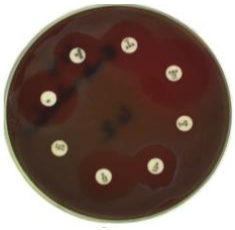
Scan® 4000
Automatic inhibition zone reader

interscience

LMU, GERMANY
Central laboratory for bacteriological diagnosis of the Veterinary Faculty of the LMU in Munich performs approximately 6,000 cultural investigations with samples of patients from the neighbouring clinics and the pathology, and to a limited extent also for submissions from veterinary surgeries.

Work with : Scan® 4000

Scan® 4000, the first device in Germany for antibiotic resistance according to CLSI VET01 standard



Interview with Dr Georg WOLF, Bacteriological Diagnostics at LMU:

Why did you feel the need in an automatic inhibition zone reader?
«For a long time we have been looking for a measuring and analysis technology for agar diffusion tests with a high level of flexibility and a user-friendliness concerning disk layouts and the qualitative evaluation of antibiotics. »

What is your procedure without using automatization ?
«The manual evaluation with templates, divider and caliper is in accordance with the principle of four eyes, where a high concentration and flexibility are required. The data will be qualified as resistant, intermediate or sensitive for documentations. For reprocessing of not plausible results the disc diffusion plates will be stored up to one week. »

What were your expectations?
«We wanted a device which can measure low-contrast bacteria colonies automatically or semi-automatically after adjustment of inhibition zones. For our applications on blood plates, we required a reliable identification of the minimum growth or haemolyzing bacterial colonies. The use of the clinical reports and the statistical evaluation needed to be simple without any great programming effort. For that, we needed simple transformable files with the original images, including the inhibition zones, as well as the qualitative evaluations of the antibiotic. At the end of 2015, we became aware of the development of a new LED lighting technology for plate readers from Interscience which matched with our expectations. »

What is your first experience with the Scan® 4000 in your lab?
« The user interface is simple and intuitive to use. Immediately after inserting a plate into the Scan® 4000, the image zooms in on the zone to analyse and automatically adjusts the brightness. Occasionally, it requires a change in lighting by a mouse click, especially on blood plates. The automatic measurement of the inhibition zone is precise and the readjustment is very easy for managing the size of the inhibition zone, as well as the position of the antibiotic disc. The good image quality on the screen and the ability, at the same time, to look at the plate on the Scan® 4000, provide a reliable adjustment even with more difficult tasks, such as the evaluation of low growing and hemolytic Streptococci on blood plates. »

What do you think of the processing of data files?
« Any number of images with measurements and evaluations can be stored in complex files (sessions) that still allow easy access and subsequent correction. Sessions are expandable, refused measurements can be reactivated later. In addition to the storage of the sessions, in our lab we will use for internal communication PDFs with reports including plate images and tables in MS-Excel files. Each can be created via a button for an entire session. We will use the records of MS-Excel files as the basis for clinical reports and for the statistical analysis of all resistance test results with our standard software. »

Did you use the colony counter function?
« We have so far not examined the suitability of the Scan® 4000 as a colony counter, since we carry out semi-quantitative investigations for the routine diagnosis of bacterial infections and this function was not decisive for the purchase. Judging from our impression of the optical quality and the counter software, nearly no limitation for colony detection can be expected. The definition of the measuring areas can be easily varied by exclusion or inclusion areas. Furthermore, the counter function of the software is intuitive, the operation is simple and the separate counting of different pigmented colonies or different colored colonies on chromogenic media is childsplay. »

How have you made your choice?
« We have tested several devices. The devices found so far were mostly omitted after inspection of specifications or after a telephone interview with another user. A device verified by us was eliminated due to the insufficient image quality for weakly contrasting bacterial colonies. For measuring inhibition zones on blood plates, it was not sufficient. Also, the flexibility with regard to the choice of antibiotic discs was not acceptable. »

Why did you choose Interscience?
«A week-long trial of the Scan® 4000 from Interscience completely dispelled our previous scepticism about the automated evaluation of disc diffusion assays. The shadow and reflection-free visualization of bacterial cultures and further technical specifications of the Scan® 4000 according to manufacturer's description motivated us to perform a demonstration in our Institute. During a very competent and pleasant presentation and short briefing, the staff from a local distributor, together with Interscience's representative, explained the technical potential of the device and the software for colony counting and for the assessment of disc diffusion assays. Without even reading the user's manual, our test layouts were created and easily applied by ourselves in our routine tests for the automated assessment of resistance patterns. »

PROTOCOL ANALYSIS

Type of sample: veterinary samples for isolation of bacteria and antibiotic resistance evaluation
Number of analysis: 6000 / per year
Bacteria: whole spectrum of fast growing bacteria
Medium for resistance analyses: Mueller-Hinton media with or without blood for agar diffusion tests
Way of determination of diffusion zones: automatic
The resistance evaluation of relevant isolates takes place in the agar diffusion test for up to 16 antibiotics per isolate. The layouts are species-specific and the evaluation of diffusion zones is currently according to CLSI VET01 as far as for the animal species and the bacteria that data are available. Alternatively, human-specific standards or data derived from the manufacturer are used.