ISRCTN52435761 https://doi.org/10.1186/ISRCTN52435761

Efficacy and safety study of SPX-001 for influenza in participating healthy adults

Submission date 30/06/2023	**Recruitment status** Not yet recruiting	[X] Prospectively registered [_] Protocol [_] Statistical analysis plan [_] Results [_] Individual participant data [X] Record updated in last year
Registration date 05/12/2023	**Overall study status** Ongoing	
Last Edited 31/10/2024	**Condition category** Infections and Infestations	

Plain English summary of protocol

Background and study aims
The study is designed to provide information about the antiviral effect, safety, and tolerability of SPX-001. Results from this proof-of-concept clinical study will be useful in developing a new therapy for viral respiratory tract infections, e.g., influenza.

Who can participate?
Healthy volunteers

What does the study involve?
Up to 50 participants will be enrolled on the study. Each participant will remain in the study for about 7 months from screening until their last follow-up visit.
The study is divided into 4 phases:
Screening phase: Screening will occur between Day -90 to Day-3/-2. Historical generic screening data collected through the hVIVO generic screening process may be transferred to this study after the study-specific consent form has been signed by the participant.
Vaccination phase: Participants will be invited to the clinic to be randomly allocated to receive a single jab in the arm of a dose of either: SPX-001 or placebo.
Participants will reside in the quarantine unit for approximately 11days (from Day-2/-1 to Day8).
Procedures will include:
Admission to quarantine unit on Day-2/-1.
Baseline assessment will be conducted as per the Schedule of Events (SoE) up to inoculation on Day0.
Influenza virus inoculation on Day0.
Randomisation.:
From Day1 (am) to Day 7 inclusive, participants will be given 3 daily doses of SPX-001 or a placebo
Quarantine phase: Participants will stay in the quarantine unit for approximately 11 days (from Day -2 to Day 8).
Follow-up phase: Final follow-up visit- Participants are invited to come in for their follow-up visit on Day28 (±3days).

What are the possible benefits and risks of participating?
There are no particular benefits to participation, however, HOCl is classified as non-hazardous by the Environmental Protection Agency which has approved the use of HOCl as a “no-rinse” food sanitiser and for the treatment of drinking water. It is also routinely used as a dental wash and to disinfect swimming pools, surfaces, and medical instruments. Inhalation of SPX-001: cough or sneezing may occur when the product is inhaled- adverse events will be monitored.
Pain or bruising at the site when blood is drawn- sample will be obtained by a trained professional.
Nasal sampling may cause discomfort, sneezing, watery eyes, irritated nose, or nose bleeding to minimise risk, sample collection will be performed by appropriately qualified and trained study staff to minimise discomfort.
Severe complications from the Perth virus are not expected, as these tend to occur almost in infants, the elderly or persons of any age with chronic comorbidities Influenza infection in healthy adults usually resolves within 7 days.

Where is the study run from?
SpectrumX Medical Limited (UK)

When is the study starting and how long is it expected to run for?
June 2023 to June 2027

Who is funding the study?
SpectrumX Medical Limited (UK)

Who is the main contact?
Madhuri Patel, m.patel@hvivo.com

Contact information

Type(s)
Scientific

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Additional identifiers

EudraCT/CTIS number
Nil known

IRAS number
1006806

ClinicalTrials.gov number
Nil known

Secondary identifying numbers
SPX-001-01, IRAS 1006806

Study information

Scientific Title
A phaseIb, randomised, double-blind, placebo-controlled, proof-of-concept study to evaluate the efficacy (anti-viral activity) and safety of SPX-001 in an influenza challenge model in healthy adult participants

Acronym
Safety and antiviral activity of SPX-01 influenza

Study objectives
The primary statistical hypothesis is that post-exposure treatment with SPX-001, administered at a dose of 207 µg nebulised 3 times per day will significantly reduce influenza VL-AUC as determined by qRTPCR on nasal samples compared to placebo, using a two-sided type-1 error rate of 5% starting 1-day post-viral challenge (Day 1, pm) up to Day 8 (pm).

