# Corporate Presentation





### Forward-Looking Statements

This presentation contains forward-looking statements within the meaning of The Private Securities Litigation Reform Act of 1995. These statements include, but are not limited to, statements related to the potential benefits of Vaxcyte's vaccine candidates, including breadth of coverage and the ability to deliver a potentially best-in-class pneumococcal conjugate vaccine; demand for Vaxcyte's vaccine candidates; the process and timing of anticipated future development and manufacture of Vaxcyte's vaccine candidates; the timing and availability of topline data for the VAX-24 Phase 1/2 clinical proof-of-concept study in adults aged 18 to 64 and the separate Phase 2 study in adults aged 65 and older; the submission of a VAX-24 pediatric IND application; the announcement of guidance for VAX-A1; the nomination of a final vaccine candidate for VAX-PG; the achievement of future funding milestones; the use and availability of funds from CARB-X; the growth and expansion of the pneumococcal vaccine market; the potential conversion by the pneumococcal vaccine market to a prime-boost schedule; the market opportunity for Vaxcyte's vaccines; Vaxcyte's expectations regarding the potential benefits, spectrum coverage, adoption speed and immunogenicity of its vaccine candidates; the timing of the initiation, progress and expected results of Vaxcyte's preclinical studies, clinical trials and research and development plans; and other statements that are not historical fact. The words "anticipate," "believe," "continue," "could," "designed," "estimate," "expect," "intend," "may," "plan," "potential," "predict," "project," "should," "target," "will," "would" and similar expressions are intended to identify forward-looking statements, although not all forward-looking statements contain these identifying words.

These forward-looking statements are based on Vaxcyte's current expectations and actual results and timing of events could differ materially from those anticipated in such forward-looking statements as a result of risks and uncertainties, including, without limitation, risks related to Vaxcyte's product development programs, including development timelines, success and timing of chemistry, manufacturing and controls and related manufacturing activities; potential delays or inability to obtain and maintain required regulatory approvals for its vaccine candidates; the risks and uncertainties inherent with preclinical and clinical development processes; the success, cost and timing of all development activities and clinical trials; sufficiency of cash and other funding to support Vaxcyte's development programs and other operating expenses; and the ongoing COVID-19 pandemic, which could materially and adversely affect Vaxcyte's business and operations. These and other risks are described more fully in Vaxcyte's filings with the Securities and Exchange Commission (SEC), including its Quarterly Report on Form 10-Q filed with the SEC on August 8, 2022 or in other documents Vaxcyte subsequently files with or furnishes to the SEC. Vaxcyte undertakes no duty or obligation to update any forward-looking statements contained in this release as a result of new information, future events or changes in its expectations.





### Key Corporate Highlights

Clinical-Stage Vaccine Innovation Company – Led by Pneumococcal Conjugate Vaccine (PCV) Franchise



### LARGE MARKET OPPORTUNITY FOR PCV FRANCHISE

- Scalable platform enabling broaderspectrum PCVs: VAX-24 & VAX-XP
- Lead candidate: VAX-24
  - Potential best-in-class 24-valent PCV designed to replace SOC in adults and children
  - Fast Track designation in adults
  - Phase 1/2 enrollment in adults completed; anticipate topline data in Oct or Nov 2022<sup>(1)</sup>
  - Enrollment completed in separate
     Phase 2 study in older adults 65+
  - Completed successful pediatric pre-IND meeting with FDA



### CELL-FREE PROTEIN SYNTHESIS PLATFORM

- Leverages site-specific conjugation
- Permits production of "tough-to-make" antigens
- Demonstrated speed, flexibility and scalability



### DISCIPLINED TARGET SELECTION

- Targets well-defined >\$7B market segment
- Honors well-understood
   PCV MOA
- Leverages established surrogate immune endpoints and clinical pathways



### ROBUST DEVELOPMENT PIPELINE

- Platform unlocks large market opportunities:
  - VAX-A1: Novel Group A
     Strep conjugate vaccine
  - VAX-PG: Novel periodontitis therapeutic vaccine



### ALIGNED CRITICAL RESOURCES

- Strategic alignment with Lonza (manufacturing)
- Seasoned management team, directors and advisors
- Cash, cash equivalents and investments of \$361.4M as of 6/30/22

(1) Guidance provided as of September 6, 2022.



### Experienced Team, Board of Directors and Scientific Advisors

Outstanding Track Record in Vaccines and Biopharma

#### **Management Team**



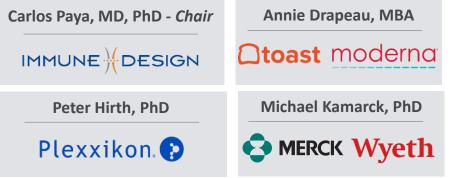








#### **Board of Directors**

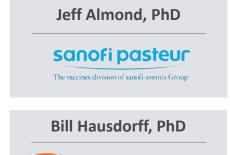








#### **Scientific Advisory Board**







**Emmanuel Hanon, PhD** 





### Pipeline of High-Fidelity Vaccines

#### Broad-Spectrum Conjugate and Novel Protein Vaccines to Prevent or Treat Bacterial Infectious Diseases



<sup>(1)</sup> Guidance provided as of September 6, 2022

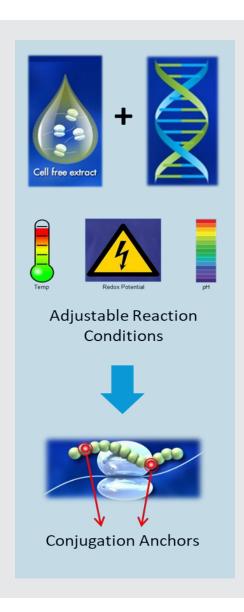
<sup>(3)</sup> Subject to satisfactory topline results from the VAX-24 Phase 1/2 study in adults 18 to 64 years of age.



<sup>(2)</sup> Guidance provided as of August 8, 2022.

### Cell-Free Protein Synthesis Platform Unlocks Multiple Vaccine Applications

Design and Produce Proteins Beyond Reach of Conventional Methods



### CELL-FREE PROTEIN SYNTHESIS

- Transcriptional & translational (ribosomal) machinery from E coli stored as a frozen "extract"
- Produces singular protein of interest at high yields
- Enables site-specific conjugation via insertion of multiple nnAA conjugation anchors
- Permits protein production in nonphysiological conditions

### SPEED, FLEXIBILITY, SCALABILITY

- Rapidly screen vaccine candidates
- Flexible reaction conditions
- Scaled to 1000L using standard equipment

### SUPERIOR CONJUGATE VACCINES

- Site-specifically attach antigens onto protein carriers designed to:
  - Enable consistent
     exposure of T-cell
     epitopes and/or B-cell
     epitopes on protein
     carrier
  - Avoid off-target effects
  - Enable use of less protein carrier without sacrificing immunogenicity
  - Enable broaderspectrum vaccines

### NOVEL PROTEIN VACCINES

- Able to produce
   "tough-to-make"
   protein antigens that
   conform to target
   pathogens
- Increased likelihood of protective immune response



## PCV Opportunity



### Global Impact of Pneumococcal Disease Remains Significant



### ABOUT STREPTOCOCCUS PNEUMONIAE

Streptococcus pneumoniae is the most common pathogen causing pneumococcal disease (PD).

