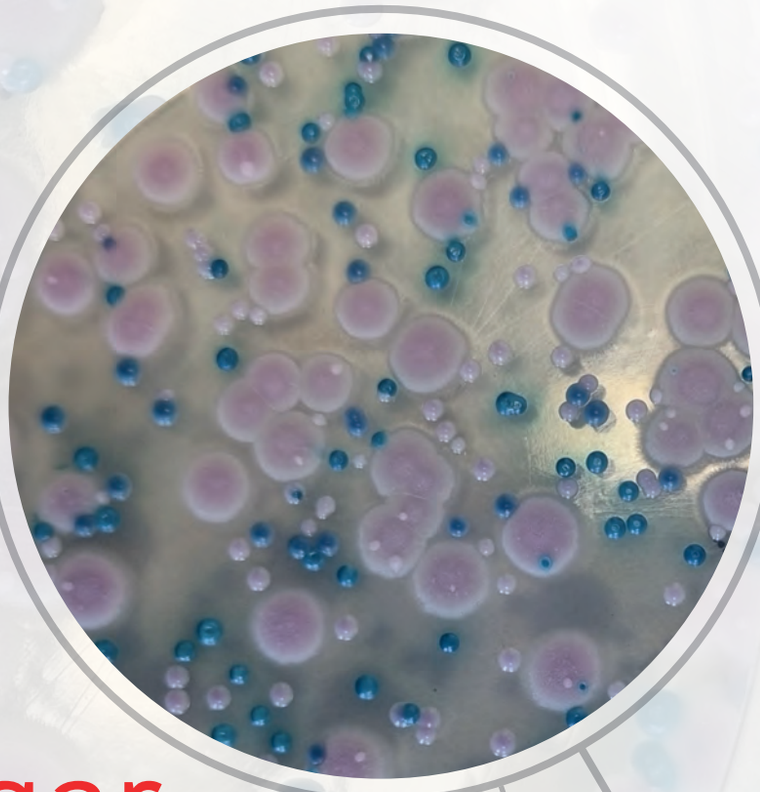
GRASO BIOTECH



CHROMagar

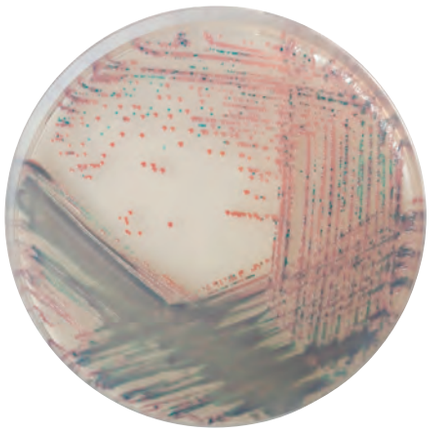
Staph aureus
StrepB
Acinetobacter
Listeria
Candida
Candida Plus
Pseudomonas
Orientation
Malassezia
Mastitis
Campylobacter

C.difficile
Salmonella Plus
STEC
Y.enterocolitica
ECC
ESBL
mSuperCARBA
COL-APSE
VRE
MRSA
LIN-R

For Professionals

grasobiotech.pl

CHROMagar **Staph aureus**



Colony appearance:

S. aureus – pink,

other bacteria – blue or inhibited.

A medium designed for the detection and isolation of *Staphylococcus aureus*.

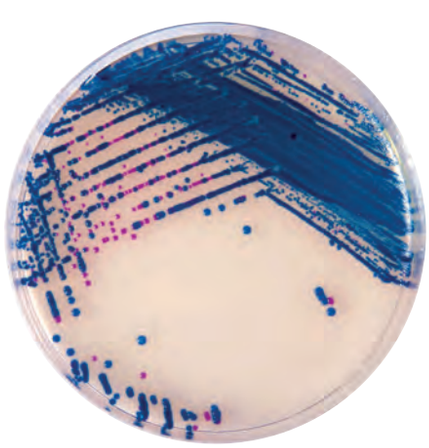
Sensitivity 95,5% / Specificity 99,4% [1]

Ref. no. 1404PD90

S. aureus is an important pathogen isolated from clinical and industrial samples. Human beings are the main reservoir of this microorganism. It colonizes the nasal vestibule, anal area, and skin. *S. aureus* is a source of skin and soft tissue infections and can also contribute to serious infections of the blood, bones, joints and pneumonia. That's why effective diagnostics is crucial, especially at the early stages of testing.

Thanks to high sensitivity and specificity, the CHROMagar Staph aureus medium allows for the detection of this pathogen in the tested sample within 24 hours.

CHROMagar **StrepB**



Colony appearance:

Streptococcus group B - pink to violet,

other bacteria - blue, colorless, or inhibited.

A medium designed for the isolation and differentiation of Group B Streptococcus (*Streptococcus agalactiae*).

Sensitivity 92% / Specificity 95% [2]

Ref. no. 1007PD90

S. agalactiae – Group B Streptococcus (GBS) can cause severe infections in newborns, such as sepsis and meningitis. In 70% of cases, the presence of GBS in the genital tract of pregnant women leads to perinatal infections in newborns. One of the most effective methods for preventing such infections is screening for *S. agalactiae* carriage. Detecting the presence of GBS enables appropriate antibiotic therapy to be administered in a timely manner.

