

# Anaerobic bacteriology: new generation technology

## Improving diagnostics??



### About ESGAI

ESGAI is the ESCMID Study Group for Anaerobic Infections, and currently consists out of 45 members from 19 countries. ESGAI is focusing on all topics, which are connected with the role of anaerobic bacteria in infection and health. Among others, how to diagnose difficult to identify anaerobes by MALDI-TOF MS, how to test antibiotic susceptibility more easily (EUCAST methodology). We continue the surveillances about the antibiotic resistance among important anaerobes and we also deal with anaerobes involved in oral infections. Our aim is to organise postgraduate workshops during ECCMIDs and outside of the ECCMIDs. The Scientific Affairs Subcommittee of ESCMID evaluated the activities of SGs and **ESGAI was among the top-five performers in 2014**. With the support of ESGAI a Special Issue of **ANAEROBE** was organized with the aim to show antibiotic resistance data of anaerobic bacteria from different European countries. To join the study group, please visit the website of ESCMID ([www.escmid.org/esgai](http://www.escmid.org/esgai)).

The **Postgraduate Technical Workshop** on Anaerobic Infections entitled "**Anaerobic bacteria: next generation technology meet anaerobic diagnostics**" held in Groningen in 2014, was a great success. The 25 participants came from a variety of countries and to complete the international companionship 11 international experts lectured on their field of expertise. The average course rating was 3.5, out of a rating scale from 1 to 4.



### Study for comparison of *Bacteroides* antibiotic resistance genes between clinical isolates and isolates obtained from the normal flora

(Organised by Jozsef Sóki Szeged, Hungary)

The aim of this study is to examine the antibiotic resistance levels and the presence of antibiotic resistance genes of normal flora isolates belonging to genus *Bacteroides*. Five countries (Belgium, Germany, Hungary, Slovenia and Turkey) would be involved to allow comparison with the earlier data of clinical isolates. In Hungary during the preliminary experiments ca. 70 *Bacteroides* isolates were collected from stool samples of carbapenem untreated and treated persons using a special *Bacteroides* selective agar (developed by John Perry [John.Perry@nuth.nhs.uk]) with and without meropenem. The antibiotic susceptibility testing is in progress using the agar dilution method. The main beta-lactam resistance genes (*cepA*, *cfxA* and *cfiA*) in case of all the 70 strains has been determined; the *cepA* was characteristic for *B. fragilis* isolates, no *cfiA* gene was found and the prevalence of the *cfxA* gene exceeded the values obtained for clinical strains previously. Isolation and collection of the strains from the other countries is in progress.

### Publications

- Nagy E, Justesen US, Eitel Z, Urbán E, on behalf of ESGAI: Development of EUCAST disk diffusion method for susceptibility testing of the *Bacteroides fragilis* group isolates. *Anaerobe* 2015; 31:65-71
- Johansson A, Nagy E, Sóki J, on behalf of ESGAI: Detection of carbapenemase activities of *Bacteroides fragilis* strains with matrix-assisted laser desorption ionisation-time of flight mass spectrometry (MALDI-TOF MS). *Anaerobe* 2014; 26:49-52
- Székely E, Eitel Z, Molár S, Szász IÉ, Bilca D, Sóki J: Analysis of Romanian *Bacteroides* isolates for antibiotic resistance levels and the corresponding antibiotic resistance genes *Anaerobe* 2015; 31:11-14
- Sydenham TV, Sóki J, Hasman H, Wang M, Justesen US, on behalf of ESGAI: identification of antimicrobial resistance genes in multidrug-resistant clinical *Bacteroides fragilis* isolates by whole genome shotgun sequencing. *Anaerobe* 2015; 31:59-64

### ENRIA project

(coordinated by ACM Veloo, Groningen, The Netherlands)

The European Network for the Rapid Identification of Anaerobes (ENRIA) is a collaboration between the ESGAI and the ESGEM. Its goal is to optimize the MALDI-TOF MS database of the Bruker system for the identification of anaerobic bacteria. The core group consists out of 7 core laboratories from different European countries; England, Wales, Denmark, Hungary, Belgium, France and The Netherlands. The leading institute is the department of Medical Microbiology, University Medical Center Groningen, The Netherlands. At this moment about 650 strains representing 250 different species have been collected and characterized using 16S rRNA gene sequencing. From part of these strains a Main Spectral Profile (MSP) has been created. Preliminary for the validation of the optimized database a ring test has been performed between the different core laboratories. The results will be used to determine when a laboratory has sufficient MALDI-TOF MS experience in order to obtain a reliable spectrum of anaerobic bacteria. The first publication within this project has been published and the second publication is in progress.

Veloo ACM et al., *The influence of incubation time, sample preparation and the exposure to oxygen on the quality of MALDI-TOF MS spectra of anaerobic bacteria*. *Clin Microbiol Infect*. 2014; 20:O1091-1097



### Investigation of antimicrobial susceptibility patterns of *Prevotella* isolates in European countries.

(Organised by Nurver Ulger Toprak, Istanbul, Turkey)

The objective of this study is to determine the susceptibility patterns of clinically important *Prevotella* species isolated from different European countries and three university hospitals in Turkey. The aim is also to investigate species differences regarding the sources of isolates and to seek region-dependent differences in resistance rates. We have planned to study a total of 500 *Prevotella* species, prospectively collected between 2014 and 2015. Fifty-three of the isolates were identified phenotypically. The isolates were analysed in parallel by matrix-assisted laser desorption ionisation-time of flight mass spectrometry system; Vitek MS (bioMérieux, France) and by 16S rRNA gene sequencing. Their susceptibility to ampicillin, ampicillin/sulbactam, piperacillin/tazobactam, imipenem, meropenem, clindamycin, ceftiofur, moxifloxacin, tigecycline, metronidazole, tetracycline and erythromycin was determined using E-test (bioMérieux, France) method. The results were interpreted according to the MIC breakpoints recommended by CLSI and EUCAST. The most common isolates were *Prevotella bivia* (41.5%), *Prevotella buccae* (11.3%), *Prevotella denticola* (11.3%) and *Prevotella disiens* (9.4%). According to EUCAST, the isolates were highly resistant to clindamycin (54.7%) and ampicillin (39.6%). Ampicillin/sulbactam, piperacillin/tazobactam, imipenem, meropenem, tigecycline and metronidazole displayed high in vitro activity against *Prevotella* isolates. Identification and antimicrobial susceptibility testing of the remaining organisms at Marmara University and isolation and collection of the strains from the other countries are in progress.

