

MicroBioLogics®

Microorganisms for Education

In order to help teachers choose from the hundreds of microorganism strains offered in its catalog, MicroBioLogics® has listed a few strains that are typical for a species. All strains are derived from Reference Culture Collections.

The strains may be purchased in small quantities called KWIK-STIK™ 2 Packs. A KWIK-STIK™ is a self-contained unit featuring a single microorganism strain in a lyophilized pellet, a reservoir of hydrating fluid, and inoculating swab. A LYFO DISK® is a lyophilized pellet containing a single strain of a microorganism.

The biosafety level for each strain is listed. All MicroBioLogics® strains are biosafety level 1 or 2. Information on biosafety levels and safety practices can be found in TIB.072, "Microorganism Biosafety Levels". TIB.072 can be found at www.microbiologics.com. Go to "Search MicroBioLogics" on the home page, enter 072 in the search box, and search by documents.

The growth conditions needed for each microorganism are listed. More information on the growth requirements of various species are in TIB.081 which can be found by searching documents at www.microbiologics.com.

At the end of the microorganism list, there is a partial list of MicroBioLogics® mixed cultures. These cultures imitate clinical specimens.

Can't find what you want? Many more microorganisms can be found at www.microbiologics.com. Need more information? Technical Support Specialists are available to help you with your choice. Technical Support Specialists may be contacted at techsupport@mbi2000.com or 866-286-6691 (USA).

BACTERIA

Alcaligenes faecalis

Found in soil, water, feces, urine, blood, sputum, wounds, pleural fluid, nematodes and insects.

Example MicroBioLogics Catalog # 0402P

Biosafety Level 1

Colonies Sheep Blood Agar: Small gray, umbonate colonies with flat spreading edge and fruity odor.

Gram Stain Gram negative rods or coccal rods.

Phenotypic Rxns. Oxidase (Kovacs): positive, Nitrate (broth) positive, Motility Medium B: positive.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Bacillus cereus

Spores are widespread. Implicated in food poisoning.

Example MicroBioLogics Catalog # 0998P

Biosafety Level 1

Colonies Sheep Blood Agar: Large, gray, dull, raised, colonies, which have an irregular shape and are beta hemolytic (clearing around colonies).

Gram Stain Straight, gram positive rod, with an ellipsoidal or spherical, terminal endospore.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Corynebacterium pseudodiphtheriticum

Part of the normal oropharyngeal flora.

Example MicroBioLogics Catalog # 0965P

Biosafety Level 1

Colonies Sheep Blood Agar: Small to medium, circular, convex, entire edge, white to cream, dull, and opaque.

Gram Stain Straight to slightly curved gram positive rods with tapered ends, often in characteristic palisade arrangement. Club-shaped forms may be present.

Phenotypic Rxns. Catalase (3% Hydrogen Peroxide): positive.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Enterobacter aerogenes

Found in water, sewage, soil, dairy products and human and animal feces.

Example MicroBioLogics Catalog # 0306P

Biosafety Level 1

Colonies Sheep Blood Agar: Medium to large, gray, mucoid, convex, circular colonies.

Gram Stain Straight gram negative rod.

Phenotypic Rxns. Oxidase (Kovacs): negative.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Enterococcus faecalis

Found in feces of humans.

Example MicroBioLogics Catalog # 0366P

Biosafety Level 2

Colonies Sheep Blood Agar - Small to medium, gray/white, translucent, smooth, circular with entire edge.

Gram Stain Gram positive ovoid cells, mostly in pairs or short chains.

Phenotypic Rxns. Catalase (3% Hydrogen Peroxide): negative, Bile Esculin Agar: positive.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Escherichia coli

Found in lower intestine of warm-blooded animals.

Example MicroBioLogics Catalog # 0483P

Biosafety Level 1

Colonies Medium to large, gray, mucoid, convex

MacConkey Agar: Deep pink colonies with surrounding pink precipitate.

Gram Stain Gram negative straight rod.

Phenotypic Rxns. Oxidase (Kovacs): negative, Indole (Kovacs): positive, MUG (E. coli Broth w/MUG): positive.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Klebsiella pneumoniae

Found in feces, food and water. Can cause urinary and respiratory infections.

