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A 3-antigen hepatitis B vaccine provides consistently higher seroprotection rates (SPR) and anti-HBs titers compared to single-antigen vaccine in adults with comorbidities known to be associated with poor response to vaccinations:

Results from the phase III double-blind, randomized study (PROTECT)

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INTRODUCTION

- The hepatitis B virus (HBV) remains a significant public health burden with an estimated 2.2 million chronically-infected people in the U.S. alone.
- Public health initiatives name immunization as the most effective strategy for prevention of HBV infections, however, U.S. adult vaccination rates remain persistently low at only ~25% of all adults ≥ 19 years.
- Moreover, there is reduced immunogenicity with current standard-of-care, single antigen HBV vaccines in older individuals, those with immuno-compromising comorbidities, including obesity, diabetes, and those who smoke.
- Sci-B-Vac® is a 3-antigen HBV vaccine that contains all three HBV surface antigens (HBsAg) – S, pre-S1, and pre-S2 – is adjuvanted with alum, and manufactured in mammalian CHO cells.
- The pre-S1 antigen induces key neutralizing antibodies that block virus-receptor binding and T cell response to pre-S1, and pre-S2 antigens could further boost responses to the S antigens, resulting in a more immunogenic response[1,2].
- Two head-to-head phase 3 studies comparing Sci-B-Vac to the single-antigen vaccine, Engerix-B®, were recently completed in the U.S., Europe, and Canada, including the PROTECT study presented here.

OBJECTIVES

Co-primary objectives:

- Non-inferiority of seroprotection rates (SPRs) (≥ 10 mIU/mL) of Sci-B-Vac® vs. Engerix-B® in all participants age ≥ 18 years, 4 weeks after 3rd vaccination (at day 196)
- Superiority of SPR of Sci-B-Vac® vs. Engerix-B® in participants age ≥ 45 years, 4 weeks after 3rd vaccination (at day 196)

Secondary and Exploratory objectives:

- Kinetics of SPR, GMC of anti-HBs, analysis of SPR and GMC in subgroups of interest, safety information (12 month follow-up)

STUDY DESIGN

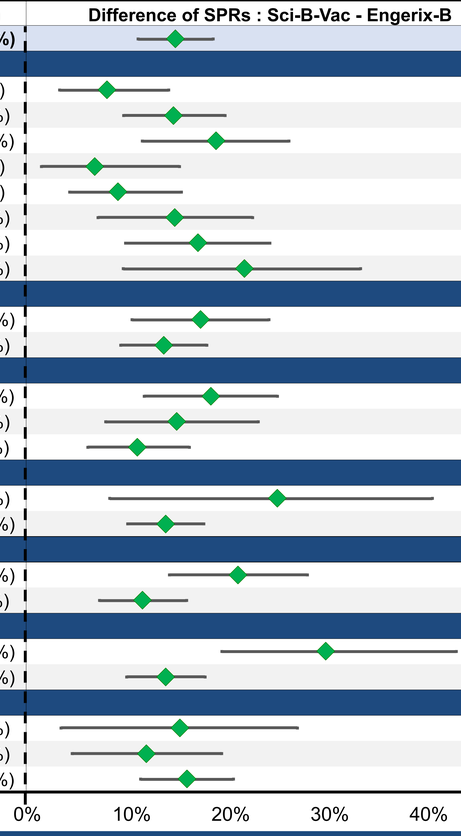
- Eligibility criteria : (i) ≥ age 18, (ii) any gender, (iii) healthy or controlled chronic condition (e.g. Type 2 Diabetes), (iv) negative serology (HBV, HCV, HIV), and (v) no severe renal impairment
- Age stratification : Age 18-44, 45-64, and 65+
- Vaccination dosages & schedule :
  - Sci-B-Vac® : 10µg, 1mL injection at 0, 4, 24 wks
  - Engerix-B® : 20µg, 1mL injection at 0, 4, 24 wks
- Safety follow-up : 12 months

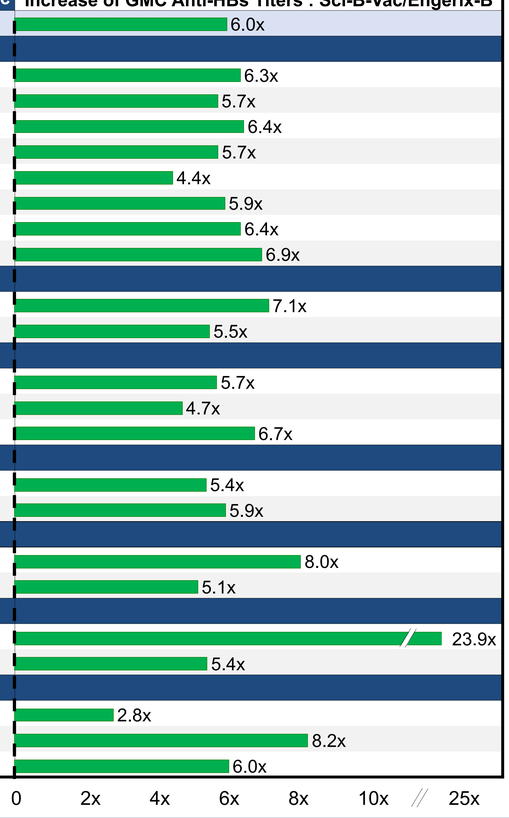
Clinical Trials Identifier: NCT03393754

RESULTS

Consistently high SPRs and anti-HBs titers for Sci-B-Vac® across all key subgroups compared to Engerix-B® at Day 196

