Rapid Pathogen Identification and Phenotypic Antimicrobial Susceptibility Testing

Niraj Kumar, Susmita Chaudhuri, Shinjini Bhatnagar, Gagandeep Kang
Centre for Biodesign and Diagnostics
Translational Health Science and Technology Institute, Faridabad

Abstract

Unavailability of rapid diagnostics for pathogen identification and antimicrobial susceptibility testing has been the significant factor contributing towards unnecessary/inappropriate use of antibiotics resulting into emergence/spread of antimicrobial resistance (AMR) among pathogens. We aim to develop syringe compatible, single-use, affordable and user-friendly combination of device that can isolate bacteria from whole-blood/urine samples, enrich, culture, identify and establish their antimicrobial susceptibility profile(s) for multiple drugs simultaneously within 90-minutes. The proposed solution would help in guided clinical-decision making and minimize empirical use of antibiotics resulting into reduced emergence/spread of AMR. This would ultimately reduce duration and cost of treatment as value proposition to the customers.

- Available tools do not meet current requirement as have high turn-around time and cost.
- Also, the gold standard test (the culture test) has high turn-around-time.

Landscape of AMR Diagnostics

Antimicrobial Resistance (AMR)

- Microbes have acquired resistance to many of the antibiotics (even for those which have never been used by now)
- Post-antibiotic era?

Impact of Bacterial Capture & Enrichment

- Rapid pathogen culture & identification
- Follow-on molecular assay compatible
- Easy sample/device transport
- Low-resource requirement
- Lower Turn-Around-Time (mCId: ≤60 min; mCId+ASTd: ≤90 min)
- Affordable (mCId: ≤150 INR; mCId+ASTd: ≤250 INR)

Conclusion

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