Biomed Global

Rev: 0
Effective Date: 15/11/2024
REF SP90C1031

# Columbia 5% Sheep Blood Agar/SDA with Chloramphenicol | Ready-to-use Media

a product by Biomed MDX

IVD

## Intended Use:

Columbia Agar with 5% Sheep Blood and SDA with Chloramphenicol (Biplate) medium is a dual-purpose medium used to isolate and cultivate bacteria, yeast and fungi from clinical specimens. Columbia Agar with 5% Sheep Blood allows for the differentiation of bacteria based on their hemolytic reactions, while SDA with Chloramphenicol is a selective medium for the isolation of yeast and fungi.

## Principle of the Procedure:

**Columbia 5% Sheep Blood Agar** :

Columbia agar with 5% sheep blood is a differential and enriched medium widely employed in clinical microbiology. Its composition of Columbia agar base supplemented with 5% defibrinated sheep blood provides essential nutrients and growth factors, supporting the cultivation of a broad spectrum of microorganisms, including fastidious species. The sheep blood component also facilitates the differentiation of bacteria based on their hemolytic properties. Columbia Agar Base is a foundational medium for cultivating a wide range of bacteria, including both fastidious and non-fastidious organisms. Introduced in 1966, it provides a rich environment for microbial growth. Modifications can be introduced to enhance its utility. For example, specific additives can be incorporated to selectively inhibit the growth of certain bacterial groups, allowing for the isolation of specific target organisms from complex samples.

**SDA with Chloramphenicol**:

Sabouraud Dextrose Agar (SDA) with chloramphenicol is a selective medium used for the isolation of fungi, particularly yeasts and molds, while inhibiting bacterial growth. The base medium, SDA, provides a rich source of carbohydrates (dextrose) and nitrogen (peptone) essential for fungal proliferation. The inclusion of chloramphenicol, a broad-spectrum antibiotic, acts as the selective agent. Chloramphenicol effectively suppresses the growth of a wide range of bacteria, including both Gram-positive and Gram-negative species, thereby minimizing bacterial contamination and allowing for the preferential growth of fungi. This selective pressure is crucial when culturing specimens that may contain a mixed microbial population, as it facilitates the isolation and identification of the target fungal species without overgrowth by bacteria.

## Product Summary:

**Columbia 5% Sheep Blood Agar**:

Columbia Agar Base is a foundational medium for cultivating a wide range of bacteria, including both fastidious and non-fastidious organisms. Introduced in 1966, it provides a rich environment for microbial growth[1]. Modifications can be introduced to enhance its utility. For example, specific additives can be incorporated to selectively inhibit the growth of certain bacterial groups, allowing for the isolation of specific target organisms from complex samples.

**SDA with Chloramphenicol**:

Infections associated with dermatophytes, other fungi and yeasts, are increasingly becoming a health problem, especially in developed countries. The diffusion of immunodeficiencies-related diseases, together with advanced medical techniques used, including intensive care units, organ transplants and the indiscriminate prescription of antimicrobials have inevitably led to an increased number of immunocompromised patients, and created the ideal conditions for the development of opportunistic fungal infections[2]. Dermatophytes are a group of filamentous fungi able to utilize keratin found in skin, hair or nails which can damage these tissues. The most frequent types of infections are Tinea capitis, Tinea pedis and Tinea unguium, involving head, feet and nails of the patient respectively[3]. They are responsible for most of the superficial mycosis known as 'dermatophytosis' and affecting about 20-25% of the worldwide population[4]. Dermatophyte fungi include three genera occupying different ecological niches, but they are all associated to human clinical conditions with *Trichophyton rubrum* being the most common. Overall, dermatophyte infections are very common and rarely invasive because of the inability of these organisms to infect non-keratinised tissues, such as internal tissues and organs. However, the severity of the condition is always dependent on the host's immune response, the virulence of the species involved and the environmental conditions. Chloramphenicol acts as a broad spectrum antimicrobic which inhibits a wide range of gram-positive and gram-negative bacteria.

**Formulation* (PER LITER):**

| Columbia 5% Sheep Blood Agar | | SDA with Chloramphenicol | |
|---|---|---|---|
| Pancreatic Digest of Casein | 10.0g | Pancreatic Digest of Casein | 5.0g |
| Meat Peptic Digest | 5.0g | Peptic Digest of Animal Tissue | 5.0g |
| Yeast Extract | 5.0g | Dextrose | 40.0g |
| Heart Pancreatic Digest | 3.0g | Agar | 15.0g |
| Corn Starch | 1.0g | Chloramphenicol | 0.05g |
| Sodium Chloride | 5.0g | | |
| Agar | 13.5g | | |
| Sheep Blood | 50.0g | | |

pH 7.3 +/- 0.2 pH 5.6 +/- 0.2

*Adjust and/or supplemental as required to meet performance criteria

# Procedure

### Materials Provided

90mm Columbia Sheep Blood Agar/SDA with Chloramphenicol.

