Verein für **medizinische Qualitätskontrolle**
Association **pour le contrôle de Qualité medical**
Associazione **per il controllo di qualità medico**

Comment on the survey specimen B9 Microbiology 2015-2

Specimen A: Urinary tract infection in a young woman outside hospital
Requirement: Potentially pathogenic bacteria (genus + species) + resistance testing

This was a strain of *Staphylococcus saprophyticus,* the second most common cause of urinary tract infections in young women outside of the hospital. Almost all participants were successful with the identification without difficulty. *S. saprophyticus* is a novobiocin-resistant, coagulase-negative staphylococcus.

The β-lactam antibiotic susceptibility testing caused considerable difficulties. On the one hand, EUCAST no longer includes testing of penicillin resistance for coagulase-negative staphylococci, but on the other hand, the Schweizerisches Antibiogramm-Komitee [the Swiss Antibiogram Committee, SAC] is of the opinion that penicillin-sensitivity can be detected in all staphylococci with an extending edges around the penicillin disc (1 Unit) and a diameter of inhibition zone ≥ 26 mm. When the edge around the penicillin disc cannot be clearly evaluated and the zone of inhibition diameter is ≥ 26 mm—according to CLSI (also opinion of SAC)—the determination of negative β-lactamase can be indicative of sensitivity to penicillin.
Now, however, EUCAST has defined ampicillin-inhibition zones for *S. saprophyticus*. An ampicillin (2 µg) inhibition zone of ≥ 18 mm s susceptibility to ampicillin, amoxicillin and piperacillin (with or without beta-lactam inhibitor). In our laboratory we found that in β-lactamase-negative *S. saprophyticus*- strains the edge of the ampicillin inhibition zones appear rather sharp without a magnifying glass; however, the extending edges can be seen with a magnifying glass. This was the case with the present strain: the penicillin inhibition zone was 24 mm and only after monitoring with the magnifying glass extending. By contrast, the ampicillin inhibition zone was 25 mm and extending when viewed with a magnifying glass; β-lactamase was negative. We accepted all results for penicillin and ampicillin this time. We request that in future you test ampicillin in *S. saprophyticus* but no longer report penicillin.

It is important to note that in the disc test for *S. saprophyticus* the same threshold values apply for cefoxitin as for *Staphylococcus aureus* and *Staphylococcus lugdunensis* (≥ 22 mm sensitive, ≤ 21 mm resistant). The following threshold values apply according to MIC: MIC values > 8 mg/L are considered methicillin-resistant (Cave: for *S. aureus* and *S. lugdunensis* MIC already values of > 4 mg/L are determined resistant). Some participants selected the wrong threshold values which lead to incorrect cefoxitin resistance. Our strain had a cefoxitin MIC of 4 mg/L; hence, it was sensitive.

We accepted all results for oxacillin because *S. saprophyticus* has an inherent—without *mecA* gene—an increased oxacillin MIC. Our strain had an oxacillin MIC of 1 mg/L, which is considered resistant at a threshold of 0.25 mg/L for coagulase-negative staphylococci. However, methicillin resistance should not be derived from this MIC but from the cefoxitin inhibition zone. Our strain was cefoxitin sensitive (see above) and therefore not resistant to cephalosporins.

The remaining antibiotics did not pose any problems, but note that with urinary tract infections antibiotics are not specified that are not used for a urinary tract infection (e.g., mupirocin). The testing of inappropriate antibiotics leads to a deduction even when the microbiology result is correct because reporting it could mislead the submitter.

	Number
Staphylococcus saprophyticus	64
Staphylococcus warneri	1
Gram-positive cocci	1

Specimen B: Wound infection
Requirement: Potentially pathogenic bacteria (genus + species) + resistance testing

This isolated Staphylococcus aureus was easy to identify. The penicillin zone of inhibition was small but extended; beta-lactamase was negative. This, however, was a MRSA simultaneously lacking β-lactamase, which we very rarely see. To diagnose MRSA, either cefoxitin or oxacillin values must be reported. This time we still allowed the notation "MRSA" without resistance-information regarding cefoxitin or oxacillin. Next time we would like to evaluate the values for cefoxtin or oxacillin that were actually measured. If this is not possible for technical reasons, it is essential to report resistant or sensitive in the antibiotics list for oxacillin and/or cefoxtin.

	Number
Staphylococcus aureus MRSA	60
Staphylococcus aureus	5
Not Specified	1

We would like to point out that the homepage of the Swiss Society for Microbiology - www.swissmicrobiology.ch - is currently under construction and the compilations of the comparisons of the antibiotic guidelines per EUCAST and CLSI (created by the Swiss antibiogram committee) are not accessible. By mid-August, the latest version for 2015 will be live.

Specimen C: Bacteremia
Requirement: Potentially pathogenic bacteria (genus + species)

Bacteremia involving environmental bacteria is in itself rare and mostly originates from catheters (Kaselitz T.B., N.I. Hariadi, J.J. LiPuma, J.B. Weinberg. 2012. *Rhizobium radiobacter* bacteremia in a neonate. Infection 40:437-439). Our strain was *Rhizobium radiobacter,* a non-fermenting gram-negative rod (previously *Agrobacterium radiobacter).* The germ grows optimally at 25-28 °C but at 37 °C as well. Colonies on blood agar are slightly yellowish. *R. radiobacter* has peritrichous flagella, is urease positive, oxidizes a large amount of sugar, and is sensitive to colistin and to many other antibiotics.

