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Single ascending dose, multiple ascending dose, first-in-human study to assess the safety, tolerability, pharmacokinetics and pharmacodynamics of INS-3001

Submission date
13/10/2022

Recruitment status
No longer recruiting

Registration date
20/10/2022

Overall study status
Completed

Last Edited
27/01/2026

Condition category
Circulatory System

[_] Prospectively registered
[_] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

Background and study aims
INS-3001 is a new compound that may potentially be used for the treatment of cardiovascular calcifications (calcium deposits in the heart and/or arteries) that come with age. Such calcifications can result in cardiovascular diseases, like aortic valve stenosis. Aortic valve stenosis is a narrowing of the aortic valve that makes it harder for blood to flow from the left ventricle to the aorta. To date, there are no medications available that can inhibit the development of cardiovascular calcifications. The new compound INS 3001 is able to inhibit the formation of hydroxyapatites, the calcium crystals that cause cardiovascular calcifications.

Who can participate?
Adults aged 18 to 64 years

What does the study involve?
SAD Part:
The study will take a maximum of 7 weeks from the screening until the follow-up visit. For the study it is necessary that the volunteer stays in the research center for one period of 4 days (3 nights). This will be followed by a short visit to the research center for a follow-up. The volunteer will be given INS-3001 or a placebo as an injection under the skin (subcutaneous).

MAD Part:
This part will take about 12 weeks in total. For the study the patient will have two overnight stays at the research center (2 nights + 1 night). The patient will be given INS-3001 or a placebo as an injection under the skin (subcutaneous).

What are the possible benefits and risks of participating?
Possible side effects:
The study compound may cause side effects. As INS-3001 will be administered to humans for the first time in this study, the side effects of INS-3001 in humans are not known yet. INS-3001 has

been studied extensively in the laboratory and in animals. INS-3001 inhibits calcification processes.
In a study with young rats, INS-3001 slowed calcium deposition in the growth plates, but this effect was not seen in adult rats and dogs. No side effects in the bones are therefore expected in adult humans.
INS-3001 or a placebo will be given as an injection under the skin. This subcutaneous injection may be painful or cause some bruising at the site of injection.
The study compound may also have (serious) side effects that are still unknown.
In addition to unknown side effects, there is a (small) chance that an allergic reaction will occur. This can be caused by the study compound or other ingredients that are used to prepare the formulation.
Possible discomforts:
Blood draw:
Drawing blood may be painful or cause some bruising. On the day of administration of the study compound, blood will be sampled very frequently using an indwelling cannula (a tube in a vein in the arm) to determine the course of the concentration of INS-3001 in the blood over time. The use of an indwelling cannula can sometimes lead to inflammation, swelling, hardening of the vein, blood clotting, and/or bruising around the puncture site. In some individuals, a blood draw can sometimes cause pallor, nausea, sweating, low heart rate, and/or drop in blood pressure with dizziness or fainting.
In total, we will take about x mL of blood from the volunteer. This amount does not cause any problems in adults. To compare: a blood donation involves 500 ml of blood being taken each time. If the investigator thinks it is necessary for the safety of a participant, extra samples might be taken for possible additional testing. If this happens, the total amount of blood drawn will be more than the amount indicated above.
Heart tracing:
To make a heart tracing, electrodes (small, plastic patches) will be placed on the volunteer's arms, chest, and legs. To monitor your heart rate continuously (on the day of administration of the study drug), electrodes will be placed on the volunteer's chest and abdomen. Prolonged use of these electrodes can cause skin irritation (rash and itching).
Fasting:
If the volunteer has to fast for a prolonged time during the study, this may lead to symptoms such as dizziness, headache, stomach upset, or fainting.
Coronavirus test:
Samples for the coronavirus test will be taken from the back of the volunteer's nose and throat using swabs. Taking the samples only takes a few seconds, but can cause discomfort and give an unpleasant feeling. Taking a sample from the back of the volunteer's throat may cause him to gag. When the sample is taken from the back of the volunteer's nose, they may experience a stinging sensation and their eyes may become watery.

Where is the study run from?
The study will be conducted from three clinical sites in the Netherlands (two sites) and the United Kingdom (one site).

When is the study starting and how long is it expected to run for?
November 2021 to February 2023

Who is funding the study?
Vifor (International) Inc.