- Non-invasive PD includes otitis media, sinusitis, pneumonia
- Invasive PD (IPD) includes bacteremia, meningitis
- Pneumococci cause over 50% of bacterial meningitis cases in the U.S.



### CURRENT \$7 BILLION GLOBAL VACCINE CATEGORY

Vaccinations are recommended globally for infants and adults to prevent PD.

Standard of Care schedule in the U.S.:

- Infants: Prevnar 13® (PCV13) or Vaxneuvance™ (PCV15) x 4 doses/each
- Adults: Prevnar 20<sup>™</sup> (PCV20) or PCV15 x 1 dose followed by Pneumovax<sup>®</sup> 23 (PPV23) x 1 dose, if PCV15



### GLOBAL INCIDENCE & IMPACT OF PD STILL SUBSTANTIAL

Global incidence driven by emerging serotypes not covered by currently available vaccines.

- In the U.S. alone, there are ~900K pneumococcal pneumonia cases per year resulting in ~150K hospitalizations
- Among children < age 5, PD is a leading cause of death globally



<sup>&</sup>lt;sup>1</sup> Gierke 2015

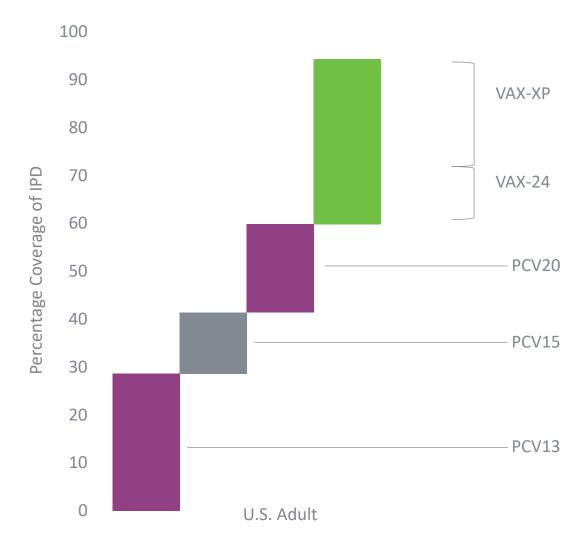
<sup>&</sup>lt;sup>2</sup> https://www.cdc.gov/abcs/reports-findings/survreports/spneu18.pdf CDC 2018

<sup>&</sup>lt;sup>3</sup> https://www.cdc.gov/pneumococcal/clinicians/clinical-features.html

### Significant Unmet Needs Despite Recent Coverage Expansion in Adults

Resulting in Spectrum of Coverage Driving Adoption of Pneumococcal Vaccines





Most IPD is caused by strains above and beyond Prevnar 13<sup>®</sup>, driving need for broader-spectrum PCVs.

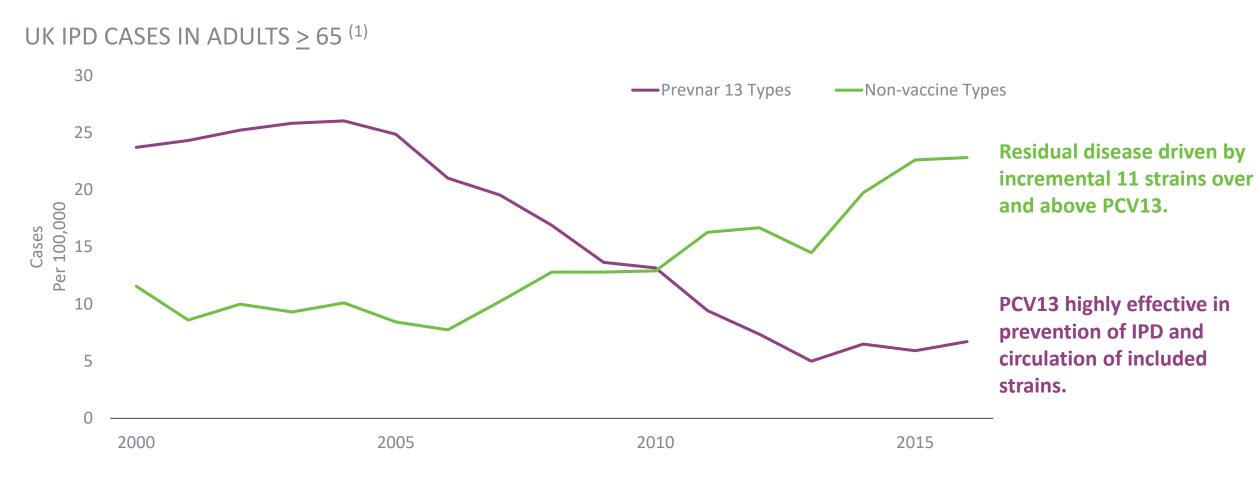


<sup>(1)</sup> Data in the US is for 2017, inclusive of those > 5 yrs of age.

<sup>(2)</sup> Varghese et al. Clin Micro and Infect (2020) 26(4): 512.e1-512.e10.

### Serotype Replacement Drives Need for Broader-Spectrum Vaccines

Non-Vaccine Serotypes Increase in Prevalence, as Circulation of Vaccine Serotypes is Eliminated,
Resulting in the Need for Broader-Spectrum Vaccines

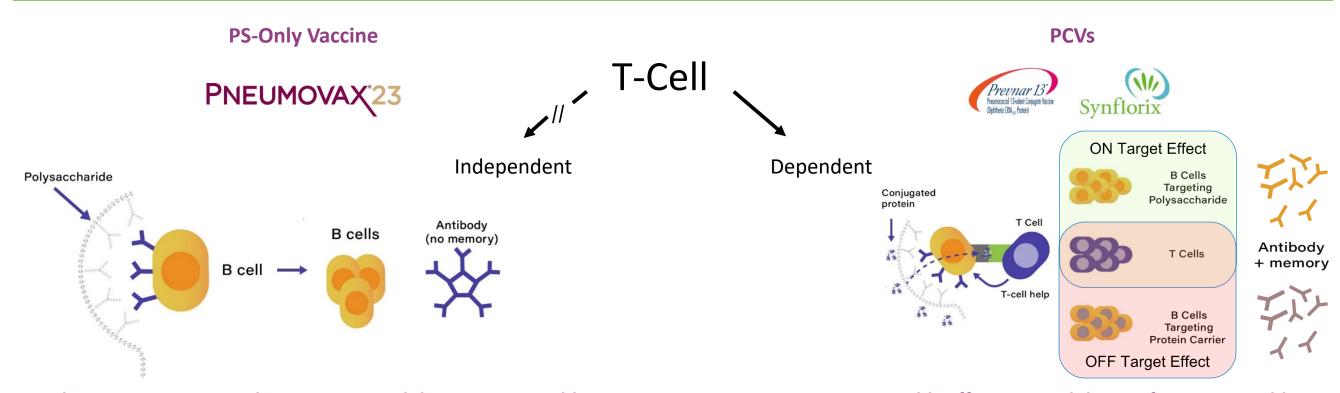


(1) Ladhani et al, Lancet Infect Dis 2018 Apr;18(4):441-45 inclusive of unpublished raw data.