The germ can be diagnosed easily with the systems API 20NE, VITEK 2 and MALDI-TOF. Most participants made a correct diagnosis.

	Number
Rhizobium radiobacter	61
Sphingomonas paucimobilis	1
Aggregatibacter acidomycetemcomitans	1
Ochrobactrum anthropi	1
Pseudomonas paucimobilis	1
Not Specified	1

Specimen D: Diarrhea
Requirement: Potentially pathogenic bacteria (genus + species)

Our strain was *Salmonella enterica subsp. enterica* serovar enteritidis *(*or in short*, salmonella* enteritidis; serovar not in italics). By MALDI-TOF, API 20E, laboratory internal Bio and VITEK 2 identification could be achieved only on the species level. For determination of serovar, biochemical methods are sufficient only in exceptional cases. The salmonella agglutination showed positive agglutination with the following antisera: Anti-poly A-E, anti-O9 (group D) and anti-H:m. *Salmonella* enteritidis is the most common enteric salmonella in humans here, and usually causes spontaneously healing diarrheal diseases that generally do need require antibiotic treatment. We accepted all results reporting salmonella, but point out that it should at least be specified whether typhoid salmonella are ruled out.

	Number
Salmonella Enteritidis	24
Salmonella enterica	9
Salmonella enterica Enteritidis	7
Salmonella enterica Gruppe D	4
Salmonella Gruppe D	3
Salmonella species	17
Salmonella Typhimurium	1
Not Specified	1

Specimen E: Dog bite
Requirement: Potentially pathogenic bacteria (genus + species)

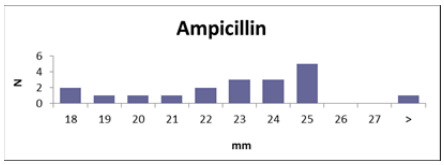
Neisseria zoodegmatis (formerly EF-4b) is a colonizer of the oral cavity and nasopharynx in dogs, cats, and rodents. In humans, they are often the cause of wound infections following bite and scratch injuries.
Using simple conventional reactions (oxidase and catalase positive, nitrate positive; see Manual of Clinical Microbiology, ASM) and gram stain (gram-negative coccoid rods) at least the possibility of *N. zoodegmatis* / *Neisseria animaloris* (formerly EF-4a) should be considered with this demanding rod in cases involving dog bites. In contrast, pasteurella show glucose fermentation in the TSI (yellow TSI streak). *Neisseria elongata* makes long gram-negative rods. *Capnocytophaga canimorsus* can principally only be found in the blood of patients following a dog bite.
N. zoodegmatis is nitrate positive as is *N. animaloris*, but does not form gas from nitrate; *N. zoodegmatis* is ADH negative *(N. animaloris* forms some gas from nitrate and is often ADH *positive).* Identification by MALDI-TOF or sequencing is reliable.
We did not evaluate this sample.

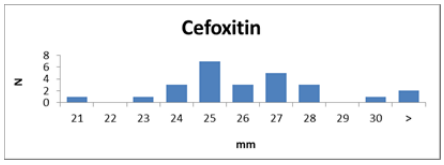
	Number
Neisseria zoodegmatis	43
Neisseria animaloris/zoodegmatis	8
Neisseria animaloris	5
Neisseria elongata	1
Neisseria elongata subsp.glycolytica	1
Moraxella species	1
Capnocytophaga canimorsus	2
Brevundimonas vesicularis	1
Pasteurella canis	1
Pasteurella species	1
Not Specified	2

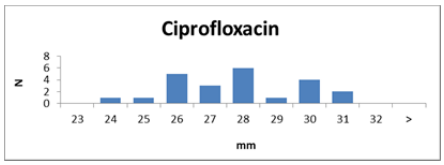
Best regards

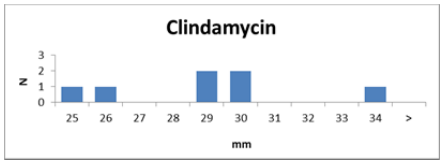
Prof. Dr. R. Zbinden *F.S. Hufschmid-Lim*

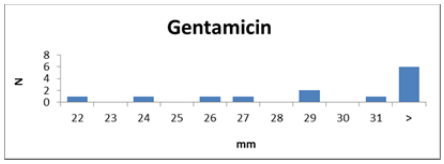
Susceptibility testing of sample A

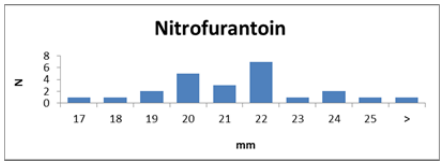


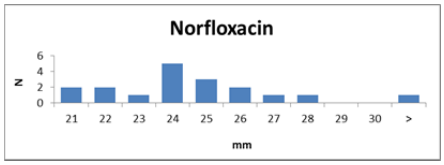


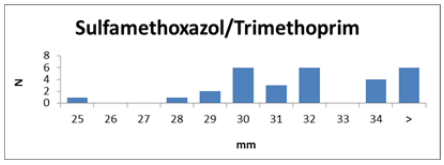












Susceptibility testing of sample B