Clinical trial results:
A phase III open-label randomised study, to evaluate the immunogenicity and safety of the concomitant administration of V419 (PR5I) given at 2, 3 and 4 months of age with two types of meningococcal serogroup C conjugate (MCC) vaccines given at 3 and 4 months of age, and followed by the administration at 12 months of age of a combined Haemophilus influenzae type b-MCC vaccine.

Summary

EudraCT number	2011-002413-11
Trial protocol	GB
Global end of trial date	27 September 2013

Results information

Result version number	v2 (current)
This version publication date	16 November 2019
First version publication date	02 August 2015
Version creation reason	

Trial information

Trial identification

Sponsor protocol code	V419-011

Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	NCT01553279
WHO universal trial number (UTN)	-
Other trial identifiers	PRI01C: Sanofi Protocol Pasteur MSD Protocol Number

Notes:

Sponsors

Sponsor organisation name	Merck Sharp & Dohme Corp.
Sponsor organisation address	2000 Galloping Hill Road, Kenilworth, NJ, United States, 07033
Public contact	Senior Vice President, Global Clinical Development, Merck Sharp & Dohme Corp., ClinicalTrialsDisclosure@merck.com
Scientific contact	Senior Vice President, Global Clinical Development, Merck Sharp & Dohme Corp., ClinicalTrialsDisclosure@merck.com

Notes:

Paediatric regulatory details

Is trial part of an agreed paediatric investigation plan (PIP)	No
Does article 45 of REGULATION (EC) No 1901/2006 apply to this trial?	No
Does article 46 of REGULATION (EC) No 1901/2006 apply to this trial?	Yes

Notes:

Results analysis stage

Analysis stage	Final
Date of interim/final analysis	27 September 2013
Is this the analysis of the primary completion data?	Yes
Primary completion date	27 September 2013
Global end of trial reached?	Yes
Global end of trial date	27 September 2013
Was the trial ended prematurely?	No

Notes:

General information about the trial

Main objective of the trial:

The primary objectives of this study are to evaluate the immunogenicity and safety of concomitant administration of V419 (PR51) with 2 types of meningococcal serogroup C conjugate (MCC) vaccines to healthy infants at 3 and 4 months of age in terms of antibody seroprotection rate (SPR) to MCC. Participants also received a Haemophilus influenza type B (Hib)-MCC vaccination at 12 months of age. It was hypothesized that the SPR to MCC at 1 month post-dose 2 of either tetanus toxoid conjugated Meningo C (MCC-TT) or CRM197 conjugated Meningo C (MCC-CRM) vaccines would be acceptable when administered concomitantly with V419.

Protection of trial subjects:

This study was conducted in conformance with Good Clinical Practice standards and applicable country and/or local statutes and regulations regarding ethical committee review, informed consent, and the protection of human subjects participating in biomedical research.

Background therapy: -

Evidence for comparator: -

Actual start date of recruitment	30 March 2012
Long term follow-up planned	No
Independent data monitoring committee (IDMC) involvement?	No

Notes:

Population of trial subjects

Subjects enrolled per country

Country: Number of subjects enrolled	United Kingdom: 284
Worldwide total number of subjects	284
EEA total number of subjects	284

Notes:

Subjects enrolled per age group

In utero	0
Preterm newborn - gestational age < 37 wk	0
Newborns (0-27 days)	0
Infants and toddlers (28 days-23 months)	284

Children (2-11 years)	0
Adolescents (12-17 years)	0
Adults (18-64 years)	0
From 65 to 84 years	0
85 years and over	0

Subject disposition

Recruitment

Recruitment details: -

Pre-assignment

Screening details:

Infant participants were enrolled at 11 study sites in the United Kingdom.

Period 1

Period 1 title	Part 1: Infant Vaccinations
Is this the baseline period?	Yes
Allocation method	Randomised - controlled
Blinding used	Not blinded

Arms

Are arms mutually exclusive?	Yes
Arm title	V419 and MCC-TT

Arm description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-TT (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 3 doses of Prevnar 13® (at 2, 4, and 12 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Arm type	Experimental
Investigational medicinal product name	V419
Investigational medicinal product code	
Other name	PR51; VAXELIS®
Pharmaceutical forms	Suspension for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Diphtheria and Tetanus toxoids and acellular Pertussis adsorbed, inactivated Poliovirus, Haemophilus b conjugate [meningococcal outer membrane protein complex], and Hepatitis B [recombinant] vaccine administered via 0.5 mL intramuscular injection.

Investigational medicinal product name	PREVNAR 13®
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Suspension for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Pneumococcal conjugate vaccine (13-valent, adsorbed) administered via 0.5 mL intramuscular injection (routine vaccination).

Investigational medicinal product name	MCC-TT
Investigational medicinal product code	
Other name	NEISVAC-C®
Pharmaceutical forms	Suspension for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Meningococcal Group C polysaccharide conjugate vaccine to tetanus toxoid adsorbed 0.5 mL intramuscular injection at 3 and 4 months of age.

Investigational medicinal product name	Hib-MCC
Investigational medicinal product code	
Other name	MENITORIX®
Pharmaceutical forms	Solution for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Haemophilus type b and meningococcal Group C conjugate vaccine administered via 0.5 mL intramuscular injection.

Arm title	V419 and MCC-CRM

Arm description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-CRM (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 3 doses of Prevnar 13® (at 2, 4, and 12 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Arm type	Experimental
Investigational medicinal product name	V419
Investigational medicinal product code	
Other name	PR51; VAXELIS®
Pharmaceutical forms	Suspension for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Diphtheria and Tetanus toxoids and acellular Pertussis adsorbed, inactivated Poliovirus, Haemophilus b conjugate [meningococcal outer membrane protein complex], and Hepatitis B [recombinant] vaccine administered via 0.5 mL intramuscular injection.

Investigational medicinal product name	MCC-CRM
Investigational medicinal product code	
Other name	MENJUGATE®
Pharmaceutical forms	Suspension for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Meningococcal Group C conjugate vaccine to CRM-197 adsorbed 0.5 mL intramuscular injection at 3 and 4 months of age.

