EUCAST EUROPEAN COMMITTEE ON ANTIMICROBIAL SUSCEPTIBILITY TESTING

European Society of Clinical Microbiology and Infectious Diseases

Standard Operating Procedure

Organisation and maintenance of the EUCAST main website and the EUCAST MIC and zone diameter distribution website

EUCAST SOP 6.3

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Foreword

The European Committee on Antimicrobial Susceptibility Testing (EUCAST) is organised by the European Society of Clinical Microbiology and Infectious Diseases (ESCMID), the European Centre for Disease Prevention and Control (ECDC), and the national antimicrobial breakpoint committees in Europe, currently in France, Norway, Sweden, The Netherlands and The United Kingdom. EUCAST was established by ESCMID in 1997, was restructured in 2001-2002 and has been in operation in its current form since 2002. Countries outside Europe are increasingly forming EUCAST-affiliated national antimicrobial susceptibility testing (AST) committees and implementing the EUCAST systems of testing methods and breakpoints.

The current remit of EUCAST is to harmonise clinical breakpoints for existing drugs in Europe, to determine clinical breakpoints for new drugs, to set epidemiological cut off values, to revise breakpoints as required, to harmonise methodology for antimicrobial susceptibility testing, to develop a website with MIC and zone diameter distributions of antimicrobial agents for a wide range of organisms, to provide continuing education on AST and to liaise with European governmental agencies and European networks involved with antimicrobial resistance and resistance surveillance.

Information on EUCAST, EUCAST breakpoints and all documents are freely available on the EUCAST website at http://www.EUCAST.org.

Citation of EUCAST documents

The copyright of all documents and data published on the EUCAST website remains with EUCAST. All are freely available for re-use if reference to the EUCAST website is given and documents and data are not resold. Any secondary publication of the data must be referenced with the declaration that "These data have (or this document has) been produced in part under ECDC service contracts and made available at no cost by EUCAST and can be accessed freely on the EUCAST website www.eucast.org. EUCAST recommendations are frequently updated and the latest versions are available at www.eucast.org."

EUCAST documents published on the EUCAST website should be cited in the following way: European Committee on Antimicrobial Susceptibility Testing. Name of document, EUCAST version number, year. Website address.

This SOP should be cited as: “Organisation and maintenance of the EUCAST main website and EUCAST MIC and zone diameter distribution website. European Committee on Antimicrobial Susceptibility Testing. EUCAST SOP 6.3, 2021. http://www.eucast.org.”

Abbreviations	
AFST	Antifungal Susceptibility Testing
CLSI	Clinical and Laboratory Standards Institute
ECOFF	Epidemiological Cut-Off
ECDC	European Centre for Disease Prevention and Control
EMA	European Medicines Agency
EUCAST	European Committee on Antimicrobial Susceptibility Testing
ESCMID	European Society for Clinical Microbiology and Infectious Diseases
FAQ	Frequently Asked Questions
ISO	International Organization for Standardization
MIC	Minimum Inhibitory Concentration
NAC	National Antimicrobial susceptibility testing Committee
QC	Quality Control
SOP	Standard Operating Procedure
WHO	World Health Organization

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1	Scope
1.1	This SOP describes how the EUCAST websites are organised and maintained.

2	Introduction
2.1	EUCAST has two separate websites.
2.2	The main website gives a detailed description of the EUCAST structure and activities, presents news related to EUCAST activities and provides access to all EUCAST documents and other educational information.
2.3	The EUCAST MIC and zone diameter distribution website provides collated distributions of MICs (multiple MIC methods) and zone diameters (EUCAST method only).

