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A clinical trial to assess three self-amplifying ribonucleic acid (saRNA) vaccines against Ebola, Marburg, and Lassa fever viruses

Submission date
22/07/2025

Recruitment status
No longer recruiting

Registration date
26/09/2025

Overall study status
Ongoing

Last Edited
10/11/2026

Condition category
Infections and Infestations

[X] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[_] Results
[_] Individual participant data
[X] Record updated in last year

Plain English summary of protocol

Background and study aims
This study, called EML-Vac, is testing new RNA vaccines designed to protect against three serious viruses: Ebola, Marburg, and Lassa fever. These viruses can cause severe illness known as viral haemorrhagic fever, which mostly affects people in parts of Africa. The main aim of the study is to check how safe these vaccines are when given alone or in combination. This is the first time these vaccines are being tested in humans. The study will also look at how well the immune system responds to the vaccines, but it will not test whether the vaccines actually prevent infection.

Who can participate?
The study is open to healthy adults aged 18 to 50 years. People with certain medical conditions, a history of severe allergies, or who are pregnant will not be eligible. Women who can become pregnant must use effective contraception and have regular pregnancy tests during the study. Men must use condoms during the study period.

What does the study involve?
Participants will be randomly assigned to one of five groups. Each group will receive different combinations of the Ebola, Marburg, and Lassa RNA vaccines or placebo injections. Vaccinations will be given by injection into the muscle at the start of the study and again after 12 weeks. Participants will be asked to record any symptoms in an online diary and give blood samples at several points over the course of a year to monitor their immune response. The study team will closely monitor participants for any side effects and will follow up with anyone who misses a visit.

What are the possible benefits and risks of participating?
There are no direct health benefits for participants, but the study could help develop vaccines to protect people from these dangerous viruses. Risks include mild to moderate side effects like soreness at the injection site, fatigue, headache, and muscle pain. Rare side effects may include allergic reactions, fever, or inflammation. Blood sampling may cause bruising or discomfort. Participants must also agree not to donate blood for three months after the study ends.

Where is the study run from?
Chelsea and Westminster Hospital Clinical Research Facility at St. Stephen's Centre.

When is the study starting and how long is it expected to run for?
July 2025 to June 2028

Who is funding the study?
Innovate UK

Who is the main contact?
Dr Robin Shattock, r.shattock@imperial.ac.uk

Contact information

Type(s)
Scientific

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Additional identifiers

Integrated Research Application System (IRAS)
1012266

Protocol serial number
172417

Study information

Scientific Title
A first-in-human clinical trial to assess the safety and immunogenicity of three self-amplifying ribonucleic acid (saRNA) vaccines against encoding the surface glycoprotein of Ebola virus, Marburg virus and Lassa virus (EML-Vac)

Acronym
EML-Vac

Study objectives
The main research objective is to evaluate the safety and immune responses of two immunisations with self-amplifying RNA vaccines to Marburg, Ebola and Lassa viruses, either alone or in combination, administered in the deltoid muscles at 12 weeks apart in healthy volunteers.

Secondary objective:
To characterise the types of immune responses and cells that are generated following administration of 2 doses of self-amplifying RNA vaccines to Marburg, Ebola, and Lassa viruses, either alone or in combination, administered in the deltoid muscles at 12 weeks apart in healthy volunteers.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 19/09/2025, London - London Bridge Research Ethics Committee (2 Redman Place, Stratford, London, E20 1JQ, United Kingdom; +44 (0)207 104 8229, +44 (0)207 104 8140, +44 (0) 207 104 8055; londonbridge.rec@hra.nhs.uk), ref: 25/LO/0596

Primary study design
Interventional

Study design
Interventional randomized controlled trial

Study type(s)
Safety

Health condition(s) or problem(s) studied
Healthy volunteers

Interventions
This is a single-blinded, randomised Phase I trial using the online tool “Sealed Envelope” to generate randomisation lists. Healthy participants aged 18 to 50 years will be enrolled at a single centre and immunised via the intramuscular route at week 0 and week 12. There will be 8 participants per group, with a total of 40 participants. Blood samples will be collected for safety and immunogenicity analysis at follow-up visits on days 0, 1, 7, 14, 28, 84, 85, 91, 98, 112, 168, 252, and 364.