Investigational medicinal product name	Hib-MCC
Investigational medicinal product code	
Other name	MENITORIX®
Pharmaceutical forms	Solution for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Haemophilus type b and meningococcal Group C conjugate vaccine administered via 0.5 mL intramuscular injection.

Investigational medicinal product name	PREVNAR 13®
Investigational medicinal product code	
Other name	
Pharmaceutical forms	Suspension for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Pneumococcal conjugate vaccine (13-valent, adsorbed) administered via 0.5 mL intramuscular injection (routine vaccination).

Number of subjects in period 1	V419 and MCC-TT	V419 and MCC-CRM
Started	142	142
Completed	140	141
Not completed	2	1
Consent withdrawn by subject	1	1
Lost to follow-up	1	-

Period 2	
Period 2 title	Interim Period
Is this the baseline period?	No
Allocation method	Not applicable
Blinding used	Not blinded

Blinding implementation details:

No study drug was administered during the Interim Period.

Arms

Are arms mutually exclusive?	Yes
Arm title	V419 and MCC-TT

Arm description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-TT (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 2 doses of Prevnar 13® (at 2 and 4 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Arm type	No intervention

No investigational medicinal product assigned in this arm

Arm title	V419 and MCC-CRM

Arm description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-CRM (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 2 doses of Prevnar 13® (at 2 and 4 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Arm type	No intervention

No investigational medicinal product assigned in this arm

Number of subjects in period 2	V419 and MCC-TT	V419 and MCC-CRM
Started	140	141
Completed	137	139
Not completed	3	2
Consent withdrawn by subject	2	2
Lost to follow-up	1	-

Period 3

Period 3 title	Period 2: Toddler Vaccinations
Is this the baseline period?	No
Allocation method	Randomised - controlled
Blinding used	Not blinded

Arms

Are arms mutually exclusive?	Yes
Arm title	V419 and MCC-TT

Arm description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-TT (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 2 doses of Prevnar 13® (at 2 and 4 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Arm type	Experimental
Investigational medicinal product name	Hib-MCC
Investigational medicinal product code	
Other name	MENITORIX®
Pharmaceutical forms	Solution for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Haemophilus type b and meningococcal Group C conjugate vaccine administered via 0.5 mL intramuscular injection.

Investigational medicinal product name	MMR Vaccine
Investigational medicinal product code	
Other name	M-M-RVAXPRO®
Pharmaceutical forms	Suspension for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Measles, mumps, and rubella vaccine (live) given via 0.5 mL intramuscular injection (routine vaccination).

Arm title	V419 and MCC-CRM

Arm description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-CRM (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 2 doses of Prevnar 13® (at 2 and 4 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Arm type	Experimental
Investigational medicinal product name	MMR Vaccine
Investigational medicinal product code	
Other name	M-M-RVAXPRO®
Pharmaceutical forms	Suspension for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Measles, mumps, and rubella vaccine (live) given via 0.5 mL intramuscular injection (routine vaccination).

Investigational medicinal product name	Hib-MCC
Investigational medicinal product code	
Other name	MENITORIX®
Pharmaceutical forms	Solution for injection

Routes of administration	Intramuscular use

Dosage and administration details:

Haemophilus type b and meningococcal Group C conjugate vaccine administered via 0.5 mL intramuscular injection.

Number of subjects in period 3	V419 and MCC-TT	V419 and MCC-CRM
Started	137	139
Completed	134	132
Not completed	3	7
Consent withdrawn by subject	-	5
Lost to follow-up	3	2

Baseline characteristics

Reporting groups	
Reporting group title	V419 and MCC-TT
Reporting group description:	
In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-TT (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 3 doses of Prevnar 13® (at 2, 4, and 12 months of age) and 1 dose of an MMR vaccine (at 12 months of age).	
Reporting group title	V419 and MCC-CRM
Reporting group description:	
In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-CRM (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 3 doses of Prevnar 13® (at 2, 4, and 12 months of age) and 1 dose of an MMR vaccine (at 12 months of age).	

Reporting group values	V419 and MCC-TT	V419 and MCC-CRM	Total
Number of subjects	142	142	284
Age categorical Units: Subjects			
Infants and toddlers (28 days-23 months)	142	142	284
Age Continuous Units: Days			
arithmetic mean	62.6	61.6	
standard deviation	± 6.7	± 7.2	-
Sex: Female, Male Units: Subjects			
Female	62	67	129
Male	80	75	155

End points

End points reporting groups

Reporting group title	V419 and MCC-TT

Reporting group description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-TT (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 3 doses of Prevnar 13® (at 2, 4, and 12 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Reporting group title	V419 and MCC-CRM

Reporting group description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-CRM (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 3 doses of Prevnar 13® (at 2, 4, and 12 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Reporting group title	V419 and MCC-TT

Reporting group description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-TT (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 2 doses of Prevnar 13® (at 2 and 4 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Reporting group title	V419 and MCC-CRM

Reporting group description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-CRM (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 2 doses of Prevnar 13® (at 2 and 4 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Reporting group title	V419 and MCC-TT

Reporting group description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-TT (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 2 doses of Prevnar 13® (at 2 and 4 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Reporting group title	V419 and MCC-CRM

Reporting group description:

In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-CRM (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 2 doses of Prevnar 13® (at 2 and 4 months of age) and 1 dose of an MMR vaccine (at 12 months of age).

Subject analysis set title	V419 + MCC-TT/MCC-CRM
Subject analysis set type	Per protocol

Subject analysis set description:

Pooled population of participants who received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of either MCC-TT or MCC-CRM (at 3 and 4 months of age) in Part 1.

