Mammalian Panels

Dye Mixes are cell-specific. See PM Instructions for Use before ordering.

74351	Biolog Redox Dye Mix MA (6X), 20ml ²	bottle	60.00
74352	Biolog Redox Dye Mix MB (6X), 20ml ²	bottle	60.00

² 20ml of Dye Mix is enough to assay approximately 20 panels (2,000 wells containing 50ul of medium)

Inoculating Fluids – Mammalian Panels

72301	Biolog IF-M1 RPMI w/o glu/gln, 100ml ³	bottle	63.00
72302	Biolog IF-M2 RPMI w/o glu/gln/aa, 100ml ³	bottle	63.00

³ 100ml of Inoculating Fluid is enough for approximately 20 panels

⁴ Discounted price available to not-for-profit institutions using PM technology for non-commercial research purposes.

Catalog Number	Description	Unit	Price U.S. \$
Phenotype MicroArray™ Panels and Accessories – Microbial Cells			
	PM Kit (partial phenotypic analysis with PM 1 – 4)	kit	400.00 (280.00) ³
12191	Pre-assembled kit containing 2 each of Phenotype MicroArray™ Panels 1-4. These assay bacterial cellular metabolism of carbon, nitrogen, phosphorus and sulfur sources for most gram negative bacterial species. Kit contains: 2 each - PM-1 & 2 carbon panels 2 each - PM-3 nitrogen panels 2 each - PM-4 phosphorus - sulfur panels 8 each - tubes gram-negative inoculating fluid (IF-0)		
72211	IF-0 (box of 20 tubes)	box	40.00
PM Panels¹			
12111	PM 1 96 Carbon utilization assays	panel	35.00 (25.00) ³
12112	PM 2 96 Carbon utilization assays	panel	35.00 (25.00) ³
12121	PM 3 96 Nitrogen utilization assays	panel	35.00 (25.00) ³
12131	PM 4 96 Phosphorus – Sulfur utilization assays	panel	35.00 (25.00) ³
12141	PM 5 96 Biosynthetic pathway/nutrient stimulation	panel	35.00 (25.00) ³
12181	PM 6 96 Nitrogen utilization assays	panel	35.00 (25.00) ³
12182	PM 7 96 Nitrogen utilization assays	panel	35.00 (25.00) ³
12183	PM 8 96 Nitrogen utilization assays	panel	35.00 (25.00) ³
12161	PM 9 96 Osmotic/Ionic response assays	panel	35.00 (25.00) ³
12162	PM 10 96 pH response assays	panel	35.00 (25.00) ³
12211	PM 11 96 Bacterial chemical sensitivity assays	panel	35.00 (25.00) ³
12212	PM 12 96 Bacterial chemical sensitivity assays	panel	35.00 (25.00) ³
12213	PM 13 96 Bacterial chemical sensitivity assays	panel	35.00 (25.00) ³
12214	PM 14 96 Bacterial chemical sensitivity assays	panel	35.00 (25.00) ³
12215	PM 15 96 Bacterial chemical sensitivity assays	panel	35.00 (25.00) ³
12216	PM 16 96 Bacterial chemical sensitivity assays	panel	35.00 (25.00) ³
12217	PM 17 96 Bacterial chemical sensitivity assays	panel	35.00 (25.00) ³
12218	PM 18 96 Bacterial chemical sensitivity assays	panel	35.00 (25.00) ³
12219	PM 19 96 Bacterial chemical sensitivity assays	panel	35.00 (25.00) ³
12220	PM 20 96 Bacterial chemical sensitivity assays	panel	35.00 (25.00) ³
12221	PM 21 96 Yeast – Filamentous Fungi chemical sensitivity assays	panel	35.00 (25.00) ³
12222	PM 22 96 Yeast – Filamentous Fungi chemical sensitivity assays	panel	35.00 (25.00) ³
12223	PM 23 96 Yeast – Filamentous Fungi chemical sensitivity assays	panel	35.00 (25.00) ³
12224	PM 24 96 Yeast – Filamentous Fungi chemical sensitivity assays	panel	35.00 (25.00) ³
12225	PM 25 96 Yeast – Filamentous Fungi chemical sensitivity assays	panel	35.00 (25.00) ³
12226	PM 26 96 Yeast – Filamentous Fungi chemical sensitivity assays	panel	35.00 (25.00) ³
12227	PM 27 96 Yeast – Filamentous Fungi chemical sensitivity assays	panel	35.00 (25.00) ³
12228	PM 28 96 Yeast – Filamentous Fungi chemical sensitivity assays	panel	35.00 (25.00) ³
12229	PM 29 96 Yeast – Filamentous Fungi chemical sensitivity assays	panel	35.00 (25.00) ³
12230	PM 30 96 Yeast – Filamentous Fungi chemical sensitivity assays	panel	35.00 (25.00) ³

