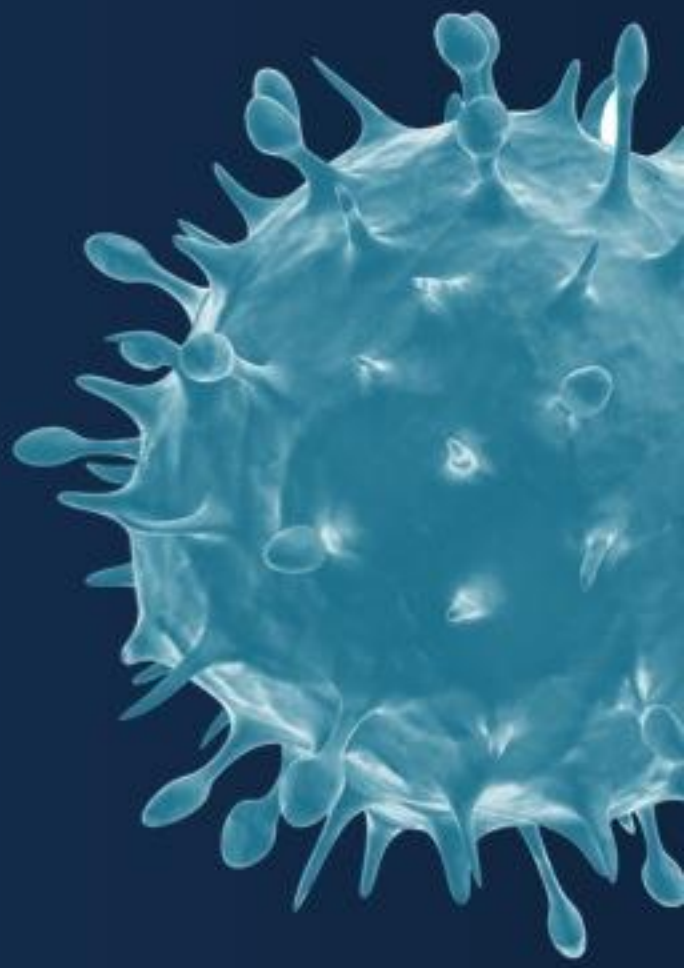
Positive 6 Month Clinical Efficacy Results

GEN-003 Immunotherapy
Candidate for Genital Herpes
Phase 2b Study

5 January 2017



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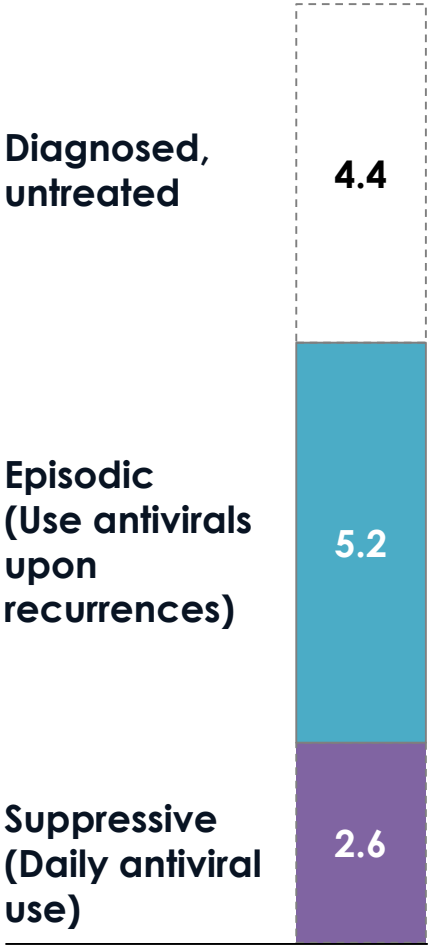
Successful Phase 2b Clinical Results – Advancing Potential Blockbuster to Phase 3