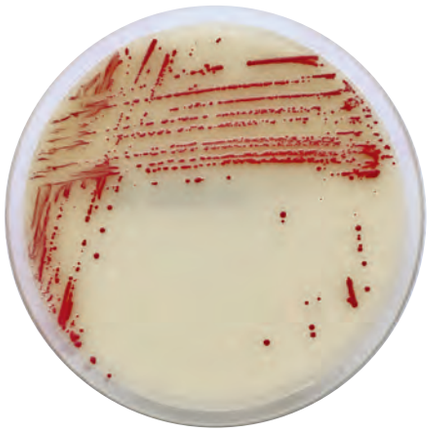
Cultures are performed directly or after enrichment from samples collected from pregnant women. The usage of CHROMagar StrepB enabling the results within just 18-24 hours of incubation under aerobic conditions at a temperature of 35-37°C.

CHROMagar **Acinetobacter**

A medium designed for the detection of *Acinetobacter* spp. strains.

Sensitivity 94,7% / Specificity 91,6% [3]

Ref. no. 1481PD90



Colony appearance:

Acinetobacter spp. - red,

other Gram(-) bacteria – mostly inhibited or blue,

Gram(+) bacteria and yeasts – mostly inhibited.

Acinetobacter spp. are bacteria commonly found in nature, with a high tolerance for environmental conditions. *Acinetobacter* species are generally not pathogenic for healthy individuals but pose a life-threatening risk to patients with advanced illnesses. In hospital settings, they are a source of infections, colonizing medical equipment, human skin, and sometimes even food. Specimens Isolated in cases of hospital-acquired infections in intensive care units can cause hospital-acquired pneumonia, bacteremia and meningitis. This is particularly true for *A. baumannii*, often characterized by multidrug resistance (MDR: resistance to third-generation cephalosporins, quinolones, carbapenems), which can contribute to increased morbidity and mortality. *A. baumannii* can enter the human body through open wounds, catheters or tracheotomy tubes.

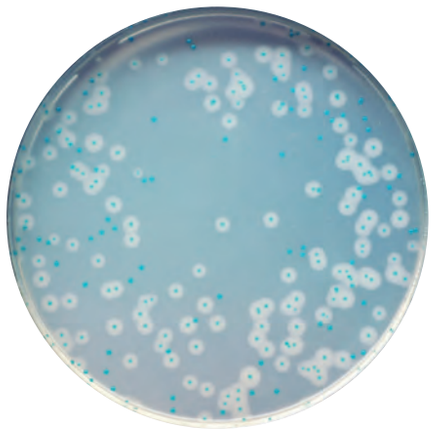
Detecting *A. baumannii* from traditional culture media, especially using media based on lactose fermentation differentiation due to the abundance of accompanying flora, can be a difficult and time-consuming task. CHROMagar Acinetobacter was designed as a highly selective medium enabling the growth of *Acinetobacter* in the form of well-visible red colonies. It is effective for screening studies from rectal swabs, nasal swabs, wound swabs, stool samples and urine samples from patients suspected of *Acinetobacter* colonization. It's also used for monitoring surface cleanliness in clinical environments. Results can be interpreted after 18-24 hours of aerobic incubation at temperature of 35-37°C.

CHROMagar **Listeria**

A medium designed for the detection, differentiation and quantitative determination of *L. monocytogenes* in food samples.

Sensitivity 100% [4]

Ref. no. 1440PD90



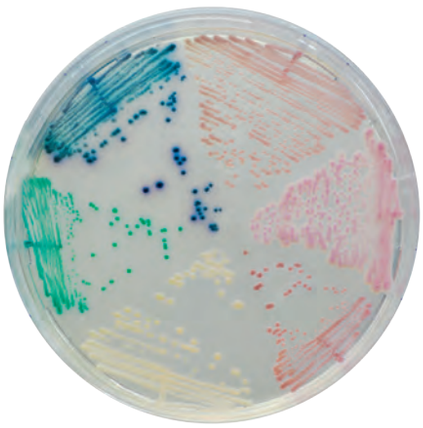
Colony appearance:

L. monocytogenes – blue colonies with a diameter below 3 mm and a white halo,

E. coli, E. faecalis – inhibited.

L. monocytogenes is a pathogen detected in food and is responsible for severe foodborne illnesses. Due to the fact that *L. monocytogenes* and *L. innocua* share similar biochemical characteristics, they cannot be differentiated using classical media such as Palcam and Oxford.

L. monocytogenes grows on CHROMagar Listeria as blue colonies with a white halo. Using this medium after screening from Semi Fraser enables the selection of negative samples in just 2 days. Identification of suspicious colonies from positive samples can be done directly from this chromogenic medium.



Colony appearance:

C. albicans - green,

C. tropicalis - metallic blue,

C. krusei - light pink, hairy,

C. glabrata, C. kefyr - mauve-brown.

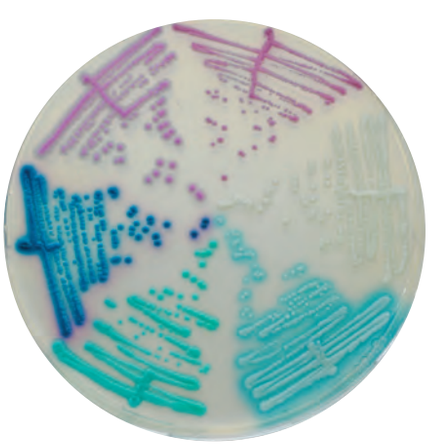
CHROMagar **Candida**

A medium designed for the isolation and differentiation of major clinically relevant *Candida* species.