Primary: Percentage of Participants with Anti-Meningococcal Serogroup C (anti-MCC) Antibody (Ab) Titre ≥1:8 dil One Month After MCC-TT or MCC-CRM (Part 1)

End point title	Percentage of Participants with Anti-Meningococcal Serogroup C (anti-MCC) Antibody (Ab) Titre ≥1:8 dil One Month After MCC-TT or MCC-CRM (Part 1)[1]

End point description:

The acceptability (i.e., percentage of participants with anti-MCC Ab titre ≥1:8 dil) of the seroprotection rate (SPR) to MCC was determined 1 month after MCC-TT or MCC-CRM Dose 2. The SPR was considered acceptable if the lower bound of the 2-sided 95% CI was >90%. Serum Ab levels were assayed using the Meningo C rabbit complement serum bactericidal Ab (rSBA) assay. All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Primary

End point timeframe:

Month 5 (1 month after MCC-TT/MCC-CRM Dose 2)

Notes:

[1] - No statistical analyses have been specified for this primary end point. It is expected there is at least one statistical analysis for each primary end point.
Justification: Per protocol, only descriptive statistics are presented.

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	121	109		
Units: Percentage of Participants				
number (confidence interval 95%)	100.0 (97.0 to 100.0)	99.1 (95.0 to 100.0)		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants with Anti-Polyribosylribitol Phosphate (anti-PRP) Antibody (Ab) Titre ≥0.15 µg/mL One Month After V419 Dose 3 (Part 1)

End point title	Percentage of Participants with Anti-Polyribosylribitol Phosphate (anti-PRP) Antibody (Ab) Titre ≥0.15 µg/mL One Month After V419 Dose 3 (Part 1)

End point description:

The acceptability (i.e., percentage of participants with anti-PRP Ab titre ≥0.15 µg/mL) of the seroprotection rate (SPR) to Haemophilus influenza type b (Hib) was determined 1 month after the third dose of V419 in participants also treated with MCC-TT or MCC-CRM. The pooled (i.e., all V419-treated participants) SPR was considered acceptable if the lower bound of the 2-sided 95% CI was >80%. Serum Ab levels were determined with radioimmunoassay (RIA). All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 5 (1 month after V419 Dose 3)

End point values	V419 + MCC-TT/MCC-CRM			
Subject group type	Subject analysis set			
Number of subjects analysed	175			
Units: Percentage of Participants				
number (confidence interval 95%)	98.9 (95.9 to 99.9)			

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants with Anti-Meningococcal Serogroup C (anti-

MCC) Antibody (Ab) Titre ≥1:8 dil and ≥1:128 dil One Month After MCC-TT or MCC-CRM Doses 1 and 2 (Part 1)

End point title	Percentage of Participants with Anti-Meningococcal Serogroup C (anti-MCC) Antibody (Ab) Titre ≥1:8 dil and ≥1:128 dil One Month After MCC-TT or MCC-CRM Doses 1 and 2 (Part 1)

End point description:

The percentage of participants with anti-MCC Ab titres ≥1:8 dil and ≥1:128 dil 1 month after MCC-TT or MCC-CRM Doses 1 and 2 was determined in participants also treated with V419. Serum Ab levels were assayed using the Meningo C rabbit complement serum bactericidal Ab (rSBA) assay. All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 4 and Month 5 (1 month after MCC-TT/MCC-CRM Doses 1 and 2)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	121	109		
Units: Percentage of Participants				
number (confidence interval 95%)				
Post-MCC Dose 1: % with ≥1:8 dil (n=102, 84)	100.0 (96.4 to 100.0)	96.4 (89.9 to 99.3)		
Post-MCC Dose 1: % with ≥1:128 dil (n=102, 84)	98.0 (93.1 to 99.8)	84.5 (75.0 to 91.5)		
Post-MCC Dose 2: % with ≥1:8 dil (n=121, 109)	100.0 (97.0 to 100.0)	99.1 (95.0 to 100.0)		
Post-MCC Dose 2: % with ≥1:128 dil (n=121, 109)	99.2 (95.5 to 100.0)	99.1 (95.0 to 100.0)		

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Titres (GMTs) for Meningococcal Serogroup C (MCC) One Month After MCC-TT or MCC-CRM Doses 1 and 2 (Part 1)

End point title	Geometric Mean Titres (GMTs) for Meningococcal Serogroup C (MCC) One Month After MCC-TT or MCC-CRM Doses 1 and 2 (Part 1)

End point description:

Anti-MCC antibody GMTs were determined 1 month after MCC-TT or MCC-CRM Doses 1 and 2 in participants also treated with V419. Serum antibody levels were assayed using the Meningo C rabbit complement serum bactericidal antibody (rSBA) assay. All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 4 and Month 5 (1 month after MCC-TT/MCC-CRM Doses 1 and 2)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	121	109		
Units: Titres				
geometric mean (confidence interval 95%)				
Post-MCC Dose 1 anti-MCC GMTs (n=125, 111)	1353 (1058.4 to 1729.6)	285.0 (201.5 to 403.1)		
Post-MCC Dose 2 anti-MCC GMTs (n=125, 111)	2024.7 (1689.8 to 2425.9)	1077.4 (847.5 to 1369.8)		

Statistical analyses

No statistical analyses for this end point

Secondary: Antibody (Ab) Response Rates for V419 Antigens One Month After V419 Dose 3 (Part 1)

End point title	Antibody (Ab) Response Rates for V419 Antigens One Month After V419 Dose 3 (Part 1)

End point description:

The percentage of participants meeting Ab response rates for V419 antigens was determined after Dose 3. Response rate criteria for Haemophilus influenza Type B (PRP); hepatitis B (HBsAg); diphtheria; tetanus; and polio types 1, 2, and 3 are shown below. The percentage of responders to pertussis (pertussis toxoid [PT]; filamentous haemagglutinin (FHA); fimbrae types 2 and 3 [FIM]; and pertactin [PRN]) was determined as 1) if pre-vaccination Ab concentration <lower limit of quantification (LLoQ) but post-vaccination Ab concentration ≥LLoQ; or 2) if pre-vaccination Ab concentration was ≥LLoQ but post-vaccination Ab concentration was ≥pre-immunization levels. Antibody titres were measured by RIA for PRP, enhanced chemiluminescence assay (ECi) for HBsAg, micrometabolic inhibition test (MIT) for diphtheria and poliovirus, and enzyme-linked immunosorbent assay (ELISA) for tetanus, PT, FHA, FIM, and PRN. Randomized, treated participants with data and no protocol violations are included.

