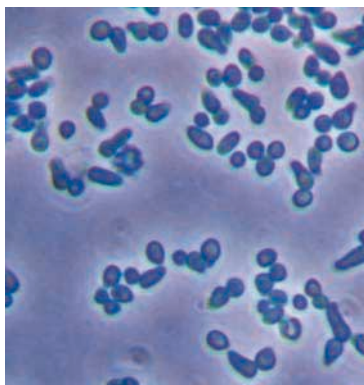


Everyday we come in contact with microorganisms. Sometimes we fight against them or we examine different specimens for them. Nowadays we even let them work for us. Knowing about the importance of isolation, detection analysis and cultivation, Fluka supports such activities with a wide range of products. The development of new methods and solutions



helps us to reach our targets in quality control, research and production. Diverse food and pharmaceutical industries, and the health care system, have made significant progress in this area and continue to perform innovative research.

Culture Media and Supplements

Fluka provides all the common dehydrated media and supplements as well as many specialties for the determination, isolation and cultivation of microorganisms (figure 1, 2, 3).

Over 400 dehydrated media are listed in the Fluka catalog. Additionally we offer a Microbiology Manual giving you detailed information and applications. The manual is available as printed version and on a CD. Fluka develops new media for distinct problems of our customers. A choice of innovative media makes the determination of microorganisms easier and more selective.

Chromogenic Media

The principle of a Chromogenic Medium is based on a common medium supplemented with a

chromogenic mixture (table 1). This method makes the detection of microorganisms faster, more reliable and accurate. Most of the microorganisms can be differentiated from others by the presence of characteristic enzymes which are highly specific to the examined organism. The chromogenic agent (e.g. X-glucuronide) used in the medium helps to detect

the enzyme activity. The cells absorb the chromogenic agent and the intracellular enzyme splits the bond between the chromophore and the sugar residue in most instances. The released chromophore gives coloration to the colonies.



Figure 1:
Comparison of
Media for Piericidin
Production

Fluorescence Media

E. coli can be demonstrated with Fluorescence Media by fluorescence in the UV. The media are based on a common formulation for the detection

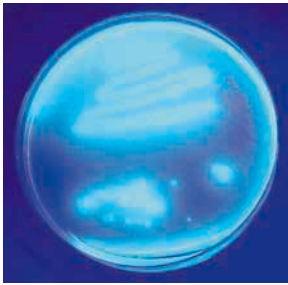


Figure 2:
BROLACIN MUG Agar



Figure 3:
Cereus selective Agar

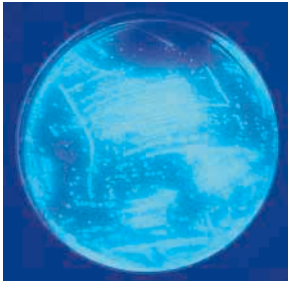


Figure 4:
ECD MUG Agar Plate
with Fluorescence Media

and enumeration of *E. coli* (table 2) supplemented with 4-methylumbelliferyl- β -D-glucuronide (MUG).

β -D-glucuronidase, which is produced by *E. coli*, cleaves MUG to 4-methylumbelliferone and glucuronide. The fluorogen 4-methylumbelliferone can be detected under a long wavelength UV lamp like in figure 4.

BSM Agar/Broth

Fluka developed BSM (Bifidus Selective Medium) especially for quality control in the dairy industry (table 4).

It has been designed for the selective isolation, identification and enumeration of Bifidobacteria like *Bifidobacterium longum* and *Bifidobacterium infantis*. Bifidobacteria grow very well on it while Lactobacillus and Streptococcus strains are inhibited. Bifidobacterium colonies grow within 24-48 hours (sometimes the growth might need up to three days because of the highly selective conditions). The colonies are violet/brown. At the industrial level this medium allows an easy and fast quality control of yogurt made with Bifidus and can be used to control the count of Bifidus bacteria.

