



## LEARNING LOUNGE EXCLUSIVE: A MICROBIOLOGIST'S PERSPECTIVE ON IMPROVING LAB COMMUNICATION TO ACCELERATE ANTIMICROBIAL STEWARDSHIP

Viewpoints Series: Rolando Soloaga, PhD  
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*Clinical microbiologists and laboratory scientists provide the critical decision-making data clinicians and pharmacists need to deliver appropriate patient therapy. For lab professionals invested in antimicrobial stewardship, limited opportunities to educate and partner with clinicians and pharmacists can hinder an institution's stewardship efforts and impact patient outcomes. Associate professor and clinical microbiologist Rolando Soloaga shares his perspective on how diagnostic tools can foster cross-department collaboration, particularly in Latin American countries, and help facilitate successful antimicrobial stewardship programs.*

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### **bioMérieux: How would you describe the levels of awareness and education about antimicrobial resistance in your region among healthcare professionals?**

**Soloaga:** Throughout the years, I have traveled across Latin America giving talks related to clinical microbiology on antimicrobial resistance (AMR) and antimicrobial stewardship (AMS) programs and have been able to observe firsthand the enormous differences in the level of knowledge among distinct regions between large capital cities and the interior of various countries. Secondly, as expected, there is a great difference in knowledge about AMR among infectious disease specialists, intensive care physicians, and microbiologists as compared to the rest of the medical specialties where knowledge is lower overall. Continued support for awareness and education are needed.



**bioMérieux: In your experience, why might the laboratory lack visibility or influence within an antimicrobial stewardship program?**

**Soloaga:** Several factors that contribute to a lack of visibility are inherent to the lab itself, including the lack of dialogue with the medical team, gaps in infectious disease education, the absence of AMR data and statistics in designing empirical treatments, and issues demonstrating the quality of results. All of these challenges result from a lack of continuing educational opportunities, resources, software, and automated systems that deliver rapid results impacting the therapeutic management of the patient. Real-time AMR data of local epidemiology can reveal the incidence of different etiological agents to the responsible physician almost immediately. Problems with publishing and disseminating the data within the hospital itself presents another challenge.

**bioMérieux: What opportunities do you see to improve stewardship-driven education and communication between front-line clinicians and pharmacists with the laboratory?**

**Soloaga:** Without a doubt, the formation of an AMS team is a great opportunity for microbiologists to partner with the medical team and clinical pharmacologists and provide education on relevant laboratory practices. For example, collecting valid samples can significantly reduce unnecessary antimicrobial treatment. Improper antimicrobial stewardship is associated with higher laboratory costs, more expensive treatments, longer hospitalization stays, catheterization, and increased toxicity. The lab's role is to provide information on the clinical significance of different microorganisms and their resistance mechanisms to the rest of the medical team. Holding conferences and other events, both inside and outside the hospital, provide more opportunities for lab professionals to gain visibility and play a key role in education. In addition, daily conversations with physicians on important clinical cases gives lab professionals a chance to collaborate on the management and optimization of patient diagnosis and treatment, with the goal of improving patient safety and reducing financial costs.

**bioMérieux: Considering your current teaching roles at several universities, how do you prepare your students to communicate effectively as lab professionals about antimicrobial stewardship with other healthcare stakeholders?**

**Soloaga:** In my experience in both undergraduate and graduate medical education, it is important to integrate knowledge and training (in addition to everything else!) so that microbiologists understand the clinical aspects of different infections and their therapeutic management. At the same time, the clinician receives education on obtaining valid samples, the time it takes to process, the performance of the different techniques and their post-test usefulness, and interpretation of the results. I personally believe that integrated workshops and classes between physicians and microbiologists function as a tool that enriches both disciplines and ultimately benefits the patient.

**bioMérieux: What diagnostic improvements have been successfully implemented in your region so far, and what do you hope to improve in the future?**

**Soloaga:** Undoubtedly, the introduction of Maldi-TOF methodology to the laboratory workflow has significantly changed lab performance, both in terms of time-to-results and their reliability for organism identification. Integrating this technology into automated systems leads to same-day results for antimicrobial susceptibility testing (AST) and has constituted a significant improvement in our region.



More recently, the introduction of multiplex PCR testing utilizing a syndromic strategy approach has greatly impacted timely diagnosis and treatment of patients.

Biomarkers like procalcitonin can also be leveraged to reduce days of antibiotic treatment, assisting clinicians in determining if a patient has a true bacterial infection or a nonspecific inflammatory process that does not require antibiotics. Finally, microbiological management systems like R.E.A.L. can handle patient data, issue emergency alarms, create visuals to represent incidence and resistance statistics, and make antibiotic usage reports in real-time on behalf of healthcare professionals. R.E.A.L. has been a great advancement in Latin America.

Expectations for the future include new syndromic multiplex PCR panels that can be used directly with samples from patients with joint infections, sexually transmitted diseases, tuberculosis, pneumonia, endemic mycosis fungi, and other infections. Also worth mentioning are the molecular techniques that can be easily applied to routine laboratory procedures to detect microorganisms directly from patient blood samples. The use of methodologies such as mNGS (Metagenomic Next Generation Sequencing) for different infections is also promising.

**bioMérieux: How can lab professionals maximize the value of diagnostic solutions and tools their facility may already own in order to improve cross-department collaboration and antimicrobial stewardship?**

**Soloaga:** Rapid diagnostic methods that include MALDI-TOF, molecular biology, automated identification systems, and antibiotic susceptibility testing have little clinical, epidemiological, or financial impact if the results do not reach the responsible clinician in real time. Lab software must enable immediate data viewing and have the capability to issue emergency messages. This does not eliminate the need for consistent dialogue between clinicians and microbiologists, a practice that enriches both for the benefit of better patient management and positions the microbiologist at a higher level of relevance. Rather, the laboratory must clearly explain which algorithms are being used and what their limitations are in order to get the most out of each of these technologies and maximize cost-benefit investment.

**bioMérieux: What one thing would you encourage a lab professional to do today to improve communication with front-line professionals to help minimize unnecessary use of antimicrobials for better patient outcomes?**

**Soloaga:** The laboratory must understand that it plays a critical role within AMS to reduce antimicrobial resistance, morbidity, mortality and financial costs, and that recognition of its contribution will be directly tied to these metrics. Lab professionals can clearly position themselves as core members of a healthcare team, finding satisfaction in knowing that their knowledge will help save patient lives. They can demonstrate their value as part of an antimicrobial stewardship team in a number of ways, including recommending treatment for a pathogen specifically based on rapid diagnostic results, designing empirical treatments based on local epidemiology, reducing toxicity, and eliminating unnecessary use of broader-spectrum antibiotics.

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