- Statistically significant improvements in clinical disease versus placebo across multiple endpoints 6 months post-dosing
- Compelling profile cemented across three clinical studies
  - Durable impact on clinical disease
  - Significant reduction in viral shedding
  - At most once-yearly maintenance dosing
  - Safety profile appropriate for therapeutic setting
- Important critical path milestones imminent
  - End-of-phase 2 meeting with the FDA: Q1
  - Phase 3 start: Q4
- If approved, would be the first new treatment for genital herpes infections in more than 20 years
- Large unmet patient need in a disease of epidemic proportions
  - Potential ~$2 billion global revenue opportunity*

*Source: Genocea market research

Millions Infected with Genital Herpes Need a New Treatment Option

Treatment Distribution*



* Millions of US patients

Benefits from Antivirals Today

- **No benefits**
- **Little benefit**
  - No impact on recurrence frequency
  - Small reduction in duration
- **Most patients do not persist**
  - Loathe "daily reminder"
  - Incomplete efficacy

GEN-003 Target Profile

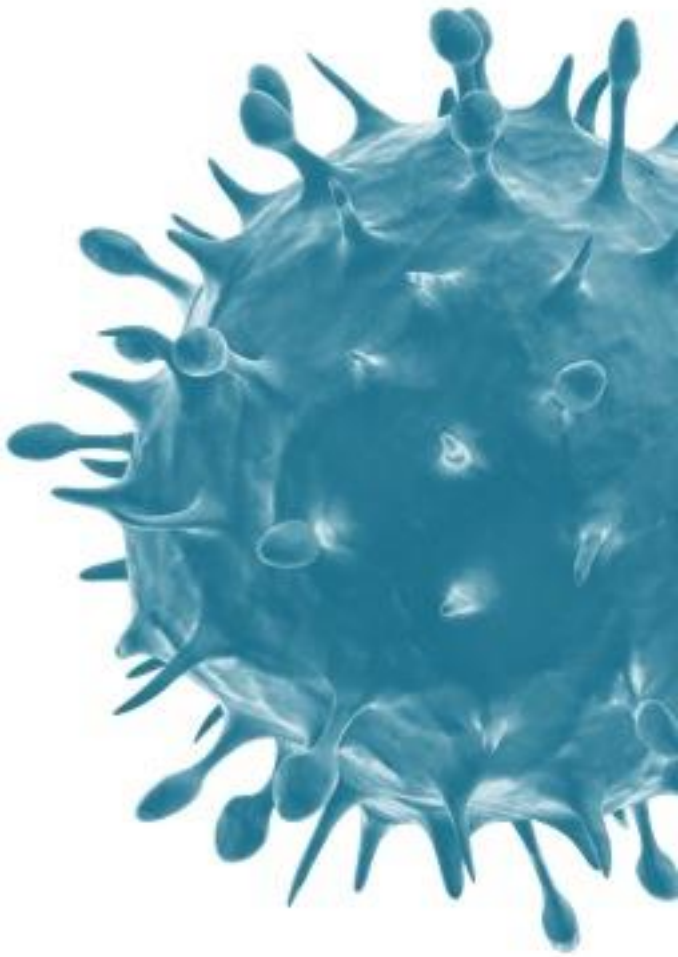
- **Reduce clinical disease:**
  - **Total lesion days**
  - **Recurrence number**
  - **Recurrence duration**
- **Reduce viral shedding**
- **Minimize treatment burden**

- **No pill burden**
- **Similar disease control**
- **Potential additive effect as combo**

Source: Genocea market research

GEN-003 Phase 2b Trial

6 Month Clinical Readout



Goals & Objectives

- Overall goal
  - Evaluate Phase 3-ready formulation of GEN-003 and define dose for Phase 3 trials

- Primary objective (completed successfully in September 2016[1])
  - Compare efficacy of two dose levels of GEN-003 and placebo by impact on viral shedding

- Secondary objectives
  - Evaluate impact on clinical disease vs. placebo at 6 and 12 months
  - Evaluate impact on viral shedding vs. placebo at 6 and 12 months
  - Immunogenicity
  - Safety and tolerability

Note (1) Press release - http://ir.genocea.com/releasedetail.cfm?ReleaseID=991389