Sensitivity 100% / Specificity 100% for *C. albicans* [5]

Ref. no. 1400PD90

The genus *Candida* comprises yeast-like fungi that cause opportunistic infections in immunocompromised individuals. Approximately 40-80% of people have *C. albicans* as a part of their normal gastrointestinal flora. Antibiotic therapy can disrupt the microbiome balance, leading to yeast infection symptoms. Fungal infections caused by *Candida albicans* can manifest as superficial or invasive conditions, causing inflammation of the oral mucosa and infections of the lungs, central nervous system and other internal organs. Although *C. albicans* remains a primary pathogen, the importance of other species such as *C. tropicalis*, *C. krusei* or *C. glabrata* has proportionally increased in recent years. This shows how important it is to detect and identify *Candida* for the right choice of antifungal therapy.



Colony appearance:

C. albicans - green-blue,

C. tropicalis - metallic blue with a pink halo,

C. krusei - pink, fluffy,

C. glabrata - mauve,

C. auris - light blue with a blue halo, blue from the side of the plate,

bacteria - inhibited.

CHROMagar **Candida Plus**

A medium designed for the detection and differentiation of major clinical *Candida* species, including *C. auris*.

Sensitivity 100% / Specificity for C. auris 100% [6]

Ref. no. 1406PD90

Among the *Candida* fungi, *C. albicans* is the most frequently isolated pathogen. In recent years, due to the widespread use of antifungal agents, the significance of *C. auris*, *C. krusei*, *C. glabrata*, and *C. tropicalis* has increased.
C. auris is resistant to fluconazole (90% of strains) and some strains are multidrug resistant including amphotericin B, voriconazole and/or echinocandins.

CHROMagar Candida Plus is the first chromogenic isolation medium designed for the detection and differentiation of *C. auris* alongside other clinically major *Candida* species. Due to its high specificity, it can also be used as a screening medium in epidemics cases, both for samples from patients and from surfaces suspected of being contaminated with *C. auris*.
The test is performed with skin, throat, ear and vaginal swabs, as well as sputum, urine and feces, in parallel with cultures on Sabouraud agar. Results can be interpreted after 24-48 hours of aerobic incubation at 30-37°C.

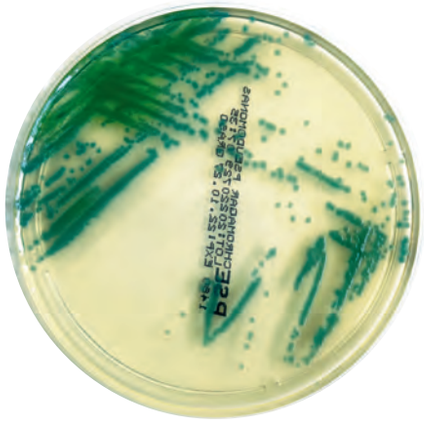
CHROMagar **Pseudomonas**

A medium designed for the detection and isolation of *Pseudomonas spp*.

Ref. no. 1480PD90

Pseudomonas are ubiquitous bacteria found in soil, on plants, in freshwater and marine environments. Many strains can proliferate at low temperatures (psychrophilic strains), contaminating food or pharmaceutical products stored in refrigerators. *P. aeruginosa* is an important indicator of the effectiveness of the disinfection of recreational water. This parameter is currently used as a criterion in the monitoring of pools and swimming areas. Additionally, *P. aeruginosa* is significant not only as an indicator but also as an opportunistic pathogen, often transmitted through water.

CHROMagar Pseudomonas medium also enables the detection of psychrophilic *Pseudomonas* species responsible for food spoilage at low temperatures. Some of these strains include: *P. fragi*, causing spoilage in dairy products; *P. taetrolens*, responsible for egg spoilage; and *P. mudicolens* and *P. lundensis*, associated with the spoilage of milk, cheese, meat, and fish. However, these strains rarely cause food poisoning. CHROMagar Pseudomonas is easy to read after just 24 hours of incubation. Colonies can be observed under normal lighting conditions. *Pseudomonas* strains grow as colonies with an intense blue-green color easilly visible. The medium can also be used in the membrane filtration method, where the membrane is placed onto the agar plate after inoculation.



Colony appearance:

Pseudomonas, including P. aeruginosa – blue-green,

most Enterobacterales - purple-pink to violet or inhibited,

Gram(+) bacteria - inhibited.

CHROMagar **Orientation**

A medium designed for the detection of pathogens responsible for urinary tract infections, such as *E. coli*.

Sensitivity 100% / Specificity 98% [7]

Ref. no. 1410PD90

Urinary tract infections (UTI) account for about 40% of hospital--acquired infections and around 15% of community-acquired infections. In approximately 90% of cases, UTI are caused by *E. coli*. The etiological agents of uncomplicated UTI can also be Gram(+) bacteria such as *Enterococcus* spp., *S. agalactiae* and *S. saprophyticus*. In complicated infections, the presence of other Gram(-) rods like *Enterobacterales* (e.g. *Proteus* spp., *Klebsiella* spp., *Enterobacter* spp.), non-fermenting rods (*P. aeruginosa*, *Acinetobacter* spp.) and Gram(+) bacteria like *Enterococcus* spp., *Staphylococcus* spp. (other than *S. saprophyticus*) and *Corynebacterium urealyticum* is observed.
UTI are recurrent infections, particularly troublesome for women, mainly caused by *E. coli*. In newborns, the most common causes of UTI are *Klebsiella* spp. and Gram(+) bacteria, while in male infants up to 6 months old bacteria like *P. mirabilis* residing under the foreskin.