One single primary endpoint has been defined for this study which is to evaluate the efficacy of SPX-001, in terms of reduction of area under the viral load time curve (VLAUC) after influenza viral challenge when compared to placebo.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 30/11/2023, East of England – Cambridgeshire and Hertfordshire Research Ethics Committee (The Old Chapel, Royal Standard Place, Nottingham, NG1 6FS, United Kingdom; +44 (0)207 104 8096; cambsandherts.rec@hra.nhs.uk), ref: 23/EE/0157

Study design
Randomized placebo-controlled double-blind parallel-group study

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)
Other

Study type(s)
Safety, Efficacy

Participant information sheet
Not available in web format, please use the contact details to request a participant information sheet

Health condition(s) or problem(s) studied
Influenza virus

Interventions
A total of 50 participants will take part in this study. Each participant will be randomly allocated to one of 2 treatment groups of 25 participants.
Group 1: 25 participants will receive the inhaled study drug, SPX-001 solution 115mg/mL, three times daily (292 mg daily dose delivered to the airways) for 7 days.
Group 2: 25 participants will receive an inhaled dose of matched placebo (a clear colourless solution with volume to match SPX-001) for 7 days.
A designated unblinded statistician, separate from the conduct or analysis of the study, will be responsible for the computer-generated randomisation schedule.

Intervention Type
Drug

Pharmaceutical study type(s)
Pharmacodynamic, Dose response

Phase
Phase I

Drug/device/biological/vaccine name(s)
SPX-001 [hypochlorous acid (HOCl)]

Primary outcome measure
VL-AUC of influenza challenge virus measured using quantitative reverse transcriptase-polymerase chain reaction (qRT-PCR) on nasal samples starting a day post-viral challenge (Day 1, pm) up to Day 8 (am)

Secondary outcome measures

To evaluate the effect of SPX-001, in reducing or shortening viral shedding after influenza viral challenge compared to placebo:
1. Peak viral load of influenza as defined by the maximum viral load measured using quantifiable qRT-PCR measurements in nasal samples from Day 1 (pm) up to Day 8 (am)
2. Time (hours) to a confirmed negative test measured using quantifiable qRT-PCR measurements in nasal samples from Day 1 (pm) to first confirmed non-quantifiable assessment after peak measure (after which no further virus is quantified)

To evaluate the effect of SPX-001, in reducing or shortening culturable/replicating virus after influenza viral challenge compared to placebo:
1. VL-AUC of influenza challenge virus as measured using viral culture on nasal samples, from Day 1 (pm) up to Day 8 (am)
2. Peak viral load of influenza as defined by the maximum viral load measured using quantitative viral culture measurements in nasal samples from Day 1 (pm) up to Day 8 (am)
3. Time (hours) to confirmed negative test measured using quantifiable viral culture measurements in nasal samples from Day 1 (pm) to first confirmed non-quantifiable assessment after peak measure (after which no further virus is quantified)

To evaluate the effect of SPX-001, in reducing clinical symptoms due to influenza viral challenge compared to placebo:
1. Area under the curve over time of total clinical symptoms score (TSS-AUC) measured using a symptom scoring system collected 3 times daily from Day 1 (am) up to Day 8 (am)
2. Peak symptoms diary card score: peak of total clinical symptoms (TSS) measured using a graded symptom scoring system collected 3 times daily from Day 1 (am) up to Day 8 (am)
3. Peak daily symptom score measured using the individual maximum daily sum of symptom score from Day 1 up to Day 8
4. Time to symptom resolution measured using a graded daily symptom score system from time of peak daily symptom score to time of returning to baseline score

To evaluate the safety of SPX-001 when compared to placebo:
1. Occurrence of adverse events (AEs) from dosing up to Day 28 (±3 days).
2. Occurrence of serious adverse events (SAEs) from dosing up to Day 28 (±3 days).