Group 1 receives 5 µg of LNP-MARVsaRNA-01 (Marburg glycoprotein RNA) plus two doses of placebo (phosphate buffered saline) at both week 0 and week 12.

Group 2 receives 4 µg of LNP-EBOVsaRNA-01 (Ebola glycoprotein RNA) plus two doses of placebo at both week 0 and week 12.

Group 3 receives 4 µg of LNP-LASSAsaRNA-01 (Lassa glycoprotein RNA) plus two doses of placebo at both week 0 and week 12.

Group 4 receives 5 µg of LNP-MARVsaRNA-01 and 4 µg of LNP-EBOVsaRNA-01 plus one dose of placebo at both week 0 and week 12.

Group 5 receives 5 µg of LNP-MARVsaRNA-01, 4 µg of LNP-EBOVsaRNA-01, and 4 µg of LNP-LASSAsaRNA-01 with no placebo at both week 0 and week 12.

Intervention Type
Drug

Phase
Phase I

Drug/device/biological/vaccine name(s)
LNP-EBOVsaRNA-01, MARVsaRNA-01, LASSAsaRNA-01

Primary outcome(s)
1. Solicited local injection site reactions starting within 7 days of administration of the vaccine: pain, tenderness, erythema, swelling. These will be measured using a participant diary card.
2. Solicited systemic reactions starting within 7 days of administration of the vaccine: pyrexia, fatigue, myalgia, headache, chills, arthralgia. These will be measured using a participant diary card.
3. Unsolicited adverse reactions (ARs) throughout the trial period (including serious ARs).
4. Serious Adverse Events throughout the trial period.
5. Unsolicited adverse events throughout the trial period.
6. The titre of vaccine-induced serum IgG binding antibody responses to the Marburg virus, Ebola virus and Lassa virus fever virus surface glycoproteins 2 weeks after the second vaccinations (day 98). Antigen-specific IgG antibody concentrations in participant sera will be measured in ng/mL using validated ELISA.

Key secondary outcome(s)
1. Cell-mediated vaccine-induced immune responses measured by T and B cell ELISpot in participants using PBMC taken on days 0, 28, 84 and 98 (T cells) or 112 (B cells).
2. Cell-mediated vaccine-induced immune responses measured by flow cytometry and intracellular cytokine staining using PBMC taken on days 0, 28, 84 and 98.
3. Serum neutralising antibodies in a Marburg, Ebola or Lassa pseudovirus-based neutralisation assay using sera taken on days 0, 28, 84, 98 and 112.
4. The profile of class and sub-class of antibody response will be measured in ng/mL using antigen-specific IgG (1-4) and IgA antibody validated ELISA on days 0, 28, 84, 98 and 112.
5. Serum markers of innate immune response measured by MSD assay in participant plasma on days 1 and 85.

6. Purification of antigen-specific B cells to isolate neutralising monoclonal antibodies to enhance understanding of targeted epitopes. B cells will be isolated from participant PBMC taken on day 112.

Completion date
30/06/2028

Eligibility

Key inclusion criteria
1. Healthy adults, aged 18-50 years on the day of screening
2. Willing and able to provide written informed consent
3. If female and of childbearing potential, willing to use a highly effective method of contraception from screening until 18 weeks after last injection
4. If male and not sterilised, willing to avoid impregnating female partners from screening until 18 weeks after last injection
5. Willing to avoid all other vaccines from within 4 weeks before and after the first and second injection
6. Willing and able to comply with visit schedule, complete online diaries and provide samples
7. Willing to abstain from donating blood for three months after the end of their participation in the trial or longer, if necessary
8. Willing to grant authorised persons access to his/her trial-related medical record and GP records either directly or indirectly
i A woman will be considered of childbearing potential following menarche and until becoming post-menopausal unless permanently sterile. Permanent sterilisation methods include hysterectomy, bilateral salpingectomy and bilateral oophorectomy. A post-menopausal state is defined as no menses for 18 months without an alternative medical cause.
ii The following methods are considered highly effective:
• combined (estrogen and progestogen containing) hormonal contraception associated with inhibition of ovulation – oral, intravaginal or transdermal;
• progestogen-only hormonal contraception associated with inhibition of ovulation – oral, injectable or implantable
• intrauterine device (IUD);
• intrauterine hormone-releasing system (IUS);
• bilateral tubal occlusion;
• vasectomised partner, where the vasectomised partner has received medical assessment of the surgical success; and
• sexual abstinence, defined as refraining from heterosexual intercourse – must be the preferred and usual lifestyle of the participant.
iii Nonclinical studies of saRNAs showed maximal expression of the vaccine immunogen at 7 days post-immunisation, approaching baseline by 3 weeks post-immunisation, with some residual very low expression seen out to 9 weeks. Biodistribution studies with LNP-MARVsaRNA, LNP-EBOVsaRNA and LNP-LASSAsaRNA are planned, but in the absence of data we wish to take a conservative approach to the contraception period and require an 18-week washout period.
iv Through the use of condoms or sexual abstinence
It is recommended that participants have an up to date vaccination status for any required immunisations.