3	EUCAST main website
3.1	**Location** The main EUCAST website is part of the ESCMID website (http://www.escmid.org) but may be accessed directly at http://www.EUCAST.org. The server is located at the site of the ESCMID website provider, Code Red Media GmbH, Düsseldorf, Germany. The website software is the same software as used for other ESCMID websites, “Typo3” (see http://typo3.org for details). The website is managed through EUCAST and the ESCMID Executive Office at: ESCMID Gerbergasse 14 3rd floor 4051 Basel Switzerland
3.2	**Website update** The Website Manager is currently the EUCAST Technical Data Coordinator. The website is updated by the Website Manager or by ESCMID InformationTechnology staff on direction from the EUCAST Chairman, Technical Data Coordinator or Scientific Secretary.
3.3	**Software update**

	Software updates are made as part of the upgrade process for the ESCMID website through the ESCMID Executive Office.
3.4	**Organisational structure** Pages and sub-pages are organised as follows: Homepage Organisation EUCAST statutes Steering Committee General Committee Subcommittees EUCAST AFST VETCAST (Need to add AMST) National AST Committees (NAC) Development Laboratories Network Laboratories Consultations EUCAST News New definitions of S, I and R Clinical breakpoints and dosing About “clinical breakpoints” Splitting MIC wild-type distributions When there are no breakpoints? Where clinical data are lacking! EUCAST setting breakpoints. Rapid AST in blood cultures Methods QC Breakpoints for short incubation Screening for resistance mechanisms FAQ on RAST Expert rules and intrinsic resistance Resistance mechanisms Guidance documents SOP MIC and zone diameter distributions and ECOFFs

AST of bacteria
- Media preparation
- MIC determination
- Disk diffusion methodology
- Disk diffusion implementation
- Compliance of manufacturers
- Breakpoint tables
- Quality Control
- Strains with defined susceptibility
- Calibration and validation
- Warnings!
- Guidance documents
- MIC testing service from EUCAST
- Previous versions of tables

AST of mycobacteria
- Clinical breakpoints for antimycobacterial agents
- MIC & ECOFFs
- Methods in Mycobacteria
- Documents
- Scientific publications
- Meetings and Minutes

AST of fungi
- Breakpoints for antifungals
- MIC distributions and ECOFFs
- Methods of antifungal susceptibility testing
  - AST of yeasts
  - AST of moulds
  - AST of dermatophytes
- QC AFST tables
- Rationale documents for antifungals
- Publications in journals
- Meetings, Minutes and Reports
- Previous versions of documents

AFST of veterinary pathogens
- VetCAST meetings

Frequently Asked Questions (FAQ)

Meetings
- EUCAST meetings

Publications and documents
- Rationale Documents
- Standard Operation Procedures
- Discussion documents

	Consultations Publications in journals Technical notes Posters Other Documents External documents Reports Presentations and statistics EUCAST at ECCMID Videos and online seminars Online seminars English Chinese Warnings! Translations Information for industry Links and Contacts
3.5	**Home page** The homepage includes the following: General information about EUCAST. A list of pages as detailed in 3.4 with links to these pages. A list of recent news items with links to detailed information. A Newsfeed link which enables anyone to provide automatic listing of EUCAST News items on their own website. Email addresses of the EUCAST Chairman, Scientific Secretary, Clinical Data Coordinator, Technical Data Coordinator, Head of EUCAST Development Laboratory (EDL) – bacteria, Head of EUCAST Development Laboratory (EDL) – fungi, Webmaster Logos of ESCMID, ECDC and EMA with links. A link to a list of all website changes.
3.6	**EUCAST Organisation pages** EUCAST statutes