To continue to monitor the safety of the influenza challenge virus:
1. Occurrence of AEs related to the viral challenge from viral challenge (Day 0) up to the Day 28 follow-up
2. Occurrence of SAEs related to the viral challenge from viral challenge (Day 0) up to the Day 28 follow-up

To further evaluate the effect of SPX-001, in reducing or shortening viral shedding after influenza viral challenge compared to placebo:
1. Duration of quantifiable influenza qRT-PCR measurements in nasal samples from Day 1 (pm) up to Day 8 (am). Duration is defined as the time (hours) from first quantifiable until first confirmed non-quantifiable assessment after their peak measure (after which no further virus is quantified).
2. Duration of quantitative influenza viral culture measurements in nasal samples from Day 1 (pm) up to Day 8 (am). Duration is defined as the time (hours) from first quantifiable until first confirmed non-quantifiable assessment after their peak measure (after which no further virus is quantified)

To further evaluate the effect of SPX-001, in reducing or shortening culturable/replicating virus after influenza viral challenge compared to placebo:

Duration of quantitative influenza viral culture measurements in nasal samples from Day 1 (pm) up to Day 8 (am). Duration is defined as the time (hours) from first quantifiable until first confirmed non-quantifiable assessment after their peak measure (after which no further virus is quantified).

To evaluate the effect of SPX-001, in reducing the incidence of influenza infection due to influenza viral challenge, compared to placebo:
1. RT-PCR-confirmed influenza infection, defined as 2 quantifiable (≥ lower limit of quantification [LLOQ]) qRT-PCR measurements (reported on 2 or more independent samples over 2 consecutive days or within 48 hours of each other), from Day 1 (pm) up to Day 8 (am)
2. Occurrence of at least 1 positive quantitative (≥LLOQ) cell culture measurement in nasal samples, from Day 1 (pm) up to Day 8 (am)
3. RT-PCR-confirmed symptomatic influenza infection, defined as:
3.1. RT-PCR-confirmed influenza infection (2 quantifiable [≥LLOQ] qRT-PCR measurements [reported on 2 or more independent samples over 2 consecutive days or within 48 hours of each other]), from Day 1 (pm) up to Day 8 (am)
AND
3.2. Total symptoms score ≥2 at a single time point
4. RT-PCR-confirmed moderately severe symptomatic influenza infection, defined as:
4.1. RT-PCR-confirmed influenza infection (2 quantifiable [≥LLOQ] qRT-PCR measurements [reported on 2 or more independent samples over 2 consecutive days or within 48 hours of each other]), from Day 1 (pm) up to Day 8(am)
AND
4.2. Any symptoms score of grade ≥2 at any single time point
5. Culture lab-confirmed symptomatic influenza infection, defined as:
5.1. Lab-confirmed culturable influenza infection (1 quantifiable [≥LLOQ] cell culture measurement), from Day 1 (pm) up to Day 8 (am)
AND
5.2. Any symptoms score of ≥ grade 2 at any single time point

To further evaluate the effect of SPX-001, in reducing clinical symptoms due to influenza viral challenge compared to placebo:
1. Time to peak as measured by graded daily symptom score system (from Day 1 [am] to the time of peak daily symptom score)
2. Number (%) of participants with symptom scored grade 2 or higher, from Day 1 (am) up to Day 8(am)
3. Number (%) of participants with symptom scored grade 2 or higher by time point, from Day 1 (am) up to Day 8 (am)

To explore the effect of SPX-001 in reducing symptoms and symptomatic infection after influenza viral challenge compared to placebo:
1. Clinical symptom-related endpoints may be further explored, as measured with either the full 13 or a subset of the 13symptoms within the graded symptom scoring system

To further evaluate the effect of SPX-001, in reducing the incidence of influenza infection due to influenza viral challenge, compared to placebo:
1. Number (%) of participants with lab-confirmed infection and fever (≥37.9°C)
2. Further sensitivity analysis may be performed on the above qRT-PCR-related incidence endpoints where detection by qRT-PCR is reported above the lower limit of detection (LLOD) instead of the LLOQ. Details will be provided in the statistical analysis plan (SAP)

To evaluate the effect of SPX-001, in reducing nasal discharge compared to placebo:
1. Total weight of mucus produced from Day 1 (am) up to Day 8 (am)
2. Total number of tissues used by participants from Day 1 (am) up to Day 8 (am)