Study Design

- Randomized, double-blind, placebo-controlled
- 131 subjects with a history of recurrent genital herpes
- 3 dose groups
  - Placebo (n=44)
  - 60 µg per antigen / 50 µg of Matrix-M adjuvant (n=43)
  - 60 µg per antigen / 75 µg of Matrix-M adjuvant (n=44)
- Most other design elements consistent with prior GEN-003 trials
  - Inclusion / exclusion criteria, demographics, sites, dose regimen, viral shedding swabbing compliance

Improved Lesion Data Collection Strengthens GEN-003 Clinical Endpoints Assessment

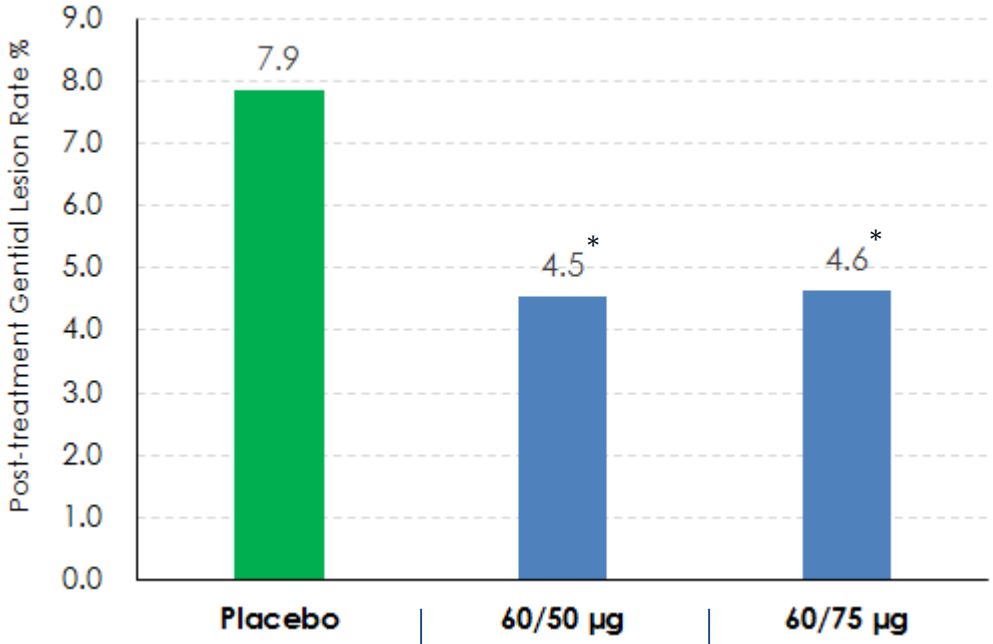
- Phase 2b – more comprehensive
  - Lesion data collected daily throughout trial
  - Data recorded via smartphone-based app with reminders
- Previous GEN-003 studies
  - Lesion data only during 28-day observation periods
    - Pre-treatment
    - Immediately post-treatment
    - 6 & 12 months post-treatment
  - Data recorded via paper diary based on recall

Analytical Enhancements

- Capture data on additional clinical endpoints:
  - Number of recurrences
  - Duration of recurrences
- Enables Phase 3-like analysis across doses <u>after treatment</u>, rather than versus baseline

GEN-003 Significantly Reduces Genital Lesion Rate vs. Placebo

Mean Genital Lesion Rates[1] Post Treatment Over 6 Months After Last Dose



	Placebo	60/50 µg	60/75 µg
Total days with lesions[2]	605	354	374
% reduction vs. placebo		**41%***	**38%***

