seropositive cohorts, proportion of subjects who reported injection site AEs was higher in V160 recipients than placebo controls. Proportion of subjects who reported systemic AEs was comparable across V160 doses/formulations and placebo. In the CMV seronegative cohort, immune responses increased with incremental dosing. More importantly, recipients of V160 from several dose levels mounted NAB and CMI responses at 1 month post dose 3 (PD3) that were comparable to baseline levels measured in seropositive subjects.

Conclusion. V160 had acceptable safety profile across all dose levels and formulations studied; Vaccine was immunogenic and elicited NAB and CMI responses at 1 month PD3 that were comparable to natural CMV infection.

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1022. Establishing Models of Herpes Simplex Virus Type 2 Superinfection of Herpes Simplex Virus Type 1 Seropositive Mice to Test The Efficacy of a Novel Vaccine

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Background. Multiple subunit vaccines that elicit neutralizing antibodies (nAbs) against the immunodominant HSV-2 glycoproteins D and/or B (gD and gB) were advanced into the clinic after demonstrating protection against disease in animal models. However, although the vaccines elicited nAbs in seronegative and boosted nAb titers in HSV-1 seropositive (HSV-1$^+$) participants, none prevented HSV-2 infection suggesting that nAbs alone are not sufficient. The results also indicate that current animal models are not predictive of clinical trial outcomes. We recently engineered a candidate single cycle vaccine strain deleted in gD (ΔgD-2) and showed that it elicits high titer non-neutralizing Abs that provide complete protection against HSV-1 or HSV-2. The Abs passively protect naïve mice and activate the Fc receptor to induce antibody-dependent cell mediated cytotoxicity (ADCC). We hypothesize that ΔgD-2 will protect HSV-1$^+$ individuals from HSV-2 because it elicits a different type of immune response. To test this hypothesis, we established a model of HSV-2 superinfection in HSV-1$^+$ mice.

Methods. We infected mice by corneal scarification with serial dilutions of a clinical strain of HSV-1 (Bx^{3}1.1) to identify a sublethal dose associated with seroconversion. We then superinfected mice on the skin with HSV-2 and monitored for disease. The presence of virus in dorsal root ganglia (DRG), the site of HSV latency, was determined by quantitative PCR.

Results. Corneal infection with 10^4 PFU of HSV-1 resulted in disease in 18/29 (62%) mice and 13/18 survived. Seroconversion was documented in 9/13 survivors. Surviving mice were superinfected 2 weeks post-recovery with HSV-2. All of the mice developed signs of disease, but only 2/9 who were HSV-1$^+$ died compared with 4/4 seronegative mice (P = 0.02, Fisher exact test). HSV-2 DNA was detected in the DRG of 12/13 mice.

Conclusion. Sublethal HSV-1 corneal disease provides partial protection against HSV-2 superinfection and provides a model to test vaccine efficacy. We speculate that superinfection boosts preexisting nAb titers, a response consistent with immune repertoire freeze, but that ΔgD-2, because it elicits ADCC Abs, will overcome repertoire freeze and provide greater protection against HSV-2 superinfection.

Disclosures. **W. Jacobs**, X-vax: Grant Investigator, Research grant and Research support. **B. C. Herold**, X-vax: Grant Investigator, Research grant and Research support.

1023. Sustained Lesion and Shedding Rate Reductions in Genital Herpes Patients 24 Months after Immunization with GEN-003, a Genital Herpes Immunotherapy

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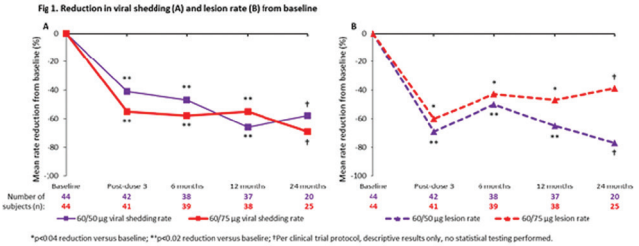
Background. Herpes simplex viruses (HSVs) are the main cause of genital ulcers worldwide. GEN-003 is an investigational genital herpes immunotherapy composed of HSV-2 antigens gD2DTMR and ICP4.2, and the saponin-based adjuvant Matrix-M2^{TM} (MM2). In a Phase 2 dose-ranging study (GEN-003-002), 3 doses of GEN-003 reduced HSV-2 lesion rate (percent of days with genital lesions) and anogenital HSV-2 shedding rate (percent of days with detectable virus). The antiviral effect of GEN-003 persisted to 12 months after the 3-dose vaccination regimen. We report here the results of an extension study to evaluate efficacy and immunogenicity of GEN-003 at 24 months post-vaccination.