To explore baseline immunology and response to infection with influenza:
Blood and nasal samples may be used for exploratory assays related to respiratory viral infection and immunology

Overall study start date
20/06/2023

Completion date
27/06/2027

Eligibility

Key inclusion criteria
1. Written informed consent signed and dated by the participant and the investigator obtained before any assessment is performed.
2. Aged between 18 and 55 years old on the day prior to signing the consent form.
3. A total body weight ≥50 kg and body mass index (BMI) ≥18 kg/m2 and ≤35 kg/m2.
4. In good health with no history, or current evidence, of clinically significant medical conditions, and no clinically significant test abnormalities that will interfere with participant safety, as defined by medical history, physical examination, (including vital signs), electrocardiogram (ECG), and routine laboratory tests as determined by the investigator.
5. Participants will have a documented medical history either prior to entering the study or following medical history review with the study physician at screening.
6. The following criteria are applicable to female participants participating in the study:
6.1. Females of childbearing potential must have a negative pregnancy test prior to enrolment
6.2. Females of non-childbearing potential:
6.2.1. Postmenopausal females are defined as amenorrhea for 12 months or greater with no alternative medical cause. A high follicle-stimulating hormone (FSH) level, within the appropriate postmenopausal range, may be used to confirm a postmenopausal state in the absence of combined hormonal contraception or hormone replacement therapy. If there are less than 12 months of amenorrhea, 2 FSH samples are required at least 4-6 weeks apart.
6.2.2. Documented status as being permanently sterile (e.g., tubal ligation, hysterectomy, bilateral salpingectomy, and bilateral oophorectomy).
7. The following criteria apply to female and male participants:
7.1. Female participants of childbearing potential must use one form of highly effective contraception. Hormonal methods must be in place for at least 2 weeks prior to the first study visit. The contraception use must continue until 28 days after the date of the last dosing with IMP. Highly effective contraception is as described below:
7.1.2. Established use of hormonal methods of contraception described below (for a minimum of 2 weeks prior to the first study visit). When hormonal methods of contraception are used, male partners are required to use a condom with a spermicide:
7.1.2.1. Combined (oestrogen and progestogen-containing) hormonal contraception associated with inhibition of ovulation: 1. oral 2. intravaginal 3. transdermal
7.1.2.2. Progestogen-only hormonal contraception associated with inhibition of ovulation: 1. oral 2. injectable 3. implantable
7.1.3. Intrauterine device.
7.1.4. Intrauterine hormone-releasing system.

7.1.5. Bilateral tubal ligation.
7.1.6. Male sterilisation (with the appropriate post-vasectomy documentation of the absence of sperm in the ejaculate) where the vasectomised male is the sole partner for that woman.
7.1.7. True abstinence – sexual abstinence is considered a highly effective method only if defined as refraining from heterosexual intercourse during the entire period of risk associated with the study treatments. The reliability of sexual abstinence needs to be evaluated in relation to the duration of the clinical trial and the preferred and usual lifestyle of the participant.
7.2. Male participants must agree to the contraceptive requirements below at entry to quarantine and continuing until 28 days after the date of last dosing with IMP:
7.2.1. Use a condom with a spermicide to prevent pregnancy in a female partner or to prevent exposure of any partner (male and female) to the IMP.
7.2.2. Male sterilisation with the appropriate post-vasectomy documentation of the absence of sperm in the ejaculate (please note that the use of condoms with spermicide will still be required to prevent partner exposure). This applies only to males participating in the study.
7.2.3. In addition, for female partners of childbearing potential, that partner must use another form of contraception such as one of the highly effective methods mentioned above for female participants.
7.2.4. True abstinence – sexual abstinence is considered a highly effective method only if defined as refraining from heterosexual intercourse during the entire period of risk associated with the study treatments. The reliability of sexual abstinence needs to be evaluated in relation to the duration of the clinical trial and the preferred and usual lifestyle of the participant.

