SABOURAUD DEXTROSE AGAR, EMMONS w/ and w/o ADDITIVES

INTENDED USE

Remel Sabouraud Dextrose Agar, Emmons w/ and w/o Additives are solid media recommended for use in qualitative procedures for primary isolation and cultivation of pathogenic yeast and molds from clinical specimens.

SUMMARY AND EXPLANATION

Sabouraud Dextrose Agar, Emmons is a modification of the medium developed by Sabouraud in 1892.[1] Emmons neutralized the pH, increasing it to 7.0, and reduced the concentration of dextrose from 40 to 20 g/l.[2] Adding antibiotics to this medium has made it inhibitory to bacterial overgrowth while allowing isolation of pathogenic fungi. This selectivity is achieved by incorporation of chloramphenicol, cycloheximide, gentamicin, penicillin, and/or streptomycin.[3]

PRINCIPLE

Casein and meat peptones supply nitrogenous compounds and amino acids necessary for the growth of fungi. Dextrose is an energy source which serves to support the growth of fungi. Chloramphenicol and gentamicin are broad-spectrum antibiotics which inhibit a range of gram-positive and gram-negative bacteria. Cycloheximide is inhibitory to rapidly growing saprophytic fungi that could overgrow slower-growing primary pathogens. Penicillin is active against gram-positive bacteria. Streptomycin inhibits gram-positive and gram-negative bacteria. Yeast extract may be added to the medium as a growth supplement to ensure the growth of fastidious fungi.

REAGENTS (CLASSICAL FORMULA)*

Base Medium:

Dextrose	20.0 g	Meat Peptone	5.0 g
Casein Peptone	5.0 g	Agar	15.0 g
		Demineralized Water	1000.0 ml

pH 7.0 ± 0.2 @ 25 C

The following combinations of optional ingredients are available per liter of medium:

1. Chloramphenicol ..... 50.0 mg
2. Cycloheximide ..... 500.0 mg
3. Gentamicin ..... 40.0 mg
4. Chloramphenicol ..... 50.0 mg
   Gentamicin ..... 40.0 mg
5. Chloramphenicol ..... 50.0 mg
   Cycloheximide ..... 500.0 mg
6. Penicillin ..... 20,000 U
   Streptomycin ..... 40.0 mg
7. Yeast Extract ..... 10.0 g

*Adjusted as required to meet performance standards.

PROCEDURE

1. Inoculate and streak the specimen as soon as possible after it is received in the laboratory. Consult appropriate references for information regarding specimen processing and inoculation.[4,5]
2. Inoculate selective and nonselective media for isolation of fungi from potentially contaminated sources.
3. Incubate plates in ambient air at 25-30°C in an inverted position with increased humidity for 30 days or longer.
4. Examine media for fungal colonies exhibiting typical color and morphology.

QUALITY CONTROL

All lot numbers of Sabouraud Dextrose Agar, Emmons w/ and w/o Additives have been tested using the following quality control organisms and have been found to be acceptable. This quality control testing meets or exceeds CLSI standards.[6] Testing of control organisms should be performed in accordance with established laboratory quality control procedures. If aberrant quality control results are noted, patient results should not be reported.

CONTROL	INCUBATION	RESULTS
Sabouraud Dextrose Agar, Emmons:		
**Candida albicans* ATCC® 60193	Ambient, up to 72 h @ 25-30°C	Growth
**Trichophyton mentagrophytes* ATCC® 9533	Ambient, up to 72 h @ 25-30°C	Growth
Cryptococcus neoformans ATCC® 34877	Ambient, up to 72 h @ 25-30°C	Growth
Sabouraud Dextrose Agar, Emmons w/ Chloramphenicol:		
**Candida albicans* ATCC® 10231	Ambient, up to 72 h @ 25-30°C	Growth
**Trichophyton mentagrophytes* ATCC® 9533	Ambient, up to 72 h @ 25-30°C	Growth
Cryptococcus neoformans ATCC® 34877	Ambient, up to 72 h @ 25-30°C	Growth
**Escherichia coli* ATCC® 25922	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)

(Continued on back)