¹ Details of the assays in the panels can be found at www.biolog.com/PM_Maps.html

Biolg Prepared Plated Media² (SOLD IN INCREMENTS OF 15 PLATES / BOX-SEE PAGE 6 FOR PRICING CHART)

71102	BUG + B(Biolog Universal Growth) Agar w/ 5% sheep blood	plate	(D)
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² Must be stored at 2-8° C.

Other Prepared Plated Media² (SOLD IN INCREMENTS OF 10 PLATES / BOX - SEE PAGE 6 FOR PRICING CHART)

Bio-M1040	Tryptic Soy Agar (TSA)	plate	(BA)
Bio-M1006	Tryptic Soy Agar (TSA) w/ 5% sheep blood	plate	(BA)
Bio-M1065	R2A Agar	plate	(BH)

² Must be stored at 2-8° C.

³ Discounted price available to not-for-profit institutions using PM technology for non-commercial research purposes.

Catalog Number	Description	Unit	Price U.S. \$
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Dye Mixes and Inoculating Fluids for PM Microbial Panels

Dye Mixes are cell specific - see PM Instructions for Use before ordering

74221	Biolog Redox Dye Mix A (100X), 20ml ¹	bottle	80.00
74222	Biolog Redox Dye Mix B (100X), 20ml ¹	bottle	80.00
74224	Biolog Redox Dye Mix D (100X), 20ml ¹	bottle	120.00
74225	Biolog Redox Dye Mix E (100X), 20ml ¹	bottle	80.00
74226	Biolog Redox Dye Mix F (100X), 20ml ¹	bottle	120.00
74227	Biolog Redox Dye Mix G (100X), 20ml ¹	bottle	120.00
74228	Biolog Redox Dye Mix H (200X), 20ml ¹	bottle	120.00

¹ 20ml of Dye Mix is enough for approximately 200 panels

Inoculating Fluids – Microbial Panels

72268	IF-0a GN/GP Base (1.2X), 125ml ²	GN & GP Bacteria, PM 1 – 8	bottle	25.00
72264	IF-10a GN Base (1.2X), 125ml ²	GN Bacteria, PM 9 – 20	bottle	25.00
72265	IF-11a GP Base (1.2X), 125ml ²	GP Bacteria, PM 9 – 20	bottle	25.00
72266	IF-10b GN/GP Base (1.2X), 125ml ²	GN & GP Bacteria, PM 9 – 20	bottle	25.00
72231	IFY-0 Base (1.2X), 125ml ²	Yeast & Fungi, PM 1 – 8	bottle	25.00
72232	IFY-10 Base (1.2X), 125ml ²	Yeast & Fungi, PM 9, 10, 21 – 30	bottle	25.00

² 125ml of Inoculating Fluid is enough for 10 panels

Phenotype MicroArray Services

For microbial species that Biolog has established a PM testing protocol. Customers can send strains for phenotypic testing and Biolog will send back phenotypic reports. Customers can choose hundreds to thousands of phenotypes. Reports can be generated for single-strain profiles or for pair-wise comparisons. These services are available for a wide variety of species. Further information and sample reports are available by contacting PMservices@biolog.com.

12301	Full Profile		1,500.00	(1,000.00) ³
12302	Metabolic Only		900.00	(600.00) ³
12303	Sensitivity Only		1,200.00	(800.00) ³
12311	Per Plate	set up	300.00	(200.00) ³
		per plate	70.00	50.00) ³
12321	Special handling fee for anaerobic or BSL2 work	run	750.00	(500.00) ³
12391	Data Analysis (per hour charge)	hour	240.00	(160.00) ³

³ Discounted price available to not-for-profit institutions using PM technology for non-commercial research purposes.