Who is the main contact?
Royal Infirmary Edinburgh Clinical Research Facility, info@edinburghcrf.ed.ac.uk

Contact information

Type(s)
Principal investigator

Contact name
Dr David Newby

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Additional identifiers

Clinical Trials Information System (CTIS)
2021-001969-20

Integrated Research Application System (IRAS)
1004538

Central Portfolio Management System (CPMS)
51275

Study information

Scientific Title
A first-in-human, randomized, double-blind, placebo-controlled, single and multiple ascending dose study to assess the safety, tolerability, pharmacokinetics, and pharmacodynamics of INS-3001 in healthy subjects and patients with moderate aortic valve stenosis

Study objectives
SAD Part:
In this part we will investigate how safe the new compound INS-3001 is and how well it is tolerated when it is used by healthy participants.
We will also investigate how quickly and to what extent INS-3001 is absorbed, transported, and eliminated from the body. We will compare the effects of INS-3001 with the effects of a placebo. INS-3001 has not been administered to humans before. It has so far only been extensively tested in the laboratory and on animals. INS-3001 will be tested at various dose levels.

MAD Part:
In this part we will investigate how safe the new treatment INS-3001 is and how well it is tolerated when it is used by patients. The study will investigate how quickly and to what extent INS-3001 is absorbed, transported, and eliminated from the body (this is called pharmacokinetics). The study will also investigate the anti-calcification effect of the drug.

Ethics approval required
Old ethics approval format

Ethics approval(s)
1. Approved 31/01/2022, North East - York Research Ethics Committee (NHSBT Newcastle Blood Donor Centre, Holland Drive, Newcastle upon Tyne, NE2 4NQ, UK; +44 (0)207 1048091; york.rec@hra.nhs.uk), ref: 22/NE/0004
2. Approved 09/02/2022, Medicines & Healthcare products Regulatory Agency (MHRA) (10 South Colonnade, Canary Wharf, London, E14 4PU, UK, +44 (0)20 3080 6000; info@mhra.gov.uk), ref: CTA 55892/0001/001

The HRA has approved deferral of publication of trial details.

Primary study design
Interventional

Study design
First-in-human single-ascending-dose multiple-ascending-dose study

Study type(s)
Other

Health condition(s) or problem(s) studied
Arteriosclerosis, stenosis, vascular insufficiency and necrosis

Interventions
SAD part:
From groups 1 to 7: an ascending dose of 1 mg to 400 mg INS-3001 or placebo.

MAD part:
From groups 1 to 4: dose of 25 mg to 200 mg INS-3001 or placebo.

Intervention Type
Drug

Phase
Phase I

Drug/device/biological/vaccine name(s)
INS-3001

Primary outcome(s)
Number of participants who experienced a treatment-emergent adverse event (TEAE). A TEAE was defined as any event not present prior to the first administration of the study drug or any event already present that worsened in either severity or frequency following exposure to the study drug. Any clinically significant observations in the results of clinical laboratory, vital signs, 12-lead electrocardiograms (ECGs), continuous cardiac monitoring (telemetry; SAD part only), physical examinations, or injection site assessments, as determined by the Investigator, will be recorded as TEAEs. SAD: Day 1 to Day 24; MAD: Day 1 to Day 37.

Key secondary outcome(s)

1. SAD Only: Serum concentration of INS-3001. Blood samples of 4 ml will be taken via an indwelling intravenous (IV) catheter or by direct venipuncture into heparin tubes. For calculation of descriptive statistics, below quantification level (BQL) values are set 1/2 lower limit of quantification (LLOQ) according to the statistical analysis plan (SAP). Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose.
2. MAD Only: Serum concentration of INS-3001. Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. For calculation of descriptive statistics, BQL values are set 1/2 LLOQ according to the SAP. Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, and 12 hours post-dose; Days 2, 3 and 8: Pre-dose; Day 14: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, and 48 hours post-dose.
3. MAD Only: Trough plasma concentration (Ctrough) of INS-3001. Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Ctrough was defined as the pre-dose plasma concentration on Days 2, 3, 8 and 14. Days 2, 3, 8, and 14: Pre-dose.
4. Maximum plasma concentration (Cmax) of INS-3001. Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Cmax was defined as the observed peak analyte concentration obtained directly from the experimental data without interpolation, expressed in concentration units. SAD - Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose. MAD - Day 1 and Day 14: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 48, and 168 (Day 14 only) hours post-dose.
5. Time to Cmax (Tmax) of INS-3001. Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Tmax was defined as the first observed time to reach peak analyte concentration obtained directly from the experimental data without interpolation, expressed in time units. SAD - Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose. MAD - Day 1 and Day 14: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 48, and 168 (Day 14 only) hours post-dose.
6. Time of last measurable observed concentration (Tlast) of INS-3001. Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. SAD - Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose. MAD - Day 14: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 48, and 168 hours post-dose.
7. Apparent terminal half-life (t1/2) of INS-3001. Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Calculated as: Ln (2) (0.693) /kel, where kel represents the elimination rate constant. SAD - Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose; MAD - Day 14: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 48, and 168 hours post-dose.
8. MAD Only: effective terminal phase half-life of ins-3001 based on the degree of area under the plasma concentration-time curve (AUC) accumulation (t1/2 Eff AUC). Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Day 14: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 48, and 168 hours post-dose
9. SAD Only: AUC of INS-3001 From Time 0 to Tmax (AUC0-t). Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose
10. SAD Only: AUC of INS-3001 From Time 0 (Dosing) Extrapolated to Infinity (AUC0-inf). Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Calculated as: AUC0 inf=AUC0 t+Clast/kel where Clast is the last observed quantifiable concentration. Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose
11. MAD Only: AUC of INS-3001 Over a Dosing Interval Tau (AUC0-tau). Blood samples of 4 mL will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Day 1 and Day 14: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12 and 24 hours post-dose
12. SAD Only: Apparent Oral Clearance (CL/F) of INS-3001. Blood samples of 4 ml will be taken