CHROMagar Orientation generally allows for complete differentiation of pathogens, enables semi-quantitative assessment and provides preliminary identification. It offers the same information as combining three classical plates used for UTI analysis (blood agar, CLED and MacConkey). Furthermore, the easy assessment of colony purity due to coloration enables the performance of antimicrobial susceptibility tests directly from primary isolates, eliminating the need for subcultures.

Colony appearance:

E. coli - dark pink to reddish,

Klebsiella, Enterobacter, Serratia - metallic blue,

Citrobacter - metallic blue with red halo,

P. mirabillis - colorless with brown halo,

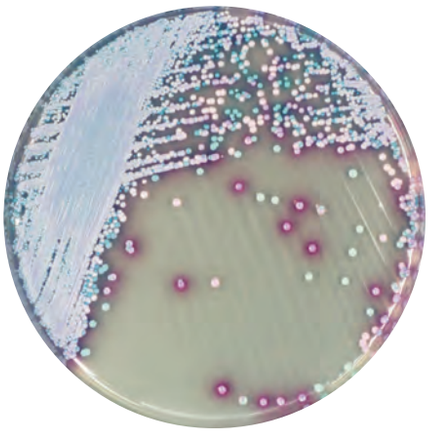
P. vulgaris - blue with brown halo,

P. aeruginosa - translucide, cream to blue,

Enterococcus - turquoise blue

S. saprophyticus - pink, opaque, small,

S. aureus - golden, opaque, small.



Colony appearance:

M. furfur - large, light pink, wrinkled,

other Malassezia spp., including M. globosa and M. stricta - pink to violet

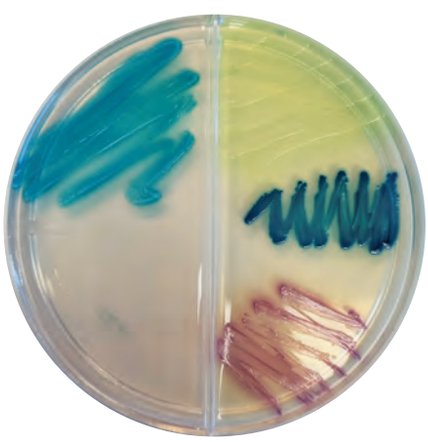
CHROMagar **Malassezia**

A medium designed for the detection and differentiation of *Malassezia* species from human and animal samples.

Sensitivity > 97% / Specificity > 71% [8]

Ref. no. 1407PD90

Mallasezia is a fungus naturally occurring on both human and animal skin. It doesn't typically cause infections on healthy skin; however, certain *Malassezia* species can induce severe skin or ear inflammations on sensitive or irritated skin. Due to similar morphology and biochemical traits among *Malassezia* species, traditional diagnostics are not effective for differentiation. Therefore, CHROMagar Malassezia medium not only detects it but also differentiates the most commonly pathogenic species of *Malassezia*.



Colony appearance:

CHROMagar Mastitis GP:

S. agalactiae - turquoise blue,

S. uberis - metallic blue,

S. aureus - pink,

Gram(-) bacteria - inhibited.

CHROMagar Mastitis GN:

Klebsiella, Enterobacter, Citrobacter - metallic blue,

E. coli - dark pink to reddish,

Proteus - with a brown halo,

C. albicans - cream,

Gram(+) bacteria - inhibited.

CHROMagar **Mastitis**

Media designed for the isolation and differentiation of the main pathogens responsible for mastitis from milk samples.

Ref. no. 2034PD90

Mastitis causes a reduction in milk quantity and quality, increases expenses due to excessive use of medications in cattle and poses a risk of drug presence in milk or meat, which can eventually pose a threat to public health. The lack of control over the spread of mastitis infections leads to significant economic losses for milk producers and the dairy industry. To avoid widespread antibiotic use in cattle and reduce the economic burden of clinical udder inflammation, the rapid identification of pathogens from milk is of paramount importance in farm management.

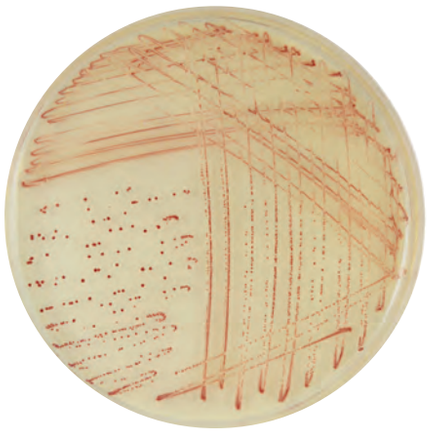
CHROMagar Mastitis is a new tool available in the market for the rapid and straightforward differentiation of major bacteria involved in mastitis infections, utilizing two differentiating media on a single plate. The color differentiation of key pathogenic bacteria after just 24 hours of cultivation simplifies the selection of appropriate and optimized therapies. The use of a divided plate enables the simultaneous identification of the entire spectrum of both Gram(+) and Gram(-) bacteria.

CHROMagar **Campylobacter**

A medium designed for the detection, differentiation and quantitative determination of thermotolerant *Campylobacter*.

Sensitivity 100% / Specificity 94% [9]

Ref. no. 1385PD90



Colony appearance:

C. jejuni, C. coli, C. lari - red,

other bacteria - blue or inhibited.

Campylobacter is a major pathogen responsible for foodborne diarrheal diseases and causes stomach and intestinal inflammation in people worldwide. Through the use of the transparent CHROMagar Campylobacter medium, on which *Campylobacter* strains grow as red colonies, determining their numbers becomes easier compared to traditional media containing charcoal, where colonies are poorly visible and difficult to count. For better differentiation, the growth of other bacteria is inhibited or appears as blue colonies. Results can be interpreted after 36-48 hours of incubation under microaerophilic conditions at 42°C. For diagnosis, rectal swabs or fecal samples can be used.