### Materials Required but Not Provided

Ancillary culture media, reagents, and laboratory equipment as required.

### Test Procedure

1. Collect a sample of the undiluted, well-mixed sample using a calibrated loop (0.01 or 0.001 ml) for each of the two media of this biplate.
2. First, streak a sample on Columbia Sheep Blood Agar, then the second sample on SDA with Chloramphenicol Agar.
3. Incubate plates at 35°C ± 2°C for 18 to 72 hours.
4. Observe the result according to user requirements.
5. Dispose of all used reagents and contaminated materials as infectious waste. Laboratories must handle and dispose of all waste safely according to regulations.

### Results

Examine for colonies exhibiting colonial morphology. Appropriate biochemical or immunological tests may be required for final identification.

### Quality Control

Inoculate representative samples with the following strains. Incubate the inoculated plates at 35 ± 2°C for 18 to 72 hrs. to allow colonies to develop on the medium.

**Columbia Sheep Blood Agar**:

| Strains | ATCC® | Growth |
|---|---|---|
| *Escherichia coli* | 25922 | Growth at 24 hours, beta hemolysis |
| *Streptococcus pyogenes* | 19615 | Growth at 24 hours, beta hemolysis |
| *Streptococcus pneumoniae* | 6305 | Growth at 24 hours, alpha hemolysis |
| *Candida albicans* | 60193 | Growth at 24 hours, no hemolysis |
| *Enterococcus faecalis* | 9533 | Growth at 24 hours, gamma hemolysis |
| Uninoculated plate | - | No Growth |

**SDA with Chloramphenicol:**

| Strains | ATCC® | Growth |
|---|---|---|
| *Candida albicans* | 60193 | Growth at 72 hours |
| *Trichophyton mentagrophytes* | 9533 | Growth at 72 hours |
| *Escherichia coli* | 25922 | Partial to complete inhibition |
| Uninoculated plate | - | No Growth |

### Transportation:

Temperature fluctuations may occur during transportation. However, these fluctuations do not affect the performance, quality, or safety of the media.

### Storage and Shelf Life:

Upon receipt, store plates at 2 to 8°C, in their original sleeve wrapping until just before use. Avoid freezing and overheating.

The plates may be inoculated up to the expiration date (see package label) and incubated for the recommended incubation times.

### Warning and Precautions:

For in vitro diagnostic use. For Professional Use Only. Do Not Reuse.

Do not use plates if they show evidence of microbial contamination, discoloration, drying, cracking, or other signs of deterioration.

### Limitation of the Procedure

This medium is for laboratory use only and is not intended for the diagnosis of disease or other conditions. Identifications are presumptive and colonies should be identified using appropriate methods [5-8]

## Reference

1. Ellner, P. D., Stoessel, C. J., Drakeford, E., & Vasi, F. A. (1966). New Culture Medium for Medical Bacteriology.
2. Chanyachailert, P., Leeyaphan, C., & Bunyaratavej, S. (2023). Cutaneous fungal infections caused by dermatophytes and non-dermatophytes: an Updated Comprehensive Review of Epidemiology, Clinical presentations, and diagnostic testing. *Journal of Fungi*, *9*(6), 669.
3. Reddy, K. R. (2017). Fungal Infections (Mycoses): Dermatophytoses (Tinea, Ringworm). *Journal of Gandaki Medical College-Nepal*, *10*(1).
4. Keshwania, P., Kaur, N., Chauhan, J., Sharma, G., Afzal, O., Alfawaz Altamimi, A. S., & Almalki, W. H. (2023). Superficial Dermatophytosis across the World's Populations: Potential Benefits from Nanocarrier-Based Therapies and Rising Challenges. *ACS omega*, *8*(35), 31575-31599.
5. Zimbro, M. J., Power, D. A., Miller, S. M., Wilson, G. E., & Johnson, J. A. (Eds.). (2009). Difco™ and BBL™ manual: Manual of microbiological culture media (2nd ed.). Becton, Dickinson and Company.
6. Zimbro, M. J., Power, D. A., Miller, S. M., Wilson, G. E., & Johnson, J. A. (Eds.). (2009). Difco™ and BBL™ manual: Manual of microbiological culture media (2nd ed.). Becton, Dickinson and Company.

## Packaging Symbol

| Symbol | Definition |
|---|---|
| REF | Catalogue number |
| IVD | In Vitro Diagnostic Medical Device |
| LOT | Batch code |
| | Date of manufacture |
| | Temperature limit |
| | Use-by date |
| | Keep away from sunlight |
| | Do not re-use |
| | Fragile, handle with care |
| | Consult instructions for use or consult electronic instructions for use |
| | Do not use if packaging damaged and consult instructions for use |
| | Manufacturer |

## Further Information:

For further information please contact your Biomed MDX representative.

Biomed MDX Sdn Bhd
8, Jalan IAN 3, Industri Angkasa Nuri,
76100 Durian Tunggal, Melaka, Malaysia
+6063370191
https://biomedmdx.com/
info@biomedmdx.com