Methods. GEN-003-002 subjects who received at least 1 dose of GEN-003 (dose groups: 30 or 60 µg of antigens combined with 25, 50 or 75 µg of MM2) were eligible to enroll in the extension study. At 24 months post-vaccination, anogenital swabs were collected twice daily for 28 days for HSV-2 DNA detection by quantitative PCR. During this period, subjects also reported genital herpes lesion data via a daily reporting tool. Blood samples were collected at the end of the swab collection period to evaluate humoral and cellular immune responses. HSV-2 immunoglobulin G (IgG) was measured by ELISA, and HSV-2 neutralizing antibodies were measured by a colorimetric assay. Cellular responses were evaluated in peripheral blood mononuclear cells using an interferon-g/granzyme B Fluorospot assay.

Results. 140 subjects were enrolled. At 24 months, those in the two best-performing GEN-003-002 study groups, 60 µg antigens combined with either 50 or 75 µg MM2 (60/50 and 60/75, respectively), recorded decreased mean viral shedding rates of 58% and 69% below baseline, similar to the 12-month shedding rate reductions, and mean anogenital lesion rates of 77% and 39% below baseline, respectively (**Fig 1**). In all dose groups, mean IgG titers to ICP4.2 and gD2ΔTMR were sustained from 12 to 24 months. Similarly, mean neutralizing antibody titers did not change significantly from month 12 to 24.

Fig 1. Reduction in viral shedding (A) and lesion rate (B) from baseline



*p<0·04 reduction versus baseline; **p<0.02 reduction versus baseline; †Per clinical trial protocol, descriptive results only, no statistical testing performed.

Conclusion. GEN-003 induces reductions in HSV-2 shedding and genital herpes lesion rates that persist to 24 months following treatment. Humoral immune responses to GEN-003 are maintained at 24 months after immunization.

Disclosures. **T. Heineman**, Genocea Biosciences: Employee, Salary. **L. K. Mcneil**, Genocea Biosciences: Employee, Salary. **T. Oliphant**, Genocea Biosciences: Consultant, Consulting fee. **A. Natenshon**, Genocea Biosciences: Employee, Salary. **N. Van Wagoner**, Genocea Biosciences: Consultant, Research support and Travel support to present at scientific meetings .**J. B. Flechtner**, Genocea Biosciences: Employee, Salary **S. Hetherington**, Genocea Biosciences: Employee, Salary/

1024. Estimating the Health and Economic Impact of Universal Varicella Vaccination in Jordan

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Background. To evaluate the impact of adding universal varicella vaccination (UVV) to the existing childhood vaccination programme in Jordan, and identify the most cost-effective strategy.

Methods. A dynamic transmission model of varicella infection was calibrated to available varicella seroprevalence data within the region and validated against local epidemiological data. Local direct and indirect costs and healthcare utilization data were used. We considered the health and economic impact of one dose UVV administered concurrently with MMR at 12 months of age with 95% coverage, and two dose strategies with short (6 month) and long (4 year) intervals between First and Second dose. We took the societal perspective (direct and indirect costs) and discounted costs and QALYs by 3%/year to assess cost-effectiveness.

Results. The model estimated the current burden of varicella at 172,000 cases/year, an incidence rate of 2,200/100,000 persons. In the 5th/25th year after vaccination, all strategies substantially reduced total varicella incidence by 89.5%/96.6% (1 dose), 92.3%/98.0% (2 dose short), and 90.5%/98.3% (2 dose long), compared with no vaccine (Figure 1). In the absence of vaccination, an estimated $47.89 M ($28.81 M direct, $19.08 indirect) was spent annually on varicella treatment. The average annual total treatment costs over 25 years from the societal perspective were $4.01M (1 dose), $3.34M (2 dose short), and $3.43M (2 dose long). Considering a willingness to pay (WTP) threshold of $3,600 USD / QALY and the societal perspective, the 1 dose program was the most cost-effective with cost savings of $83.40 USD and health gain of 4.127×10^{-5} QALYs per person. 2 dose programs are similarly cost-saving and highly effective, compared with a scenario of no vaccination; however, moving incrementally from a 1 dose strategy, incremental cost-effectiveness ratios (ICERS) were $6.9M/QALY (short vs. 1 dose) and $13.5M/QALY (long vs. short), both well as above the WTP threshold. All strategies reached.

Conclusion. One or two dose UVV in Jordan will significantly reduce varicella disease burden and is cost saving relative to no vaccine over 25 years.