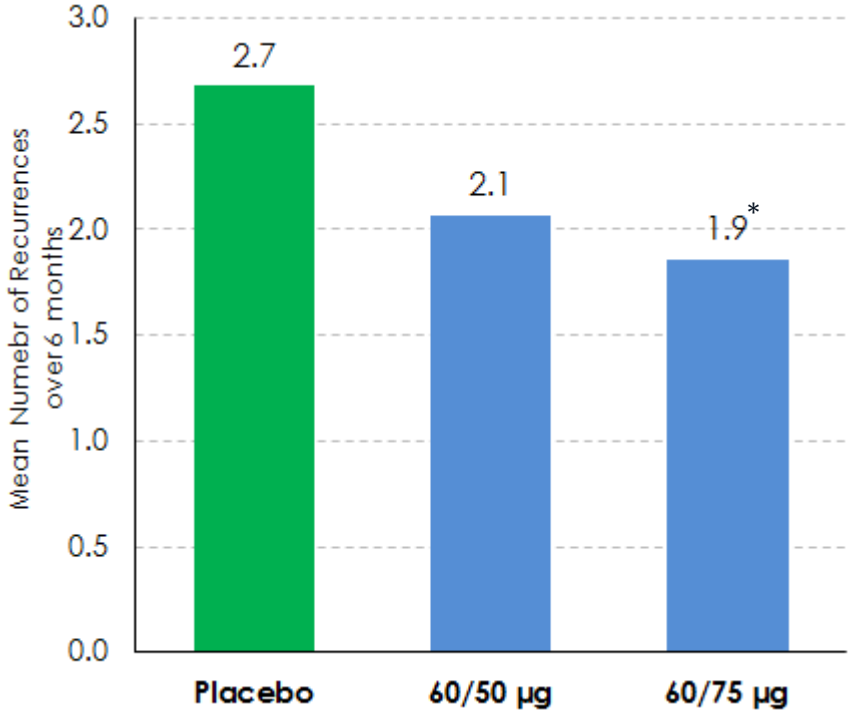
- **Significant efficacy vs. placebo**
- Endpoint captures durable impact on clinical disease

Wilcoxon Rank Sum test vs. placebo * $p<0.05$

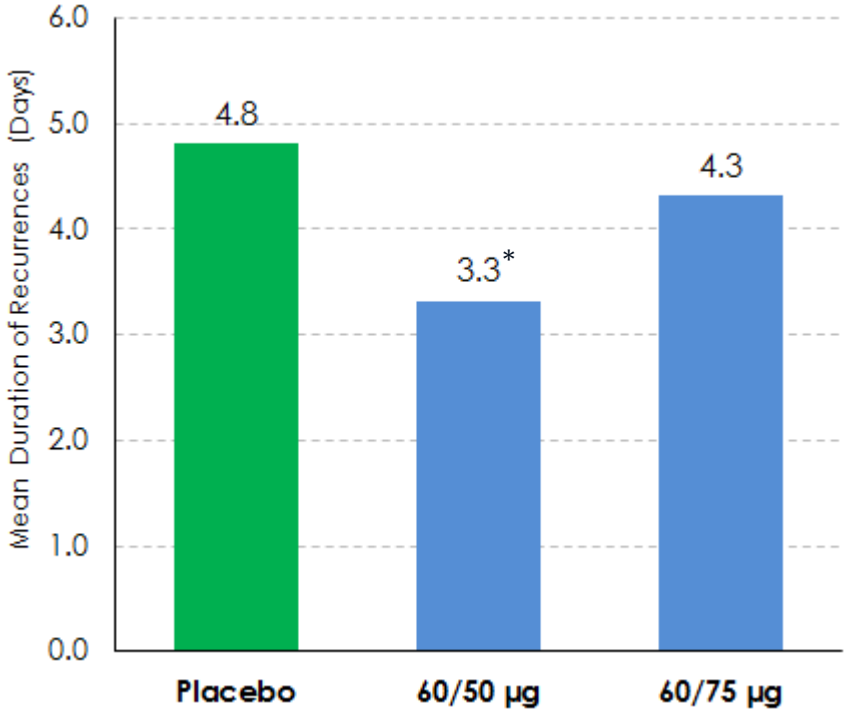
Notes (1) Days with lesions divided by total days
(2) For dose group as a whole during 6 month period

GEN-003 Significantly Reduces both the Number and Duration of Recurrences Versus Placebo