### PCVs Designed to Overcome the Limitations of Polysaccharide-Only Vaccines

PCV Efficacy Driven by T-Cell Epitopes on Diphtheria Toxin Protein Carrier – CRM<sub>197</sub><sup>(1)</sup>



#### **Broad Coverage But Limited Protection in Adults - Not Boostable**

Pneumococcal capsular polysaccharides (PS) antigens lead to:

- Transient Ab responses (IgM) protect against sepsis, but not pneumonia
- No T-cell mediated memory responses, thus no boost
- Hyporesponsive effect inhibits ability to boost PCVs post-prime

#### Narrow Coverage But Highly Effective in Adults & Infants - Boostable

Conjugation of PS to protein carrier leads to:

- Enhanced Ab responses (IgG) that protect against pneumonia
- T cell-mediated memory to provide boostable, durable protection
- Characteristic interstrand crosslinked matrix-like structures

Note: Graphics adapted from Strugnell et al, Understanding Modern Vaccines, Vol 1, Issue 1, 61-88. (1) Protein carrier in Prevnar 13 is a modified form of diphtheria toxin ( $CRM_{197}$ ).

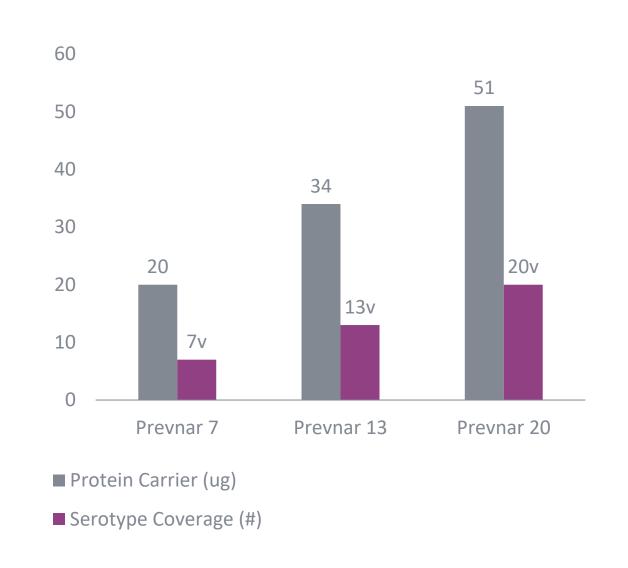


#### **Limitations of Current PCVs**

Coverage Expansion Needed to Address Circulating Disease, but Protein Carrier Backbone Problematic

#### LIMITATIONS OF CONVENTIONAL CHEMISTRY

- Random conjugation
- Higher ratio of protein carrier to polysaccharide, due to reaction conditions required for conjugation
- Further exacerbates carrier suppression, due to competition for CD4+ help between diseasespecific polysaccharides and non-disease specific protein carrier



(1) Prevnar 20 BLA Clinical Review Memorandum. STN: 125731/0 June 8, 2021.



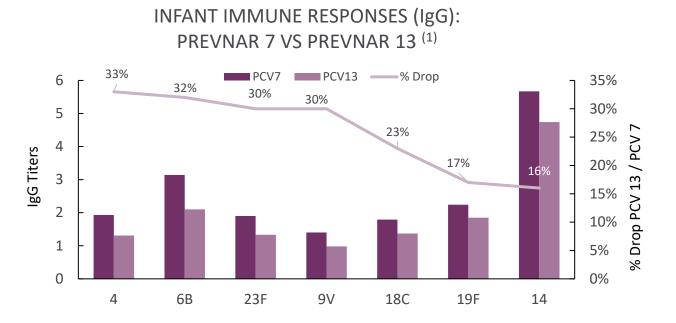
### Limitations of Current PCVs: Adding Conjugates Results in Lower Ab Titers

Coverage Expansion Using Conventional Chemistry Has Led to Carrier-Induced Immune Suppression

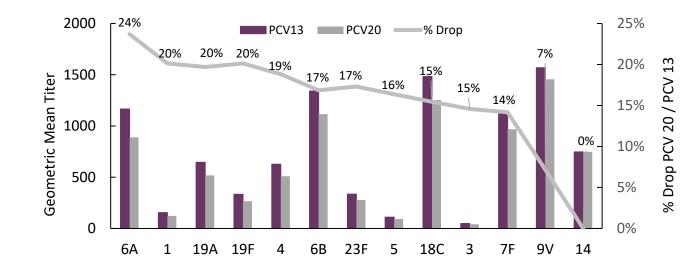
#### **CARRIER SUPPRESSION**

Diminished immune response to target polysaccharides due to cumulative amount of protein carrier

- Expanded spectrum of coverage requires increasing protein carrier burden
- Reduced immune responses consistently demonstrated with > spectrum PCVs in both infants and adults







- Yeh et al, Pediatrics. 126: e493 (2010).
- (2) Prevnar 20 BLA Clinical Review Memorandum. STN: 125731/0 June 8, 2021