End point type	Secondary

End point timeframe:

Month 5 (1 month after V419 Dose 3)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	125	105		
Units: Percentage of Participants				
number (confidence interval 95%)				
Anti-PRP ≥0.15 µg/mL (n=93, 82)	97.8 (92.4 to 99.7)	100.0 (95.6 to 100.0)		
Anti-HBsAG ≥10 mIU/mL (n=93, 82)	96.8 (90.9 to 99.3)	96.3 (89.7 to 99.2)		
Anti-Diptheria ≥0.01 IU/mL (n=125, 104)	100.0 (97.1 to 100.0)	100.0 (96.5 to 100.0)		
Anti-Diptheria ≥0.1 IU/mL (n=125, 104)	68.0 (59.1 to 76.1)	74.0 (64.5 to 82.1)		
Anti-Tetanus ≥0.01 IU/mL (n=122, 105)	100.0 (97.0 to 100.0)	100.0 (96.5 to 100.0)		

Anti-Tetanus ≥0.1 IU/mL (n=122, 105)	100.0 (97.0 to 100.0)	100.0 (96.5 to 100.0)		
Anti-PT seroresponse (n=100, 75)	99.0 (94.6 to 100.0)	100.0 (95.2 to 100.0)		
Anti-FHA seroresponse (n=100, 74)	91.0 (83.6 to 95.8)	90.5 (81.5 to 96.1)		
Anti-PRN seroresponse (n=100, 73)	95.0 (88.7 to 98.4)	90.4 (81.2 to 96.1)		
Anti-FIM seroresponse (n=100, 75)	96.0 (90.1 to 98.9)	96.0 (88.8 to 99.2)		
Anti-Polio 1 ≥ 1:8 dil (n=114, 95)	100.0 (96.8 to 100.0)	100.0 (96.2 to 100.0)		
Anti-Polio 2 ≥ 1:8 dil (n=106, 89)	100.0 (96.6 to 100.0)	100.0 (95.9 to 100.0)		
Anti-Polio 3 ≥ 1:8 dil (n=90, 74)	100.0 (96.0 to 100.0)	100.0 (95.1 to 100.0)		

Statistical analyses

No statistical analyses for this end point

Secondary: Antibody (Ab) Geometic Mean Titres (GMTs) for Haemophilus influenza Type B (Polyribosylribitol Phosphate [PRP]) One Month After V419 Dose 3 (Part 1)

End point title	Antibody (Ab) Geometic Mean Titres (GMTs) for Haemophilus influenza Type B (Polyribosylribitol Phosphate [PRP]) One Month After V419 Dose 3 (Part 1)

End point description:

The GMTs for PRP Ab titres were determined for each arm. Antibody titres for PRP were measured by radioimmunoassay (RIA). All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 5 (1 month after V419 Dose 3)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	93	82		
Units: µg/mL				
geometric mean (confidence interval 95%)	6.44 (4.7 to 8.83)	8.21 (6.08 to 11.09)		

Statistical analyses

No statistical analyses for this end point

Secondary: Antibody (Ab) Geometic Mean Titres (GMTs) for Hepatitis B Surface Antigen (HBsAg) One Month After V419 Dose 3 (Part 1)

End point title	Antibody (Ab) Geometic Mean Titres (GMTs) for Hepatitis B

	Surface Antigen (HBsAg) One Month After V419 Dose 3 (Part 1)

End point description:

The GMTs for HBsAg Ab titres were determined for each arm. Antibody titres for HBsAg were measured by enhanced chemiluminescence (ECi) assay. All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 5 (1 month after V419 Dose 3)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	93	82		
Units: mIU/mL				
geometric mean (confidence interval 95%)	195.1 (150.7 to 252.7)	247.7 (186.3 to 329.3)		

Statistical analyses

No statistical analyses for this end point

Secondary: Antibody (Ab) Geometic Mean Titres (GMTs) for Diptheria One Month After V419 Dose 3 (Part 1)

End point title	Antibody (Ab) Geometic Mean Titres (GMTs) for Diptheria One Month After V419 Dose 3 (Part 1)

End point description:

The GMTs for diphtheria Ab titres were determined for each arm. Antibody titres for diptheria were measured by enhanced micrometabolic inhibition test (MIT). All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 5 (1 month after V419 Dose 3)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	125	104		
Units: IU/mL				
geometric mean (confidence interval 95%)	0.198 (0.165 to 0.237)	0.22 (0.181 to 0.268)		

Statistical analyses

No statistical analyses for this end point

Secondary: Antibody (Ab) Geometic Mean Titres (GMTs) for Tetanus One Month After V419 Dose 3 (Part 1)

End point title	Antibody (Ab) Geometic Mean Titres (GMTs) for Tetanus One Month After V419 Dose 3 (Part 1)

End point description:

The GMTs for tetanus Ab titres were determined for each arm. Antibody titres for tetanus were determined with enzyme-linked immunosorbent assay (ELISA). All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 5 (1 month after V419 Dose 3)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	122	105		
Units: IU/mL				
geometric mean (confidence interval 95%)	1.03 (0.9 to 1.17)	0.95 (0.82 to 1.1)		

Statistical analyses

No statistical analyses for this end point

Secondary: Antibody (Ab) Geometic Mean Titres (GMTs) for Pertussis Toxoid (PT) One Month After V419 Dose 3 (Part 1)

End point title	Antibody (Ab) Geometic Mean Titres (GMTs) for Pertussis Toxoid (PT) One Month After V419 Dose 3 (Part 1)

End point description:

The GMTs for PT Ab titres were determined for each arm. Antibody titres for PT were measured with enzyme-linked immunosorbent assay (ELISA). All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 5 (1 month after V419 Dose 3)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	112	89		
Units: EU/mL				
geometric mean (confidence interval 95%)	131.5 (117.2 to 147.6)	133.3 (118.3 to 150.2)		

Statistical analyses

No statistical analyses for this end point

Secondary: Antibody (Ab) Geometic Mean Titres (GMTs) for Filamentous Haemagglutinin (FHA) One Month After V419 Dose 3 (Part 1)

End point title	Antibody (Ab) Geometic Mean Titres (GMTs) for Filamentous Haemagglutinin (FHA) One Month After V419 Dose 3 (Part 1)

