

BactiCALC

SIMPLE USER GUIDE



This task was completed on the basis of results of research carried out within the scope of the 6th stage of the National Programme "Governmental Programme for Improvement of Safety and Working Conditions" funded by the resources of the National Centre for Research and Development.

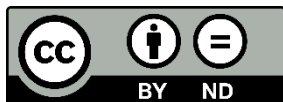
Task no.: I.PN.02,



pt. Biofilm-forming pathogens – development of modern tools for monitoring the level of microbiological cleanliness of surfaces

The Central Institute for Labour Protection – National Research Institute is the Programme's main co-ordinator.

CIOP  **PIB** **75** LAT



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Warsaw 2025

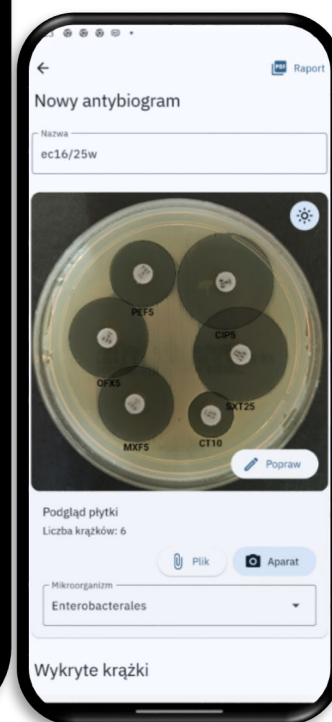
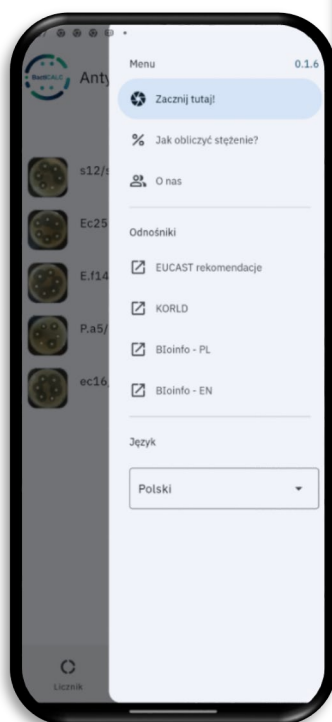
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START HERE!

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1. Start here!

BactiCALC – how does it work

BactiCALC is an app that helps with microbiology lab work. It automatically counts bacterial colonies on a Petri dish, calculates their concentration, and helps interpret antibiograms. Usage instructions for the app are available in a tutorial video on the YouTube channel of the Central Institute for Labour Protection – National Research Institute (CIOP-PIB).

The app's accuracy depends on the quality of your sample and photo. To get reliable results:

- Use only clean, undamaged, and mold-free Petri dishes.
- The photo must show one whole Petri dish—nothing else. Preferably on a black background.

Photography tips

1. Find a well-lit spot—ideally a desk or table (at least 50 × 30 cm) lit by natural, diffused light.
2. Take a photo of the dish using a smartphone or tablet. Make sure the entire Petri dish is visible.
3. Avoid shadows and reflections. If your photos come out blurry or poorly lit, consider building a simple **light tent** (e.g., from black matte cardboard) to improve image quality.

How to build a light tent?

Below is an example of a basic shadow-free light tent. You'll need:

- (A) Black matte A4 paper – this will be the background for your Petri dish.
- (B) A4 (or larger) cardboard – preferably black and matte. Cut a hole in it for your phone camera.
- (C) Two supports of equal height (10–15 cm) – e.g., pipette tip boxes, foam blocks, cups, etc.