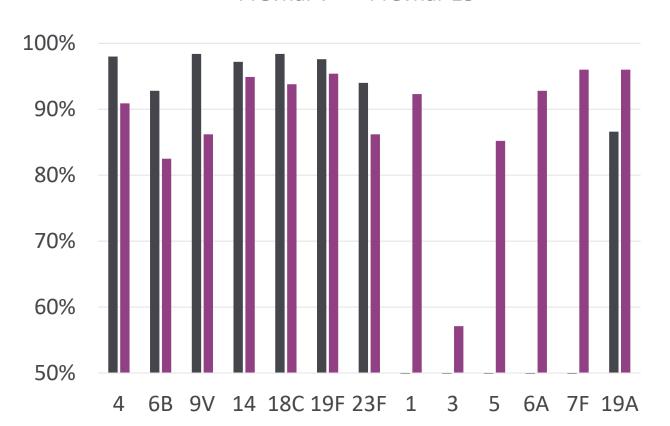


# Limitations of Current PCVs: Adding Conjugates Results in Lower Seroprotective Levels<sup>1,2</sup>

#### **CURRENT REGULATORY GUIDANCE: MUST BE WITHIN 10%3 TO BE NON-INFERIOR POST-DOSE 3**

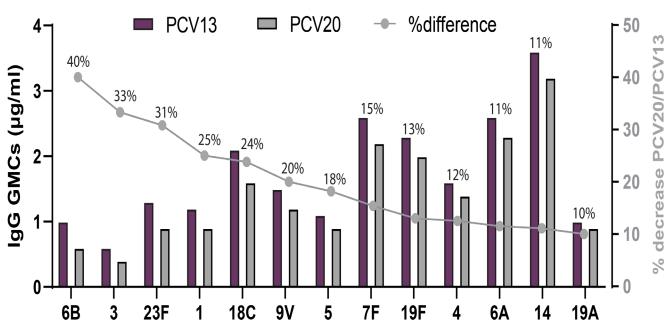


■ Prevnar 7 ■ Prevnar 13



PH 2 INFANT DATA IMMUNE TITERS
PREVNAR 13 VS PREVNAR 20<sup>(4)</sup>

#### IgG Titer 1 month post Dose 3 in infants



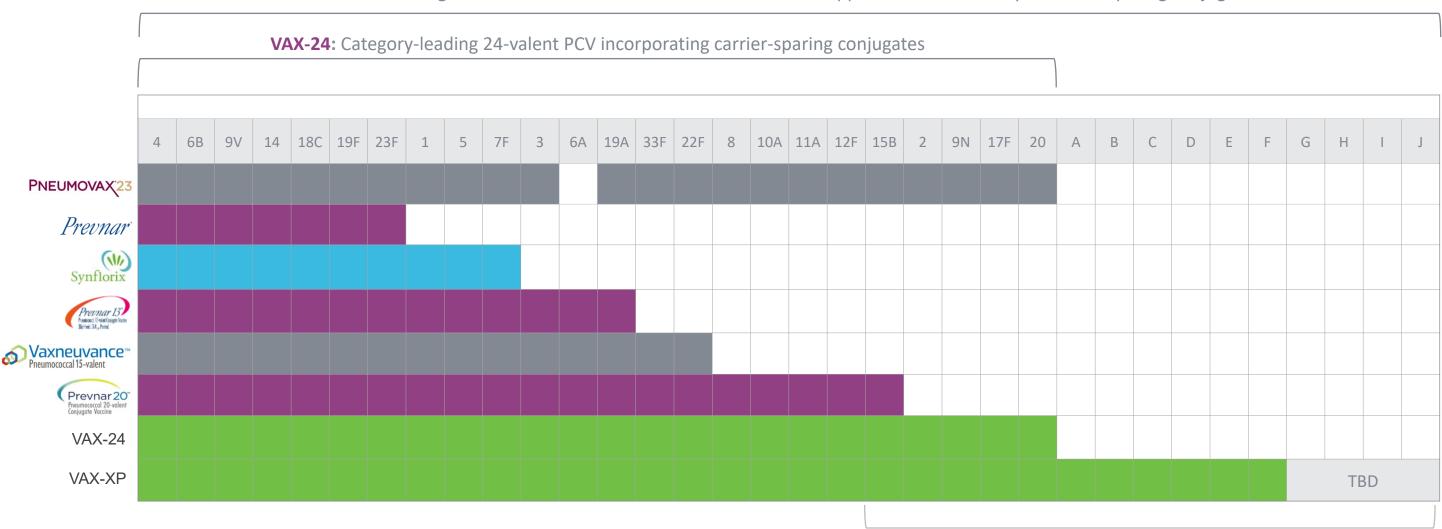
- (1) Prevnar 13 BLA Clinical Review Memorandum by FDA. February 17, 2010
- (2) Seroprotection is defined as a serotype-specific IgG antibody level of ≥0.35mcg/mL
- B) Non-inferiority comparison is LL of 95% CI of the comparator to the mean % responders of the SoC
- (4) Clintrials.gov NCT03512288 Phase 2 study (N=460)



### Vaxcyte PCV Franchise Designed to Offer Broader Protection

Potential for Sustained Leadership in the Established >\$7B Pneumococcal Vaccine Market

**VAX-XP:** Next-generation >30-valent PCV showcases franchise approach and scalability of carrier-sparing conjugates



Spectrum of Coverage Drives Adoption

Source: Prescribing information for Prevnar, Prevnar 13, Prevnar20, Synflorix, Vaxneuvance, and Prevnar 20. Company filings for Vaxcyte



### Pneumococcal Vaccine Market is Highly Attractive

#### VAX-24 has the Potential to Become the Most Broad-Spectrum PCV

#### PNEUMOCOCCAL VACCINE MARKET DYNAMICS

### SPECTRUM OF COVERAGE DRIVES ADOPTION

- Potential for rapid adoption, with ACIP recommendation driving uptake
- Examples: PCV13 vs Prevnar 7 (PCV7) and Shingrix<sup>®</sup> vs Zostavax<sup>®</sup>

#### **ATTRACTIVE MARGINS**

- Pneumococcal vaccines are premium priced in the U.S., delivering highly attractive margins
- Broader-spectrum PCVs maintain premium price

#### **PCVs ARE BEST-IN-CLASS**

- Well-understood T-cell dependent MOA tied to co-presentation of disease-specific polysaccharide antigens with mapped T-cell epitopes on protein carrier
- Well-defined clinical development path: Non-inferiority to SOC using validated surrogate immune endpoints adequate for full approval for follow-on PCVs

#### **DURABLE REVENUE STREAM**

 PCV13 & PPV23 have generated >\$100B in revenues with annual sales of ~\$6B to the Prevnar franchise and ~\$1B to PPV23



- FDA approved in 4Q:2017 to prevent shingles in adults
- ACIP granted "preferred recommendation"
- Replaced the incumbent (Zostavax from Merck)

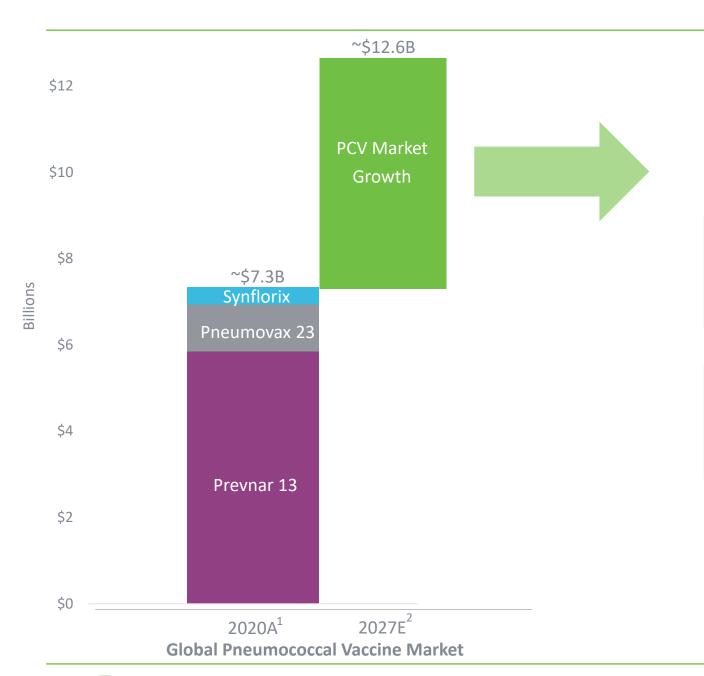
MOA = mechanism of action; SOC = standard of care; ACIP = US CDC Advisory Committee on Immunization Practices.

(1) Revenues reported in GSK (Shingrix) and Merck (Zostavax) financial filings.



### Pneumococcal Vaccine Market Poised for Significant Growth

Expected to Reach \$12.6B by 2027 Driven Primarily by Growth in Adult Market



#### **PCV Market Growth Drivers**

- "At risk" adults 18+ newly included in U.S. universal vaccination recommendation
- >25% of adults aged 50-64 eligible for PCVs
- Strong ACIP consideration to expand U.S. universal adult vaccination to >50 years from >65 (doubling market size)
- Would necessitate prime-boost for effective long-term protection (further expanding market size)
- Broad-spectrum PCVs may increase number of countries recommending vaccination for adults due to cost-benefit evaluation
- Premium price for PCV20 and PCV15 shows value of incremental strains vs. PCV13
- (1) Sources: Company websites; Prevnar 20 and Vaxneuvance have since been approved in 2021.
- (2) Global Pneumococcal Vaccine Market (2022-2027), Infogence Global Research.