End point description:

The GMTs for FHA were determined for each arm. Antibody titres for FHA were measured by enhanced chemiluminescence (ECi) assay. All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 5 (1 month after V419 Dose 3)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	112	88		
Units: EU/mL				
geometric mean (confidence interval 95%)	50.4 (44.8 to 56.6)	50.1 (43.7 to 57.4)		

Statistical analyses

No statistical analyses for this end point

Secondary: Antibody (Ab) Geometic Mean Titres (GMTs) for Pertactin (PRN) One Month After V419 Dose 3 (Part 1)

End point title	Antibody (Ab) Geometic Mean Titres (GMTs) for Pertactin (PRN) One Month After V419 Dose 3 (Part 1)

End point description:

The GMTs for PRN were determined for each arm. Antibody titres for PRN were measured by enhanced chemiluminescence (ECi) assay. All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 5 (1 month after V419 Dose 3)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	112	87		
Units: EU/mL				
geometric mean (confidence interval 95%)	90.4 (73.2 to 111.7)	106.8 (83.7 to 136.3)		

Statistical analyses

No statistical analyses for this end point

Secondary: Antibody (Ab) Geometic Mean Titres (GMTs) for Fimbrae Types 2 and 3 (FIM) One Month After V419 Dose 3 (Part 1)

End point title	Antibody (Ab) Geometic Mean Titres (GMTs) for Fimbrae Types 2 and 3 (FIM) One Month After V419 Dose 3 (Part 1)

End point description:

The GMTs for FIM were determined for each arm. Antibody titres for FIM were measured by enhanced chemiluminescence (ECi) assay. All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 5 (1 month after V419 Dose 3)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	112	89		
Units: EU/mL				
geometric mean (confidence interval 95%)	401.7 (339.4 to 475.5)	441.7 (363.2 to 537.2)		

Statistical analyses

No statistical analyses for this end point

Secondary: Antibody (Ab) Geometic Mean Titres (GMTs) for Polio Types 1, 2, and 3 One Month After V419 Dose 3 (Part 1)

End point title	Antibody (Ab) Geometic Mean Titres (GMTs) for Polio Types 1, 2, and 3 One Month After V419 Dose 3 (Part 1)

End point description:

The GMTs for polio types 1, 2, and 3 were determined for each arm. Antibody titres for polio types 1, 2, and 3 were measured by micrometabolic inhibition test (MIT). All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 5 (1 month after V419 Dose 3)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	114	95		
Units: titre (1/dil)				
geometric mean (confidence interval 95%)				
Anti-Polio 1 GMT (n=114,95)	214 (164.9 to 277.7)	257.9 (193.8 to 343.1)		
Anti-Polio 2 GMT (n=106, 89)	385.2 (288.2 to 514.9)	400.6 (290.6 to 552.3)		
Anti-Polio 3 GMT (n=90, 74)	502.2 (370.2 to 681.4)	405.1 (284.9 to 576)		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants with Anti-Meningococcal Serogroup C (anti-MCC) Antibody (Ab) Titre ≥1:8 (1/dil) and Titre ≥1:28 (1/dil) One Month After Anti-Haemophilus Influenzae Type B (Anti-Hib) Vaccination (Part 2)

End point title	Percentage of Participants with Anti-Meningococcal Serogroup C (anti-MCC) Antibody (Ab) Titre ≥1:8 (1/dil) and Titre ≥1:28 (1/dil) One Month After Anti-Haemophilus Influenzae Type B (Anti-Hib) Vaccination (Part 2)

End point description:

The percentage of participants with anti-MCC Ab titres ≥1:8 (1/dil) and ≥1:28 (1/dil) were determined prior to, and 1 month after, administration of the single HiB-MCC vaccine at 12 months of age. Serum Ab levels were assayed using the Meningo C rabbit complement serum bactericidal Ab (rSBA) assay. All randomized and treated participants with data available, who had no protocol violations that could interfere with results, and received all Part 1 vaccinations are included.

End point type	Secondary

End point timeframe:

Month 12 and Month 13 (Prior to anti-Hib MCC and 1 month after anti-HiB MCC)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	111	111		
Units: Percentage of Participants				
number (confidence interval 95%)				
Pre-Hib anti-MCC % titre ≥1:8 (1/dil) [n=89, 94]	83.1 (73.7 to 90.2)	40.4 (30.4 to 51.0)		
Pre-Hib anti-MCC % titre ≥1:28 (1/dil) [n=89, 94]	40.4 (30.2 to 51.4)	16.0 (9.2 to 25.0)		
Post-Hib anti-MCC % titre ≥1:8 (1/dil)[n=109, 110]	100.0 (96.7 to 100.0)	97.3 (92.2 to 99.4)		

Post-Hib anti-MCC % titre ≥1:28 (1/dil)[n=109,110]	99.1 (95.0 to 100.0)	95.5 (89.7 to 98.5)		

Statistical analyses

No statistical analyses for this end point

Secondary: Antibody (Ab) Geometric Mean Titres (GMTs) for Meningococcal Serogroup C (MCC) One Month After Anti-Haemophilus Influenzae Type B (Anti-Hib) Meningococcal Serogroup C (MCC) Vaccination (Part 2)

End point title	Antibody (Ab) Geometric Mean Titres (GMTs) for Meningococcal Serogroup C (MCC) One Month After Anti-Haemophilus Influenzae Type B (Anti-Hib) Meningococcal Serogroup C (MCC) Vaccination (Part 2)

End point description:

Antibody GMTs were were determined prior to, and 1 month after, administration of the single HiB-MCC vaccine at 12 months of age. Serum Ab levels were assayed using the Meningo C rabbit complement serum bactericidal Ab (rSBA) assay. All randomized and treated participants with data available, who had no protocol violations that could interfere with results, and received all Part 1 vaccinations are included.