Table 4: Bifidus Selective Medium

Fluka Cat. No.	Product
90273	BSM broth
88517	BSM agar
83055	BSM supplement



imMedia™

E. coli growth broths or agars with antibiotics with/without IPTG and X-gal, ready to use for molecular biology (table 3). Specially formulated growth media for *E. coli* that eliminate the time consuming need for autoclaving in media preparation. They are ready to use after heating for only approx. 4 min. in a microwave oven. They are presterilized, low- salt LB agar or broth supplemented with antibiotics, or with antibiotics and IPTG and X-gal. The media are developed for the maintenance, propagation of antibiotic resistant and for the blue/white recombinant *E. coli* screening. One package contains 20 pouches and each pouch provides sufficient material for 200 ml *E. coli* growth medium (equivalent to 8-10 plates).

Silicate Medium

Silica gels have not been commonly used in microbiological media preparations due to an apparent tediousness in the preparation procedure. Nevertheless there had been requests for such media by our customers. Therefore Fluka created a silicate medium – Fluka product number 52450. By offering this silica sol as a base medium, we can now facilitate the further development of new microbiological media. The substitution of agar by silica is useful for special applications such as cultivation of microorganisms under high pressure or in cases where agar and its hydrolysis products lead to problems. One other fact is that silica is not a C-source and this makes the medium more defined.

Literature – Silica Media:

- [1] A.S.Dietz, A.A.Yayanos, Appl. and Environm. Microbiol. 36, 966 (1978)
- [2] C.B.Taylor, J. gen. Microbiol. 4,235 (1950)
- [3] A.A.Yayanos et al., Porc. Natl. Acad. Sci. 78, 5212 (1981)

Figure 5:
Bioreactor for
Fermentation at Fluka

Base Ingredients

Fluka offers a wide range of basic reagents for preparing research, control and molecular biology media. Additionally we supply base ingredients for fermentation in large quantities (figure 5) in our catalog. On request we offer bulk quantities. As basic components of a medium, you need a carbon source, a nitrogen source, salts and gelling agents. For the carbon source we provide many different sugars or extracts (glucose, sorbitol, lactose, raffinose, malt extract, ...) well suited for microbiology. The nitrogen sources can be different peptones, extracts and sometimes single amino acids. Nowadays many people are changing from animal derived products to a plant peptone from potato, soybean, wheat or broad bean. Experience shows that you get the same, or even better, yield of biomass and biotransformed products. The salts are the buffering agents to keep the pH stable and assure the osmotic balance. Sometimes salt can make a medium more selective. An alternative method is to use selective antibiotics. Therefore Fluka offers a large stock of about 200 selective antibiotics for this purpose.

Homoserine Lactones (Quorum Sensing)

Quorum sensing is the regulation of gene expression in response to the variation in cell-popula-

Table 5: Homoserine Lactones

Fluka Cat. No.	Product
09945	N-Butyryl-DL-homoserine lactone
09926	N-Hexanoyl-DL-homoserine lactone
10939	N-Heptanoyl-DL-homoserine lactone
10940	N-Octanoyl-DL-homoserine lactone
10937	N-Tetradecanoyl-DL-homoserine lactone
17248	N-Decanoyl-DL-homoserine lactone
17247	N-Dodecanoyl-DL-homoserine lactone
10942	N-Butyryl-DL-homocysteine thiolactone

tion density. Bacteria produce and release chemical signal molecules, the concentration which is bound is a function of the cell density. At a minimal threshold these substances increase the gene expression. Different bacteria communicate in this way to regulate diverse physiological activities. Virulence, competence, conjugation, antibiotic production, motility, sporulation, symbiosis and biofilm formation are some processes depending on such molecules. Fluka produces different homoserine lactones which are built by Gram-negative bacteria (table 5 and figure 6).

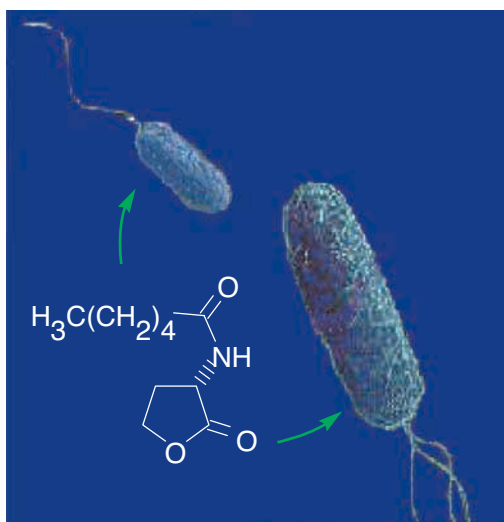


Figure 6: Homoserine Lactones for example in a Biofilm of different Bacteria Species (Quorum Sensing)

Nowadays some scientist try to stimulate bacteria for different applications, while others try to inhibit them with antagonists. Another method is destroying the homoserine lactones as was done by a Chinese team. The team has recently demonstrated genetically engineered tobacco and potato plants that apparently resist a plant pathogen by destroying its AHL (Dong Y.H. et al, Nature 411, 813-816; 2001).