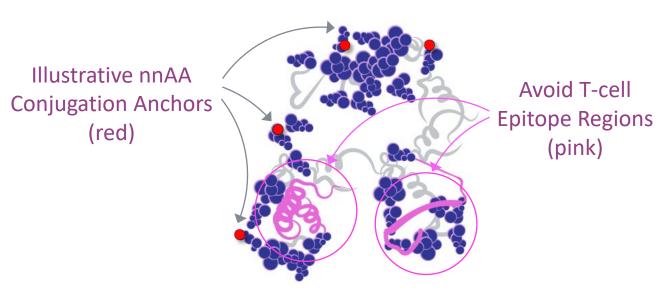
# Differentiated PCV Franchise Led by VAX-24



### VAX-24 Employs Carrier-Sparing Conjugates

Cell-Free Platform Enables Precise Conjugation to Enhance Potency of Standard Protein Carrier

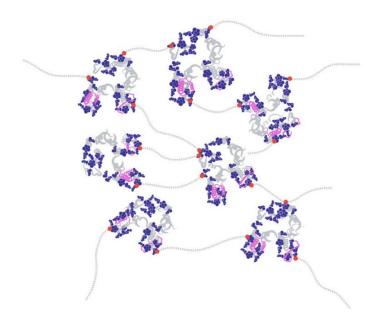
### PRECISE, SITE-SPECIFIC CONJUGATION SITES ON PROPRIETARY eCRM® PROTEIN CARRIER



#### **eCRM: Enhanced Potency Potential**

- Avoids masking sites on CRM<sub>197</sub> carrier responsible for T-cell help
- Optimized sites for conjugation using copper-free click chemistry
- More consistent antigenic presentation

#### FINAL VAX-24 CONJUGATES IN CUSTOMARY MATRIX FORM



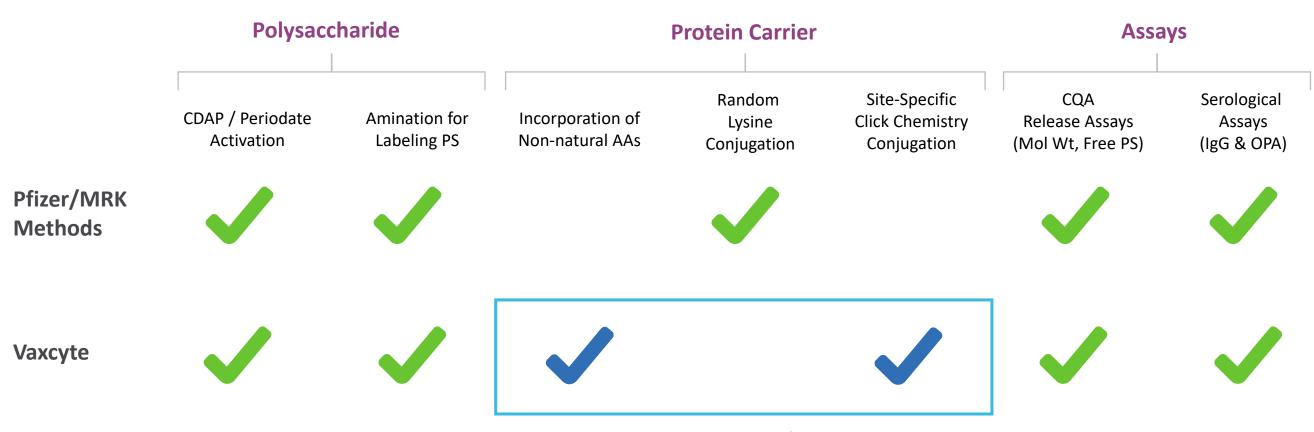
#### **Carrier-Sparing Conjugates**

- Less protein carrier / conjugate may allow addition of more serotypes while minimizing carrier suppression and maintaining immunogenicity
- VAX-24 and VAX-XP conjugates form standard PCV interstrand crosslinked matrices
  - Perceived as foreign by the host
  - Allows use of standard critical quality attributes and serological assays



### VAX-24 Design Leverages Many Standard PCV Conventions

Utilizes Proven Components, Chemistries and Assays to Reduce Risk and Uncertainty



Novel Enablement: Site-specific conjugation via incorporation of nnAA conjugation anchors

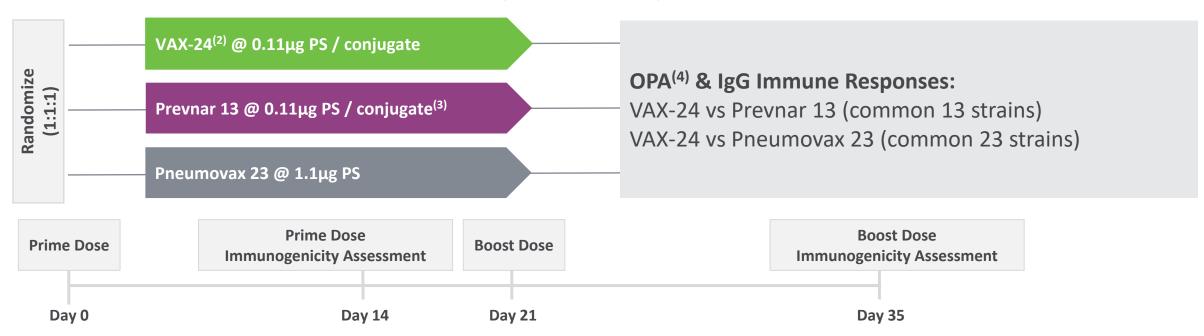
- Where appropriate, we expect to capitalize on the efficiencies of well-established clinical, manufacturing & regulatory precedents by leveraging conventional methods for the development of VAX-24
- Vaxcyte has leveraged the same animal models utilized in the development of both approved PCVs (Prevnar and Synflorix)

### VAX-24 Preclinical POC Study

Designed to Assess Conjugate-Like Immune Responses vs Standard of Care

Study Design: Vaccination of rabbits<sup>(1)</sup> with doses matching weight-to-weight allometric scaling to marketed human dose

PRECLINICAL POC STUDY: RABBITS (N=10/COHORT) DOSED AT DAY 0 & DAY 21



#### **Key Objectives:**

Demonstrate conjugate-like responses vs SOC on all 24 serotypes

- OPA Responses: Primary surrogate endpoint for full approval in adults
- IgG Responses: Co-Primary surrogate endpoint for full approval in infants
- (1) Represents same rabbit model as utilized in the development of approved PCVs (Prevnar, Prevnar 13, Synflorix).
- (2) VAX-24 conjugates produced with all Lonza-produced materials (eCRM & 24 polysaccharides).
- (3) Prevnar 13 dose of 6B is 2x the amount relative to the other conjugates, so equates to 0.22ug in this study.
- (4) Opsonophagocytic activity assay (OPA) measures the functional capacities of vaccine-candidate-raised antibodies.

