CARB-X
Combating Antibiotic Resistant Bacteria

Development Stages in Scope
Diagnostics

CARB-X only supports diagnostics proposals for bacterial ID and/or AST in the development stages outlined below, some guidance is provided below as to typical activities that would be considered in or out of scope in line with these stages.

Feasibility: Benchtop feasibility demonstrated with clinical specimens. Sufficient data to support the feasibility of the approach including data that the pathogen of interest can be detected. Scope out downstream critical path activities, evaluate critical requirements and outline a high-level target product profile. For instrument-based systems, develop and evaluate an Alpha Prototype of the system or of high-risk modules, including software, and plan for beta prototype and software development. For consumables, produce and evaluate a Research Lot of material. Demonstrate understanding of relevant clinical care pathway and testing algorithms and how product would be differentiated from competition.

Optimization: Optimization and Preparation for Assay, Software, and Instrument Development. Continue prototype testing, as required, to support assay development. Finalize diagnostic target(s) and methods for detecting or quantitating target(s). Develop detailed plans and finalize critical design requirements. Finalize initial instrument and software architecture, incorporating input on manufacturability of proposed product. Identify and execute commercial agreements with key external development partners. Begin implementing a Quality Management System; draft regulatory strategy, intended use statement, analytical and clinical study plans. Complete technology transfer from Research to Development.

Development: Develop reagents and buffers. Build and test non-GLP prototypes of components and subsystems. Code and unit test software. Build first release of instrument software for integration testing. Develop protocols for assay and integration testing. Finalize User Interface specification. Produce initial assay lots with quantities sufficient to initiate real-time stability studies on development lots. Demonstrate sensitivity and specificity with prototype assay. Freeze design documents for system. Begin pilot scale manufacturing preparations for development lots in a GMP compliant process with concurrent document development. Fully implement a Quality Management System. Hold pre-IDE meeting with FDA or relevant Stringent Regulatory Authority (SRA). Initiate Design History file and Device Master Record (once all priority requirements are met for instrument, assay, and reagents). Identify pilot system manufacturing facility. Order tooling and equipment necessary.

Verification and Validation (limited scope): Produce and evaluate pilot lots of reagents and instruments per process and under document control. Integrate and test instruments, software and assays, evaluating performance and updating specifications. Implement design improvements to address defects discovered during testing. Increase the maturity of software. Complete short-term stability testing of reagents. Complete hardware/software/assay integration and verification testing. Demonstrate technology in a laboratory environment including studies on de-identified clinical samples. Submit preliminary findings to FDA or relevant SRA to determine class of diagnostic and route of submission required. Evaluate documentation and pilot manufacturing processes to ensure GMP compliance. Prepare for clinical testing (site selection, IRB approvals, etc.). Refine commercial plan and health economics assessment that supports the approach.

Out of scope (too late, beyond CARB-X funding):

- Clinical validation of the technology including demonstration in a relevant clinical environment to support regulatory filings
- Longer term studies in support of regulatory filings such as long-term stability studies.
- Marketing support including submission of marketing approvals.
- Manufacturing of the final instrument to be marketed and associated scale-up activities

The following are more broadly outside of the scope of the call:

- Research use only instruments
- Biomarker ID and development
- Purely detecting bacterial vs viral infection without Bacterial ID or AST
- Surveillance or screening rather than diagnosis
- Informatics proposals

The following can only be included if part of a broader diagnostic development package but will not be considered as an application in isolation

- Library building