	A general description of the EUCAST statutes (with the date of the last amendment) and a link to the full document. Steering Committee A description of the committee structure and a link to the full list of committee members. General Committee A description of the committee structure and a link to the full list of committee members. Subcommittees A description of how EUCAST subcommittees are set up, how they operate and links to details of current subcommittees. National AST Committees (NAC) A description of "National antimicrobial Susceptibility Testing Committees" and a link to more detailed information. EUCAST Development Laboratories A description of the EUCAST Development Laboratories and contact details. EUCAST Network Laboratories A description of the EUCAST AST and AFST networks of laboratories and lists of participating laboratories.
3.7	**Consultations** There are two sections containing: A list of all current consultations All previous consultation with comments and EUCAST responses A generic template for comments is included.
3.8	**EUCAST News** A list of latest news items and updates from EUCAST, with links to detailed information.
3.9	**New Definitions of S, I and R** A description of the revised definitions of S (Susceptible – standard dosing regimen). I (Susceptible – Increased exposure) and R (Resistant), including links to: • a 3-page "Information to clinical colleagues,\ • EUCAST explanatory video • online seminars on how to implement and use the new susceptibility categories and on the use of the ATU in clinical laboratories • a PowerPoint implementation tool and accompanying pdf, and • a EUCAST guidance document
3.10	**Clinical breakpoints and dosing** An introduction to the breakpoint tables and links to the current breakpoint

	tables for bacteria and fungi as pdf files for printing and excel files for direct use on screen. There are also links to the following documents: • Aminoglycoside guidance document • Guidance for organisms not listed in breakpoint tables • What to do when there are no clinical breakpoints • Area of Technical Uncertainty (ATU)
3.11	**Rapid AST in blood cultures** Information and guidance on the implementation and day-to-day use of rapid disk diffusion susceptibility testing of isolates direct from positive blood cultures. It includes sections and documents on: Methods QC Breakpoint for short incubation Screening for resistance mechanisms FAQ on RAST
3.12	**Expert rules and intrinsic resistance** A general description of EUCAST expert rules with links to full current and previous versions of the rules.
3.13	**Resistance mechanisms** An introduction to the EUCAST guideline for the detection of resistance mechanisms and specific resistances of clinical and/or epidemiological importance with a link to the current version (11 July 2017).
3.14	**SOPs and Guidance documents** Links to SOPs Links to EUCAST guidance documents: • Direct susceptibility testing (16 Feb 2012) • Oral cephalosporins and Enterobacteriaceae breakpoints (16 Feb 2012) • *Stenotrophomonas maltophilia* (1 Feb 2012) • *Burkholderia cepacia* group (20 July, 2013) • Breakpoints for topical use of antimicrobial agents (29 March, 2014) • Daptomycin in endocarditis caused by Enterococci (March 2016, updated 24 Sept 2016) • Recommendations for colistin (polymyxin E) MIC testing - joint EUCAST and CLSI recommendation (22 March, 2016) • What to do when there are no breakpoints in the EUCAST breakpoint table (5 July, 2016) • *Legionella pneumophila* susceptibility testing (9 September, 2016) • Setting breakpoints for agent-inhibitor combinations (2 October 2017) • EUCAST system for antimicrobial abbreviation (13 July, 2018) • Guidance on the 2019 modifications of susceptibility categories S, I

	and R categories (22 October, 2018) • This presentation also informs laboratories on how to implement the Area of Technical Uncertainty • ATU - the Area of Technical Uncertainty - Guidance to laboratories on how to deal with the ATU in antimicrobial susceptibility testing (21 December, 2018; updated 2 Jan, 2019) • Guidance document on tigecycline dosing - in relation to EUCAST breakpoints for tigecycline 2019 (23 December, 2018) • Guidance on cefotaxime and ceftazidime disks with and without clavulanic acid for ESBL confirmation (12 February, 2019) • Guidance for industry on the working order between pharmaceutical industry, EMA and EUCAST (5 May, 2019) • Guidance on the implementation and use of the 2020 aminoglycoside breakpoints • Guidance on cefiderocol MIC broth microdilution
3.15	**MIC distributions and ECOFFs** A general description of the MIC distributions section of the MIC and zone diameter distribution website with a link to the website. Links are provided to: • The MIC distribution website • MIC and zone diameter correlations page as well as spreadsheets for entering and supplying data for adding to the EUCAST distributions website. A list of updates to ECOFFs which have been revised according to the new procedures is also provided.
3.16	**AST of bacteria** Subsections as follows giving detailed descriptions of technical procedures for the following: <u>Media preparation</u> Description of EUCAST agar and broth media with links to detailed documents on media preparation. In addition to the English version, there is a link to versions in other languages. Respective NACs are responsible for maintaining the versions in languages other than English. <u>MIC determination</u> A note that the EUCAST recommendations for MIC determination for non-fastidious organisms are in agreement with the recommendations from the International Standards Organisation and a link to the ISO document. A note on media recommended by EUCAST for fastidious organisms and a link to detailed instructions for preparation of media for fastidious organisms. A link to EUCAST tables giving QC ranges for recommended QC strains. <u>Disk diffusion methodology</u> Links to documents giving detailed descriptions of the disk diffusion test method, a Powerpoint teaching presentation on the disk diffusion method