#### **Key Endpoints:**

Immunogenicity (OPA & IgG)

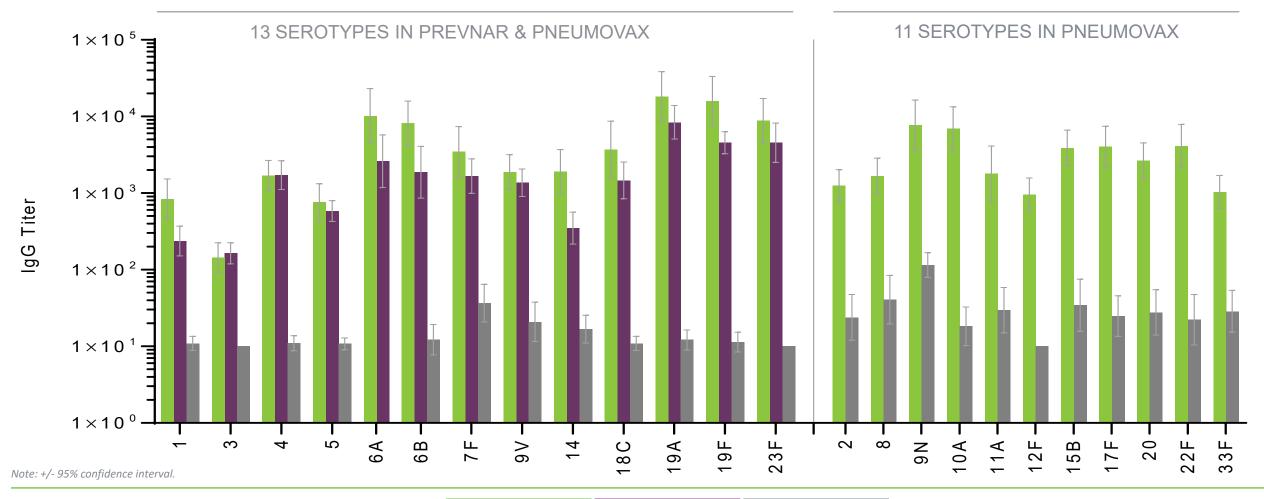
- VAX-24 vs Prevnar 13 common serotypes (Day 35)
- VAX-24 vs Pneumovax 23 for 11 incremental serotypes (Day 35)



### VAX-24 Preclinical POC Study Supports Potential to Deliver Broader-Spectrum PCV

IgG Antibody Titer Comparisons (Current Standard for Approval in Pediatrics)

- Comparable or better immune responses for VAX-24 relative to Prevnar 13 and Pneumovax 23 across common strains.
- Potential for approval in pediatrics based on non-inferiority relative to standard of care (≥ 50% of IgG titers one month post-boost).

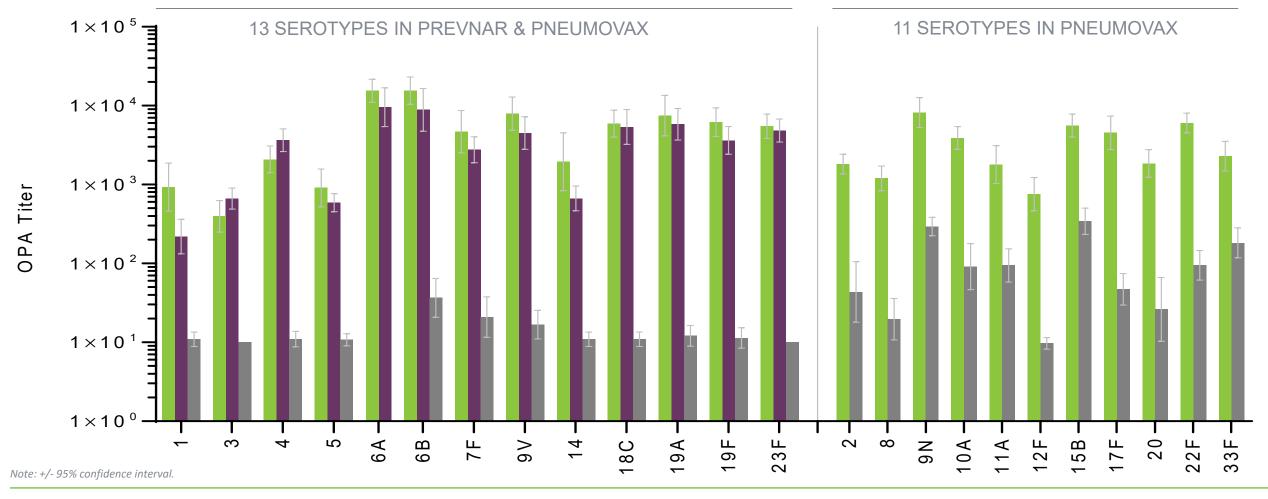




### VAX-24 Preclinical POC Study Supports Potential to Deliver Broader-Spectrum PCV

Functional Antibody (OPA) Responses (Current Standard for Approval in Adults)

- Comparable or better immune responses for VAX-24 relative to Prevnar 13 and Pneumovax 23 across all common strains.
- Potential for approval in adults based on non-inferiority relative to standard of care (≥ 50% of OPA titers one month post-vaccination).

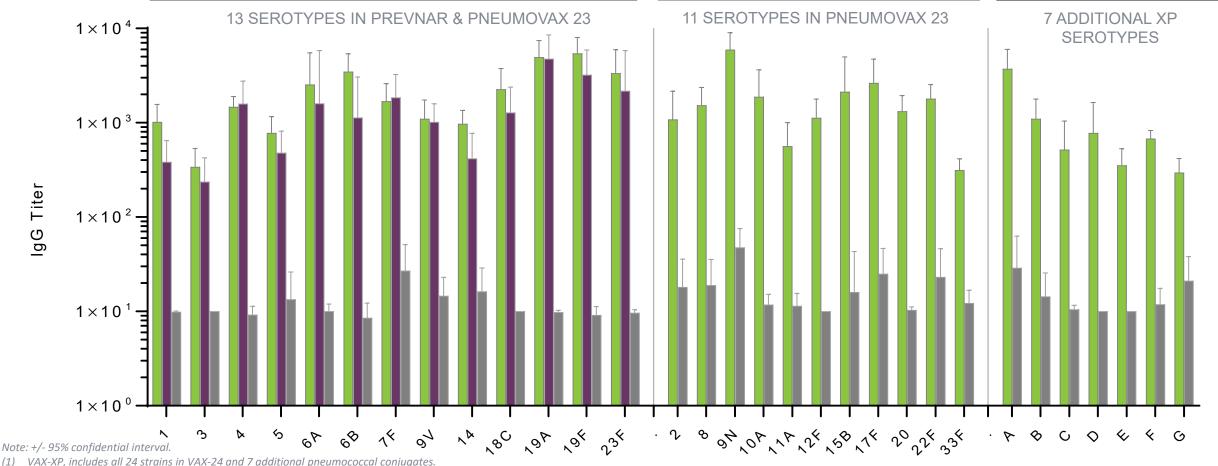




### VAX-XP: Further Evidence of Potential for Platform Scalability

IgG Responses for VAX-XP Comparable to Prevnar 13 & Superior to Polysaccharide-only Serotypes

- VAX-XP incorporates VAX-24 strains plus emerging serotypes responsible for significant IPD & antibiotic resistance.
- Demonstrates spectra scalability of platform and reproducibility of VAX-XP POC data with conjugates produced at larger scale.



(2) PS/Alum = PSs formulated with alum.