Peptone Testkit

Many biotechnologists and microbiologists are confronted with the question of what is the best peptide source for their microorganisms. There are many different choices of peptones for a fermentation, a growth or for a control medium. With a peptide source specifically fitted to your microorganisms, you can increase the yield (figure 7) and improve the reproducibility of your results. The Fluka Peptone Testkit (Fluka product number 66315) helps to find the best peptone for your organisms, with the result saving money and time.

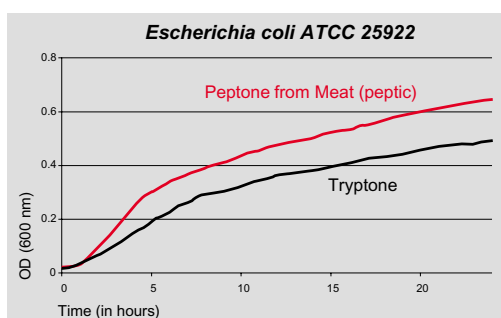


Figure 7: Growth of *E. coli* with different Peptone (1% peptone + 0.5% NaCl, Inoculum: 10^5 cfu/ml, temperature: 37°C)

The Microbiology Manual on CD

A new excellent tool to support our customers working with microorganisms.

You will find a Microbiology Media Data Bank on this CD, giving you detailed product information

- product composition
- directions for use
- required additives
- test strains
- pack sizes
- background information about the application
- references, literature

Using the advanced search machine on this CD you can search for names, synonyms, keywords and for product numbers of Fluka and competitors.

The detailed product information is printable as a working sheet. You will also find additional product information as pdf-files.

A link to our website gives you the prices in your local currency.

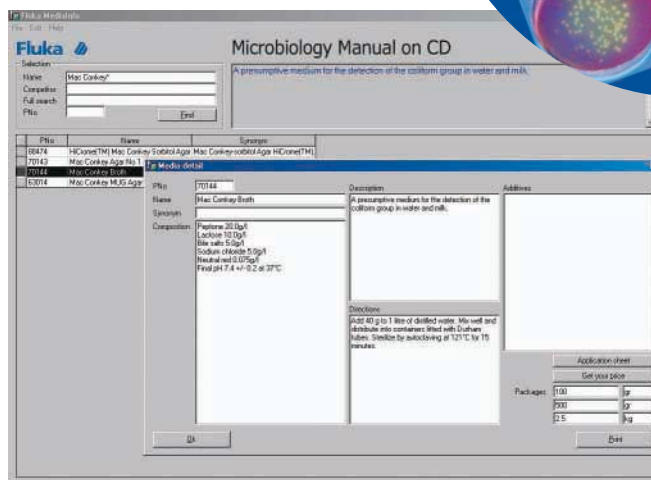
As the stock of this excellent CD is limited, please reserve your CD now.

Just fax us the inserted survey to

Mr. Jvo Siegrist
fax ++41 (0)81 755 2848 (Switzerland)

Mr. Simon Nikolay
fax ++49 (0)89 6513 1166 (Germany)
fax ++44 (0)1202 714 133 (UK)

Alternatively you may prefer to send us the electronic survey on
www.sigma-aldrich.com/analytix or
eMail to isiegris@eurnotes.sial.com
or to snikolay@eurnotes.sial.com.



