

## CARB-X Complete Portfolio, as of 5/13/24

Since CARB-X was launched in July 2016

### CARB-X GRADUATES - THERAPEUTICS

Product Developer & Graduation Date	Product	Bacteria	Novelty*			Development Stage			
			New Abx Cls	New Abx Tgt	Non trad	Hit-to-lead	Lead Optimization	Pre-Clinical	Phase 1
Clarametx Biosciences 11/22	CMTX-101: Antibiofilm Monoclonal Antibody	ESKAPE, MRSA	•	•	•				
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: Novel Fluorocycline	<i>Acinetobacter</i> , <i>Enterobacteriaceae</i>							
Iterm 03/19	Sulopenem	Gram-negative activity							
Spero 03/18	SPR741: Antibiotic Potentiator	Gram-negative activity	•		•				
Oppolitech 10/17	LPS	Gram-negative pathogens							

### CARB-X GRADUATES - PREVENTATIVES

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

### CARB-X GRADUATES - DIAGNOSTICS

Product Developer & Graduation Date	Product	Syndrome	Healthcare Level	Development Stage			
				Feasibility	Optimization	Development	Verification & Validation
Pattern Bioscience 06/23	Digital culture single cell biometric analysis	Lower respiratory tract infections	LIV				
Helixbind 03/22	Rapid/BSI, Automated culture-free	Bloodstream infections	LIV				
Proteus 02/22	Rapid POC Dx, Optical bacterial imaging	Lower respiratory tract infections	LIV				
Specific Diagnostics 03/20	SPECIFAST REVEAL™, Colorimetric Sensor Array to detect VOCs	Bloodstream infections	LIV				
T2 Biosystems 09/19	Expanded bacteria and resistance panels for T2Dx	Bloodstream infections	LIV				

## Active Product Pipeline, as of 5/13/24

Products currently funded and supported by CARB-X

### ACTIVE - THERAPEUTICS PROJECTS

Product Developer	Product	Bacteria	Novelty*			Development Stage			
			New Abx Cls	New Abx Tgt	Non trad	Hit-to-lead	Lead Optimization	Pre-Clinical	Phase 1
Bugworks Research	GYROX: Gyrase-topoisomerase inhibitor	Gram-negative pathogens	•						
Trellis Bioscience	TRL1068: Anti-biofilm monoclonal antibody	Broad spectrum	•	•	•				
Peptilogics	PLG0206: Direct-acting engineered peptides	Broad spectrum	•		•				
Macro Biologics (formerly 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	•						
Debiopharm	Debio1453: FabI inhibitor	<i>Neisseria gonorrhoeae</i>	•						
Microbiotix	T3SS Inhibitor: virulence modifier	<i>Pseudomonas aeruginosa</i>	•	•	•				
Cellics Therapeutics	Macrophage Nanosponge: sepsis inhibitor	Broad spectrum toxins & cytokines	•	•	•				
Centauri Therapeutics	ABX01 program: Dual acting large molecule	Gram-negative pathogens	•	•	•				
Basilea (formerly Spexis/Polyphor)	LptA-OMPTA: LPS transport inhibitor	<i>Enterobacteriaceae</i> CRE	•	•	•				
GangaGen Biotech	Klebicans: Engineered proteins	<i>Klebsiella pneumoniae</i>	•	•	•				
Helmholtz Centre HZI	HZI-LDC: <i>S. aureus</i> α-hemolysin Inhibitors	<i>Staphylococcus aureus</i>	•	•	•				
The University of Melbourne at the Doherty Institute	PBT2: Antibiotic potentiator	CABP bacteria	•	•	•				
Locus Biosciences	LBP-KP01: CRISPR-Cas3 Bacteriophages	<i>Klebsiella pneumoniae</i>	•	•	•				
Harvard University - Myers Lab	Oxepanoprolinamides: oral translation inhibitor	CABP/SSTI bacteria	•						
Helmholtz HIPS	DnaN inhibitors for CABP infections	CABP bacteria	•						