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### Vaxcyte PCV Franchise Leverages Established Regulatory Pathway

Well-Trodden Clinical Plan Aligned with Current FDA, EMA and WHO Guidance and Precedent PCVs

### CURRENT FDA, EMA & WHO GUIDANCE AND PRECEDENT

- Well-defined established surrogate immune endpoints
- No anticipated requirement for field efficacy trials
- Licensure via non-inferior immune responses vs. SOC (1)
- Consistent with Merck (PCV15) & Pfizer (PCV20)
   BI As<sup>(2)(3)</sup>

 Consistency across Ph 2 POC and Ph 3 pivotal studies for immune response in adult and infant programs (4)(5)(6)

#### VAXCYTE'S APPROACH FOR VAX-24

#### **CLINICAL APPROACH:**

 Designed to follow precedent of Pfizer (PCV20) & Merck (PCV15)

#### **ADULT POC STUDY:**

- Ph 2 clinical POC study N~800 healthy adults aged 50-64
- Topline results expected in October or November 2022<sup>(7)</sup>

#### FDA REGULATORY ACCELERANTS ACHIEVED:

- Fast Track designation in adults
- Allowing direct to infants vs traditional toddler POC study<sup>(8)</sup>
- (1) For adults: Lower limit of the 95% CI for the OPA GMR  $\geq$ 0.5 for each serotype comparison. For infants: Lower limit of the 95% CI for the 1gG GMC ratio post dose 4 is  $\geq$ 0.5 and LL of the 95% CI for % of subjects achieving an 1gG concentration  $\geq$  0.35  $\mu$ g/mL 1 month after dose 3 is <-10%. (2) Clinicaltrials.gov: Pfizer clinical studies for 20vPnC NCT03512288, NCT03550313, NCT03313037, NCT03313037
- (2) Clinicaltrials.gov: Pfizer clinical studies for 20VPnC NCT03512288, NCT03550313, NCT03313050, NCT03313037, NCT03760146, NCT03835975, and NCT03828617.

  (3) Clinicaltrials.gov: Merck clinical studies for V114 (PCV15) NCT02987972, NCT03620162, NCT03692871, NCT03731182, NCT03480763, NCT03615482, NCT03547167, NCT03480802, and NCT03565900.
- (4) WHO. Recommendations to assure the quality, safety and efficacy of pneumococcal conjugate vaccines, in WHO Expert Committee on Biological Standardization, 60<sup>th</sup> report. Geneva, Switzerland: WHO; 2013:91-521.
- (5) Prevenar 13 FDA Summary Basis for Regulatory Action. BLA/STN: 125324, 2010. ttps://www.fda.gov/downloads/BiologicsBloodVaccines/Vaccines/ApprovedProducts/UCM206140.pdf. Accessed January 10, 2020.
- Guidelines on clinical evaluation of vaccines. EMEA/CHMP/VWP/164653/05, April 2018. https://www.ema.europa.eu/en/documents/scientific-guideline/draft-guideline-clinical-evaluation-vaccines-revision-1\_en.pdf, Accessed Feb 11, 2020.
- (7) Guidance provided as of August 8, 2022.
- (8) Based on written feedback from pre-IND meeting; subject to satisfactory topline results from the VAX-24 Phase 1/2 study in adults 18 to 64 years of age.



### VAX-24 Phase 1/2 Clinical Proof-of-Concept Study Initiated in Q1:22

Topline Safety, Tolerability and Immunogenicity Results Anticipated in October or November 2022<sup>(1)</sup>

**Study Design:** Randomized, Observer-Blind, Dose-Finding, Controlled Study to Evaluate Safety, Tolerability & Immunogenicity of VAX-24 vs SOC in Adults Aged 18-64



 Phase 1 portion of the study is evaluating safety and tolerability of a single injection of VAX-24 at three dose levels and compared to Prevnar 20™ in 64 healthy adults 18 to 49 years of age. Participants were randomized equally in four separate arms and were evaluated for safety 8 and 29 days after dosing.

- Phase 2 portion of the study is evaluating safety, tolerability and immunogenicity of a single injection of VAX-24 at three dose levels and compared to Prevnar 20™ in ~800 healthy adults 50 to 64 years of age. Participants were randomized equally in four separate arms and 28 days after participants are dosed, serology samples collected to assess immunogenicity.
- All participants in the Phase 1/2 study will be followed for a total of six months after dosing to assess safety and tolerability.

<sup>(2)</sup> Pilot Safety Follow-up will continue thru Day 212 in parallel upon initiation of Clinical POC Study after Day 29 safety observation.

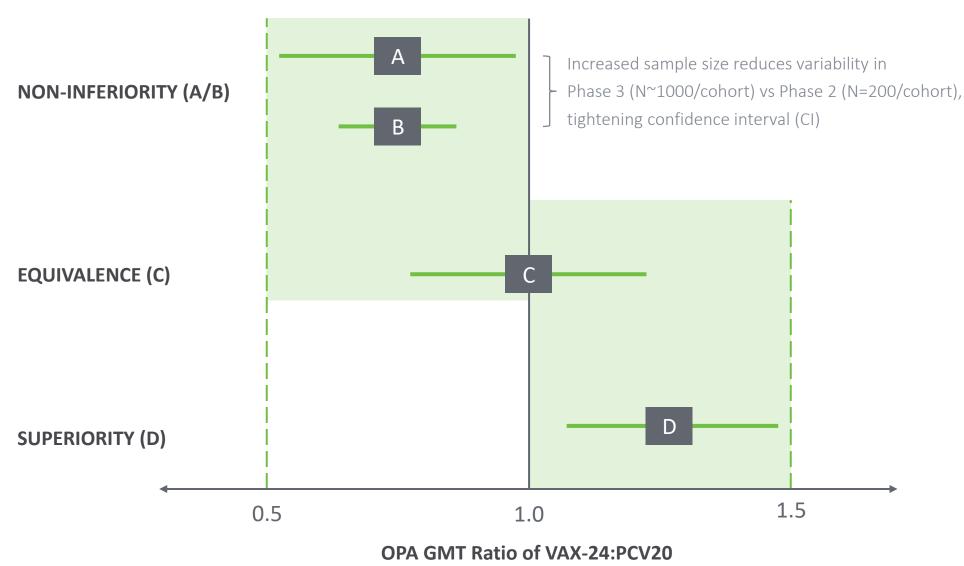


<sup>(1)</sup> Guidance provided as of August 8, 2022.