	and a reading guide to help ensure that users read tests correctly. There is a link to translations of these documents in other languages than English. <u>Disk diffusion implementation</u> A link to a checklist to assist in the introduction of the EUCAST disk diffusion test in the clinical laboratory. There is a link to translations of these documents in other languages than English. <u>Breakpoint tables</u> Links to current MIC and zone diameter breakpoint tables. Quality Control and QC Tables Links to EUCAST tables giving QC ranges for recommended routine QC strains and an extended set covering specific resistance mechanisms. <u>Strains with well-defined susceptibility</u> Strains with resistance mechanisms where MIC-values (and zone diameters) have been well defined using several different broth microdilution panels before and after freeze drying. <u>Calibration and validation</u> Links to a series of documents giving detailed data supporting zone diameter breakpoints for particular groups of organisms. <u>Warnings</u> Link to section 3.24. <u>Guidance documents</u> Links to documents giving guidance on particular issues in antimicrobial susceptibility testing, such as direct susceptibility testing and testing *Stenotrophomonas maltophilia*. MIC determination services provided by the EUCAST Development Laboratory. A description of services provided by the EDL in Sweden A link is provided to a subject contact form' <u>Previous versions of documents</u> Links to all previous versions of EUCAST breakpoint and QC tables.
3.17	**AST of mycobacteria** The more recently established Standing Antimycobacterial AST Subcommittee has developed a reference method for susceptibility testing of *M. tuberculosis*. Supporting documentation is made available in this section, including links to: Breakpoint Tables (which has a *M. tuberculosis* tab) the EUCAST Distribution website The reference method itself and a SOP for calibrating surrogate methods

	Rationale documents Scientific publications Meetings and minutes.
3.18	**AST of fungi** The AFST subcommittee is a Standing Subcommittee which deals with all aspects of breakpoints and susceptibility testing methods for fungi. A separate section is provided on the website giving links to: Breakpoints for antifungals MIC distributions and ECOFFs Methods in antifungal susceptibility testing QC AFST Tables Rationale documents for antifungals Documents for discussion in AFST Publications in journals Meetings,Minutes and Reports Previous versions of documents
3.19	**AST of veterinary pathogens** VetCAST is a Standing EUCAST Subcommittee dealing with all aspects of antimicrobial susceptibility testing of bacterial pathogens of animal origin and animal bacteria with zoonotic potential. Links to documents related to AST of veterinary pathogens are provided, including: VetCAST vision, strategy, remits VetCAST guidance on how to collect and handle PK data Rationale documents Agenda and minutes of meetings Publications Presentations
3.20	**Frequently Asked Questions (FAQ)** Links to a regularly-updated file with answers to frequently asked questions covering breakpoint issues, susceptibility testing methodology and the MIC and zone diameter distribution website.
3.21	**Meetings** Includes sections on the following: Forthcoming meetings including Steering Committee meetings, the next