Mean Number of Recurrences Over 6 Months Following Last Dose



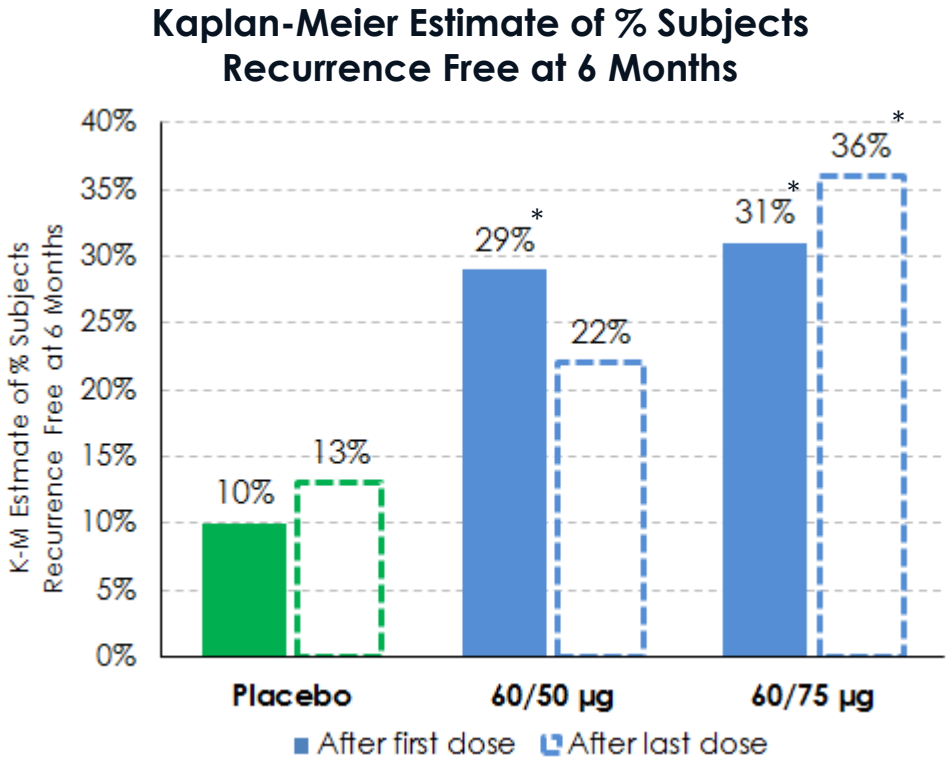
Mean Duration of Recurrences Over 6 Months Following Last Dose



Wilcoxon Rank Sum test vs. placebo * $p<0.05$

- Reducing the frequency and duration of recurrences is important to both patients and their caregivers

GEN-003 Drives Significant Improvement in Number of Subjects Recurrence Free at 6 Months