Your Sigma-Aldrich Service Partners

Austria Wien

Tel. 01-605 81 10
Fax 01-605 81 20

Australia Castle Hill

Tel. (61-2) 9841 0555
Fax (61-2) 9841 0500

Belgium/Luxembourg Bornem

Tel. 03-899 13 01
Fax 03-899 13 11

Canada Oakville

Tel. 1-800-565-1400
Fax 1-800-265-3858

Czech Republic Praha

Tel. 02-2176 1310
Fax 02-2176 3300

Denmark Vallensbæk Strand

Tel. 43 56 59 10
Fax 43 56 59 05

Finland Helsinki

Tel. 09-350 9250
Fax 09-350 92555

France St. Quentin Fallavier

Tél. 0800 21 1408 (Numéro Vert)
Fax 0800 03 1052 (Numéro Vert)

Germany Taufkirchen

Free Tel. 0800 51 55 000
Free Fax 0800 64 90 000

Greece Ilioupoli, Athens

Tel. 010-994 8010
Fax 010-994 3831

Hungary Budapest

Tel. (06-1) 269-6474
Fax (06-1) 235-9050

Ireland Dublin

Tel. 01-404-1900
Fax 01-404-1910

Israel Rehovot

Tel. 08-9484-222
Fax 08-9484-200

Italy Milano

Tel. 02-33417-310
Fax 02-38010-737

Norway Oslo

Tel. 23 17 60 00
Fax 23 17 60 10

Poland Poznań

Tel. 061-829 01 00
Fax 061-829 01 20

Portugal Sintra

Tel. 800 20 21 80 (Gratuito)
Fax 800 20 21 78 (Gratuito)

South Africa Johannesburg

Tel. 011-979 1188
Fax 011-979 1119

Spain Alcobendas, Madrid

Tel. 900 10 13 76 (Gratuito)
Fax 900 10 20 28 (Gratuito)

Sweden Stockholm

Tel. 020-35 05 10
Fax 020-35 25 22

Switzerland Buchs

Swiss Freecall 0800 80 00 80
Fax 081 755 28 15

The Netherlands Zwijndrecht

Tel. 078-620 54 11
Fax 078-620 54 21

United Kingdom Gillingham

Free Tel. 0800 717181
Free Fax 0800 378785

USA Milwaukee

Tel. 1-800-558-9160
Fax 1-800-962-9591

Table 1: Fluka Chromogenic Media

Fluka Cat. No.	Product	Description
72953	Candida Ident Agar	For the selective isolation and identification of <i>Candida albicans</i> from clinical material like stool, urine, skin scurf and swabs. In addition the Medium is also used for the isolation and identification of a wide range of Gonococci, Yeasts and molds.
87959	HiCrome™ Coliform Agar	A selective chromogenic medium recommended for simultaneous detection of <i>Escherichia coli</i> and total coliforms in water and food samples.
95207	HiCrome™ E. coli Agar A	Recommended for the detection and enumeration of <i>Escherichia coli</i> in foods without further confirmation on membrane filter or by indole reagent (figure 8).
70722	HiCrome™ E. coli Agar B	Recommended for the detection and enumeration of <i>Escherichia coli</i> in foods without further confirmation on membrane filter or by indole reagent.
73009	HiCrome™ ECC Agar	A differential medium recommended for the presumptive identification of <i>Escherichia coli</i> and other coliforms in food and environmental samples (figure 9).
89823	HiCrome™ ECC Selective Agar	A selective medium recommended for the simultaneous detection of <i>Escherichia coli</i> and coliforms in water and food samples (figure 10).
88474	HiCrome™ Mac Conkey Sorbitol Agar	Recommended for selective isolation of <i>Escherichia coli</i> O157:H7 from food and animal feeding stuffs. Mac Conkey Sorbitol Agar is based on the formulation described by Rappaport and Henigh.
70641	HiCrome™ MS.0157 Agar	A selective medium recommended for the simultaneous detection of <i>Escherichia coli</i> , <i>Escherichia coli</i> O157:H7 and coliforms in water and food samples.
73318	HiCrome™ Salmonella Agar	A selective medium used for simultaneous detection of <i>Escherichia coli</i> and Salmonella from food and water (figure 11).
84369	Salmonella Chromogen Agar (Rambach equivalent Agar)	A differential diagnostic agar for the detection of Salmonella in food and clinical material.
92435	TBX Agar (Tryptone Bile X-glucuronide Agar)	For the detection and enumeration of <i>Escherichia coli</i> in foodstuffs, animal food and water without further confirmation.