End point type	Secondary

End point timeframe:

Month 12 and Month 13 (Prior to anti-Hib MCC and 1 month after anti-HiB MCC)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	111	111		
Units: tire (1/dil)				
geometric mean (confidence interval 95%)				
Pre-Hib anti-MCC GMT (n=89, 94)	50.3 (34.4 to 73.4)	8.7 (5.9 to 12.9)		
Post-Hib anti-MCC GMT (n=109, 110)	3257.9 (2597.4 to 4086.3)	580.8 (432.7 to 779.5)		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants with Anti-Polyribosylribitol Phosphate (PRP) Antibody (Ab) Titres ≥0.15 µg/mL and ≥1.0 µg/mL One Month After Anti-Haemophilus Influenzae Type B MCC Vaccination (Part 2)

End point title	Percentage of Participants with Anti-Polyribosylribitol Phosphate (PRP) Antibody (Ab) Titres ≥0.15 µg/mL and ≥1.0 µg/mL One Month After Anti-Haemophilus Influenzae Type B MCC Vaccination (Part 2)

End point description:

The percentage of participants with anti-PRP Ab titres ≥0.15 µg/mL and ≥1.0 µg/mL was determined prior to, and 1 month after, administration of the anti-Hib vaccination at Month 12. Anti-PRP Ab titres were measured with radioimmunoassay (RIA). All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 12

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	111	111		
Units: Percentage of Participants				
number (confidence interval 95%)				
Pre-Hib-MCC anti-PRP ≥0.15 µg/mL (n=82, 87)	93.9 (86.3 to 98.0)	95.4 (88.6 to 98.7)		
Pre-Hib-MCC anti-PRP ≥1.0 µg/mL (n=82, 87)	54.9 (43.5 to 65.9)	56.3 (45.3 to 66.9)		
Post-Hib-MCC anti-PRP ≥0.15 µg/mL (n=110, 106)	100.0 (96.7 to 100.0)	100.0 (96.6 to 100.0)		
Post-Hib-MCC anti-PRP ≥1.0 µg/mL (n=110, 106)	99.1 (95.0 to 100.0)	100.0 (96.6 to 100.0)		

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric Mean Titres (GMTs) for Anti-Polyribosylribitol Phosphate (PRP) Antibody (Ab) One Month After Anti-Haemophilus Influenzae Type B (HiB) MCC Vaccination (Part 2)

End point title	Geometric Mean Titres (GMTs) for Anti-Polyribosylribitol Phosphate (PRP) Antibody (Ab) One Month After Anti-Haemophilus Influenzae Type B (HiB) MCC Vaccination (Part 2)

End point description:

Anti-PRP Ab GMTs were determined prior to, and 1 month after, administration of the anti-Hib vaccination at Month 12. Anti-PRP Ab titres were measured with radioimmunoassay (RIA) and are expressed as µg/mL. All randomized and treated participants with data available and who had no protocol violations that could interfere with results are included.

End point type	Secondary

End point timeframe:

Month 4 and Month 5 (1 month after MCC-TT/MCC-CRM Doses 1 and 2)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	111	111		
Units: µg/mL				
geometric mean (confidence interval 95%)				
Pre-Hib-MCC anti-PRP ≥0.15 µg/mL (n=82, 87)	1.09 (0.81 to 1.45)	1.18 (0.90 to 1.55)		
Post-Hib-MCC anti-PRP ≥1.0 µg/mL (n=110, 106)	100.19 (81.05 to 123.86)	121.00 (101.11 to 144.80)		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants Experiencing an Adverse Event (AE) [Part 1]

End point title	Percentage of Participants Experiencing an Adverse Event (AE) [Part 1]

End point description:

An AE is defined as any unfavorable and unintended change in the structure, function, or chemistry of the body temporally associated with the use of the investigational product, whether or not considered related to the use of the product. All randomized participants who received ≥1 dose of study medication in Part 1 are included.

End point type	Secondary

End point timeframe:

Up to 4.5 months (up to 15 days after the final Part 1 vaccination)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	142	142		
Units: Percentage of Participants				
number (confidence interval 95%)	98.6 (95.0 to 99.8)	97.2 (92.9 to 99.2)		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants Experiencing a Vaccine-Related Systemic Adverse Event (AE) [Part 1]

End point title	Percentage of Participants Experiencing a Vaccine-Related Systemic Adverse Event (AE) [Part 1]

End point description:

An AE is defined as any unfavorable and unintended change in the structure, function, or chemistry of the body temporally associated with the use of the investigational product, whether or not considered

related to the use of the product. All randomized participants who received ≥1 dose of study medication in Part 1 are included. As per protocol, all injection site AEs were considered vaccine-related.

End point type	Secondary

End point timeframe:

Up to 4.5 months (up to 15 days after the final Part 1 vaccination)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	142	142		
Units: Percentage of Participants				
number (confidence interval 95%)	98.6 (95.0 to 99.8)	96.5 (92.0 to 98.8)		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants Experiencing a Solicited Injection Site Reaction (ISR) at the V419 Injection Site (Part 1)

End point title	Percentage of Participants Experiencing a Solicited Injection Site Reaction (ISR) at the V419 Injection Site (Part 1)

End point description:

The percentage of participants with solicited ISRs was determined for each arm. Solicited ISRs consisted of injection site pain, erythema, and swelling. All randomized participants who received ≥1 dose of study medication in Part 1 are included.

End point type	Secondary

End point timeframe:

Up to 4.5 months (up to 15 days after the final Part 1 vaccination)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	142	142		
Units: Percentage of Participants				
number (confidence interval 95%)				
Erythema (n=142, 142)	71.1 (62.9 to 78.4)	64.8 (56.3 to 72.6)		
Pain (n=142, 142)	63.4 (54.9 to 71.3)	66.2 (57.8 to 73.9)		
Swelling (n=142, 142)	51.4 (42.9 to 59.9)	47.2 (38.8 to 55.7)		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants Experiencing an Unsolicited Injection Site Reaction (ISR) at the V419 Injection Site (Part 1)

End point title	Percentage of Participants Experiencing an Unsolicited Injection Site Reaction (ISR) at the V419 Injection Site (Part 1)

End point description:

The percentage of participants with unsolicited ISRs was determined for each arm. Unsolicited ISRs were any injection-site ISRs not considered solicited. All randomized participants who received ≥1 dose of study medication in Part 1 are included.