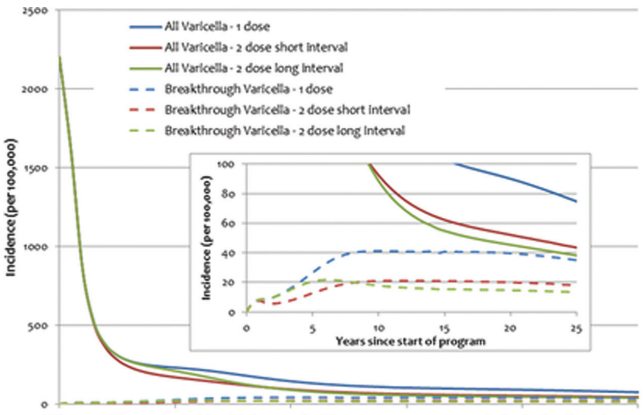

Figure 1: The projected health impact (incidence per 100,000 population) of universal varicella vaccination in Jordan considering three vaccination strategies: 1 dose administered at 12 months, 2 doses with a short interval (2nd dose 6 months after 1st, at 18 months) and 2 doses with a long interval (2nd dose 4 years after 1st, at 5 years). All varicella (across all age groups) is the sum of natural and breakthrough varicella. The inset graph is a more detailed view of the larger graph, with a y-axis going from 0-100, compared to the full y-axis ranging from 0 to 2500.

Disclosures. **W. Hayajneh**, Merck & Co., Inc.: Consultant, Consulting fee. **J. Maalouf**, Merck & Co., Inc.: Employee, Salary. **B. Kuter**, Merck & Co., Inc.: Employee, Salary.**T. Weiss**, Merck & Co., Inc.: Employee, Salary. **V. Daniels**, Merck & Co., Inc.: Employee, Salary. **L. Wolfson**, Merck & Co., Inc.: Employee, Salary.

1025. Serum and Lung Pharmacokinetics of ASN100, a Monoclonal Antibody Combination for the Prevention and Treatment of *Staphylococcus aureus* Pneumonia

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Background. Monoclonal antibodies (mAbs) are well-suited for the prevention and treatment of acute bacterial infections. ASN100 is a combination of two fully human IgG1 mAbs, ASN-1 and ASN-2 that together neutralize six *Staphylococcus aureus* cytotoxins, alpha-hemolysin (Hla) and five leukocidins (HlgAB, HlgCB, LukED, LukSF [PVL] and LukGH) that are important in the pathogenesis of *S. Aureus* pneumonia. We aimed to characterize the pharmacokinetics (PK) of ASN100 in both serum and lung epithelial lining fluid (ELF) in male and female healthy volunteers.

Methods. The safety, tolerability, and serum and lung PK of single intravenous infusion of ASN100 was evaluated in a Phase 1 study. Eight subjects (3:1 randomization) in two double-blind cohorts received ASN100 (doses of 3600 mg or 8000 mg) or placebo. ASN-1 and ASN-2 were administered in a fixed dose 1:1 ratio. Twelve subjects received ASN100 open-label at doses of 3600 mg or 8000 mg and each underwent two bronchoalveolar lavage (BAL) fluid collections either on days 1 and 30 or on days 2 and 8 post-dosing. ASN-1 and ASN-2 concentrations were determined by ELISA. The ELF concentrations were normalized based on urea concentrations in serum and BAL fluid.

Results. No dose limiting toxicity was observed. Adverse events (AEs) showed no association of increased incidence with higher dose. All AEs were mild or moderate in severity, with 83.3% of subjects receiving ASN100 reporting at least one AE vs. 100% of placebo subjects. A dose proportional increase in serum peak and exposure (AUC) of ASN-1 and ASN-2 was observed and the serum PK of ASN-1 and ASN-2 were comparable (approximate half-life of each antibody was 3 weeks). Penetration of ASN-1 and ASN-2 into the ELF of the lung was observed at the first post-dose time point of 24 hours, peak concentrations were observed after day 2 and the mAbs remained detectable at day 30.

Conclusion. ASN100 was safe and well tolerated at doses up to 8000 mg (4000 mg ASN-1 and 4000 mg ASN-2). The PK profiles of ASN-1 and ASN-2 were comparable following simultaneous administration. Significant lung concentrations of each mAb were demonstrated between day 1 and 30 post-dosing. These data support continued clinical development of ASN100 for the prevention and treatment of *S. Aureus* pneumonia.