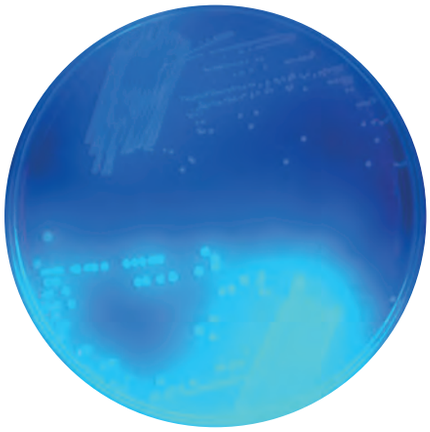
CHROMagar Campylobacter can also be used for the detection of *Campylobacter* in the analysis of food products, animal feeds and environmental samples according to ISO 10272-1.

CHROMagar **C. difficile**

A medium designed for the isolation and direct identification of *Clostridioides difficile*.

Sensitivity 95,4% / Specificity 88,8% [10]

Ref. no. 1408PD90



Colony appearance:

C. difficile - colorless, fluorescing under the influence of UV light with a length of 365 nm,

most other bacteria - inhibited.

C. difficile is responsible for post-antibiotic pseudomembranous colitis and milder antibiotic-associated diarrhea. Due to the destruction of a portion of the gut microbiota by antibiotics, certain strains of *C. difficile* can proliferate, including toxigenic serotypes. Diseases caused by *C. difficile* usually relate to hospital-acquired infections. These infections are generally endogenous, but they can also be exogenous infections resulting from the transfer of toxigenic strains or their spores by medical personnel, other patients or carriers. The emergence of highly toxigenic *C. difficile* strains in recent years has made these infections more frequent and harder to treat. Although PCR is the leading method for detecting *C. difficile*, cultivation is essential for strain typing and antimicrobial susceptibility testing.

CHROMagar C. difficile is an exceptionally sensitive and selective medium that uses fluorescence. It has been specially designed to simplify and speed up the cultivation, on which, unlike to traditional media requiring 48 hours of incubation, *C. difficile* on CHROMagar C. difficile grows after just 24 hours under anaerobic conditions.

CHROMagar **Salmonella Plus**

Colony appearance:

Salmonella, including S. typhi - pink/purple,

other bacteria - blue, colorless or inhibited.

A medium designed for the detection and selective isolation of *Salmonella* spp., including lactose-fermenting strains. Additionally, the medium meets the requirements of ISO 6579-1 standard.

Sensitivity 99% [11]

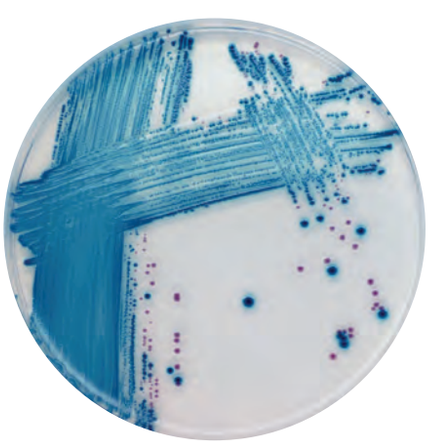
Ref. no. 1421PD90

Salmonella is one of the most common causes of food poisoning, mainly due to contamination in the food chain and/or during food production processes, but also because of poor hand hygiene. *Salmonella* causes gastrointestinal diseases characterized by symptoms such as abdominal cramps, diarrhea, nausea and vomiting. The pathogenicity of these microorganisms varies depending on specific serovars and can differ within the same subspecies.

The traditional method of detecting *Salmonella* based on H_2S production has a very low specificity and gives a number of false positive results (for *Citrobacter*, *Proteus*, etc.). Additionally, some *Salmonella* strains are capable of lactose fermentation, potentially leading to misidentification or even missed diagnosis when conventional selective media such as XLD, MacConkey or Hektoen are used.

Unlike traditional media, CHROMagar Salmonella Plus eliminates most false positives while still detecting all *Salmonella* strains.

CHROMagar **STEC**



Colony appearance:

main Shiga toxin-producing E. coli serotypes - mauve,

other Enterobacterales - colorless, blue, or inhibited.

A medium designed for the detection and selective isolation of Shiga toxin-producing *Escherichia coli*.

Sensitivity > 91,4% / Specificity > 86,7% [12]

Ref. no. 1381PD90

STEC strains, also known as verotoxigenic *E. coli*, produce toxins with hemolytic activity that lead to the destruction of red blood cells. The most well-known verotoxigenic strain is *E. coli* O157, but other serotypes also belong to this group. Verotoxigenic *E. coli* strains are among the most dangerous human pathogens, causing hemorrhagic colitis with watery-bloody diarrhea and painful abdominal cramps. Infections can lead to life-threatening conditions such as hemolytic-uremic syndrome (HUS) and thrombotic thrombocytopenic purpura (TTP).

In many cases, diagnostic laboratories used to focus solely on detecting pathogenic *E. coli* O157 bacteria due to the lack of available media for detecting other serotypes. The development of CHROMagar STEC has addressed this gap by not only detecting typical STEC O157 strains but also other serotypes such as O26, O45, O103, O111, O121, O145. As a result, it serves as an extremely useful tool in large-scale screening studies conducted on numerous samples.

