ARUP LABORATORIES | A nonprofit enterprise of the University of Utah and its Department of Pathology

Effective Date: July 21, 2025

TEST CHANGE

# Antimicrobial Susceptibility, AFB/Mycobacteria

0060217, MA AFB

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| Specimen Requirements: | |
| Patient Preparation: | |
| Collect: | Actively growing isolate in pure culture. |
| Specimen Preparation: | Transport sealed container with pure isolate~~culture~~ on solid or liquid media. Place each isolate~~specimen~~ in an individually sealed bag. |
| Transport Temperature: | Room temperature. Submit M. tuberculosis complex isolates. ~~If culture is suspected of being a microorganism identified on the IATA list as an infectious substance affecting humans, submit specimen~~ according to Infectious Substance, Category A~~,~~ shipping guidelines. |
| Unacceptable Conditions: | Mixed isolates~~cultures~~ or nonviable organisms. M. tuberculosis complex isolates~~Organisms~~ submitted on an agar plate. |
| Remarks: | |
| Stability: | Ambient: 2 weeks; Refrigerated: 2 weeks; Frozen: unacceptable~~2 weeks~~ |
| Methodology: | Broth Macrodilution/Broth Microdilution |
| Performed: | Sun-Sat |
| Reported: | Varies |
| Note: | AFB susceptibility testing is billed at the panel level. Charges will vary based on organism identified. An additional handling fee will be billed for all organisms submitted that are not in pure culture as indicated in the specimen requirements. If species identification is not provided or if incorrect identification is provided, identification will be performed at ARUP. Additional charges apply. M. tuberculosis complex isolates mono-resistant to p~~P~~yrazinamide (PZA) will be further identified to species by PCR at an additional charge. An additional charge will be added for drug requests that are not tested at ARUP and require sendout. |
| CPT Codes: | CPT codes vary based on method |
| New York DOH Approval Status: | This test is New York DOH approved. |

Interpretive Data:

| Test Name | Methodology | Drugs Tested | CPT Code |
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| Antimicrobial Susceptibility - AFB/Mycobacterium tuberculosis Primary Panel | MGIT960 Broth Macro dilution | The interpretation provided is based on results for the following drugs at the stated concentrations: Drugs tested: Ethambutol: 5.0 ug/mL; Isoniazid: 0.1 ug/mL (0.4 ug/mL if resistant to 0.1 ug/mL); Rifampin: 1.0 ug/mL. This procedure screens isolates of M. tuberculosis complex for drug resistance. The procedure does not use serial dilutions to provide quantitative MIC values. Single critical concentrations for each antimycobacterial agent used have been defined by the United States Public Health Service. | 87188 x4 |
| Antimicrobial Susceptibility - AFB/Mycobacterium tuberculosis Secondary Panel | Agar proportion and Broth dilution | Note: If M. tuberculosis complex isolate is resistant to rifampin or any two primary drugs, a secondary panel is available as a send-out test. The interpretation provided is based on testing for the following drugs at the stated concentrations: Drugs tested: Amikacin: 6 ug/mL; capreomycin: 10 ug/mL; cycloserine: 60 ug/mL; ethionamide: 10 ug/mL; kanamycin: 6 ug/mL; PAS: 8 ug/mL; streptomycin at a low level (2.0 ug/mL) and a high level (4.0 ug/mL). Levofloxacin and moxifloxacin are tested at 2, 4 and 8 ug/mL | 87190 x6, 87188 x3 |
| Antimicrobial Susceptibility - AFB/Mycobacteria | Broth Microdilution | See organism-specific panels below. | 87186 |
| Mycobacterium aviumintracellulare Complex | Broth Microdilution | Drugs tested: Amikacin, clarithromycin, linezolid, moxifloxacin. Clofazimine at request only Clarithromycin results predict azithromycin. Because MIC results do not predict clinical response and may be misleading, rifampin, rifabutin, and ethambutol MICs are not tested. | 87186 |
| Rapid Growing Mycobacteria | Broth Microdilution | Drugs tested: Amikacin, cefoxitin, ciprofloxacin, clarithromycin, clofazimine, | 87186 |