### Vaccine Development Overview<sup>1</sup>

Non-Inferiority to Lower-Valent Vaccines is Standard for Broader-Spectrum Versions, e.g., VAX-24 vs PCV20

- Pneumococcal strains outside the SOC (e.g., PCV15 or PCV20) are a significant cause of invasive disease
- Incremental coverage has been a primary driver for approval of broader-spectrum PCVs (evidenced by 4-fold rise in Ab responses over baseline)
- For strains included in available vaccines, non-inferior immune responses relative to SOC is the standard for approval (the LL of 95<sup>th</sup> CI ≥ 50% of the GMR relative to the SOC)



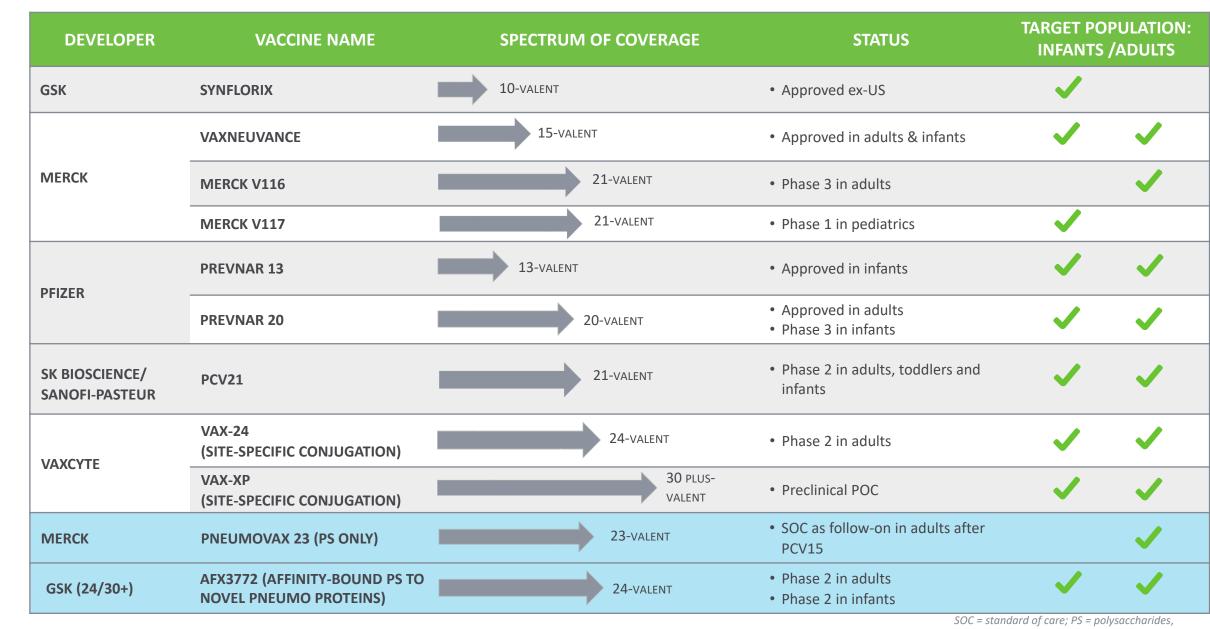
(1) For illustrative purposes only; not depicting a specific vaccine result SOC = standard-of-care; LL = lower limit, GMT = Geometric Mean Titer



### The Pneumococcal Vaccine Landscape

Vaxcyte PCV Franchise Designed to Offer Broadest Spectrum of Coverage

**PCV** 



NON-PCV APPROACHES



## Non-PCV Pipeline



### VAX-A1: Group A Strep Conjugate Vaccine Program

#### Novel Conjugate Vaccine Designed to Provide Universal Protection

#### UNMET NEED

- Group A Strep causes 700M global annual cases of pharyngitis (strep throat) and increases risk of severe invasive infections such as sepsis, necrotizing fasciitis and toxic shock syndrome
- Upgraded CDC threat given significant source of antibiotic Rxs driving resistance which has nearly tripled in past decade
- Responsible for post-infectious immune-mediated rheumatic heart disease leading to over 300K deaths in 2015
- Highly prevalent in children and rate of invasive disease in adults > 65 has more than doubled (exceeding IPD rate in adults)

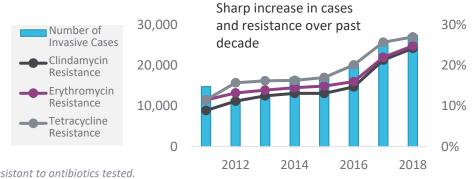
#### VAX-A1: BROAD-SPECTRUM, MONOVALENT CONJUGATE VX

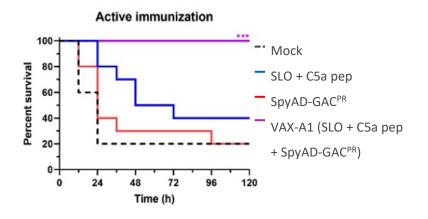
- Designed to confer robust, boostable and durable protection against a broad spectrum of subtypes of Group A Strep
- Leverages site-specific conjugation to disease-specific carrier to expose mapped T- and B-cell epitopes
- Proprietary conserved antigen Polyrhamnose conjugated to an immunogenic disease-specific carrier along with two conserved virulence factors

### PROGRAM STATUS

- Partially funded by grant from CARB-X (consortium of BMGF, Wellcome Trust, US Biodefense Agency (BARDA)); add'l August 2021 award of \$3.2M toward IND-enabling activities; total potential funding of up to \$13.9M inclusive of grants to date
- Initiated IND-enabling activities in 2H:21
- Anticipate providing guidance on the expected timing for adult IND application submission in 2H:22<sup>(1)</sup>

#### **KEY DATA**





CDC. Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: US Department of Health and Human Services, CDC; 2019. BMGF = Bill & Melinda Gates Foundation.



<sup>(1)</sup> Guidance provided as of August 8, 2022.

Resistant includes those isolates intermediate or fully resistant to antibiotics tested.

CDC Antibiotic Resistance Threats in the United States, 2019, Atlanta, GA: US Dena

### VAX-PG: Periodontitis Vaccine Program

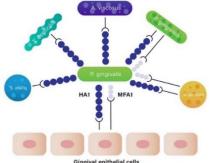
#### Therapeutic Vaccine Targeting Gingipains to Address Large, Underserved Market

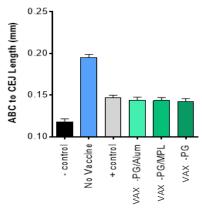
UNMET NEED	<ul> <li>Periodontal disease is a chronic oral inflammatory disease leading to destruction of soft &amp; hard tissues supporting the teeth</li> <li>Highly prevalent: 65 million US adults afflicted</li> <li>Significant morbidity and lost productivity: &gt;\$50B in lost productivity in 2010</li> <li>Associated with increased risk of heart attack, stroke, cardiovascular disease and Alzheimer's Disease</li> </ul>
VAX-PG: MULTIVALENT THERAPEUTIC VACCINE	<ul> <li>Incorporates proprietary combination of known virulence factors of keystone pathogen</li> <li>Preclinical model demonstrated protein-specific IgG response following immunization and protected mice from P. gingivalis-elicited oral bone loss</li> <li>Initial goal to develop therapeutic vaccine that slows or stops disease progression</li> </ul>
PROGRAM STATUS	<ul> <li>Preclinical proof of concept published in Journal of Clinical Periodontology</li> <li>Next milestone: Nominate final vaccine candidate by the end of 2022<sup>(1)</sup></li> </ul>
MOA & KEY DATA	Restoration of balanced microbiota by interrupting underlying inflammatory condition  Challenge Study Results











Immunization with all formulations of VAX-PG provided significant protection against oral bone loss compared to the unvaccinated control (p<0.01)

(1) Guidance provided as of August 8, 2022. Huang et.al. J Clin Periodontol. 2019 Feb;46(2):197-205



### **Key Corporate Highlights**



Large Market Opportunity for Lead PCV Franchise

Cell-Free Protein Synthesis Platform

**Disciplined Target Selection** 

Robust Pipeline with Multiple Novel Vaccines

Aligned Critical Resources