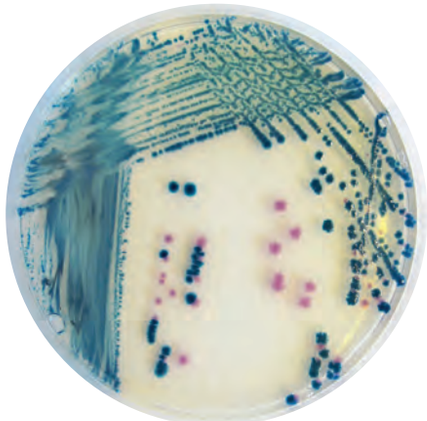
CHROMagar **Y. enterocolitica**

A medium designed for the detection and differentiation of pathogenic strains of *Yersinia enterocolitica*.

Sensitivity 100% / Specificity 99% [13]

Ref. no. 1484PD90

Y. enterocolitica is one of the most common foodborne pathogens transmitted through contaminated food, and its main animal reservoir is swine. In some countries, bacterial gastroenteritis in humans caused by *Y. enterocolitica* is almost as common as those caused by *Salmonella* and *Campylobacter*. Most commonly, it affects individuals at a young age, including infants and young children, causing prolonged diarrhea, accompanied by fever and lymph node involvement within the abdominal cavity. Due to the ability of this pathogen to grow under refrigerated conditions, it is becoming a growing concern in terms of food safety. However, not all strains of *Y. enterocolitica* cause illness in humans. Strains belonging to biotype 1A are non-pathogenic and widely distributed in the environment. Human-pathogenic strains belong to biotypes 1B, 2, 3, 4, 5. The traditional method of culturing these bacteria using CIN Agar, where both pathogenic and non-pathogenic strains grow as similar colonies, adds extra work and prolongs diagnosis. The use of CHROMagar Y. enterocolitica medium enables rapid differentiation of pathogenic strains from other bacteria based on the growth of characteristic colonies.



Colony appearance:

pathogenic Y. enterocolitica - mauve,

non-pathogenic Y. enterocolitica and commensal flora (Citrobacter, Enterobacter, Aeromonas, etc.) - metallic-blue or inhibited.

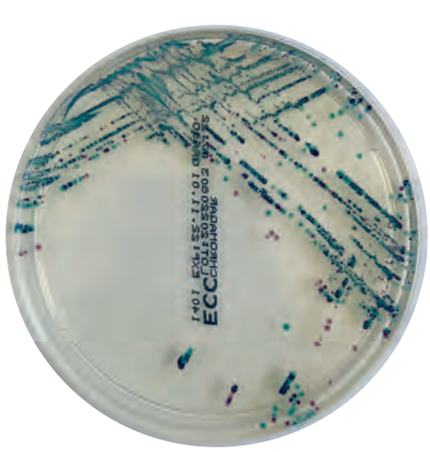
CHROMagar **ECC**

A medium designed for the detection and enumeration *Escherichia coli* and other coliform bacteria in water and food samples.

Ref. no. 1401PD90

Coliform bacteria (*Enterobacterales* capable of fermenting lactose) are bacteria present in the gastrointestinal flora of humans and warm-blooded animals, as well as in soil and water. Coliforms are evidence of organic, environmental or fecal contamination. Fecal contamination, due to coliform bacteria from animal feces, mainly includes *E. coli* and thermotolerant strains of *Klebsiella*. *E. coli* can contaminate drinking water when water treatment systems are insufficient or during periods of heavy rainfall. Monitoring food and water production for the presence of these bacteria is essential, as high levels of contamination can lead to water supply interruptions and food recalls. To safeguard public health, strict regulations regarding the presence of *E. coli* / coliforms in water and food samples have been established.

CHROMagar ECC enables simultaneous detection and differentiation of *E. coli* and coli group bacteria on a single medium. It is easy to read due to the high contrast between colony colors (either mauve or blue).



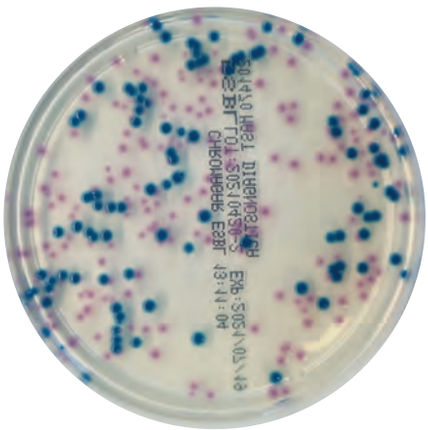
Colony appearance:

E. coli - blue,

coliforms - mauve,

other bacteria - colorless or inhibited.

CHROMagar **ESBL**



Colony appearance:

ESBL E. coli - dark pink to reddish

ESBL gr. KEC - metallicblue

ESBL Proteus - brown halo

ESBL Pseudomonas - transculent

ESBL Acinetobacter - cream

Non resistant other Gram(-) bacteria - inhibited

Gram(+) bacteria - inhibited

Yeasts - mostly inhibited

A medium designed for the detection and selective isolation of Gram(-) bacteria producing extended-spectrum ß-lactamases.

Sensitivity 100 % / Specificity 97% [14]

Ref. no. 1470PD90

ESBL (extended-spectrum beta-lactamases) are enzymes that determine the resistance of bacteria to penicillins, third-generation cephalosporins and monobactams. They are produced by Gram(-) bacteria, mainly of the order *Enterobacterales*, which are now widely distributed in this group of bacteria.