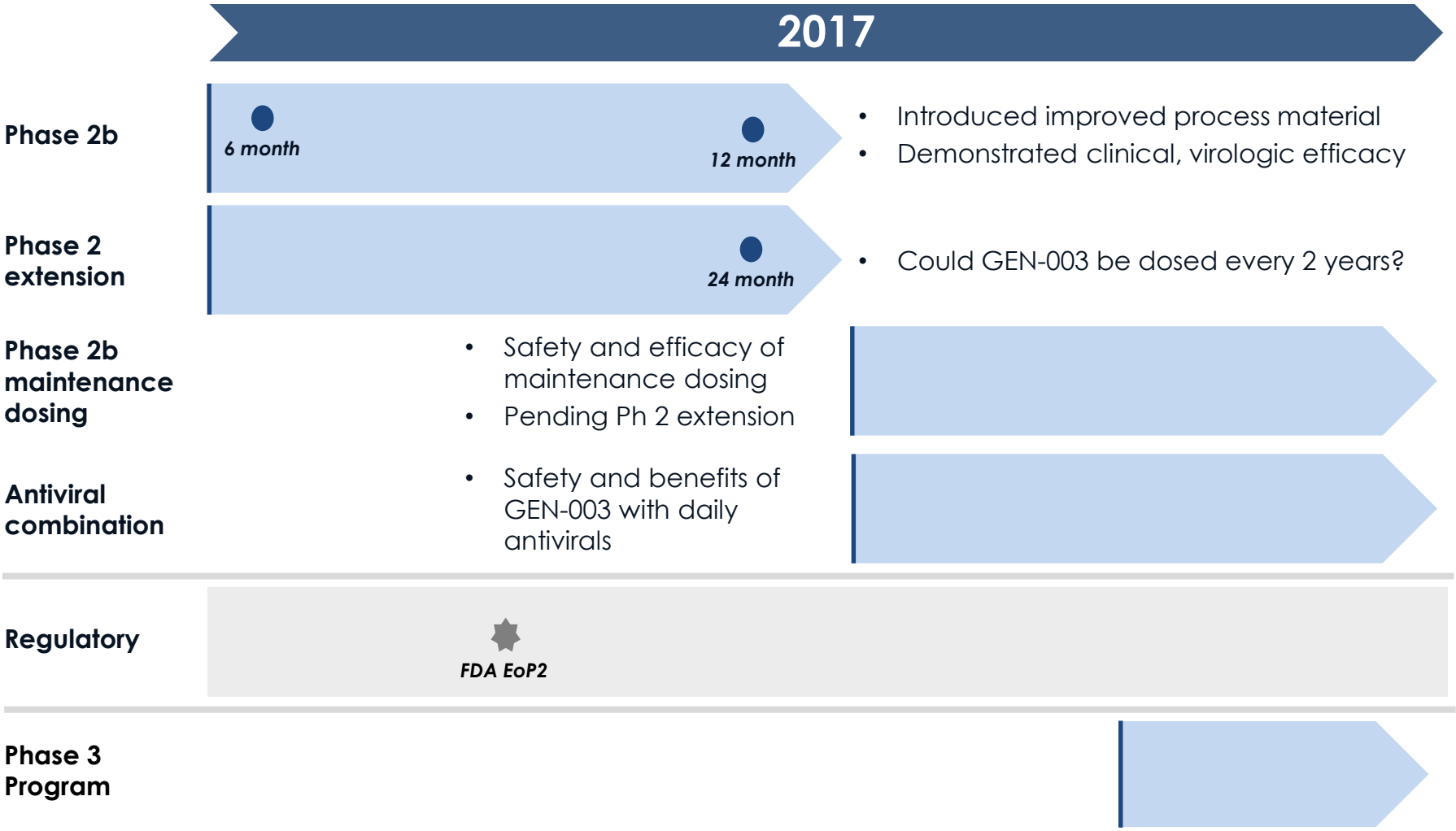
Log rank test vs. placebo * $p<0.05$

- GEN-003 patients 2-3 times more likely to be completely recurrence-free than placebo at 6 months
- GEN-003 efficacy consistent with Phase 2 clinical trial

Positive GEN-003 Phase 2b Results Provide Strong Foundation for Phase 3

- Statistically significant improvements in clinical disease versus placebo across multiple endpoints 6 months post-dosing
- Significant reductions in viral shedding
- Prioritizing 60 µg per antigen / 50 µg adjuvant based on clinical & virologic efficacy and tolerability
- Finalizing Phase 3 program preparations with FDA in Q1

