

## CARB-X Complete Portfolio, as of 6/15/22

Since CARB-X was launched in July 2016

### CARB-X GRADUATES - THERAPEUTICS

Product Developer & Graduation Date	Product	Bacteria	Novelty*			Hit-to-lead	Development Stage		
			New Abs Cls	New Abs Tgt	Non trad		Lead Optimization	Pre-Clinical	Phase 1
GlaxoSmithKline 12/21	GSK3882347 FimH antagonist UTI	<i>E. coli</i>	•	•	•				
Entasis Tx. 12/20	ETX0282CPDP Oral combination	Gram-negative pathogens							
Tetraphase 06/19	TP-6076	<i>Acinetobacter</i> , <i>Enterobacteriaceae</i>							
Iterm 03/19	Sulopenem	Gram-negative activity							
Spero 03/18	SPR741	Gram-negative activity	•		•				
Oppilotech 10/17	LPS	Gram-negative pathogens							

### CARB-X GRADUATES - PREVENTATIVES

Product Developer & Graduation Date	Product	Bacteria	Novelty*		Hit-to-lead	Development Stage		
			Type	Lead Optimization		Pre-Clinical	Phase 1	
Seres 04/21	SER-155. Microbiome	Broad spectrum activity vs CRE/VRE	Microbiome					
Vedanta 09/18	VE303	<i>C. difficile</i>	Microbiome					

### CARB-X GRADUATES - DIAGNOSTICS

Product Developer & Graduation Date	Product	Bacteria	Type	Feasibility	Development Stage		
					Optimization	Development	Verification & Validation
Helixbind 03/22	Rapid/BSI, Automated culture-free	Bloodstream infections	Hospital Dx pathogen ID				
Proteus 02/22	Rapid POC Dx, Optical bacterial imaging	POC Diagnostic	Rapid Point of Care Dx				
Specific Diagnostics 03/20	SPECIFAST REVEAL™, Colorimetric Sensor Array to detect VOCs	Bloodstream infections	Hospital Dx				
T2 Biosystems 09/19	Expanded bacteria and resistance panels for T2Dx	Bloodstream infections	Hospital Dx				

## Active Product Pipeline, as of 6/15/22

Products currently funded and supported by CARB-X

### ACTIVE - THERAPEUTICS PROJECTS

Product Developer	Product	Bacteria	Novelty*			Hit-to-lead	Development Stage		
			New Abs Cls	New Abs Tgt	Non trad		Lead Optimization	Pre-Clinical	Phase I
Bugworks Research	GYROX. Gyrase-topoisomerase inhibitor	Gram-negative pathogens	•						
Trellis Bioscience	TRL1068 Monoclonal antibody	Broad spectrum	•	•	•				
Peptilogics	PLG0206 Direct-acting engineered peptides	Broad spectrum			•				
Amicrobe	Amicidin-β. Local antimicrobial	Broad spectrum	•		•				
Phico Therapeutics	SASpject PT3.9 Engineered Bacteriophage	<i>Pseudomonas aeruginosa</i>	•	•	•				
Mutabilis	EBL-1463 Non -beta-lactam PBP inhibitor	CRE bacteria	•						
Summit Therapeutics	SMT-738 first-in-class LoICDE targeting antibiotic	CRE bacteria	•	•					
Entasis Therapeutics	Non-beta-lactam PBPI	Gram-negative pathogens	•						
Debiopharm	Debio1453. FabI inhibitor	<i>Neisseria gonorrhoeae</i>	•						
Clarametx Biosciences	CMTX-101 Monoclonal antibody	ESKAPE, MRSA	•	•	•				
Forge Therapeutics	FG-LpxC-LUNG. LpxC inhibitor	Gram-negative pathogens	•	•					
Microbiotix	T3SS Inhibitor, virulence modifier	<i>Pseudomonas aeruginosa</i>	•	•	•				
BioVersys	BV300 Novel Class Pyrrolocytosines	ESKAPE, MRSA	•						
Cellics Therapeutics	Macrophage Nanosponge	Broad spectrum toxins & cytokines	•	•	•				
Centauri Therapeutics	ABX01 Dual acting large molecule	Gram-negative pathogens	•	•	•				
Debiopharm	Debio1454. FabI inhibitor	<i>Acinetobacter baumannii</i>	•						
Evotec SE	TriBE broad spectrum antibiotics	Gram-negative, Gram-positive	•	•					
University of Queensland	OCTAPEPTIN Engineered peptides	Gram-negative pathogens	•		•				
Spexis (formerly Polyphor)	OMPTA Thanatin	<i>Enterobacteriaceae</i> CRE	•	•	•				