Disposable Hardware

3001	Pipette Tips - sterile, racked, box of 960 (for electronic pipettors)	box	102.60
3003	Pipette Tips - w/anti-aerosol filter, sterile, racked box of 960 (for inoculation of fungal microplates w/electronic pipettors)	box	154.50
3102	Reservoirs – sterile, case of 100	case	46.60
	LongSwabs™ – sterile, 7", cotton tipped swabs:		
3021	Box of 1,000 (10 bags of 100 swabs)	box	25.50
3023	Box of 100 (individually wrapped swabs)	box	18.50
	Streakerz™ – sterile, 6", pointed wooden streaking sticks:		
3025	Box of 1,000 (10 bags of 100)	box	22.75
3026	Box of 1,000 (50 bags of 20)	box	24.25
3032	PM Gas Bags – for panels needing a special gas atmosphere (100 bags)	box	40.00

Prices - Plated Media (PRICE IS PER PETRI PLATE)

Product Class	Number of Plates (Sold in increments of 15 plates)	1200+	210 – 1185	105 - 195	60 - 90	30 – 45	15
(D)		0.76	0.80	0.88	1.11	1.34	1.46
Product Class	Number of Plates (Sold in increments of 10 plates)	1200+	200 – 1190	100 - 190	60 - 90	30 - 50	10 - 20
(BA)		0.41	0.44	0.52	0.57	0.73	0.84
(BH)		0.71	0.73	0.84	1.01	1.17	1.40

Ordering Information

Please use product number and item name when ordering.
Purchase orders for shipment should be sent to:

Biolog, Inc.
Attn: Customer Service
21124 Cabot Blvd.
Hayward, CA 94545

Customer Service accepts customer orders via phone or fax from 7:30 am to 4:30 pm (Pacific Time).

TOLL FREE **800-284-4949**
FAX ORDERS **510-782-4639**
EMAIL **csorders@biolog.com**

Written confirmation of telephone orders is not required. If written confirmation is sent, please mark clearly CONFIRMATION OF PHONE ORDER on the purchase order. This will avoid duplicate shipments. Due to shipping requirements for perishable items, orders called in by 10:00 am (Pacific Time) on Monday, Tuesday, and Wednesday, are shipped that same day. Orders placed after 10:00 am (Pacific Time) on Wednesday will ship the following Monday.

Terms and Conditions

- All shipping is EXW shipping point (Hayward, CA; Lexington, KY; Lake Charles, LA; Syracuse, NY; USA).
- All payments must be made in US dollars. Payment by North American end-users is net 30 days.
- For shipments outside of North America, please call for terms. **Buyer pays all insurance, foreign duties and taxes.**
- Freight and service charges are added to the invoice.
- All prices subject to change without notice.

Return Shipments

Biolog, Inc. cannot accept returned perishable materials (Media, Reagents, PM panels, etc.) once they have been shipped. When placing an order, please pay special attention to each item’s unit type (box, tube, plate, etc.) to ensure that the correct quantity is ordered.

No return will be accepted without the correct Return Materials Authorization (RMA) number from Biolog Technical Applications & Service, phone 510-785-2564, email tech@biolog.com. **UNAUTHORIZED RETURNS CANNOT BE ACCEPTED AND WILL BE RETURNED AT SENDER’S EXPENSE.**

Service Contract Options

Full Service Plan

The Full Service Plan includes all labor, travel, and expenses for an unlimited number of on-demand service visits and includes one (1) preventive maintenance visit per year by a trained Biolog Technical Application & Service representative. Full service customers receive priority scheduling for a preventive maintenance date. All labor, travel, expenses and parts are covered. The term of this contract is per calendar year, payable in advance.

Preventive Maintenance Plan

A trained Biolog Technical Application & Service representative performs the preventive maintenance on your OmniLog or MicroStation reader, electronic pipettor and Biolog turbidimeter during the year. All labor, travel, and expenses are covered and warranted for 30 days. Replacement parts not included. Allow 90 days for a scheduled date. The term of this contract is one year, payable in advance.

Per-Call Plan

The Per-Call Plan requires issuing a Purchase Order for an estimated amount. Parts, labor (\$125/hour), travel, and other accrued expenses are invoiced. The minimum labor invoice is 4 hours plus all expenses. Contact the TAS Department for a quote and scheduling at (510) 785-2564 or via email at tech@biolog.com.

Part number	Description	Price U.S. \$
SC90003	OmniLog Full Service Plan	9,200.00
SC90001	OmniLog Annual Preventive Maintenance	4,000.00
SC90005	OmniLog Per-Call Plan	Quote