Disclosures. **Z. Magyarics**, Arsanis Biosciences GmbH: Employee, Salary. Arsanis, Inc.: Shareholder, Share options. **F. Leslie**, Arsanis., Inc.: Employee and Shareholder, Salary. **S. A. Luperchio**, Arsanis Inc.: Employee and Shareholder, Salary. **B. Jilma**, Arsanis Biosciences GmbH: Investigator, Investigator fee. **C. Stevens**, Arsanis Inc.: Employee and Shareholder, Salary.**E. Nagy**, Arsanis: Employee and Shareholder, Salary.

1026. Comparison of Viral Loads in Patients with Co-infections vs. Single-virus Infections

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Background. Molecular testing for respiratory viruses in clinical practice is common, often with multiple viruses detected. Viral load has been correlated with illness severity, but correlation of co-detection of viruses and viral load is less clear. We sought to compare cycle threshold (Ct) values, a marker inversely related to viral load, between single vs. co-detection of common respiratory viruses.

Methods. Children <18 years with respiratory symptoms and/or fever who presented to the ED or were admitted were enrolled. Nasal/throat specimens were obtained and combined. Singleplex qRT-PCR was used to test for 11 respiratory viruses. Clinical and demographic information were collected.

Results. From 11/15/15-7/15/16, 1255 children were enrolled, with median age of 26.5 months, 53.4% male, 54.3% White, 38.7% Black, 6.4% other, and 23.5% Hispanic. The median days of illness were 3 days. Of the total cohort, 904 (72%) tested positive for at least one viral pathogen. **Table 1**compares Ct values of single vs. co-detection for each individual virus.

Table 1.

	N	Ct-Median (IQR)	p-value	Days of Illness - Median (IQR)	p-value
Respiratory Syncytial Virus (RSV) Single	144	25.5 (22.86-29.03)	0.05	4 (3-5)	0.82
RSV-Co-detection	63	27.0 (23.47-33.82)		3 (3-7)	
Human Rhinovirus (HRV)-Single	289	27.5 (23.79-32.50)	0.000	3 (2-4)	0.002
HRV-Co-detection	117	32.8 (29.08-35.49)		3 (2-6)	
Adenovirus (AdV)-Single	79	28.7 (23.84-33.62)	0.001	3 (2-4)	0.06
Adv-Co-detection	7	32.8 (27.40–36.69)		3 (2-4)	
Human metapneumovirus (HMPV)-Single	75	28.8 (25.37-32.22)	0.75	4 (3-6)	0.45
HMPV-Co-detection	30	28.2 (24.86-33.11)		4 (3-7)	
Parainfluenza (PIV)-Single	36	25.2 (23.75-28.76)	0.005	3.5 (2-5.5)	0.34
PIV-Co-detection	15	28.8 (26.04-34.50)		3 (1–4)	
Flu-Single	127	26.6 (24.71-30.51)	0.34	3 (2-5)	0.83
Flu-Co-detection	26	28.0 (25.98-30.14)		3.5 (2-6)	

Conclusion. Single detection with RSV, HRV, AdV, and PIV had lower Ct values, indicating higher viral loads, compared with co-detection with other viruses. Additional research is needed to understand the reason for lower viral loads for co-detection vs. single detection in select respiratory viruses.

Disclosures. **W. Schaffner**, Pfizer: Scientific Advisor, Consulting fee. Merck: Scientific Advisor, Consulting fee. Novavax: Consultant, Consulting fee. Dynavax: Consultant, Consulting fee. Sanofi-pasteur: Consultant, Consulting fee. GSK: Consultant, Consulting fee. Seqirus: Consultant, Consulting fee. **N. B. Halasa**, sanofi pasteur: Research Contractor, Research support. Astra Zeneca: Research Contractor, Grant recipient.

1027. Study to Address Threats of Acute Respiratory Infections among Congregate Military Populations (ATARI)

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Background. More than 90% of active duty personnel receive influenza vaccinations yearly. Despite high coverage, influenza-like illnesses (ILI) remain a frequent cause of missed duty and hospitalizations, particularly in U.S. military recruits. More research is needed on the epidemiology and etiology of ILI to reduce the burden of respiratory infections in congregated military settings.

Methods. We conducted a prospective cohort study to assess ILI patterns among US Army recruits in a 9-week basic combat training course at Ft. Benning, GA. Demographic data, vaccination history, and information on recent illness were collected at enrollment in January 2017. Participants were divided into two platoons with staggered biweekly visit schedules. Visits occurred from reception through training, with nasal swabs and symptom surveys (all visits) and blood draws (weeks 8 and