

## Answering the Call to Arms: Tools for Assessing the Anti-infective Potential of Natural Products in a Time of Rising Antibiotic Resistance

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### Congress Abstract

As antibiotic resistance continues to rise, the pool of viable anti-infective therapeutic options is becoming rapidly exhausted. New therapies are in high demand and natural products are a likely source of novel bioactive compounds to meet this need. In particular, botanical secondary metabolites represent a rich pool for antibiotic discovery efforts. Plants are often the primary ingredients used in traditional anti-infective therapies, and yet their activity and mechanisms of action are often poorly understood. Much of the antibacterial research on botanical extracts and essential oils has focused on growth inhibitory studies using outdated methods limited in their ability to obtain an accurate assessment of bioactivity. The emergence of new molecular and bioanalytical tools for drug discovery provides a unique opportunity for application to natural products research.

Using *Staphylococcus aureus* as a model, tools for anti-infective testing of plant extracts will be reviewed, specifically focusing on the merits and limitations of each method. Examples include standardized methods for examining activity for the inhibition of growth (e.g., MIC, MBC), virulence (e.g., quorum sensing and toxin quantification) and pathogenesis (e.g., biofilms and antibiotic synergy). Data from our recent discoveries of novel biofilm [1] and quorum sensing [2, 3] inhibitors isolated from medicinal plants (*Rubus ulmifolius*, *Castanea sativa* and *Schinus terebinthifolius*) will be presented in the review of these tools.

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**References:** [1] Quave CL, Estévez-Carmona M, et al. (2012) PLoS ONE, 7(1): e28737. [2] Quave CL, Lyles JT, et al. (2015) PLoS ONE, 10(8): e0136486. [3] Quave CL, Horswill AR (2014) Frontiers in Microbiology, 5: 706.