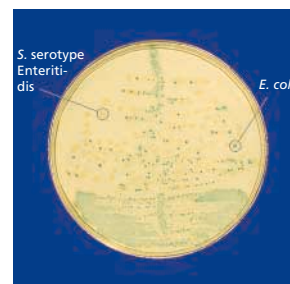


Figure 8: HiCrome™ E. coli Agar A

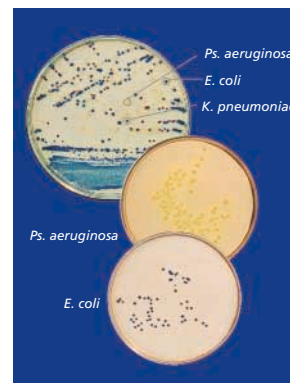


Figure 9: HiCrome™ ECC Agar

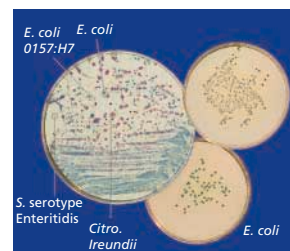


Figure 10: HiCrome™ ECC Selective Agar

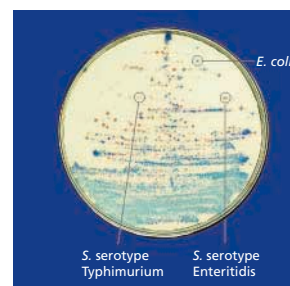


Figure 11: HiCrome™ Salmonella Agar

Table 2: Fluka Fluorescence Media

Fluka Cat. No.	Product	Description
16016	BRILA MUG Broth	A selective medium for the detection of <i>E. coli</i> and coliforms in the water of bathing areas.
16037	BROLACIN MUG Agar	For the enumeration, isolation and identification of microorganisms in urine.
22099	CASO MUG Agar	Universal medium for enumeration and cultivation of a wide variety of microorganisms in particular <i>E. coli</i> .
31401	DEV Lactose Peptone MUG Broth	For the enrichment and titre determination of coliform bacteria in connection with the bacteriological examination of water.
44782	E. coli O157:H7 MUG Agar	Selective agar for the isolation and differentiation of enterohaemorrhagic (EHEC) <i>E. coli</i> O157:H7-strains from food and clinical material.
44657	ECD MUG Agar	The bile-salt mixture in this <i>E. coli</i> Direct Agar extensively inhibits the non-obligatory intestinal accompanying flora.
62634	LST-MUG Broth	Fluorescent method for the detection of <i>E. coli</i> .
63014	Mac Conkey MUG Agar	For the isolation of Salmonella, Shigella and coliform bacteria, in particular <i>E. coli</i> , from diverse material.
17165	MUG Tryptone Soya Agar	For cultivation of fastidious and nonfastidious microorganisms by fluorescent method.
80961	Plate Count MUG Agar	For the determination of bacterial counts and identification of <i>E. coli</i> in milk, dairy products, water and other material.
95273	VRB MUG Agar	Selective medium for the detection and enumeration of coliform bacteria, in particular <i>E. coli</i> .

Table 3: imMedia™

Fluka Cat. No.	Product	Description
21614	imMedia™ Amp Agar	LB Agar, ampicillin
28202	imMedia™ Amp Blue	LB Agar, ampicillin, IPTG, X-gal
28207	imMedia™ Amp Liquid	LB Broth, ampicillin
21601	imMedia™ Kan Agar	LB Agar, Kanamycin
28236	imMedia™ Kan Blue	LB Agar, Kanamycin, IPTG, X-gal
17986	imMedia™ Kan Liquid	LB Broth, Kanamycin
22293	imMedia™ Zeo Agar	LB Agar, Zeocin
21608	imMedia™ Zeo Liquid	LB Broth, Zeocin

Please take a look at our former
 Analytix newsletters at www.sigma-aldrich.com/analytix.