Example MicroBioLogics Catalog # 0351P

Biosafety Level 2

Colonies Sheep Blood Agar: Medium to large, gray/white, circular, domed, mucoid colonies.

Gram Stain Gram negative straight rod.

Phenotypic Rxns. Oxidase (Kovacs): negative.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Kocuria rhizophilia

Isolated from mammalian skin, soil, fermented foods, clinical specimens. Formerly *Micrococcus luteus*.

Example MicroBioLogics Catalog # 0359P

Biosafety Level 1

Colonies Sheep Blood Agar: Small to medium, yellow, smooth, convex colonies with regular edge.

Gram Stain Large, gram positive cocci occurring in tetrads and irregular clusters of tetrads.

Phenotypic Rxns. Catalase (3% Hydrogen Peroxide): positive, Coagulase (rabbit plasma-tube): negative, Bacitracin Disk (0.04U): susceptible (any zone), No growth on Sheep Blood Agar after incubation at 35 C for 48 hrs. under anaerobic conditions.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 48 hours.

Mycobacterium smegmatis

Isolated from smegma, a secretion of mammalian genitals.

Example MicroBioLogics Catalog # 0721P

Biosafety Level 1

Colonies Middlebrook 7H11: Small to medium, circular to irregular, flat, erose edge, dull and rough, translucent, cream turning yellow/orange with age.

Gram Stain Gram positive rod, medium to long.

Phenotypic Rxns. Kinyoun Acid Fast Stain: positive, Catalase (3% Hydrogen Peroxide): positive.

Grows on: Middlebrook 7H11 Agar, Lowenstein Jensen Agar, Nutrient Agar, Tryptic Soy Agar, Sheep Blood Agar, 35°C, 48 hours.

Proteus mirabilis

Found in human intestinal system, soil, polluted waters. Common cause of urinary tract infections.

Example MicroBioLogics Catalog # 0321P

Biosafety Level 2

Colonies Sheep Blood Agar: Gray colonies with swarming.
MacConkey Agar: Good growth; round, colorless colonies with some swarming.

Gram Stain Gram negative straight rod.

Phenotypic Rxns. Oxidase (Kovacs): negative.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Pseudomonas aeruginosa

Found in moist environments such as drains and vegetables. Can cause infections in wounds, burns and urinary tract.

Example MicroBioLogics Catalog # 0353P

Biosafety Level 2

Colonies Sheep Blood Agar: 2 colony types: Large, flat, circular to irregular shaped, gray with silver sheen(98%); and small and compact.
Nutrient and Tryptic Soy Agar: Green after 48 hours at 35°C. Produces pyocyanin and pyoverdin.

Gram Stain Straight or slightly curved gram negative rod.

Phenotypic Rxns. Oxidase (Kovacs): positive, Motility B Medium: positive.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Salmonella enterica subsp. enterica serovar Choleraesuis var Kunzendorf

Intestinal tract of some mammals.

Example MicroBioLogics Catalog # 0903P

Biosafety Level 2

Colonies Sheep Blood Agar: Medium, gray/white, circular, convex colonies.

Gram Stain Gram negative straight rod.

Phenotypic Rxns. Oxidase (Kovacs): negative, Vitek 2: H₂S positive, Hektoen Enteric agar: good growth, blue-green colonies with black centers.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Serratia marcescens

Found in water, soil, plants, animals.

Example MicroBioLogics Catalog # 0806P

Biosafety Level 1

Colonies Sheep Blood Agar: Two colony types: Medium to large, 95% are red/pink, 5% are gray, circular, convex, slightly beta hemolytic colonies (slight clearing around colonies).

Gram Stain Gram negative straight rod.

Phenotypic Rxns. Oxidase (Kovacs): negative.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Staphylococcus aureus

Found on human skin, mucous membranes, anterior nares. May cause disease or food poisoning.

Example MicroBioLogics Catalog # 0360P

Biosafety Level 2

Colonies Sheep Blood Agar: Medium to large, convex, both white and pale white colonies, smooth, opaque, beta hemolytic (clearing around colonies).

Gram Stain Gram positive cocci occurring singly, in pairs and in irregular clusters.

Phenotypic Rxns. Catalase(3% Hydrogen Peroxide): positive, Coagulase(rabbit plasma-tube): positive.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Staphylococcus epidermidis

Found on human skin, mucous membranes.