	General Committee meeting and educational meetings. Links to minutes of recent General Committee meetings and summaries of recent Steering Committee meetings. Also included are sections with links to minutes or summary minutes from earlier meetings.
3.22	**Publications and Documents** Links to pdf versions of a wide range of EUCAST documents as follows: Rationale Documents for antimicrobial agents Documents for individual agents giving the rationale for EUCAST breakpoints. Standard Operation Procedures Documents on breakpoint settings and aspects of EUCAST organisation. Discussion documents Documents released for consultation on various aspects of breakpoint setting and antimicrobial susceptibility testing. Documents have a set time period for comments, after which comments are reviewed, the document amended if necessary and the document is then published. Publications in journals EUCAST articles in peer-reviewed scientific journals. Technical notes Notes in CMI summarising longer documents on breakpoints or susceptibility testing methods. Posters Presentations at international symposia. Other documents Definitive documents, expert rules, as well as documents about the process of harmonizing breakpoints. External documents Includes links to relevant external documents not prepared by EUCAST, including ISO and EMA documents. Reports Links are provided to pdf copies of EUCAST reports which have appeared in ESCMID News or the EUCAST Newsletter.
3.23	**Presentations and statistics** Links to data on EUCAST international uptake, establishment of NACs and uptake of EUCAST guidelines and methods. Links to general website use statistics and statistics on the use of the MIC ad

	ECOFF software Links to pdf files of available presentations from EUCAST symposia and educational workshops at ECCMID.
3.24	**Videos and online seminars from EUCAST** In collaboration with the WHO, EUCAST publishes instruction videos on how to perform antimicrobial susceptibility testing using EUCAST recommended methods and interpretation.
3.25	**Warnings!** Notification of products (disks, media batches, gradient tests or procedures) which are not performing to the expected standard.
3.26	**Translations** Translations of EUCAST documents in several languages.
3.27	**Information for industry** Links to the working order between industry, EMA and EUCAST.
3.28	**Links and Contacts** Includes links to relevant organisations including ECDC, EMA and CLSI and the current national breakpoint committees in Europe. Includes email addresses of the Chairman, Scientific Secretary, Clinical Data Coordinator, the Technical Data Coordinator and the Webmaster. Contact details for the EUCAST Development Laboratories for Antimicrobial Susceptibility Testing of bacteria and fungi are provided.

4	**EUCAST MIC and zone diameter distribution website**
4.2	**Website update** The Website Manager is currently the EUCAST Technical Data Coordinator. The website is updated by the Website Manager. Directions for update may be from the EUCAST Chairman, Clinical Data Coordinator, Technical Data Coordinator or Scientific Secretary or by staff at the EUCAST Development Laboratory. New distributions are very frequently added to the website.
4.3	**Software update** Software updates are made when commissioned by EUCAST. Work is done by Code Red, Düsseldorf, Germany.

4.4	**Organisational structure** Home page Search selection MIC distributions **or** Zone diameter distributions Selection by Antimicrobial agent **or** Organism MIC distribution tables Histograms of selected organism-agent distribution Zone diameter distribution tables Histograms of selected organism-agent distribution
4.5	**Home page** Description of the database, presentation format and limitations of the data. A method is provided for submission of data to be considered for inclusion in the database.
4.6	**Search selection** Buttons allow search selection for MIC or zone diameter distributions, and presentation of either distributions for all available organisms for a particular antimicrobial agent, or distributions for all available antimicrobial agents for a particular organism.
4.7	**MIC distribution tables** MIC distributions are presented as line listings with one line for each antimicrobial agent if the search is based on a specific organism, or one line per organism if the search is based on a specific antimicrobial agent. The MIC distribution covers a twofold dilution range from ≤0.002 to ≥512 mg/L and provides the total number of isolates in the database at each dilution. The numbers within the wild-type distribution are highlighted in blue (as long as the number of isolates at a dilution represents at least 1% of total number of isolates in the distribution). At the end of each distribution information is provided on the number of distributions contributing to the counts on each line, the total count of observations on each line, the ECOFF or tentative ECOFF (TECOFF) and the confidence interval for each (T)ECOFF. Clicking on the name of the agent or organism at the start of the line displays a histogram of the distribution (see 4.9).
4.8	**Zone diameter distribution tables** Zone diameter distributions are presented as line listings with one line for each antimicrobial agent if the search is based on a specific organism, or one line per organism if the search is based on a specific antimicrobial agent.