End point type	Secondary

End point timeframe:

Up to 4.5 months (up to 15 days after the final Part 1 vaccination)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	142	142		
Units: Percentage of Participants				
number (confidence interval 95%)	6.3 (2.9 to 11.7)	11.3 (6.6 to 17.7)		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants Experiencing a Solicited Injection Site Reaction (ISR) at the MCC-TT or MCC-CRM Injection Site (Part 1)

End point title	Percentage of Participants Experiencing a Solicited Injection Site Reaction (ISR) at the MCC-TT or MCC-CRM Injection Site (Part 1)

End point description:

The percentage of participants with solicited ISRs was determined for each arm. Solicited ISRs consisted of injection site pain, erythema, and swelling. All randomized participants who received ≥1 dose of study medication in Part 1 are included.

End point type	Secondary

End point timeframe:

Up to 4.5 months (up to 15 days after the final Part 1 vaccination)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	142	142		
Units: Percentage of Participants				
number (confidence interval 95%)				
Erythema (n=142, 142)	56.3 (47.8 to 64.6)	45.8 (37.4 to 54.3)		

Pain (n=142, 142)	41.5 (33.3 to 50.1)	45.8 (37.4 to 54.3)		
Swelling (n=142, 142)	35.9 (28.0 to 44.4)	28.2 (20.9 to 36.3)		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants Experiencing an Unsolicited Injection Site Reaction (ISR) at the MCC-TT or MCC-CRM Injection Site (Part 1)

End point title	Percentage of Participants Experiencing an Unsolicited Injection Site Reaction (ISR) at the MCC-TT or MCC-CRM Injection Site (Part 1)

End point description:

The percentage of participants with unsolicited ISRs was determined for each arm. Unsolicited ISRs consisted of bruising, dermatitis, erythema, induration, mass, pain, rash, and warmth. All randomized participants who received ≥1 dose of study medication in Part 1 are included.

End point type	Secondary

End point timeframe:

Up to 4.5 months (up to 15 days after the final Part 1 vaccination)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	142	142		
Units: Percentage of Participants				
number (not applicable)				
Bruising (n=142, 142)	1.4	4.2		
Dermatitis (n=142, 142)	0	0.7		
Erythema (n=142, 142)	0	0.7		
Induration (n=142, 142)	1.4	0.7		
Mass (n=142, 142)	3.5	2.1		
Pain (n=142, 142)	0	0.7		
Rash (n=142, 142)	1.4	0.7		
Warmth (n=142, 142)	0	2.1		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants Experiencing a Solicited Systemic Adverse Event (AE) [Part 1]

End point title	Percentage of Participants Experiencing a Solicited Systemic Adverse Event (AE) [Part 1]

End point description:

The percentage of participants with solicited systemic AEs was determined for each arm. Solicited

systemic AEs consisted of crying, decreased appetite, irritability, pyrexia, somnolence, and vomiting. All randomized participants who received ≥1 dose of study medication in Part 1 are included.

End point type	Secondary

End point timeframe:

Up to 4.5 months (up to 15 days after the final Part 1 vaccination)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	142	142		
Units: Percentage of Participants				
number (not applicable)				
Crying (n=142, 142)	85.9	81.0		
Decreased appetite (n=142, 142)	63.4	64.8		
Irritability (n=142, 142)	88.0	81.0		
Pyrexia (n=142, 142)	11.3	10.6		
Somnolence (n=142, 142)	81.7	78.9		
Vomiting (n=142, 142)	40.1	49.3		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants Experiencing Increased Temperature [Part 1]

End point title	Percentage of Participants Experiencing Increased Temperature [Part 1]

End point description:

The percentage of participants experiencing temperatures ≥38.0° Celsius (C), >38.5° C, and >39.5° C following any Part 1 vaccination was determined. All randomized participants who received ≥1 dose of study medication in Part 1 are included.

End point type	Secondary

End point timeframe:

Up to 4.5 months (up to 15 days after the final Part 1 vaccination)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	141	140		
Units: Percentage of Participants				
number (not applicable)				
% ≥38.0° C (n=141, 140)	11.3	10.6		
% >38.5° C (n=141, 140)	1.4	2.1		
% >39.5° C (n=141, 140)	0.0	0.0		

Statistical analyses

No statistical analyses for this end point

Secondary: Percentage of Participants Experiencing a Serious Adverse Event (SAE) [Part 1]

End point title	Percentage of Participants Experiencing a Serious Adverse Event (SAE) [Part 1]

End point description:

An SAE is an event that results in death; is life-threatening; results in or prolongs hospitalization; is a congenital anomaly/birth defect; is a cancer; is an overdose; or is another important medical event that may jeopardize the participant. All randomized participants who received ≥1 dose of study medication in Part 1 are included.

End point type	Secondary

End point timeframe:

Up to 4.5 months (up to 15 days after the final Part 1 vaccination)

End point values	V419 and MCC-TT	V419 and MCC-CRM		
Subject group type	Reporting group	Reporting group		
Number of subjects analysed	142	142		
Units: Percentage of Participants				
number (confidence interval 95%)	4.2 (1.6 to 9.0)	2.8 (0.8 to 7.1)		

Statistical analyses

No statistical analyses for this end point

Adverse events

Adverse events information	
Timeframe for reporting adverse events:	
Up to 12.5 months (up to 14 days after the final dose of study medication)	
Adverse event reporting additional description:	
All participants who received ≥1 dose of study medication are included.	
Assessment type	Systematic

Dictionary used	
Dictionary name	MedDRA
Dictionary version	16.1

Reporting groups	
Reporting group title	V419 and MCC-TT
Reporting group description:	
In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-TT (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 2 doses of Prevnar 13® (at 2 and 4 months of age) and 1 dose of an MMR vaccine (at 12 months of age).	
Reporting group title	V419 and MCC-CRM
Reporting group description:	
In Part 1, participants received 3 doses of V419 (at 2, 3, and 4 months of age) and 2 doses of MCC-CRM (at 3 and 4 months of age). In Part 2, participants received a single dose of Hib-MCC at 12 months of age. As routine vaccination, participants also received 2 doses of Prevnar 13® (at 2 and 4 months of age) and 1 dose of an MMR vaccine (at 12 months of age).	