Population	Engerix-B N	Sci-B-Vac N	Seroprotection Rates (SPR) : % of Subjects with Anti-HBs Titers ≥ 10 mIU/mL			Geometric Mean Concentration (GMC) of Anti-HBs Titers		
			Engerix-B	Sci-B-Vac	Difference (95% CI)	Engerix-B	Sci-B-Vac	Increase of GMC Anti-HBs Titers : Sci-B-Vac/Engerix-B
All Subjects	**723**	**718**	**76.5%**	**91.4%**	**14.9% (11.2% to 18.6%)**	**192.6**	**1148.2**	6.0x
Age								
18-44 years	135	125	91.1%	99.2%	8.1% (3.4% to 14.2%)	720.6	4570.4	6.3x
45-64 years	322	325	80.1%	94.8%	14.7% (9.8% to 19.8%)	276.5	1577.3	5.7x
≥ 65 years	266	268	64.7%	83.6%	18.9% (11.6% to 26.1%)	63.7	410.2	6.4x
18-39 years	72	71	93.1%	100.0%	6.9% (1.6% to 15.3%)	903.3	5164.2	5.7x
40-49 years	143	158	89.5%	98.7%	9.2% (4.4% to 15.5%)	645.7	2869.6	4.4x
50-59 years	164	153	78.1%	92.8%	14.8% (7.2% to 22.5%)	211.6	1250.0	5.9x
60-69 years	229	221	72.1%	89.1%	17.1% (9.9% to 24.3%)	122.9	780.5	6.4x
≥70 years	115	115	56.5%	78.3%	21.7% (9.7% to 33.2%)	34.8	241.8	6.9x
Gender								
Men	269	282	69.5%	86.9%	17.4% (10.6% to 24.2%)	106.6	761.0	7.1x
Women	454	436	80.6%	94.3%	13.7% (9.5% to 18.0%)	273.5	1498.2	5.5x
Region								
US	304	297	67.4%	85.9%	18.4% (11.8% to 25.0%)	95.7	544.0	5.7x
Canada	120	119	82.5%	97.5%	15.0% (8.0% to 23.1%)	468.1	2204.5	4.7x
Europe	299	302	83.3%	94.4%	11.1% (6.2% to 16.3%)	274.5	1851.2	6.7x
Diabetes								
Yes	60	54	58.3%	83.3%	25.0% (8.4% to 40.4%)	41.3	222.3	5.4x
No	663	664	78.1%	92.0%	13.9% (10.2% to 17.7%)	221.4	1312.2	5.9x
BMI								
> 30 kg/m2	254	269	68.1%	89.2%	21.1% (14.3% to 28.0%)	110.0	884.0	8.0x
≤ 30 kg/m2	469	449	81.0%	92.7%	11.6% (7.4% to 16.0%)	260.9	1343.0	5.1x
Daily Alcohol Consumption								
2-3 Drinks	57	51	70.2%	100.0%	29.8% (19.5% to 42.7%)	110.6	2643.8	23.9x
0-1 Drinks	662	663	77.0%	91.0%	13.9% (10.1% to 17.8%)	202.0	1093.4	5.4x
Smoking Status								
Current Smoker	95	92	70.5%	85.9%	15.3% (3.5% to 27.0%)	161.9	449.4	2.8x
Past Smoker	198	187	77.3%	89.3%	12.0% (4.7% to 19.5%)	141.1	1162.9	8.2x
Non-smoker	430	439	77.4%	93.4%	16.0% (11.4% to 20.6%)	231.0	1390.1	6.0x





CONCLUSIONS

- SPR and anti-HBs titers were consistently higher for Sci-B-Vac® compared to Engerix-B® across key subgroups, including those known to have a reduced immune response to single-antigen HBV vaccination.
- Sci-B-Vac® induced 4-8x higher antibody GMC compared to Engerix-B®, regardless of age, BMI, or diabetic status.
- Higher rates of injection site pain, tenderness, and myalgia per injection were noted with Sci-B-Vac® compared to Engerix-B®; however, AEs were mostly mild or moderate in intensity. No safety signals were observed, and safety and tolerability were consistent with the known profile of Sci-B-Vac®.

REFERENCES

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DISCLOSURE

Dr. Langley was the Principal Investigator of this study and her institution received financial support for the services performed for conducting the study at her study center(s)

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