Phase 2b Clinical Efficacy Data Maintains Momentum to Phase 3 Start

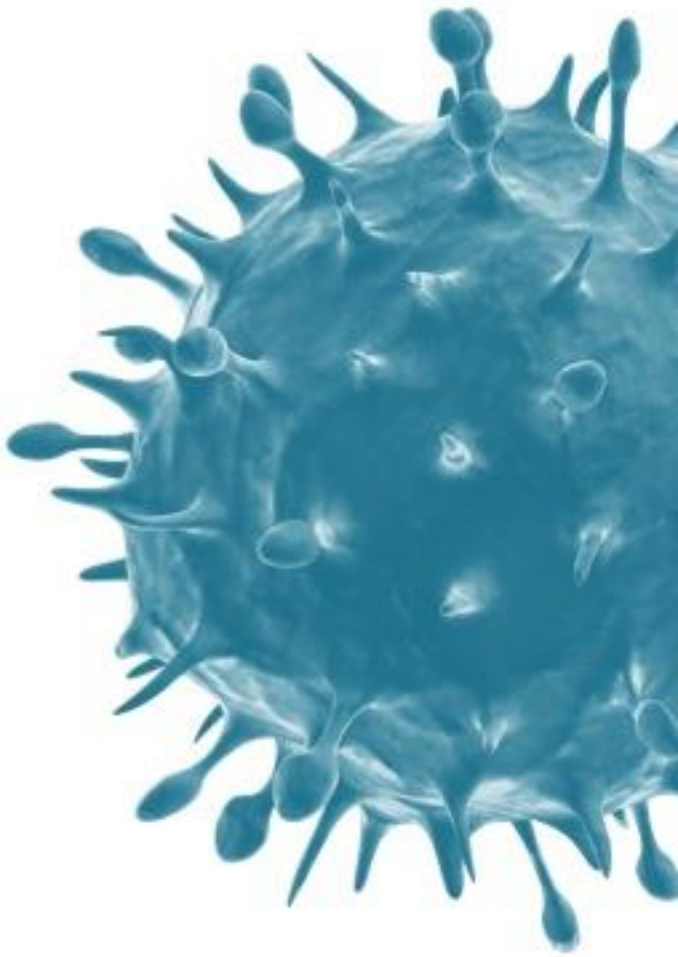


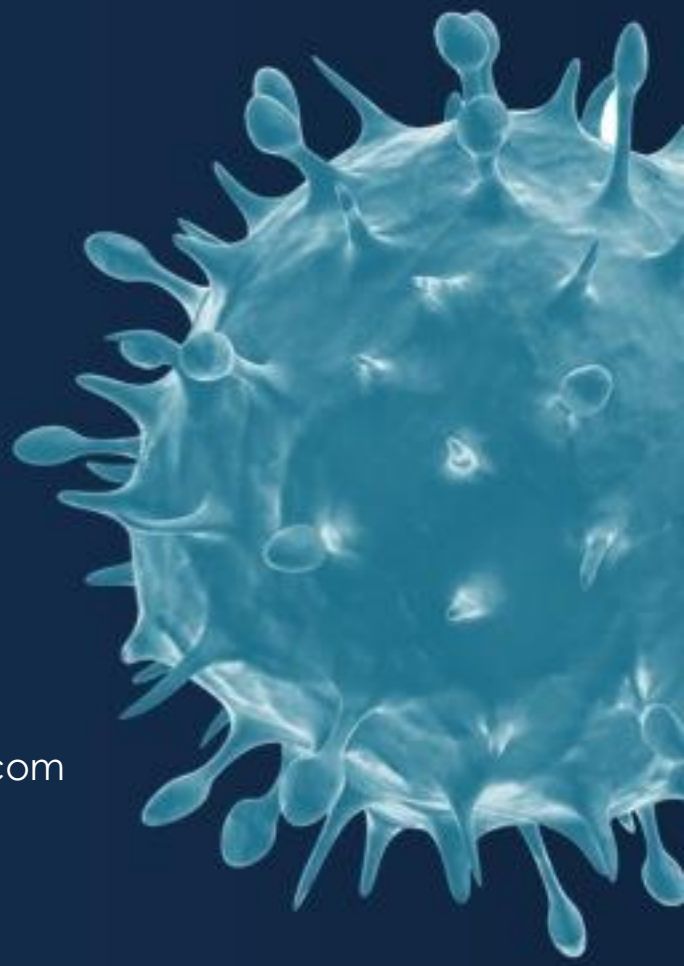
GEN-003: Phase 3-Ready Program with Blockbuster Potential

- Large unmet patient need in a disease of epidemic proportions
  - Potential ~$2 billion global revenue opportunity*
- 3 successful clinical trials to date
  - Clinical efficacy demonstrated against multiple endpoints reflecting patient unmet need
  - Durable for at least 1 year; annual maintenance dose possible
  - Comprehensive dose exploration; consistent efficacy at selected dose
  - Safety profile appropriate for therapeutic setting
- Multiple planned upcoming milestones
  - Q1: End of Phase 2 meeting
  - H2: 24-month Phase 2 data & 12-month Phase 2b data & combination study
  - Q4: Start Phase 3 trials
- Exploring global development and commercialization partner(s)

*Source: Genocea market research

Q&A





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