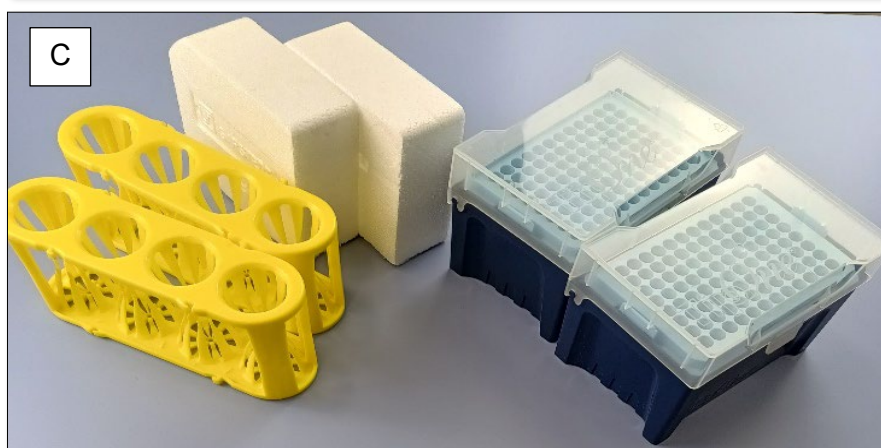
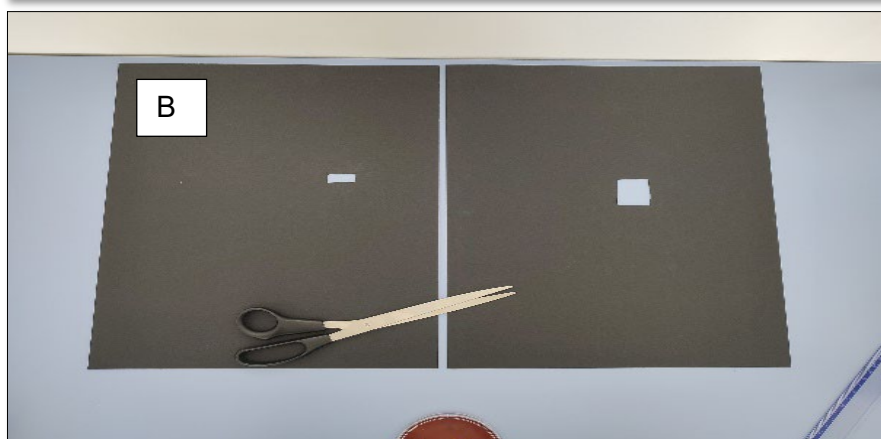
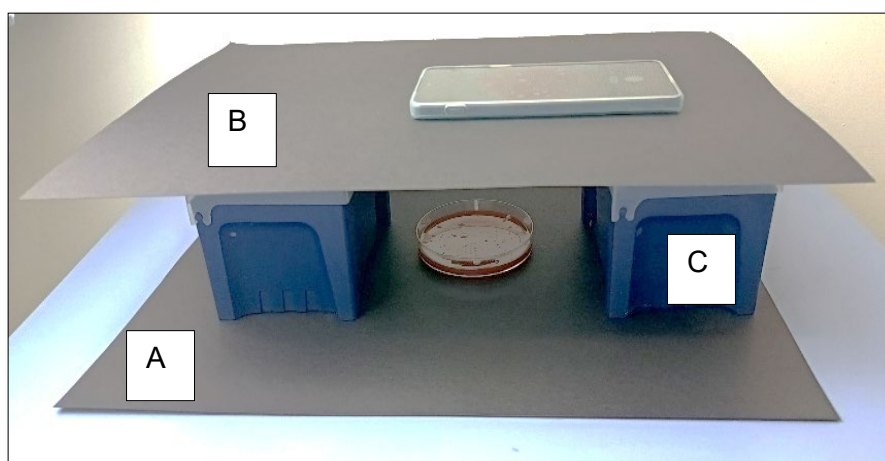
Assembly steps

- Lay the black paper (A) on a flat surface – this is your background. Place the two supports (C) on each side. Lay the cardboard (B) with the hole on top of

them. Remove the lid from the Petri dish and place it in the center of the black background (A), between the supports (C), directly under the hole in the cardboard (B). Place your phone or tablet on top of the cardboard so the camera aligns with the hole. Make sure the whole dish is visible in the frame. Adjust height and camera focus as needed.

- Take a test photo. If it looks good, take the final photo.