Participant type(s)
Healthy volunteer

Healthy volunteers allowed
No

Age group
Adult

Lower age limit
18 Years

Upper age limit
50 Years

Sex
All

Total final enrolment
40

Key exclusion criteria
1. Pregnant or lactating
2. Has a significant clinical history, physical finding on clinical examination during screening, or presence of a disease that is active or requires treatment to control it, including cardiac, respiratory, endocrine, metabolic, autoimmune, liver, neurological, oncological, psychiatric, immunosuppresive/immunodeficient or other disorders which in the opinion of the investigator is not compatible with healthy status, may compromise the volunteer's safety, preclude vaccination or compromise interpretation of the immune response to vaccine. Individuals with mild/moderate, well-controlled comorbidities are allowed.
3. History of Marburg virus, Ebola virus and/or Lassa virus infection
4. History of anaphylaxis or angioedema
5. History of severe or multiple allergies to drugs or pharmaceutical agents
6. History of severe local or general reaction to vaccination defined as:
a. local: extensive, indurated redness and swelling involving most of the arm, not resolving within 72 hours
b. general: fever ≥39.5 °C within 48 hours; bronchospasm; laryngeal oedema; collapse; convulsions or encephalopathy within 72 hours
Ever received an experimental or authorised vaccine against Ebola, Marburg, or Lassa fever viruses
7. Receipt of any immunosuppressive agents within 18 weeks of screening by any route other than topical
8. Detection of antibodies to hepatitis C
9. Detection of antibodies to HIV
10. Grade 1i and above abnormalities in routine laboratory parameters (see Table 4) using the FDA toxicity table Toxicity Grading Scale for Healthy Adult and Adolescent Volunteers Enrolled in Preventive Vaccine Clinical Trials, taking account of local laboratory reference ranges. https://www.fda.gov/media/73679/download
Participating in another clinical trial with an investigational drug or device or treated with an investigational drug within 28 days of screening.
11. Has received an immunisation within 28 days of screening
i Trace of protein and/or blood on dipstick urinalysis and ALT/AST ≤1.2 x ULN are not exclusion

Date of first enrolment

27/01/2026

Date of final enrolment
31/03/2026

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Chelsea and Westminster Hospital Clinical Research Facility (CRF) at St. Stephen’s Centre
252 Fulham Rd.
London
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SW10 9NA

Sponsor information

Organisation
Imperial College London

ROR
https://ror.org/041kmwe10

Funder(s)

Funder type
Government

Funder Name
Innovate UK

Alternative Name(s)
Technology Strategy Board

Funding Body Type
Government organisation

Funding Body Subtype

National government

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analyzed during the current study are/will be available upon request following publication from r.shattock@imperial.ac.uk. Access will require approval, by the clinical PI and scientific lead investigator and will be based on the presentation of a legitimate analysis plan and time frame. Only fully anonymized data will be made available, and this provision is covered by participant consent. Data set availability will be maintained for a minimum of 10 years from completion of the study.

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	version 2.0	05/09/2025	07/10/2025	No	Yes
Participant information sheet	version 3.0	29/01/2026	03/03/2026	No	Yes
Protocol file	version 2	01/09/2025	07/10/2025	No	No
Protocol file	version 3	29/01/2026	03/03/2026	No	No