**ACTIVE - THERAPEUTICS PROJECTS (CONTINUED)**

Product Developer	Product	Bacteria	Type	Hit-to-lead	Lead Optimization	Pre-Clinical	Phase I
Basilea Pharmaceutica International	DXR Novel Class Inhibitor	Gram-negative pathogens	• •				
GangaGen Biotech	Klebicins, Engineered proteins	<i>Klebsiella pneumoniae</i>	• • •				
Helmholtz Centre HZI	HZI-LDC <i>S. aureus</i> $\alpha$ -hemolysin Inhibitors	<i>Staphylococcus aureus</i>	• • •				
Helmholtz Institute HIPS	HZI-HIP5 Elastase (LasB) Inhibitors	<i>Pseudomonas aeruginosa</i>	• • •				
Locus Biosciences	LBP-KP01 CRISPR-Cas3 Bacteriophage	<i>Klebsiella pneumoniae</i>	• • •				
Microbiotix	Trans-translation inhibitors, oral antibiotic	MDR <i>Neisseria gonorrhoeae</i>	• •				
VenatoRx	Oral cyclic-boronate PBP inhibitor	<i>Neisseria gonorrhoeae</i>	•				

**ACTIVE - PREVENTATIVES PROJECTS**

Product Developer	Product	Bacteria	Type	Hit-to-lead	Lead Optimization	Pre-Clinical	Phase I
SNIPR BIOME ApS	SNIPR001 CRISPR-engineered preventative	<i>Escherichia coli</i>	Bacteriophage				
Integrated Biotherapeutics	IBT-V02 Multi-valent vaccine	<i>S. aureus</i>	Vaccine				
Vaxcyte (formerly SutroVax)	GAS Carbohydrate conjugate vaccine	Group A <i>Streptococcus</i>	Vaccine				
GlaxoSmithKline	GSK INTS-TCV INTS-typhoid conjugate vaccine	<i>Salmonella enterica</i>	Vaccine				
GlaxoSmithKline	GSK Strep A vaccine	Group A <i>Streptococcus</i>	Vaccine				
Vedanta	VE707 Microbiome	CRE - ESBLs	Microbiome				
Affinivax	MAPS vaccine	<i>S. aureus</i>	Vaccine				
Jenner Institute	NOMV Vaccine	<i>N. gonorrhoea</i>	Vaccine				
Vaxdyn	KAPAVAX Trivalent vaccine	Gram-negative pathogens	Vaccine				
Eligo Bioscience	EB004. CRISPR-based bacteriophage	Gram-negative pathogens	Bacteriophage				
Idorsia	VXN-319 vaccine	<i>K. pneumoniae</i>	Vaccine				
Lumen Bioscience	LMN-GI-EEC-401 Oral antimicrobial immunotherapy (mAb)	<i>C. jejuni</i> & enterotoxigenic <i>E. coli</i>	Biologic				

**ACTIVE - DIAGNOSTICS PROJECTS**

Product Developer & Graduation Date	Product / Technology	Bacteria	Type	Feasibility	Optimization	Development	Verification & Validation
Pattern Bioscience	Digital culture single cell biometric analysis	RTIs, UTIs, BSIs	Hospital Dx				
Day Zero Diagnostics	ID & AST Whole genome sequencing & machine learning	Drug-resistant pathogens	Hospital Dx				
Accelerate Diagnostics	SRS Optical Imaging	Sepsis	Rapid point of care Dx				
Avails Medical	Avails eAST, Rapid Electronic AST	Bloodstream infections	Rapid point of care Dx				
Baebies Inc.	FINDER Bacteremia ID/AST	Neonatal Sepsis	Near-Patient Dx				
GenomeKey	ID & AST Machine learning & Whole Genome	Sepsis	Rapid point of care Dx				
SpeedX	Resistance Plus InSignia Rapid Molecular ID/AST	<i>N. gonorrhoea</i> & <i>C. trachomatis</i>	Rapid point of care Dx				

## Formerly funded projects

Projects listed in this section were formerly funded, and are no longer supported by CARB-X for a variety of reasons