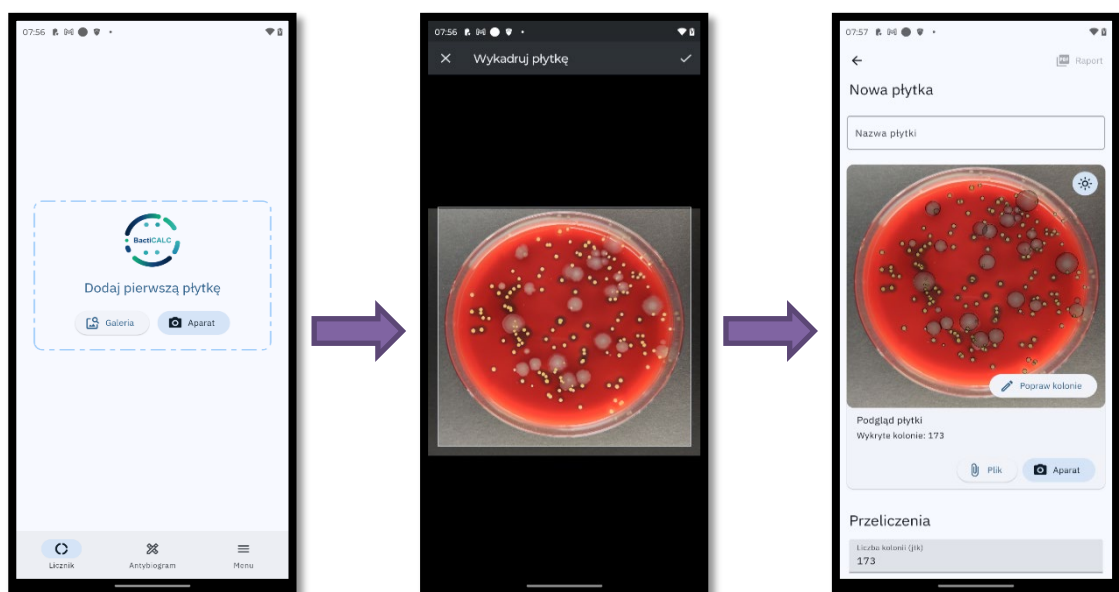
Open the **BactiCALC** app and start measuring using the **Count** or **Antibiogram** module.



2. Feature Overview

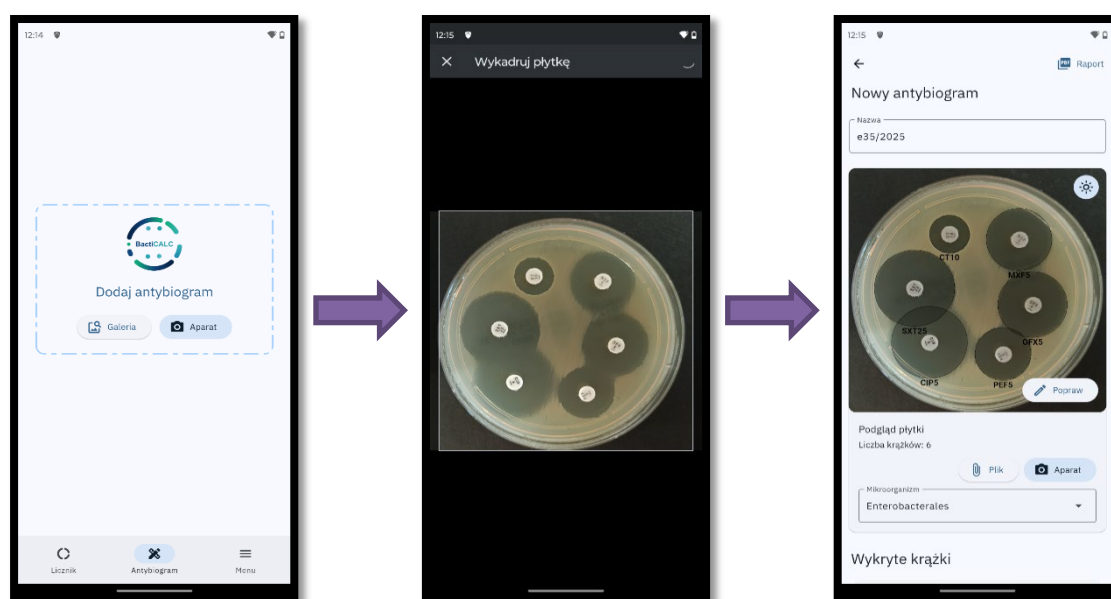
How to use the "Count" module?

1. Open the BactiCALC app and select the **"Count"** module.
2. Choose a photo – from your gallery or take a new one using the camera.
3. Crop the image so that only the test plate is visible.
4. Confirm the photo – the app will automatically count the colonies.
5. You can use the "Fix colonies" function to to:
 - a. Add missed colonies,
 - b. Remove incorrectly detected objects,
 - c. Zoom in and check details (shape, color, texture, etc.).
6. Enter test plate data:
 - a. Sample type (e.g. swab, contact plate, air sample),
 - b. Dilution factor,
 - c. Sample volume.
7. After entering the data, the app will calculate the concentrations in the appropriate units: CFU/cm², CFU/swab, or CFU/m³, depending on the sample type.
8. Generate a report and compare the result with normative or reference values.
9. **Save the report on your device or share it – generate a PDF report and send it by email or via another application (Cloud Storage, Messenger, WhatsApp, etc.).**



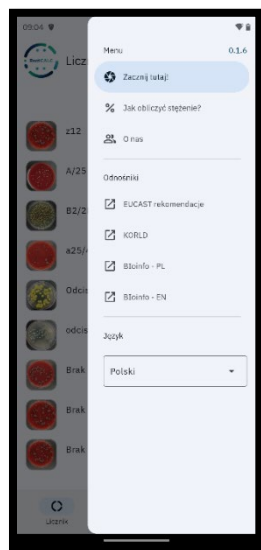
How to use the “Antibiogram” module?