Improved Protein Sequencing Reagents for Proteomics



Microphotography

Sigma-Aldrich has a **NEW** Website



Thousands of Information-packed Pages:

Product Sheets, Spectra,  **NEW PRODUCTS**, and more

Plus Improved Online Ordering:



- Simplifies your Ordering
- Shortens the Time between Ordering and Delivery to your Bench
- Allows both New and Existing Users to upgrade their Registration to Order Online by going to: www.sigma-aldrich.com/new

The Sigma-Aldrich Family



Biochemicals and Reagents for Life Science Research



Organics and Inorganics for Chemical Synthesis



Speciality Chemicals and Analytical Reagents for Research

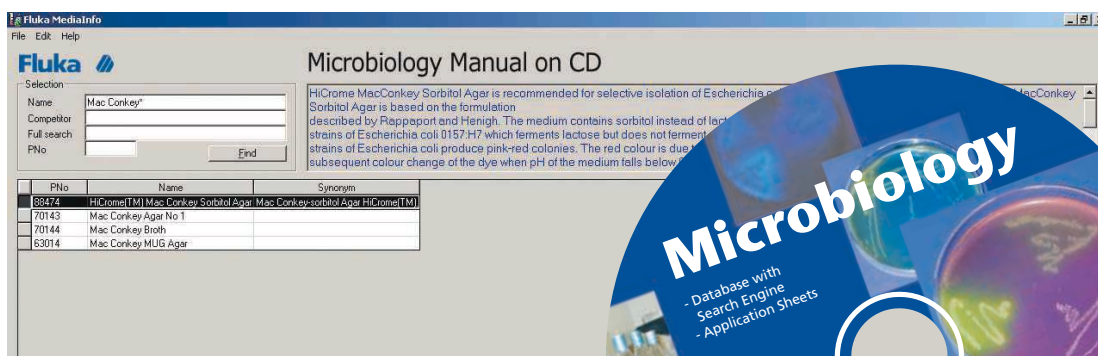


Laboratory Chemicals and Reagents for Research and Analysis



Chromatography Products for Analysis and Purification

Get your Unique Microbiology Media Data Bank on CD:



Media detail

PNo: 70144
Name: MacConkey Broth
Synonym:
Composition: Peptone 20.0g/l
Lactose 10.0g/l
Bile salts 5.0g/l
Sodium chloride 5.0g/l
Neutral red 0.075g/l
Final pH 7.4 +/- 0.2 at 37°C

Description: A presumptive medium for the detection of the coliform group in water and milk.

Directions: Add 40 g to 1 litre of distilled water. Mix well and distribute into containers fitted with Durham tubes. Sterilize by autoclaving at 121°C for 15 minutes.

Additives:

Application sheet
Get your price

Packages: 100 gr
500 gr
2.5 kg

Print

More than 450 Microbiology Media!

Advanced Search Engine – just search and print your detailed Product Information:

- Product Composition, Package Sizes
- Applications and Protocols
- Directions for Use
- Required Additives
- Test Strains
- References, Literature

Additional Application Information as pdf-Files

This excellent Tool is **free of charge!***

*The stock of this CD is **limited!** You will receive your Microbiology CD (FDQ) as long as it is available for sending us your completed survey.

Just fax the **completed survey** on the reverse side to

Mr. Jvo Siegrist
fax ++41 (0)81 755 2848 (Switzerland)
eMail: isiegris@eurnotes.sial.com

Mr. Simon Nikolay
fax ++49 (0)89 6513 1166 (Germany)
fax ++44 (0)1202 714 133 (UK)
eMail: snikolay@eurnotes.sial.com

Alternatively you may prefer to send us the electronic survey on www.sigma-aldrich.com/analytix.

Complete this Survey and get a free Microbiology CD!

1. Which of the applications listed below are relevant to your research activity?

- | | | |
|--|---|---|
| <input type="checkbox"/> Microbiology (MCBI, MIPR) | <input type="checkbox"/> Food Testing (MICB) | <input type="checkbox"/> Sterility Testing (CLMI, INHY) |
| <input type="checkbox"/> Diagnostic-Pathogens (CLMI) | <input type="checkbox"/> Water Testing (DRIN, ENVW) | <input type="checkbox"/> other, please specify _____ |
| <input type="checkbox"/> Molecular Biology (MOLE) | <input type="checkbox"/> Fermentation (FERM) | |

2. What is your job description?

- | | | |
|-------------------------------------|--|--|
| <input type="checkbox"/> Technician | <input type="checkbox"/> Head of a research department | <input type="checkbox"/> other, please specify _____ |
| <input type="checkbox"/> Student | <input type="checkbox"/> Purchaser | |