Example MicroBioLogics Catalog # 0371P

Biosafety Level 1

Colonies Sheep Blood Agar: Small to medium, smooth, raised, glistening, entire edge, white.

Gram Stain Gram positive cocci usually in pairs and and tetrads.

Phenotypic Rxns. Catalase(3% Hydrogen Peroxide): positive; Coagulase(rabbit plasma-tube): negative.

Grows on: Tryptic Soy Agar, Sheep Blood Agar, Nutrient Agar and Standard Plate Count Agar, 35°, 24 hours.

Streptococcus mitis

Found in human saliva, sputum, species, in dental plaque.

Example MicroBioLogics Catalog # 0423P

Biosafety Level 2

Colonies Sheep Blood Agar: Small, circular, translucent, alpha hemolytic (greening around the colonies).

Gram Stain Gram positive cocci in chains.

Phenotypic Rxns. Catalase: (3% Hydrogen Peroxide): negative.

Grows on: Sheep Blood Agar, 35°, 24 hours.

Streptococcus pyogenes (Group A)

Pathogenic for man and animals. May cause infections such as pharyngitis (strep throat), impetigo, endocarditis.

Example MicroBioLogics Catalog # 0385P

Biosafety Level 2

Colonies Sheep Blood Agar: Small, circular, translucent/white, entire, glistening, beta hemolytic (clearing around colonies).

Gram Stain Gram positive cocci.

Phenotypic Rxns. Catalase(3% Hydrogen Peroxide): negative; Bacitracin differential: Sensitive.

Grows on: Sheep Blood Agar, 35°, 24 hours.

YEAST

Candida albicans

Commonly found in digestive tract. May cause opportunistic infections such as thrush and vaginal candidiasis.

Example MicroBiologics Catalog # 0443P

Biosafety Level 1

Colonies Nutrient Agar: small to medium, white, circular, convex, dull colonies.

Gram Stain Gram positive, spherical, budding yeast cells.

Phenotypic Rxns. Germ Tube Test: positive; Cornmeal Agar: chlamydospore production.

Grows on: Sabouraud Dextrose Emmons Agar, Sabouraud Dextrose Agar, Nutrient Agar, Trptic Soy Agar, Potato Dextrose Agar, Standard Plate Count Agar, Nonselective Sheep Agar, 25°, 4-6 days.

Geotrichum capitatum

Forms arthroconidia.

Example MicroBiologics Catalog # 0482P

Biosafety Level 1

Colonies Sabouraud Dextrose Emmons Agar: At 48 hr: Medium, circular to irregular, convex, erose edge, white, and fuzzy. At 7 D: Large, circular to irregular, convex with raised center, cream, fuzzy.

Lactophenol Blue Stain Mycelium formation which breaks up into characteristic arthrospores - hyphae may branch.

Grows on: Sabouraud Dextrose Emmons Agar, Sabouraud Dextrose Agar, Nutrient Agar, Trptic Soy Agar, Potato Dextrose Agar, Standard Plate Count Agar, Nonselective Sheep Agar, 25°, 2-3 days.

Saccharomyces cerevisiae

Used in baking and brewing.

Example MicroBiologics Catalog # 0698P

Biosafety Level 1

Colonies Sabouraud Dextrose Emmons: Medium to large, circular, dull, white to cream colonies.

Gram Stain Gram positive, yeast cells, oval to spherical, spores are gram negative when present.

Grows on: Sabouraud Dextrose Emmons Agar, Sabouraud Dextrose Agar, Nutrient Agar, Tryptic Soy Agar, Potato Dextrose Agar, Standard Plate Count Agar, Nonselective Sheep Agar, 25°, 48 hours.

FUNGUS

Aspergillus niger

Found in soil and plant debris. May cause ostomycosis and other infections.

Example MicroBiologics Catalog # 0500P

Biosafety Level 1

Colonies Nutrient Agar: Flat, fuzzy, "salt and pepper" appearance; reverse side is yellowish tan.

Lactophenol Blue Stain Chains of small conidia which arise from short sterigmata arranged radially over the surface of the vesicle.

Grows on: Sabouraud Dextrose Emmons Agar, Sabouraud Dextrose Agar, Nutrient Agar, Trptic Soy Agar, Potato Dextrose Agar, Standard Plate Count Agar, Nonselective Sheep Agar, 25°, 4-6 days.