via an indwelling IV catheter or by direct venipuncture into heparin tubes. Calculated as: dose /AUC0-inf. Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose
13. MAD Only: Apparent Oral Clearance at Steady State (CLss/F) of INS-3001. Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Calculated as: dose/AUC0-tau. Day 14: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 48, and 168 hours post-dose
14. Apparent Volume of Distribution of INS-3001 at Terminal Phase (Vz/F). Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Calculated as: (CL/F)/kel (Day 1) or as (CLss/F)/kel (Day 14). SAD - Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose. MAD - Day 14: Pre-dose
and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 48, and 168 hours post-dose.
15. MAD Only: Accumulation Ratio (Rac) of INS-3001 of Day 14 Versus Day 1. Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Day 14: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 48, and 168 hours post-dose.
16. Dose Normalized Cmax (Cmax/Dose) of INS-3001. Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Cmax was defined as the observed peak analyte concentration obtained directly from the experimental data without interpolation, expressed in concentration units. SAD - Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose. MAD - Day 1 and Day 14: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 48, and 168 (Day 14 only) hours post-dose.
17. SAD Only: Dose Normalized AUC0-t (AUC0-t/Dose) of INS-3001. Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose
18. SAD Only: Dose Normalized AUC0-inf (AUC0-inf/Dose) of INS-3001. Blood samples of 4 ml will be taken via an indwelling IV catheter or by direct venipuncture into heparin tubes. AUC0-inf was calculated as: AUC0 inf=AUC0 t+Clast/kel where Clast is the last observed quantifiable concentration. Day 1: Pre-dose and 0.5, 0.75, 1, 1.5, 2, 3, 4, 6, 8, 12, 24, 36, and 48 hours post-dose.
19. MAD Only: Aortic Valve 18F-sodium Fluoride (NaF) Uptake. Aortic valve 18F-NaF uptake will be determined by the tissue to background ratio (TBR) derived from 18F-NaF-positron emission tomography (PET) scans. An 18F-NaF-PET scan will be performed approximately 60 minutes after IV injection of 125 megabecquerel (MBq) 18F- NaF. 24 hours prior to dosing on Day 1 and 2.5 hours post-dose on Day 14.

Completion date
23/02/2023

Eligibility

Key inclusion criteria
SAD part:
A1. Age: 21 to 60 years, inclusive, at screening.
A2. Body mass index (BMI): 18.0 to 30.0 kg/m2, inclusive, at screening.
A3. Being male or female; females must be of non-childbearing potential (ie, surgically sterilized [ie, hysterectomy, bilateral salpingectomy, or bilateral oophorectomy], physiologically incapable of becoming pregnant, or at least 1 year postmenopausal [amenorrhea duration of >=12 consecutive months]).
A4. Females must not be pregnant or lactating; nonpregnancy will be confirmed for all females by a serum pregnancy test conducted at screening, at admission, and at follow-up.
A5. Male subjects, if not surgically sterilized (i.e., vasectomized), must agree to use adequate contraception when having intercourse with a female sexual partner of childbearing potential

