

**Rapid antimicrobial susceptibility assay - a new paradigm on Microbiology lab**

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**Abstract**

Is it possible to have Antimicrobial Susceptibility Test results in 2h?

New antimicrobials are insufficient to face the increasing resistance. Older drugs and adjuvants are used more widely, but microbes also evolve to resist them. To address this and to get the right drug to the right patient at the right time, regulation and/or stewardship programs are not enough. The world needs a change on the paradigm in the way that technology is incorporated into the decision-making of antibiotic use – whether be in at home, pharmacy, doctor's office, hospital ward or farm.

Rapid diagnostic antimicrobial tests urged, improving the antimicrobials choice, helping to prevent the rise of drug resistance by reducing the unnecessary use and change our approach to bacterial infections through supporting targeted and precise therapies.

A rapid flow cytometric antimicrobial susceptibility test (AST) for bacteria isolated from companion animals - the FASTvet® assay, developed by FASTinov®, was evaluated. Bacterial strains isolated from different biological samples of companion animals with infectious diseases in progress were obtained from several veterinary clinical laboratories across the country. A total of 115 strains, comprising 65 Gram-negative and 50 Gram-positive isolates, were incubated with 13 antimicrobial drugs (ampicillin, amoxicillin-clavulanic acid, piperacillin-tazobactam, cefpodoxime, imipenem, enrofloxacin, gentamicin, amikacin for Gram-negative; penicillin, cefoxitin, enrofloxacin, vancomycin and ampicillin for Gram-positive) at breakpoint concentrations following CLSI protocol (Vet 01, 2018) for 1h and analyzed by flow cytometry. The overall categorical agreement was 95.6% for Gram-negative and 96.7% for Gram-positive isolates compared to microdilution. FASTvet kits reduce the turnaround time (2h vs 24h) with early determination of the antimicrobial susceptibility profile. The performance of the FASTvet kit agrees with the ISO recommendations for AST.

In conclusion, the correct and rapid choice of the target antibiotic therapy, will have a positive impact on animal care, and prevents antimicrobial resistance. FASTvet® kits showed

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an excellent performance, both for Gram-negative and Gram-positive isolates, encouraging us to enlarge the sample size and planning multicentric studies. An external validation, in dedicated veterinary labs, is being planned. This new and disruptive technology could change the clinical diagnostic paradigm in relation to antimicrobial therapy with a positive impact on animal's health avoiding the quick spread of resistance.

## Biography

França Andrade had graduated in Veterinary Medicine at the University of Trás os Montes and Alto Douro in 1995 and completed his PhD at the Faculty of Medicine of the University of Porto. He practices veterinary clinics and is a consultant for the Pharmaceutical Industry. He is the author of several national and international publications.

## Publications

1. A Rapid Flow Cytometric Antimicrobial Susceptibility Assay (FASTvet) for Veterinary, Preliminary Data. doi:10.3389/fmicb.2020.01944, <https://doi.org/10.3389/fmicb.2020.01944>, <https://www.frontiersin.org/articles/10.3389/fmicb.2020.01944/full>
2. Ultra-rapid flow cytometry assay for colistin MIC determination in Enterobacterales, *Pseudomonas aeruginosa* & *Acinetobacter baumannii*, DOI:10.1016/j.cmi.2020.08.019
3. Colistin Update on Its Mechanism of Action and Resistance, Present and Future Challenges, doi.org/10.3390/microorganisms8111716
4. Benzydamine Bactericidal Effect Results from a Permanent Cell Membrane Lesion, DOI:10.29011/2577-1515.100169, <https://www.gavinpublishers.com/articles/short-communication/Infectious-Diseases-Diagnosis-Treatment/benzydamine-bactericidal-effect-results-from-a-permanent-cell-membrane-lesion>
5. Antimicrobial Resistance: A One Health Concept Perspective Analysis, DOI:10.29011/2577,1515.100027, [https://www.gavinpublishers.com/assets/articles\\_pdf/1538201883article\\_pdf1756774431.pdf](https://www.gavinpublishers.com/assets/articles_pdf/1538201883article_pdf1756774431.pdf)

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