ESBL are playing an increasingly important role not only in the spread of hospital-acquired infections but also in community-acquired infections, facilitated by the easy transfer of plasmids carrying the ESBL gene. Rapid identification of ESBL(+) infections or carriage is crucial for epidemiological purposes, hospital infection prevention and selecting appropriate antibacterial therapy.

Thanks to the chromogenic properties of this medium, it is possible not only to detect, but also to differentiate Gram(-) species of ESBL(+) bacteria. The medium was developed by adding the ESBL(+) bacterial growth supplement to the CHROMagar Orientation base medium.

CHROMagar **mSuperCARBA**

A medium for the detection and isolation of *Enterobacterales* producing carbapenemases.

Sensitivity 100% / Specificity 100% [15]

Ref. no. 1473PD90

The resistance of microorganisms to antibiotics is a growing problem in modern medicine. One way to limit the effect of an antibiotic is for the bacteria to produce enzymes that break down a specific drug or entire groups of drugs. Such a mechanism is observed in the case of resistance to carbapenems. In recent years, there has been an increase in the frequency of isolating bacteria that produce carbapenemase enzymes. These are mainly KPC and MBL enzymes, but also OXA enzymes, most commonly isolated from enteric bacteria of the *Klebsiella*, *E. coli* and *Enterobacter* genera. The rapid identification of infections caused by carbapenem-resistant bacilli is therefore very important. Given that these bacteria are part of the human microbiome, determining the carriage of these microorganisms in patients is important, mainly for epidemiological purposes and as a preventive measure against hospital-acquired infections. This phenomenon particularly affects hospital strains, but increasingly, multidrug-resistant isolates are also originating from community-acquired infections.

Since introducing to the market CHROMagar KPC in 2007, many carbapenemase-producing bacteria have spread worldwide. It became necessary to develop a more sensitive method for detecting bacteria with reduced susceptibility to carbapenems. Alain Rambach and Patrice Nordmann have developed a new generation highly sensitive chromogenic medium CHROMagar mSuperCARBA.

This medium is characterized by an unprecedented sensitivity in detecting a broad range of carbapenemases, including KPC, NDM, VIM, IMP and OXA. The detection limit for CPE on this medium is 10 CFU/ml, even for weakly expressed carbapenemases such as OXA-48, while maintaining high selectivity of the medium.

Colony appearance:

CPE E. coli - dark pink to red,

CPE coliform - metallic blue,

CPE Pseudomonas - transparent, +/- natural pigment cream to green,

CPE Acinetobacter - creamy,

other Gram(-) CPE - colorless with natural pigmentation,

negative CPE E. coli/coliform - inhibited,

other Gram(-) bacteria - inhibited,

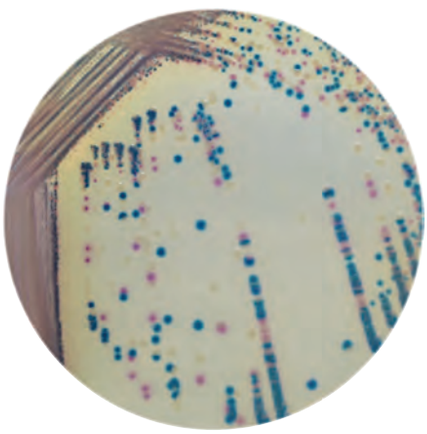
Gram(+) bacteria - inhibited.

CHROMagar **COL-APSE**

A medium designed for the qualitative, direct detection of colistin-resistant Gram(-) (COL-R) colonization of the gastrointestinal tract for the prevention and control of COL-R in healthcare settings.

Sensitivity 100% / Specificity 81% [16]

Ref. no. 1475PD90



Colony appearance:

COL-R E. coli - dark pink to reddish,

COL-R Klebsiella, Enterobacter, Citrobacter – metallic blue,

COL-R Pseudomonas - translucent cream to green,

COL-R Acinetobacter - creamy, opaque,

COL-R other Gram(-) bacteria – colorless or naturally pigmented,

COL-S Gram(-) bacteria - inhibited,

Gram(+) bacteria and yeasts - inhibited.

Polymyxin E (colistin) and B are increasingly used as antimicrobial agents in the treatment of multidrug-resistant bacterial infections. Polymyxin resistance, although inherent in Gram(+) and some Gram(-) species of *Proteus*, *Morganella*, *Serratia*, is now a problem for many other pathogens (*A. baumannii*, *P. aeruginosa*, *E. coli*, *S. enterica*, *K. pneumoniae*).

CHROMagar COL-APSE is a sensitive and specific medium for colistin-resistant pathogens with a lower detection limit of 10 CFU/ml. It allows for color differentiation of COL-R *E. coli* strains, coli group bacteria, *Pseudomonas* and *Acinetobacter*.

The test is performed using rectal, perineal or fecal swabs from patients to screen for COL-R colonization. Results can be interpreted after 18-24 hours of aerobic incubation at temperature of 35-37°C. CHROMagar COL-APSE can also be used for detecting COL-R in food products, animal feeds, samples from livestock and environmental materials.

CHROMagar **VRE**

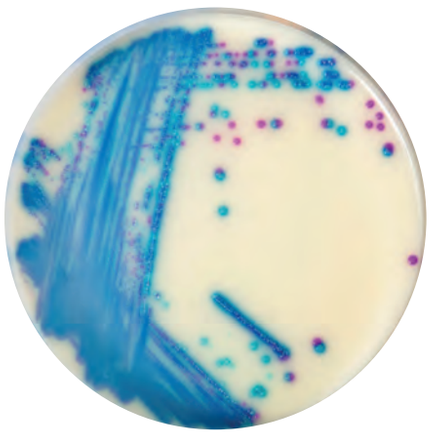
A medium designedfor the detection and isolation of vancomycin-resistant *E. faecalis* and *E. faecium* (Van A/Van B VRE).