Serious adverse events	V419 and MCC-TT	V419 and MCC-CRM	
Total subjects affected by serious adverse events			
subjects affected / exposed	6 / 142 (4.23%)	4 / 142 (2.82%)	
number of deaths (all causes)	0	0	
number of deaths resulting from adverse events			
General disorders and administration site conditions			
Crying			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	0 / 142 (0.00%)	1 / 142 (0.70%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Hypothermia			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	1 / 142 (0.70%)	0 / 142 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	

Gastrointestinal disorders			
Abdominal pain			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	0 / 142 (0.00%)	1 / 142 (0.70%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Respiratory, thoracic and mediastinal disorders			
Choking			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	0 / 142 (0.00%)	1 / 142 (0.70%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Infections and infestations			
Croup infectious			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	1 / 142 (0.70%)	0 / 142 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Gastroenteritis salmonella			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	0 / 142 (0.00%)	1 / 142 (0.70%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Gastroenteritis viral			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	0 / 142 (0.00%)	1 / 142 (0.70%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Respiratory syncytial virus bronchiolitis			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	1 / 142 (0.70%)	0 / 142 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	

Sepsis neonatal			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	1 / 142 (0.70%)	0 / 142 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Urinary tract infection			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	1 / 142 (0.70%)	0 / 142 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Metabolism and nutrition disorders			
Weight gain poor			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	1 / 142 (0.70%)	0 / 142 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	

Frequency threshold for reporting non-serious adverse events: 2 %

Non-serious adverse events	V419 and MCC-TT	V419 and MCC-CRM	
Total subjects affected by non-serious adverse events			
subjects affected / exposed	140 / 142 (98.59%)	137 / 142 (96.48%)	
Injury, poisoning and procedural complications			
Contusion			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	0 / 142 (0.00%)	3 / 142 (2.11%)	
occurrences (all)	0	3	
Nervous system disorders			
Somnolence			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	116 / 142 (81.69%)	112 / 142 (78.87%)	
occurrences (all)	227	231	
General disorders and administration site conditions			

Crying				
alternative dictionary used: MedDRA 16.1				
subjects affected / exposed	122 / 142 (85.92%)	115 / 142 (80.99%)		
occurrences (all)	273	262		
Injection site bruising				
alternative dictionary used: MedDRA 16.1				
subjects affected / exposed	4 / 142 (2.82%)	7 / 142 (4.93%)		
occurrences (all)	4	12		
Injection site erythema				
alternative dictionary used: MedDRA 16.1				
subjects affected / exposed	104 / 142 (73.24%)	96 / 142 (67.61%)		
occurrences (all)	342	305		
Injection site mass				
alternative dictionary used: MedDRA 16.1				
subjects affected / exposed	5 / 142 (3.52%)	3 / 142 (2.11%)		
occurrences (all)	5	4		
Injection site pain				
alternative dictionary used: MedDRA 16.1				
subjects affected / exposed	93 / 142 (65.49%)	100 / 142 (70.42%)		
occurrences (all)	258	267		
Injection site swelling				
alternative dictionary used: MedDRA 16.1				
subjects affected / exposed	78 / 142 (54.93%)	70 / 142 (49.30%)		
occurrences (all)	211	177		
Injection site warmth				
alternative dictionary used: MedDRA 16.1				
subjects affected / exposed	0 / 142 (0.00%)	3 / 142 (2.11%)		
occurrences (all)	0	4		
Irritability				
alternative dictionary used: MedDRA 16.1				
subjects affected / exposed	125 / 142 (88.03%)	115 / 142 (80.99%)		
occurrences (all)	301	286		
Pyrexia				
alternative dictionary used: MedDRA 16.1				

subjects affected / exposed	19 / 142 (13.38%)	18 / 142 (12.68%)	
occurrences (all)	22	23	
Gastrointestinal disorders			
Constipation			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	4 / 142 (2.82%)	3 / 142 (2.11%)	
occurrences (all)	4	5	
Diarrhoea			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	11 / 142 (7.75%)	8 / 142 (5.63%)	
occurrences (all)	15	11	
Teething			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	7 / 142 (4.93%)	1 / 142 (0.70%)	
occurrences (all)	8	1	
Vomiting			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	57 / 142 (40.14%)	71 / 142 (50.00%)	
occurrences (all)	93	112	
Respiratory, thoracic and mediastinal disorders			
Cough			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	12 / 142 (8.45%)	6 / 142 (4.23%)	
occurrences (all)	13	6	
Nasal congestion			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	4 / 142 (2.82%)	2 / 142 (1.41%)	
occurrences (all)	6	2	
Rhinorrhoea			
alternative dictionary used: MedDRA 16.1			
subjects affected / exposed	4 / 142 (2.82%)	4 / 142 (2.82%)	
occurrences (all)	4	4	
Skin and subcutaneous tissue disorders			

Rash alternative dictionary used: MedDRA 16.1 subjects affected / exposed occurrences (all)	 8 / 142 (5.63%) 8	 6 / 142 (4.23%) 7	
Psychiatric disorders Insomnia alternative dictionary used: MedDRA 16.1 subjects affected / exposed occurrences (all)	 4 / 142 (2.82%) 4	 1 / 142 (0.70%) 1	
Infections and infestations Nasopharyngitis alternative dictionary used: MedDRA 16.1 subjects affected / exposed occurrences (all) Rhinitis alternative dictionary used: MedDRA 16.1 subjects affected / exposed occurrences (all)	 11 / 142 (7.75%) 12 8 / 142 (5.63%) 8	 12 / 142 (8.45%) 14 6 / 142 (4.23%) 7	
Metabolism and nutrition disorders Decreased appetite alternative dictionary used: MedDRA 16.1 subjects affected / exposed occurrences (all)	 91 / 142 (64.08%) 164	 92 / 142 (64.79%) 167	

More information

Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? No

Interruptions (globally)

Were there any global interruptions to the trial? No

Limitations and caveats

None reported