In addition to the contraceptive requirements above, male participants must agree not to donate sperm following discharge from quarantine until 28 days after the date of the last dosing with IMP.
8. Serosuitable for the challenge virus:
8.1. The serology result obtained from the influenza A/Perth/16/2009 H3N2 virus antibody assay suggests that the participant is sensitive to
influenza A/Perth/16/2009 H3N2 virus infection (i.e., they are likely to be infected following inoculation with the challenge virus).

Participant type(s)
Healthy volunteer

Age group
Adult

Lower age limit
18 Years

Upper age limit
55 Years

Sex
Both

Target number of participants
50

Key exclusion criteria

1. History of, or currently active, symptoms or signs suggestive of upper or lower respiratory tract infection (URTI, LRTI) within 4 weeks prior to the first study visit.
2. Any history or evidence of any clinically significant or currently active cardiovascular, respiratory, dermatological, gastrointestinal, endocrinological, haematological, hepatic, immunological (including immunosuppression), metabolic, urological, renal, neurological, or psychiatric disease and/or other major diseases that, in the opinion of the investigator, may interfere with a participant completing the study and necessary investigations. The following conditions apply:
2.1. Participants with a history of resolved depression and/or anxiety may be included at the discretion of the PI. Participants with a history of stress-related illness, which is not ongoing or requiring current therapy, with good evidence of preceding stressors may also be included at the PI's discretion. As required, participants will be assessed prior to enrolment with a Patient Health Questionnaire (PHQ-9) and/or Generalised Anxiety Disorder Questionnaire (GAD-7) which must score less than or equal to 4 on admission.
2.2. Rhinitis (including hay fever) which is clinically active or a history of moderate to severe rhinitis, or a history of seasonal allergic rhinitis likely to be active at the time of inclusion into the study and/or requiring regular nasal corticosteroids on an at least weekly basis, within 30 days of admission to quarantine will be excluded. Participants with a history of currently inactive rhinitis (within the last 30 days) or mild rhinitis may be included at the PI's discretion.
2.3. Atopic dermatitis/eczema which is clinically severe and/or requiring moderate to large amounts of daily dermal corticosteroids will be excluded. Participants with mild to moderate atopic dermatitis/eczema, taking small amounts of regular dermal corticosteroids may be included at the PI's discretion.
2.4. Any concurrent serious illness including a history of malignancy that may interfere with a participant completing the study. Basal cell carcinoma within 5 years of initial diagnosis or with evidence of recurrence is also an exclusion.
2.5. Participants reporting physician-diagnosed migraine can be included provided there are no associated neurological symptoms such as hemiplegia or visual loss. Cluster headache/migraine or prophylactic treatment for migraine is an exclusion. PI discretion may also be based on for example IMP vs. non-IMP study.
2.6. Participants with physician-diagnosed mild irritable bowel syndrome not requiring regular treatment can be included at the discretion of the PI.
2.7. Participants with asthma requiring inhaled steroids daily will be excluded.
3. Any participants who have smoked ≥10 pack years at any time (10 pack years is equivalent to one pack of 20 cigarettes a day for 10 years).
4. Females who: a) Are breastfeeding, or b) Have been pregnant within 6 months prior to the study, or c) Have a positive pregnancy test at any point during screening or prior to viral challenge.
5. Lifetime history of anaphylaxis and/or a lifetime history of severe allergic reaction. Significant intolerance to any food or drug in the last 12 months, as assessed by the PI.
6. Venous access was deemed inadequate for the phlebotomy and cannulation demands of the study.
7.
7.1. Any significant abnormality altering the anatomy of the nose in a substantial way or nasopharynx that may interfere with the aims of the study and, in particular, any of the nasal assessments or viral challenge, (historical nasal polyps can be included, but large nasal polyps causing current and significant symptoms and/or requiring regular treatments in the last month will be excluded).
7.2. Any clinically significant history of epistaxis (large nosebleeds) within the last 3 months of the first study visit and/or history of being hospitalised due to epistaxis on any previous occasion.
7.3. Any nasal or sinus surgery within 3 months of the first study visit