Sensitivity 95,5% / Specificity 90,4% [17]

Ref. no. 1460PD90

There are two types of vancomycin resistance in *Enterococcus*. The first type is intrinsic resistance (mainly Van C type, but also Van D, Van E, Van F, etc.) found in *E. gallinarum* and *E. casseliflavus*/*E. flavescens*, showing a low level of resistance to vancomycin. The second type of vancomycin resistance in enterococci is acquired resistance (Van A and Van B types), most commonly observed in *E. faecium* and *E. faecalis*. Therefore, to prevent the spread of this resistance to more virulent pathogens (e.g., *S. aureus*), it is crucial to quickly detect the presence of either of these two species in a patient and accurately differentiate them from other *Enterococcus*. Since these microorganisms are part of the human microbiome, determining their carriage in patients is essential, mainly for epidemiological purposes and in the prevention of hospital-acquired infections.

On CHROMagar VRE medium, vancomycin-resistant strains of *E. faecalis* and *E. faecium* can be easily differentiated using intense colors of the grown colonies. On classical media such as Bile Esculin Agar with vancomycin, false-positive results can be obtained due to the presence of other bacteria that hydrolyze esculin, such as *Lactococcus* spp., *Pediococcus* spp.



Colony appearance:

VRE E. faecalis/E. faecium - pink to mauve,

E. gallinarum/E. casseliflavus - blue or inhibited,

other bacteria - inhibited.

CHROMagar **MRSA**

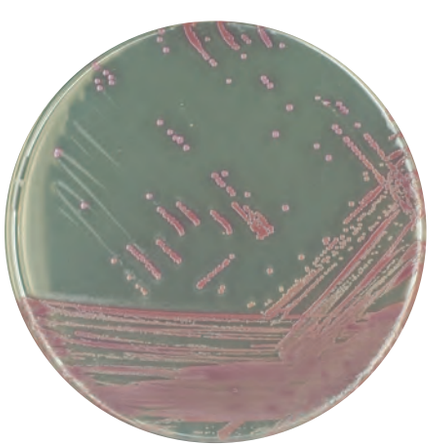
A medium for the isolation and differentiation of methicillin-resistant *Staphylococcus aureus* (MRSA).

Sensitivity 95,6% / Specificity 100% [18]

Ref. no. 1402PD90

MRSA strains are a major cause of hospital-acquired infections, especially in intensive care units. These strains can originate either from the patient (endogenous) or from the hospital environment. The resistance of MRSA to many antibiotics, including ß-lactam antibiotics, significantly limits therapeutic options. Screening tests for MRSA, particularly among patients admitted to hospital units, allow for the control of the spread of this microorganism and ensuring proper patient care. The cost savings resulting from consistent MRSA decolonization outweigh the costs of screening tests.

In 2002, CHROMagar initiated a revolution in MRSA diagnostics by introducing the first medium for their identification to the market. The use of CHROMagar MRSA allowed for the implementation of screening tests among patients, reducing the time needed to obtain results and decreasing the workload in the laboratory.



Colony appearance:

S. aureus methicillin-resistant (MRSA) - mauve,

S. aureus methicillin sensitive (MSSA) - inhibited,

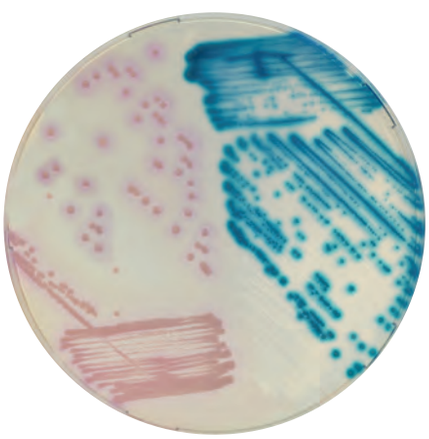
other bacteria - blue, colorless or inhibited.

CHROMagar **LIN-R**

A medium designed for the detection, isolation, and differentiation of linezolid-resistant *Staphylococcus* and *Enterococcus* strains.

99 % Sensitivity / Specificity 100 % [19]

Ref. no. 1476PD90



Colony appearance:

LZD R Enterococcus - steel blue,

LZD R S. aureus, S. epidermidis - pink,

LZD S Gram(+) bacteria - limited growth or inhibited,

Gram(-) bacteria and yeasts - inhibited.

Gram(+) cocci pose a global threat to human health due to their increasing resistance to antibiotics. Linezolid has a broad spectrum of activity against various pathogenic Gram(+) microorganisms, such as MRSA, VRS and VRE. However, following its clinical use, reports of linezolid-resistant strains (LIN-R) have emerged, with horizontal spread of resistance associated with the cfr gene. Although the prevalence of linezolid resistance remains low, the emergence of LIN-R strains still raises significant concerns.

Currently, linezolid susceptibility in clinical samples is monitored by surveillance programs in Europe and the United States. Clinical isolates for monitoring LIN-R strains include nasal swabs (for *Staphylococcus* screening), perianal and rectal samples (for *Enterococcus* screening).

CHROMagar LIN-R exhibits high sensitivity, detecting even an MIC of 8 µg/ml, allows direct plating of samples onto the medium and species identification using MALDI-TOF can be directly performed from the grown colonies.

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