**ACTIVE - PREVENTATIVES PROJECTS**

Product Developer	Product	Bacteria	Type	Hit-to-lead	Lead Optimization	Pre-Clinical	Phase I
GlyProVac	GPV02 glycosylated protein vaccine	<i>E. coli</i>	Vaccine	██████████			
LimmaTech	Multivalent Gonococcus vaccine	<i>N. gonorrhoeae</i>	Vaccine	██████████			
Syntiron	Alloy-EK vaccine	<i>E. coli</i> and <i>K. pneumoniae</i>	Vaccine		██████████		
Intravacc	Outer Membrane Vesicle vaccine	<i>N. gonorrhoeae</i>	Vaccine	██████████			
SNIPR BIOME ApS	SNIPR001 CRISPR-engineered preventative	<i>E. coli</i>	Bacteriophage			██████████	██████████
LimmaTech	LBT-SA7 (formerly IBT-V02) Multi-valent vaccine	<i>S. aureus</i>	Vaccine		██████████	██████████	
Vaxcyte (formerly SutroVax)	GAS Carbohydrate conjugate vaccine	Group A Streptococcus	Vaccine		██████████	██████████	
GlaxoSmithKline	GSK INTS-TCV INTS-typhoid conjugate vaccine	<i>Salmonella enterica</i>	Vaccine			██████████	██████████
GlaxoSmithKline	GSK Strep A vaccine	Group A Streptococcus	Vaccine			██████████	
Vedanta	VE707 Microbiome	CRE - ESBLs	Microbiome			██████████	
Jenner Institute	NOMV Vaccine	<i>N. gonorrhoeae</i>	Vaccine		██████████	██████████	
Vaxdyn	KAPAVAX Trivalent vaccine	Gram-negative pathogens	Vaccine		██████████	██████████	
Idorsia (formerly Vaxxilon)	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	Syndrome	Healthcare Level	Feasibility	Optimization	Development	Verification & Validation
Scout	Point-of-care test to detect and differentiate <i>N. Gonorrhoea</i> and <i>C. trachomatis</i>	Sexually transmitted infections	LI	██████████			
Visby Medical	Rapid detection of <i>N. Gonorrhoea</i> and antimicrobial susceptibility from urogenital samples	Sexually transmitted infections	LI	██████████			
Day Zero Diagnostics	ID & AST Whole genome sequencing & machine learning	Bloodstream infections	LIV	██████████	██████████	██████████	
Avalis Medical	Rapid Electronic AST	Bloodstream infections	LIII/LIV	██████████	██████████	██████████	
GenomeKey	ID & AST Machine learning & Whole Genome	Bloodstream infections	LIV	██████████	██████████	██████████	
SpeedX	Resistance Plus InSigna Rapid Molecular ID/AST	Sexually transmitted infections	LIV	██████████	██████████		

**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
Helmholtz Institute HIPS 8/23	HZI-HIPS Elastase (LasB) Inhibitors	<i>Pseudomonas aeruginosa</i>	•	•	•	██████████			
Summit Therapeutics 4/23	SMT-738 first-in-class LolCDE targeting antibiotic	CRE bacteria	•	•				██████████	
Basilea Pharmaceutica International 2/23	DXR Novel Class Inhibitor	Gram-negative pathogens	•	•		██████████			
Entasis Therapeutics 12/22	Non-beta-lactam PBPI	Gram-negative pathogens	•				██████████	██████████	
Evotec SE 12/22	TriBE broad spectrum antibiotics	Gram-negative, Gram-positive	•	•			██████████		
Eligo Bioscience 12/22	EB004. CRISPR-based bacteriophage	Gram-negative pathogens			Bacteriophage	██████████			
University of Queensland 11/22	OCTAPEPTIN Engineered peptides	Gram-negative pathogens	•		•			██████████	
BioVersys 09/22	BV300 Novel Class Pyrrolocytosines	ESKAPE, MRSA	•				██████████		
VenatoRx 09/22	Oral cyclic-boronate PBP inhibitor	<i>Neisseria gonorrhoeae</i>	•			██████████			
Microbiotix 09/22	Trans-translation inhibitors, oral antibiotic	MDR <i>Neisseria gonorrhoeae</i>	•	•		██████████			
Affinivax 09/22	MAPS vaccine	<i>S. aureus</i>			Vaccine		██████████		
Forge Therapeutics 09/22	FG-LpxC-LUNG. LpxC inhibitor	Gram-negative pathogens	•	•			██████████	██████████	
Debiopharm 07/22	Debio1454. FabI inhibitor	<i>Acinetobacter baumannii</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>		•				
Lytxa 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	Pyrrolocytosine	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	NBT1	<i>Acinetobacter</i> , <i>P. aeruginosa</i> , <i>Enterobacteriaceae</i>	•					

Diagnostics Development Stage

Company & CARB-X Final Investment Date	Diagnostics	Syndrome	Healthcare Level	Feasibility	Optimization	Development	Verification & Validation
Accelerate Diagnostics 12/22	SRS Optical Imaging	Bloodstream infections	LIV				
Module Innovations 05/22	ID & AST ASTSENSE UTIs	Urinary Tract Infections	LIII				
Novel Microdevices 05/22	NOVEL DX Rapid Molecular Diagnostic	Sexually transmitted infections	LII				
Talis 08/21	POC Dx, Pathogen ID	Sexually transmitted infections	LII				
MicrobeDx 08/18	Near care Dx	Urinary Tract Infections	LII				

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.