

# PHENYLETHYL ALCOHOL (PEA) AGAR

**PRODUCTS:**

**Plated Media:**

Phenylethyl Alcohol Agar with 5% Sheep Blood	P2200
Phenylethyl Alcohol Agar with 5% Sheep Blood, Anaerobic	303432

**PURPOSE:**

Phenylethyl Alcohol (PEA) Agar is recommended for the selective isolation of gram-positive cocci from clinical specimens or from mixed populations of gram-negative and gram-positive flora. The anaerobic formula is particularly effective in isolating fastidious and slowly growing gram-positive bacteria from mixed flora. Several references specify Phenylethanol Agar for use. <sup>2,3,6</sup>

**PRINCIPLE:**

PEA Agar with sheep blood is a selective media developed by Brewer and Lilley<sup>1</sup> in 1949. The addition of phenylethyl alcohol to the basal nutritive media permits the growth of gram-positive organisms (particularly cocci) while inhibiting most gram-negative organisms, especially the swarming of *Proteus* species. Most gram-negative organisms will form visible colonies, but appear smaller and fewer in number than the gram-positive colonies, allowing for isolation and subculture. The media is not recommended for the determination of hemolytic reactions, as atypical reactions may occur.

**FORMULAS:**

Approximate, per liter deionized filtered water.

**(1) Phenylethyl Alcohol with 5% Sheep Blood:**

Pancreatic Digest of Casein .....	15.0 g
Enzymatic Soy Digest .....	5.0
β-Phenylethyl Alcohol.....	2.5
Sodium Chloride.....	5.0
Agar.....	15.0
Sheep Blood.....	50.0 ml
Final pH 7.3 ± 0.2 at 25°C	

**(2) Phenylethyl Alcohol with 5% Sheep Blood, Anaerobic:**

Same as (1) with 0.5 mg Menadione and 5.0 g Hemin.

**PRECAUTIONS:\***

For *in vitro* diagnostic use. Observe approved biohazard precautions.

**Storage:** Upon receipt store at 2-8°C away from direct light. Media should not be used if there are signs of contamination, deterioration (shrinking, cracking, or discoloration), or if the expiration date has passed.

**Limitations:**

This media is not recommended for the determination of hemolytic reactions as atypical reactions may occur. Organisms should be subcultured onto Tryptic Soy Agar With 5% Sheep Blood Agar for examining hemolysis.

*Pseudomonas aeruginosa* is not inhibited on this media.

Phenylethyl alcohol may be inhibitory to some gram-positive organisms; therefore, prolonged incubation (to 48 hours) may be warranted in some cases.

**PROCEDURE:\***

**Specimen Collection:** Information on specimen collection and transport is found in standard reference materials on the subject. In general, specimens should be protected from extreme heat and cold and delivered to the laboratory without delay.

**Method of Use:** Prior to inoculation, the media should be brought to room temperature. Inoculate according to standard microbiological procedures and streak the inoculum so as to obtain isolated colonies. Incubate under conditions that will permit growth. In general, incubate at 35°C in CO<sub>2</sub> or anaerobic environment for 18-24 hours, or if necessary 48 hours.

**Interpretation:** After incubation, plates may show an area of mass or confluent growth. The streaking procedure should result in diminished numbers of colonies on the streaked areas, and one or more of these areas should exhibit isolated colonies of the organisms contained in the specimen which are suitable for subculture or examination. The colony characteristics listed below are typical:<sup>a</sup>

**Microorganisms:**

*Streptococcus viridans*  
*Streptococcus pyogenes*  
*Streptococcus pneumoniae*  
*Staphylococcus aureus*

*Staphylococcus epidermidis*

*Proteus mirabilis*

**Expected Results:**

Small, transparent to opaque, domed, smooth, and entire edge.  
 Small, transparent to opaque, domed, smooth, entire edge.  
 Small, round, and mucoid, with entire edge.  
 Average, opaque, circular, smooth, raised, usually white to colorless.  
 Average, opaque, circular, smooth, raised, usually white to colorless.  
 Partially inhibited, no spreading.

<sup>a</sup>not recommended for determination of hemolytic reactions.

**Material Required but Not Provided:** Standard microbiological supplies and equipment such as those commonly found in a microbiological laboratory are not provided.

**QUALITY CONTROL:**

**Microorganisms Used (ATCC #):**

*Streptococcus pyogenes* (19165)  
*Staphylococcus aureus* (25923)  
*Proteus mirabilis* (12453)

**Expected Result:**

Growth  
 Growth, diminished  
 Inhibited, partial or complete

Key: See "Interpretation"

**User Quality Control:** Check for signs of contamination and deterioration. PEA with 5% Sheep blood should appear firm, opaque and red in color.

**BIBLIOGRAPHY:**

1. Brewer, J. H., and B. D. Lilley, Presented before a meeting of the Maryland Association of Medical and Public Health Laboratories, Dec. 2, 1949.
2. Forbes, B. A., Sahm, D.F., and Weissfeld, A.S., *Bailey and Scott's Diagnostic Microbiology*, 10th ed., C. V. Mosby, St. Louis, 1998.
3. Isenberg, H. D. (ed.), *Clinical Microbiology Procedures Handbook*, American Society for Microbiology, Washington, D.C., 1993
4. Lilley, B. D., and J. H. Brewer, The Selective Antibacterial Action of Phenylethylalcohol. *J. Pharm. Assoc.* 42:6, 1953
5. MacFaddin, J. F., *Media for Isolation-Cultivation-Identification-Maintenance of Medical Bacteria*, vol. 1, Williams & Wilkins, Baltimore, MD, 1985.
6. Murray, P. R., et al., *Manual of Clinical Microbiology*, 8th ed., American Society for Microbiology, Washington D.C., 2003.
7. Washington, J. A., *Laboratory Procedures in Clinical Microbiology*, Springer-Verlag, New York, 1981.

\*For more detailed information, consult appropriate references.

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