	The zone diameter distribution covers a whole number range from 6 mm (no zone) to 50 mm and provides the total number of isolates in the database at each zone diameter. The numbers within the wild-type distribution are highlighted in blue. At the end of each distribution the ECOFFs, information is provided on the number of distributions contributing to the counts on each line, the total count of observations on each line, the ECOFF or tentative ECOFF (TECOFF) and the confidence interval for each (T)ECOFF. Clicking on the name of the agent or organism at the start of the line displays a histogram of the distribution (see 4.10).
4.9	**MIC distribution histograms** MIC histograms for individual antimicrobial agent-organism combinations are presented with one bar for each twofold dilution in the range ≤0.008 to ≥512 mg/L. Where there are an adequate number of distributions to set a TECOFF or ECOFF, two histograms are shown, one which presents the percentages of isolates at each dilution after aggregation of raw counts, and the other presents the percentages of isolates at each dilution where each contributing distribution has equal weight, the bars within the wild-type distribution are highlighted in blue (as long as the number of isolates at a dilution represents at least 1% of total number of isolates in the distribution) and bars representing MICs above the wild type are red. Where the number of distributions is inadequate to set a TECOFF, a single histogram is displayed presenting the percentages of isolates at each dilution after aggregation of raw counts, and all bars are coloured grey. Beneath each distribution the MIC ECOFF and confidence interval are given, together with the total number of observations and the number of data sources (distributions) included. A box with any notes relating to the distribution is positioned to the right of the histogram(s). The histograms may be downloaded as jpg files or printed directly.
4.10	**Zone diameter distribution histograms** Zone diameter histograms for individual antimicrobial agent-organism combinations are presented with one bar for each mm in the range 6mm (no zone) to 50mm. The histogram presents the percentages of isolates at each zone diameter. The bars within the wild type distribution are filled in black and bars representing zone diameters below the wild type are red. As for the MIC distributions where an adequate number of distributions are available, two histograms are displayed, unweights and equally weighted. Where the number of distributions is inadequate, and all bars are coloured grey.

	Beneath each distribution the disk content, the zone diameter ECOFF, and the confidence interval are given, together with the total number of observations and the number of data sources (distributions) included. A box with any notes relating to the distribution is positioned to the right of the histogram. The histograms may be downloaded as jpg files or printed directly.
4.11	**Sources of data** Collated distributions include: Organisms of human or animal origin. Organisms from any part of the world. Organisms from normal flora and from infections. Organisms without and with resistance mechanisms. Data may be from a variety of sources including: Published MIC distributions. Full MIC distributions provided by the authors of published studies where summary data are published. Published or unpublished resistance surveillance MIC data provided by the organisers. Published or unpublished MIC data provided by the organisers of research studies. Published or unpublished MIC data “on file” with pharmaceutical companies or commercial research laboratories. Zone diameter distributions for clinical isolates (with and without resistance mechanisms) and for quality control strains from the EUCAST susceptibility testing laboratory and generated as part of the development of the EUCAST disk diffusion method. Zone diameter data provided by clinical laboratories that are using the EUCAST disk diffusion method and can simultaneously provide data on EUCAST quality control strains.
4.12	**Release of MIC and zone diameter distributions on the website** Criteria for acceptance of MIC distributions and methods for setting ECOFFs are to be found in SOP 10.

4.13	**Information stored in relation to distributions** Where available, information is stored on the authors of the data and whether it relates to isolates from human, animal or food sources. For zone diameters, data for the EUCAST disk diffusion method only is accepted. For MICs, details of the method used are stored, although this information is not available to users of the website.