Cladosporium cladosporioides

Common air-borne saprobe. Forms dematiaceous (pigmented), septate hyphae and conidiophores.

Example MicroBioLogics Catalog # 0537P

Biosafety Level 1

Colonies Potato dextrose Agar: Colonies expanding, velvety to powdery, olivaceous green to olivaceous brown; reverse becomes olivaceous black.

Slide Culture Potato Dextrose Agar: Conidiophores arising from hyphae, bearing conidial chains laterally and terminally. Ramoconidia towards the base of the chain, 0-1 septate, more or less cylindrical. Conidia in acropetal branched chains, ellipsoidal to lemon shaped, smooth walled, olivaceous to brown.

Grows on: Sabouraud Dextrose Emmons Agar, Sabouraud Dextrose Agar, Nutrient Agar, Trptic Soy Agar, Potato Dextrose Agar, Standard Plate Count Agar, Nonselective Sheep Agar, 25°, 3-7 days.

Penicillium chrysogenum

Fungus. Source for penicillin. Forms septate, hyaline (colorless) hyphae and conidiophores branching into a penicillus.

Example MicroBioLogics Catalog # 0207P

Biosafety Level 1

Colonies Malt Extract Agar: Rapidly expanding floccose colonies, initially white, turning dark blue-green with age, exudes bright yellow pigment into medium.

Slide Culture Malt Extract Agar: Hyaline septate mycelia that produce hyaline conidiophores. The conidiophores branch into brush-like penicillus. Spores are borne in long chains from terminal sterigmata.

Grows on: Sabouraud Dextrose Emmons Agar, Sabouraud Dextrose Agar, Nutrient Agar, Trptic Soy Agar, Potato Dextrose Agar, Standard Plate Count Agar, Nonselective Sheep Agar, 25°C, 7 days.

Rhizopus stolonifer

Bread Mold Fungus. Forms rhizoids (root-like hyphae).

Example MicroBioLogics Catalog # 0209P, *Rhizopus stolonifer* (+), #208P, *Rhizopus stolonifer* (-)

Biosafety Level 1

Colonies Potato Dextrose Agar: Very fast growing, quickly filling the culture plate with dense, cottony, aerial mycelium, at first white, later becoming gray.

Slide Culture Potato Dextrose Agar: Mycelium aseptate, with many stolons (hyphal branches) connecting groups of unbranched sporangiophores. Rhizoids present. The sporangiophores terminate with a dark brown or black, spherical sporangium containing columella.

Grows on: Sabouraud Dextrose Emmons Agar, Sabouraud Dextrose Agar, Nutrient Agar, Tryptic Soy Agar, Potato Dextrose Agar, Standard Plate Count Agar, Nonselective Sheep Agar, 25°C, 48 hours.

Sodaria fimicola

Fungus. Found in herbivore feces. Form hyaline, septate hyphae.

Example MicroBioLogics Catalog # 0240P

Biosafety Level 1

Colonies Malt Extract Agar: Confluent growth of aerial, gray-white, cottony mycelium, turns black as culture ages. Black fruiting bodies appear on surface as cultures ages.

Slide Culture Malt Extract Agar: Hyaline septate mycelium, within the perithecium are black sacs (ascus) that contain 4-8 ascospores.

Grows on: Sabouraud Dextrose Emmons Agar, Sabouraud Dextrose Agar, Nutrient Agar, Tryptic Soy Agar, Potato Dextrose Agar, Standard Plate Count Agar, Nonselective Sheep Agar, 25°C, 48 hours.

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EZ-COMP™ Samples

EZ-COMP™ Samples are mixed cultures that simulate clinical samples. Below are a couple of examples from our collection.

EZ-COMP™ Sample (Simulated Throat Sample)

MicroBioLogics Catalog # 5501

Moraxella catarrhalis: Biosafety Level 1

Neisseria sicca: Biosafety Level 1

Streptococcus mitis: Biosafety Level 2

EZ-COMP™ Sample (Simulated Wound Sample)

MicroBioLogics Catalog # 5519

Staphylococcus aureus: Biosafety Level 2

Staphylococcus epidermidis: Biosafety Level 1

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