Title:

New rapid detection of beta-lactamase producing bacteria using fluorogenic probes

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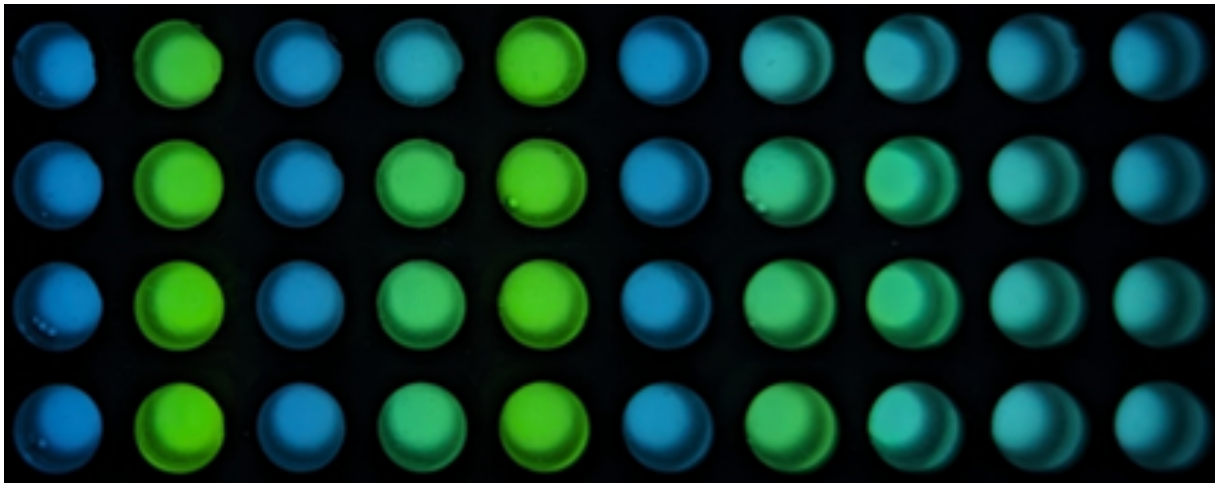
A recent OECD study reports that use of the highest-priority and third-line antibiotics is projected to increase. However, use of antibiotics also drives the development of antimicrobial resistance (AMR). Yet for 10%-20% of infections, first-line antibiotics, such as amoxicillin, would prove perfectly adequate. Unfortunately, treatment with these drugs was abandoned in the 80s due to the emergence of resistance and a lack of methods to guide the decision on antibacterial therapy. This highlights the importance of antimicrobial stewardship, and one of its important components is access to improved AMR diagnostics.

The downside to current conventional phenotypic or genotypic methods to test for antimicrobial susceptibility are turnaround times between 12 to 48 hours. Hence the importance of providing physicians with faster diagnostics that remain cost-effective. In this context, MOLSID develops diagnostic solutions based on proprietary molecular probes detecting specific enzyme activity. These SmartID® probes possess chemical and photophysical properties allowing for unmatched detection sensitivity.

MOLSID's "Pythia" test for AMR makes use of a SmartID® probe responding to β-lactamase activity. The test is so sensitive that it makes a prior step of amplifying bacterial mass ("culture") obsolete. Extensive development tests on various cultured *Enterobacterales* expressing the four Ambler classes of β-lactamases including ESBLs and carbapenemases prove that Pythia is bound to become a new paradigm in rapid AMR diagnostics. It is planned to deliver a high negative predictive value in the detection of beta-lactam resistant bacteria in just a few hours from primary samples. It provides a robust, rapid, and low-cost solution to enable health professionals to take a better-informed decision and prescribing the appropriate treatment at the very onset of an infection, leading to improved patient outcome, decreased hospital costs, and improved stewardship of humanity's heritage of antibiotics.

Picture:



Screening of different clinical bacteria isolates with smartID probe on a 96-well plate. β-lactam-resistant bacteria and β-lactam-sensitive bacteria appear green (resistant) and blue (sensitive) under UV lamp. **© Molsid**