Prior or Concomitant Medications and Assessments
8.
8.1. Evidence of influenza vaccine within 6 months, or any other vaccinations within 4 weeks, prior to the planned date of the viral challenge.
8.2. Intention to receive any vaccination(s) before the last day of follow-up. (NB. No travel restrictions will apply after the Day 28 follow-up visit).
9. Receipt of blood or blood products, or loss (including blood donations) of 550 mL or more of blood during the 3 months prior to the planned date of viral challenge or planned during the 3 months after the final visit.
10.
10.1. Receipt of any investigational drug within 3 months prior to the planned date of the viral challenge.
10.2. Receipt of 3 or more investigational drugs within the previous 12 months prior to the planned date of the viral challenge.
10.3. Prior inoculation with a virus from the same virus subtype as the challenge virus.
10.4. Prior inoculation with a virus from the same virus family as the challenge virus in the last 12 months.
10.5. Prior participation in another HVC study with a respiratory virus in the preceding 3 months, taken from the date of the viral challenge in the previous study to the date of the expected viral challenge in this study.
11. Use or anticipated use during the conduct of the study of concomitant medications (prescription and/or non-prescription), including vitamins or herbal and dietary supplements within the specified windows, unless in the opinion of the study physician/PI, the medication will not interfere with the study procedures or comprise participant safety. Specifically, the following are excluded:
11.1. Herbal supplements within 7 days prior to the planned date of the viral challenge.
11.2. Chronically used medications, vitamins, or dietary supplements, including any medications known to be potent inducers or inhibitors of cytochrome P450 (CYP) enzymes, within 21 days prior to the planned date of the viral challenge.
11.3. Over-the-counter (OTC) medications (e.g., paracetamol or ibuprofen) where the dose is taken over the preceding 7 days prior to the planned date of the viral challenge has exceeded the maximum permissible 24-hour dose (e.g., ≥4 g paracetamol over the preceding week).
11.4. Systemic antiviral administration within 4 weeks of the planned date of the viral challenge.
12.
12.1. Confirmed positive test for drugs of abuse and cotinine on a first study visit. One repeat test is allowed at the PI's discretion.
12.2. Recent history or presence of alcohol addiction, or excessive use of alcohol (weekly intake in excess of 28 units of alcohol; 1 unit being a half glass of beer, a small glass of wine or a measure of spirits), or excessive consumption of xanthine-containing substances (e.g., daily intake in excess of 5 cups of caffeinated drinks, e.g., coffee, tea, cola).
13. A forced expiratory volume in 1 second (FEV1) <80%.
14. Positive HIV, hepatitis B virus, or hepatitis C virus test.
15. Presence of fever, defined as participant presenting with a temperature reading of ≥ 37.9°C on Day -2, Day -1, and/or pre-challenge on Day 0.
16. Those employed or immediate relatives of those employed at hVIVO or the sponsor.
17. Any other medical, psychiatric, social, or occupational condition and/or responsibility that, in the opinion of the investigator, would interfere with or serve as a contraindication to protocol adherence or the assessment of safety (including reactogenicity) will deem the participant unsuitable for the study.

Any other reason that in the opinion of the investigator raises a concern that the subject will not be able to cope with quarantine requirements.

Date of first enrolment
07/10/2025

Date of final enrolment
27/06/2026

Locations

Countries of recruitment
England

United Kingdom

Study participating centre
hVIVO Services Ltd
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Study participating centre
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Sponsor type
Industry

Funder(s)

Funder type
Industry

Funder Name
SpectrumX Medical Limited

Results and Publications

Publication and dissemination plan
1. Peer reviewed scientific journals
2. Internal report
3. Publication on website
4. Other publication
5. Submission to regulatory authorities
6. Information about this study and a summary of the results will be available on a publicly accessible clinical trial database. As of January 2022, the HRA automatically registers CTIMPs and combined IMP/device trials on ISRCTN once a REC Favourable Opinion is in place. This will not include information that could identify participants.

Intention to publish date
30/06/2026

Individual participant data (IPD) sharing plan
The data-sharing plans for the current study are unknown and will be made available at a later date

IPD sharing plan summary
Data sharing statement to be made available at a later date