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| | | | doxycycline, imipenem, linezolid, moxifloxacin, tigecycline, tobramycin (M. chelonae only), and trimethoprim/sulfamethoxazole (TMP/SXT). Extended 14-day incubation is performed on isolates initially susceptible to clarithromycin to detect Erm-dependent inducible macrolide resistance. Extended drugs at an additional charge: bedaquiline, omadacycline, and eravacycline | |
| | Miscellaneous Slowly Growing Non-tuberculosis Mycobacteria (NTM, non-fastidious species) | Broth Microdilution | Drugs tested: Amikacin, ciprofloxacin, clarithromycin, doxycycline, linezolid, moxifloxacin, rifabutin, rifampin, streptomycin and trimethoprim/sulfamethoxazole (TMP/SXT). Selective reporting by organism. CLSI recommends that isolates of M. kansasii be tested against rifampin and clarithromycin only. Rifampin-susceptible isolates are also susceptible to rifabutin. If the isolate is rifampin-resistant, the following secondary drugs will also be reported: Amikacin, ciprofloxacin, linezolid, moxifloxacin, rifabutin, streptomycin and trimethoprim-sulfamethoxazole. M. marinum isolates are tested against amikacin, ciprofloxacin, clarithromycin, doxycycline, moxifloxacin, rifabutin, rifampin, and trimethoprim-sulfamethoxazole. Slowly-growing NTM other than M. kansasii and M. marinum are tested against amikacin, ciprofloxacin, clarithromycin, linezolid, moxifloxacin, rifabutin, rifampin, streptomycin, and trimethoprim-sulfamethoxazole. | |
| | Miscellaneous Slowly Growing Non-tuberculosis Mycobacteria (NTM, fastidious species) | | Susceptibility testing is not available for M. haemophilum, M. genavense, and M. ulcerans | |

Reference Interval:

| Available Separately | Test Name | Methodology | Reference Interval/Drugs Tested | CPT Code |
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| 0060347 | Antimicrobial Susceptibility - AFB/Mycobacterium tuberculosis Primary Panel | MGIT960 | The interpretation provided is based on results for the following drugs at the stated concentrations: Drugs tested: Ethambutol: 5.0 ug/mL; Isoniazid: 0.1 ug/mL (0.4 ug/mL if resistant to 0.1 ug/mL); Pyrazinamide: 100 ug/mL; Rifampin: 1.0 ug/mL. This procedure screens isolates of M. tuberculosis complex for drug resistance. The procedure does not use serial dilutions to provide quantitative MIC values. Single critical concentrations for each antimycobacterial agent used have been defined by the United States Public Health Service. | 87188 x4 |
| | Antimicrobial Susceptibility - AFB/Mycobacterium tuberculosis Secondary Panel | Agar proportion and Broth dilution | Effective February 21, 2012 Note: If M. tuberculosis isolate is resistant to rifampin or any two primary drugs, a secondary panel will be performed as a send-out test. The interpretation provided is based on testing for the following drugs at the stated concentrations: Drugs tested: Amikacin: 6 ug/mL; capreomycin: 10 ug/mL; cycloserine: 60 ug/mL; ethionamide: 10 ug/mL; kanamycin: 6 ug/mL; PAS: 8 ug/mL; streptomycin at a low level (2.0 ug/mL) and a high level (4.0 ug/mL). Levofloxacin and moxifloxacin are tested at 2, 4 and 8 ug/mL | 87190 x6, 87188 x3 |
| | Antimicrobial Susceptibility - AFB/Mycobacteria | Broth Microdilution | See organism-specific panels below. | 87186 |
| | Mycobacterium avium-intracellulare Complex | Broth Microdilution | Effective April/1/2022 Drugs tested: Amikacin, clarithromycin, linezolid, moxifloxacin. Clarithromycin results predict azithromycin. Because MIC results do not predict clinical response and may be misleading, rifampin, rifabutin, and ethambutol MICs are not tested. | 87186 |
| | Rapid Growing Mycobacteria | Broth Microdilution | Effective April 1, 2022 Drugs tested: Amikacin, cefoxitin, ciprofloxacin, clarithromycin, doxycycline, imipenem, | 87186 |

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| | | | linezolid, moxifloxacin, tigecycline, tobramycin (M. chelonae only), and trimethoprim/sulfamethoxazole (TMP/SXT). Extended 14-day incubation is performed on isolates initially susceptible to clarithromycin to detect Erm(41)-dependent inducible macrolide resistance except Mycobacterium species with a nonfuctional Erm(41) gene. | |
| | Other Slowly-Growing Non-tuberculosis Mycobacteria (NTM) | Broth Microdilution | Effective April 1, 2022 Drugs tested: Amikacin, ciprofloxacin, clarithromycin, doxycycline, linezolid, moxifloxacin, rifabutin, rifampin, streptomycin and trimethoprim/sulfamethoxazole (TMP/SXT). Selective reporting by organism. CLSI recommends that isolates of M. kansasii be tested against rifampin and clarithromycin only. Rifampin-susceptible isolates are also susceptible to rifabutin. If the isolate is rifampin-resistant, the following secondary drugs will also be reported: Amikacin, ciprofloxacin, linezolid, moxifloxacin, rifabutin, streptomycin and trimethoprim-sulfamethoxazole. M. marinum isolates are tested against amikacin, ciprofloxacin, clarithromycin, doxycycline, moxifloxacin, rifabutin, rifampin, and trimethoprim-sulfamethoxazole. Slowly-growing NTM other than M. kansasii and M. marinum are tested against amikacin, ciprofloxacin, clarithromycin, linezolid, moxifloxacin, rifabutin, rifampin, streptomycin, and trimethoprim-sulfamethoxazole. | 87186 |