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Chips for antimicrobial drug discovery and diagnosis

Anand Ramasubramanian, Anand Srinivasan and **Jose Lopez-Ribot**
University of Texas at San Antonio, USA

We are interested in the development of microscale technologies for applications in drug development and diagnostics for infectious diseases. We have developed a high-density microarray platform ('chips') consisting of nano-liter volumes of microbial pathogens on chemically modified glass slides using a robotic microarrayer. We have successfully grown 1200 individual cultures of 30 n-L volume on a standard glass slide consisting of either single or polymicrobial cultures of *Candida albicans, Pseudomonas aeruginosa* or *Staphylococcus aureus* as biofilms. These nano bio-films display morphological complexity, three dimensional architecture and drug resistance similar to conventional cultures in well-plates or flasks. I will demonstrate the suitability of the chip for single and combinatorial screening of small molecule libraries. I will also demonstrate an adaptation of the chip as a diagnostic tool for pathogen identification and antimicrobial susceptibility testing in clinical samples of MRSA. In summary, our chip platform cuts reagent use and analysis times, minimizes or eliminates labor intensive steps and dramatically reduces assay costs and thus opens a new chapter in microbial culture.

Biography

Anand Ramasubramanian is an Associate Professor of Biomedical Engineering and a Member of the South Texas Center for Emerging Infectious Diseases at the University of Texas at San Antonio (UTSA). His current research interests are in microbial bio-engineering and vascular mechano-biology. His lab focuses on developing microscale tools for understanding and combating infection and inflammation and in improving platelet storage modalities for transfusion. Prior to joining UTSA, he received his PhD in Bio-engineering from Rice University and Post-doctoral training in Chemical Engineering at UC Berkeley.

anand.ramasubramanian@utsa.edu

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