1. Select a photo of the antibiogram plate – from your gallery or take a new one using the camera.
2. Crop the image so that only the plate with antibiotic discs is visible.
3. After confirming the photo, the app will:
 - a) Detect the antibiotic discs,
 - b) Measure the zones of inhibition,
 - c) Automatically read the names of the antibiotics.
4. Enter the test plate details:
 - a) Name of the plate,
 - b) Select the microorganism group being analyzed (e.g. *Enterobacterales*).
5. Adjust the measurement results if needed. Use the “Correct” function to correct the the size of the inhibition zone or antibiotic name.
6. Generate a Report and compare your results with reference values. Sensitivity categories are based on EUCAST guidelines. Interpretation of results: S – susceptible; I – increased exposure (intermediate); R – resistant. ATU – Area of Technical Uncertainty.
7. Check the EUCAST notes. Each antibiotic includes a comment explaining the breakpoint values and interpretation of inhibition zones.
8. Save or share the result – export the report as a PDF and send it via email or your preferred app (Cloud Storage, Messenger, WhatsApp, etc.).



What is in the MENU?

In the MENU, you will find instructions on how to use the application, tips on photos and calculations, as well as links to the Bioinfo database on biological agents and the EUCAST and KORLD guidelines. The application is available in Polish and English.



3. Technical Requirements for the BactiCALC App

The BactiCALC app has been designed to run smoothly and efficiently on most modern mobile devices. Below are the minimum and recommended requirements:

📱 For Android devices:

- Operating system: Android 5.0 and newer
- Access to device memory: required for saving photos and reports
- Camera access: required to take photos of petri dishes
- Internet: optional – available with full functionality (excluding updates)

🍏 For iOS (Apple) devices:

- Operating system
 - iPhone - iOS version 13.0 or later.
 - iPad - iPadOS version 13.0 or later.

iPod – touch iOS version 13.0 or later.

- Access to device storage: required for saving photos and reports
- Access to camera: required for taking photos of dishes
- Offline mode: available with full functionality (excluding updates)

 Additional recommendations:

- Stable lighting and a uniform background improve the accuracy of photo analysis
- App version: We recommend using the latest version available on Google Play or the App Store

4. SAFE USE OF SMARTPHONES / TABLETS

When working with a smartphone or tablet in a laboratory environment, special attention must be paid to hygiene practices. Regular disinfection of mobile devices helps prevent the spread of pathogens and should be a permanent part of your safety routine—for the protection of yourself and others.

Before work:

- Whenever possible, use a **dedicated work device**.
- Store your smartphones/tablets in a **clean, easy-to-disinfect case** (e.g., silicone).
- **Always wear gloves** - do not touch smartphones/tablets with bare hands while handling samples.

During work:

- Place the smartphones/tablets only on **clean, disinfected surfaces** - **never on sample benches**.
- Operate the device **only while wearing gloves**.
- Limit usage to **essential functions only** (e.g., taking photos, entering data into the app).

After work:

- Remove contaminated gloves and **wash your hands thoroughly**. Then put on a fresh pair of gloves.
- Disinfect the smartphones/tablets using one of the following:
 - ☞ Pre-moistened **wipes with 70% alcohol** (e.g., isopropyl),
 - ☞ A **microfiber cloth** dampened with an **alcohol-based cleaning solution**,
 - ☞ Or any **device-approved disinfectant**.
- **Do not spray the device directly!** Apply the disinfectant to the cloth, not to the screen. The **microfiber cloth** should be **damp, not wet**.
- Allow the phone to **air dry completely** before the next use.
- Dispose of used materials (wipes, gloves) as **biohazardous waste**.

5. Help and Additional Resources

To facilitate your first contact with the BactiCALC application, a short instructional video has been prepared, which presents step-by-step instructions on how to use the key functions of the application: the colony counting module, antibiogram analysis, and PDF report generation. The instructional video is available on the CIOP-PIB YouTube channel and the BioInfo Database.

Instructions & Resources:

- Instructional video on [the CIOP-PIB YouTube](#) channel and [BioInfo database](#)
- More about the App in [the BioInfo database](#)

BactiCALC is available free of charge in stores:

➔  Google Play

➔  App Store