3. Could you please specify the 3 most frequently used media in your laboratory?

- | | | |
|--|---|--|
| <input type="checkbox"/> Blood Agar (Base) | <input type="checkbox"/> Nutrient Agar | <input type="checkbox"/> XLD Agar |
| <input type="checkbox"/> Brain Heart Infusion Agar | <input type="checkbox"/> Plate Count Agar | <input type="checkbox"/> other, please specify _____ |
| <input type="checkbox"/> LB Agar | <input type="checkbox"/> Sabouraud 2% Glucose Agar | _____ |
| <input type="checkbox"/> LB Broth | <input type="checkbox"/> Sabouraud 4% Glucose Agar | _____ |
| <input type="checkbox"/> Mac Conkey Broth | <input type="checkbox"/> Tryptic Soy Agar/CASO Agar | _____ |
| <input type="checkbox"/> Malt Extract Agar | <input type="checkbox"/> Tryptic Soy Broth/CASO Broth | |
| <input type="checkbox"/> Milk Agar | <input type="checkbox"/> Tryptone Water | |
| <input type="checkbox"/> Mueller Hinton Agar/Broth | <input type="checkbox"/> Violet Red Bile Agar | |

4. Approximately, what is the volume of dehydrated media you use in your laboratory on an annual basis?

- | | |
|--|--|
| <input type="checkbox"/> 1-5 kg | Please specify the number of users.
Number of users _____ |
| <input type="checkbox"/> 6-10 kg | |
| <input type="checkbox"/> 10-20 kg | |
| <input type="checkbox"/> more than 20 kg | |

5. What criteria are important for the choice of your media supplier?

- | | | |
|--|--|--|
| <input type="checkbox"/> quality | <input type="checkbox"/> certificates (analysis, test strains) | <input type="checkbox"/> other, please specify _____ |
| <input type="checkbox"/> range | <input type="checkbox"/> technical support | |
| <input type="checkbox"/> service | <input type="checkbox"/> on site stock | |
| <input type="checkbox"/> application documentation | <input type="checkbox"/> e-commerce purchasing | |

6. Who are your preferred suppliers for microbiology media?

- | | | |
|--|-------------------------------------|--|
| <input type="checkbox"/> Merck | <input type="checkbox"/> BioMerieux | <input type="checkbox"/> other, please specify _____ |
| <input type="checkbox"/> BD (Difco, BBL) | <input type="checkbox"/> Sigma | |
| <input type="checkbox"/> Oxoid | <input type="checkbox"/> Fluka | |

7. Are you responsible for ordering microbiology media?

- yes
- if not, who is responsible for ordering, please specify _____

8. Additionally I would like to receive a free copy:

- | | | |
|--|---|--|
| <input type="checkbox"/> all upcoming issues of AnalytiX (NEWA) | <input type="checkbox"/> Fluka Riedel-de Haën Catalog (003) | <input type="checkbox"/> Cell Signaling Catalog (079) |
| <input type="checkbox"/> only AnalytiX issues with relevance to the fields of work indicated above | <input type="checkbox"/> Sigma General Catalog (001) | <input type="checkbox"/> Combinatorial Chemistry Catalog (EEA) |
| <input type="checkbox"/> Origins Life Science Newsletter (DPR) | <input type="checkbox"/> Supelco Catalog (013) | <input type="checkbox"/> Equipment Catalog, coming spring 2003 (086) |
| | <input type="checkbox"/> Life Science Catalog (078) | |

Thank you for taking your time to complete our survey. We will send you the Microbiology CD* (FDQ) free of charge for your valued feedback.

Name _____	First Name _____	
Company _____	Department _____	
Street/No _____	Zip Code _____	
Town _____	Country _____	
Phone _____	Fax _____	E-mail _____

DO8

Please fax the completed survey to Mr. Jvo Siegrist at ++41 81 755 28 48 (Switzerland), or Mr. Simon Nikolay at ++49 (0)89 6513 1166 (Germany) or ++44 (0) 1202 714 133 (UK). Alternatively you may prefer to send us the electronic version of the survey on www.sigma-aldrich.com/analytix or eMail to isiegris@eurnotes.sial.com or snikolay@eurnotes.sial.com.

* You will receive your Microbiology CD (FDQ) as long as it is available for sending us the completed survey.