CONTROL	INCUBATION	RESULTS
Sabouraud Dextrose Agar, Emmons w/ Cycloheximide:		
**Candida albicans* ATCC® 10231	Ambientc, up to 72 h @ 25-30°C	Growth
**Trichophyton mentagrophytes* ATCC® 9533	Ambient, up to 72 h @ 25-30°C	Growth
**Aspergillus niger* ATCC® 16404	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
Cryptococcus neoformans ATCC® 34877	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
Sabouraud Dextrose Agar, Emmons w/ Gentamicin:		
**Candida albicans* ATCC® 10231	Ambient, up to 72 h @ 25-30°C	Growth
**Trichophyton mentagrophytes* ATCC® 9533	Ambient, up to 72 h @ 25-30°C	Growth
Cryptococcus neoformans ATCC® 34877	Ambient, up to 72 h @ 25-30°C	Growth
Pseudomonas aeruginosa ATCC® 27853	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
Sabouraud Dextrose Agar, Emmons w/ Chloramphenicol w/ Gentamicin:		
**Candida albicans* ATCC® 10231	Ambient, up to 72 h @ 25-30°C	Growth
**Trichophyton mentagrophytes* ATCC® 9533	Ambient, up to 72 h @ 25-30°C	Growth
Cryptococcus neoformans ATCC® 34877	Ambient, up to 72 h @ 25-30°C	Growth
**Escherichia coli* ATCC® 25922	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
Staphylococcus aureus ATCC® 25923	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
Pseudomonas aeruginosa ATCC® 27853	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
Sabouraud Dextrose Agar, Emmons w/ Chloramphenicol w/ Cycloheximide:		
**Candida albicans* ATCC® 10231	Ambient, up to 72 h @ 25-30°C	Growth
**Trichophyton mentagrophytes* ATCC® 9533	Ambient, up to 72 h @ 25-30°C	Growth
**Aspergillus niger* ATCC® 16404	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
Cryptococcus neoformans ATCC® 34877	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
**Escherichia coli* ATCC® 25922	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
Staphylococcus aureus ATCC® 25923	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
Sabouraud Dextrose Agar, Emmons w/ Penicillin w/ Streptomycin:		
**Candida albicans* ATCC® 10231	Ambient, up to 72 h @ 25-30°C	Growth
**Trichophyton mentagrophytes* ATCC® 9533	Ambient, up to 72 h @ 25-30°C	Growth
Cryptococcus neoformans ATCC® 34877	Ambient, up to 72 h @ 25-30°C	Growth
**Escherichia coli* ATCC® 25922	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
Staphylococcus aureus ATCC® 25923	Ambient, up to 72 h @ 25-30°C	Inhibition (partial to complete)
Sabouraud Dextrose Agar, Emmons w/ 1% Yeast Extract:		
**Candida albicans* ATCC® 60193	Ambient, up to 72 h @ 25-30°C	Growth
**Trichophyton mentagrophytes* ATCC® 9533	Ambient, up to 72 h @ 25-30°C	Growth
Cryptococcus neoformans ATCC® 34877	Ambient, up to 72 h @ 25-30°C	Growth

*CLSI recommended organism

LIMITATIONS

1. Cycloheximide may inhibit the growth of some potentially pathogenic fungi, e.g., *Cryptococcus neoformans*, some *Candida* spp., some *Aspergillus* spp., and *Zygomycetes*.[7]
2. The use of Shrink-Seals (REF R522600) or gas-permeable tape to secure the plates is recommended to prevent exogenous contamination, avoid moisture loss, and protect personnel from potential exposure to pathogenic molds.[4]

BIBLIOGRAPHY

1. Sabouraud, R. 1892. Ann. Dermatol. Syphil. 3:1061-1087.
2. Emmons, C.W., C.H. Binford, J.P. Utz, and K.J. Kwon-Chung. 1977. Medical Mycology. 3rd ed. Lea and Febiger, Philadelphia, PA.
3. Georg, L.K., L. Ajello, and M.A. Gordon. 1951. Science. 144:387-389.
4. Isenberg, H.D. 2004. Clinical Microbiology Procedures Handbook. 2nd ed., Vol. 2. ASM Press, Washington, D.C.
5. Forbes, B.A., D.F. Sahm, and A.S. Weissfeld. 2007. Bailey and Scott's Diagnostic Microbiology. 12th ed. Mosby Elsevier, St. Louis, MO.
6. Clinical and Laboratory Standards Institute (CLSI). 2004. Quality Control for Commercially Prepared Microbiological Culture Media; Approved Standard, 3rd ed. M22-A3. CLSI, Wayne, PA.
7. Larone, D.H. 2002. Medically Important Fungi, A Guide to Identification. 4th ed. ASM Press, Washington, D.C.

Refer to the front of Remel *Technical Manual of Microbiological Media* for **General Information** regarding precautions, product storage and deterioration, specimen collection, storage and transportation, materials required, quality control, and limitations.

ATCC® is a registered trademark of American Type Culture Collection.

IFU 1760, Revised August 23, 2011

Printed in U.S.A.

remel

12076 Santa Fe Drive, Lenexa, KS 66215, USA
General Information: (800) 255-6730 Website: www.remel.com Email: remel@remel.com
Local/International Phone: (913) 888-0939 International Fax: (913) 895-4128