and to not donate sperm from admission to the clinical site until 90 days after the follow-up visit.
A6. In good physical and mental health on the basis of medical history, physical examination, and routine laboratory measurements (ie, without major or clinically relevant pathology), as judged by the Investigator.
A7. Normal arterial blood pressure (systolic blood pressure of 90 to 140 mmHg, inclusive, and diastolic blood pressure of 45 to 90 mmHg, inclusive) and pulse rate (40 to 100 beats per minute, inclusive). Measurement of blood pressure and/or pulse may be repeated if in the judgment of the Investigator there is a reason to believe the initial result is inaccurate (eg, white coat hypertension).
A8. Computerized (12-lead) ECG recording without signs of clinically relevant pathology, as judged by the Investigator. The ECG may be repeated if in the judgment of the Investigator there is a reason to believe the initial result is inaccurate.
A9. Willing and able to abstain from alcohol for 72 hours (3 days) prior to screening and from 72 hours prior to study drug administration until the last PK blood sampling.
A10. Willing and able to abstain from methylxanthine-containing beverages (coffee, tea, cola, or other caffeinated beverages) from 48 hours (2 days) prior to study drug administration until the last PK blood sampling.
A11. Willing and able to abstain from herbal medications or dietary supplements (eg, St. John*s Wort or ginkgo biloba), vitamin preparations, grapefruit or grapefruit juice, or Seville oranges from 14 days prior to administration of the study drug until follow-up.
A12. Willing and able to understand and comply with the protocol requirements and instructions and likely to complete the study as planned.
A13. Willing and able to read, understand, and sign the ICF.

MAD part:
B1. Age : >55 years at screening.
B2. BMI: 18.0 to 35.0 kg/m2, inclusive, at screening.
B3. Being male or female; females must be of nonchildbearing potential (ie, surgically sterilized [ie, hysterectomy, bilateral salpingectomy, or bilateral oophorectomy], physiologically incapable of becoming pregnant, or at least 1 year postmenopausal [amenorrhea duration of >=12 consecutive months and confirmed by a follicle-stimulating hormone {FSH} test at screening]).
B4. Females must not be pregnant or lactating; nonpregnancy will be confirmed for all females by a serum or urine pregnancy test conducted at screening, at first admission, and at follow-up.
B5. Male subjects, if not surgically sterilized (i.e., vasectomized), must agree to use adequate contraception when having intercourse with a female sexual partner of childbearing potential and to not donate sperm from the first admission to the clinical site until 90 days after the follow-up visit.
B6. Moderate AVS defined as a mean pressure gradient of 20 to 40 mmHg (inclusive) or a peak aortic jet velocity (Vmax) of 3.0 to 4.0 m/s (inclusive), and an aortic valve area of >1.0 cm2.
B7. Evidence of aortic valve calcification by computed tomography (CT) or echocardiography with moderate or severe cusp calcification or with an echocardiogram or CT calcium score above 400 Agatston units.
B8. On stable medication, defined as no change within 30 days prior to screening. Minor changes in medication can be allowed if considered acceptable by the Investigator.
B9. Willing and able to abstain from herbal medications or dietary supplements (eg, St. John*s Wort or ginkgo biloba), vitamin preparations, grapefruit or grapefruit juice, or Seville oranges from 14 days prior to the first administration of the study drug until follow-up.
B10. Willing and able to understand and comply with the protocol requirements and instructions and likely to complete the study as planned.
B11. Willing and able to read, understand, and sign the ICF.

Participant type(s)

Healthy volunteer

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
21 Years

Upper age limit
60 Years

Sex
All

Total final enrolment
45

Key exclusion criteria
SAD part:
A1. Treatment with prescription medications within 14 days prior to study drug administration. An exception is made for vaccines against SARS-CoV-2, which will be allowed but must be discussed with the Investigator to mitigate against any interruptions to trial-related procedures and assessments. Potential subjects should only stop any prescribed medication at the direction of a physician.
A2. Treatment with nonprescription medications within 14 days prior to study drug administration. An exception is made for paracetamol, which is allowed up to admission to the clinical site. Potential subjects should consult a physician before stopping any regular treatment with nonprescription medication.
A3. Using tobacco products within 3 months prior to study drug administration.
A4. History of alcohol or drug abuse or addiction within 2 years prior to study drug administration.
A5. Regular consumption of more than 14 units of alcohol per week for females and more than 21 units of alcohol per week for males (1 unit equals 250 mL of beer, 100 mL of wine, or 35 mL of spirits).
A6. Regular consumption of more than 8 cups of methylxanthine-containing beverages (coffee, tea, cola, or other caffeinated beverage) per day (1 cup equals 250 mL).
A7. Participation in a clinical study involving administration of an investigational or a marketed drug within 3 months prior to screening. Participation in more than 4 other drug studies in the 12 months prior to study drug administration in the current study.
A8. Blood donation or a significant loss of blood (>450 mL) within 60 days prior to study drug administration or donation of more than 1 unit of plasma within 7 days prior to screening.
A9. Employee of PRA Health Sciences (PRA) or the Sponsor.
A10. History of any illness or condition that, in the opinion of the Investigator, might confound the results of the study or pose an additional risk when administering the study drug to the subject.
A11. Positive drug or alcohol screen (opiates, methadone, cocaine, amphetamines [including ecstasy], cannabinoids, barbiturates, benzodiazepines, gamma hydroxybutyric acid, tricyclic antidepressants, cotinine, or alcohol) at screening or at admission to the clinical site.