CARB-X Final Investment Date	Therapeutics and Preventatives	Bacteria	Novelty/Type*			Therapeutics and Vaccines Development Stage			
			New Abx Cls	New Abx Tgt	Non trad	Hit-to-Lead	Lead Optimization	Pre-Clinical	Phase I
ContraFect 04/22	Gram-negative lysins	<i>Pseudomonas aeruginosa</i>	•	•	•				
Spexis (formerly Polyphor) 03/22	OMPTA POL7306	Gram-negative ESKAPE pathogens	•	•					
Taxis Pharmaceuticals 03/22	EPI-PA Efflux Pump Inhibitor	<i>Pseudomonas aeruginosa</i>			•				
Lytica Therapeutics 03/22	StAMPS Large molecule direct-acting	Gram-negative pathogens	•						
BioVersys 01/22	AVATAR-SA Anti-virulence agent	<i>S. aureus</i> , MRSA			•				
Microbion 01/22	Novel bismuthiol, Pravibismane suspension	<i>P. aeruginosa</i> , <i>S. aureus</i> , NTM	•	•					
Oxford Drug Design 01/22	DaarSI. Aminoacyl-tRNA Syn. Inhibitor	Gram-negative pathogens	•	•					
Micurx 01/22	MRX-8. Soft drug polymyxin	Gram-negative pathogens							
Facile Therapeutics 04/21	EBSELEN Prevention of <i>C.difficile</i> recurrence	<i>C. difficile</i>							
Antabio 08/21	PEI <i>Pseudomonas</i> elastase inhibitor	<i>Pseudomonas aeruginosa</i>			•				
ContraFect 06/21	Amurins. Phage-encoded lytic	Gram-negative pathogens	•						
Idorsia 04/21	TopESKAPE. Topoisomerase inhibitor	<i>Acinetobacter</i> , <i>P. aeruginosa</i> , <i>Enterobacteriaceae</i>	•						
Techulon 04/21	PPNA-XPA	<i>P. aeruginosa</i> and <i>A. baumannii</i>			•				
Summit 09/20	SMT-571. Oral	<i>Neisseria gonorrhoeae</i>	•	•					
Zikani 08/20	Novel macrolide antibiotic	Gram-negative pathogens							
Forge Therapeutics 07/20	FG-LpxC-UTI. LpxC inhibitor	Gram-negative pathogens	•	•					
Bravos BB100 08/20	BB100 Monoclonal antibody	<i>Escherichia coli</i>			•				
Inhibrx 03/20	INBRX-111	<i>P. aeruginosa</i>			•				
Procarta 02/20	Pro-202 Oligonucleotidebased antibiotic	Gram-negative pathogens	•						
VenatoRx 12/19	VNRX-PBP. $\beta$ -lact. resistant PBP inhibitor	<i>Enterobacteriaceae</i>	•						
SciBac 05/19	SCB-102	<i>C.difficile</i>							
Recida Tx 04/19	RC-01	<i>Enterobacteriaceae</i> , <i>P. aeruginosa</i>	•	•					
Curza 04/19	CZ-02	Broad spectrum	•						
Achaogen 03/19	Next-Generation AG	Gram-negative pathogens including <i>Pseudomonas</i>							
Melinta 02/19	Pyrrrolocytosine	Broad spectrum	•						
Eligochem 12/18	Helical AMP	Gram-negative pathogens	•						
Shionogi 09/18	AGN-BL	<i>Enterobacteriaceae</i>							
Visterra 09/18	VIS705	<i>P. aeruginosa</i>			•				
Cidara Tx 04/18	CD201	<i>Acinetobacter</i> , <i>P. aeruginosa</i> , <i>Enterobacteriaceae</i>			•				
Achaogen 10/17	AKAO-LpxC	<i>P. aeruginosa</i>	•	•					
Redx Pharma 10/17	NBTI	<i>Acinetobacter</i> , <i>P. aeruginosa</i> , <i>Enterobacteriaceae</i>	•						

### Diagnostics Development Stage

CARB-X Final Investment Date	Diagnostics		Type	Feasibility	Optimization	Development	Verification & Validation
Module Innovations 05/22	ID & AST ASTSENSE UTIs	UTIs	Rapid point of care Dx				
Novel Microdevices 05/22	NOVEL DX Rapid Molecular Diagnostic	Sexually transmitted infections	Rapid Point of Care Dx				
Talis 08/21	POC Dx, Pathogen ID	ID <i>N. gonorrhoea</i> & <i>C. trachomatis</i>	Rapid point of care Dx				
MicrobeDx 08/18	Near care Dx	Urinary Tract Infections	Rapid Near to Care Dx				

The above projects are supported by CARB-X utilizing non-dilutive funding from BARDA, Wellcome Trust, Germany's Federal Ministry of Education and Research (BMBF), with funding for specific projects from the UK Government's Global Antimicrobial Resistance Innovation Fund (GAMRIF) and the Bill & Melinda Gates Foundation. NIAID provides in-kind preclinical services to the funded projects. CARB-X funding for projects ends following First-in-Human for therapeutics and following Verification and Validation for diagnostics. Characterizations of new Abx Class and New Abx Target are by CARB-X, with external expert opinion sought as required. Abx = traditional direct-acting antibiotics. Non-traditional Product = not a traditional direct-acting antibiotic.

\* New Antibiotic Class; New Molecular Target; Non-Traditional Product. Solid red arrows reflect completion of the stage, transparent coloring indicates current stage of development for active projects, and stage in which 'formerly funded' projects exited the portfolio. Arrow between stages indicate successful transition of the project through an Option stage gate.