A12. Previous participation in the current study.
A13. Positive result at screening for any of the following infectious disease tests: hepatitis B surface antigen (HBsAg), hepatitis C virus (HCV) antibodies, or human immunodeficiency virus (HIV) 1 and 2 antibodies.
A14. Positive PCR test for SARS CoV-2 at admission to the clinical site.
A15. Unsuitable veins for infusion or blood sampling.
A16. History of relevant drug and/or food allergies.
A17. Illness within 5 days prior to study drug administration (*illness* is defined as an acute [serious or non-serious] condition [eg, the flu or the common cold]).

MAD part:
B1. Rheumatic or unicuspid aortic valves.
B2. Patients with aortic sclerosis, mild or severe aortic stenosis, or absence of aortic valve calcification (ie, parameters outside the limits defined in the inclusion criteria).
B3. Severe mitral or aortic regurgitation.
B4. Severe mitral stenosis.
B5. History of aortic valve replacement.
B6. Aortic valve replacement or repair scheduled or anticipated during the study period.
B7. Left ventricular ejection fraction <50%.
B8. ECG with QTcF >480 msec (in case of a left bundle branch block [LBBB], the QT-interval can be corrected for LBBB by the formula QTLBBB - [0.86 * QRSLBBB 71]; for paced rhythms, the QTc can be corrected by the formula QTc-measured
50 ms).
B9. Patients with an estimated glomerular filtration rate <45 mL/min/1.73m2, calculated using the modification of diet in renal disease.
B10. Patients with moderate or severe hepatic impairment.
B11. Patients with known osteopenia or osteomalacia, or with hypocalcemia (adjusted calcium <2.20 mmol/L) or vitamin D deficiency (25-OH vitamin D <50 nmol/L) at screening.
B12. Patients with recent (within 3 months prior to screening) coronary artery bypass grafting, percutaneous coronary intervention, acute coronary syndrome, uncontrolled diabetes (hemoglobin A1c >9%), uncontrolled hypertension (systolic blood pressure >180 mmHg), or scheduled for a major surgery within 3 months after the follow-up visit.
B13. History of any illness or condition that, in the opinion of the Investigator, might confound the results of the study or pose an additional risk when administering the study drug to the subject.
B14. Previous participation in the current study.
B15. Positive result at screening for any of the following infectious disease tests: HBsAg, HCV antibodies, or HIV 1 and 2 antibodies.
B16. Not being vaccinated for SARS-CoV-2.
B17. Positive PCR test for SARS CoV-2 at each admission to the clinical site.
B18. Unsuitable veins for infusion or blood sampling.
B19. History of relevant drug and/or food allergies.
B20. Illness within 5 days prior to the first study drug administration (*illness* is defined as an acute [serious or non-serious] condition [eg, the flu or the common cold]).
B21. Recent bone fracture (ie, within 3 months prior to screening).
B22. Any contraindication to the 18F-NaF-PET scan assessment.

Date of first enrolment
11/09/2021

Date of final enrolment

23/02/2023

Locations

Countries of recruitment
United Kingdom

Scotland

Netherlands

Study participating centre
Royal Infirmary Edinburgh Clinical Research Facility
51 Little France Crescent
Edinburgh
Scotland
EH16 4SA

Sponsor information

Organisation
Vifor (International) Inc.

Funder(s)

Funder type
Industry

Funder Name
Vifor (International) Inc.

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary
Not expected to be made available

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Basic results		19/01/2026	23/01/2026	No	No
HRA research summary			28/06/2023	No	No