ISRCTN10688513 https://doi.org/10.1186/ISRCTN10688513

APPLIED-LUNG: Transforming lung cancer screening

Submission date
06/01/2026

Recruitment status
Recruiting

Registration date
08/01/2026

Overall study status
Ongoing

Last Edited
14/05/2026

Condition category
Cancer

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

Plain English summary of protocol

Background and study aims
Lung cancer accounts for 1 in 7 (around 50,000) of new cancers diagnosed each year in the United Kingdom with over half diagnosed at a late stage. Most cancer-related deaths (1 in 5) are due to lung cancer.
To improve early diagnosis, the NHS has introduced lung cancer screening for people at high risk using low dose CT scans. While CT scans are effective at spotting lung cancer, the wide scale roll out of CT screening requires many resources. This is challenging in an already overstretched NHS. Oxford Cancer Analytics (OXcan) has developed a new blood test capable of spotting lung cancer by analysing proteins in the blood. In previous research involving over 1,800 patients, OXcan's approach successfully picked up more than 8 in 10 early-stage lung cancers. The advantages of this blood test include safety, simplicity, and accessibility.
This study aims to measure the ability of the OXcan test to find lung cancer accurately and identify people at very low risk of lung cancer who may not need a CT scan.

Who can participate?
People at high risk of lung cancer having a low dose CT scan as part of the NHS Lung cancer screening programme in Cheshire and Merseyside.

What does the study involve?
Participants will have blood taken once when attending for their CT scan to see how well the OXcan test works. The results will be compared with their CT scan results and any future cancer diagnosis. Blood/saliva/sputum/nose/mouth swabs may also be collected once to help improve future screening for lung cancer and other diseases.

What are the possible benefits and risks of participating?
Although there are no direct benefits from taking part in this study, participants will be helping us to develop better tests to screen for lung cancer and possibly other diseases in the future. Taking a blood sample causes mild discomfort and occasionally bleeding where the needle for the blood test is inserted into the vein. There is minimal risk from giving sputum and saliva samples. Oral swabs and nasal swabs/scrapings cause very little if any discomfort when the sample is taken from the lining of the inside of the mouth and nose.
Low dose CT scans are part of routine care in the NHS Lung cancer screening programme. If

people take part in this study, they will not undergo any additional CT scans. Low dose CT scans use ionising radiation to form images of the body to provide the NHS Lung cancer screening programme with clinical information. Ionising radiation may cause cancer many years or decades after the exposure. The chances of this happening to people are the same whether they take part in this study or not.

Where is the study run from?
The study is run from Liverpool Heart and Chest Hospital NHS Foundation Trust who run the Cheshire and Merseyside NHS Lung cancer screening programme on behalf of the Cheshire and Merseyside Cancer Alliance. This study is a collaboration between Liverpool Heart and Chest Hospital NHS Foundation Trust, the University of Liverpool and OXcan. The study is sponsored by the University of Liverpool.

When is the study starting and how long is it expected to run for?
February 2026 to January 2039

Who is funding the study?
1. National Institute of Health and Care Research (NIHR) (UK)
2. Oxford Cancer Analytics Ltd (UK)

Who is the main contact?
Dr Serena Chee, serena.chee@liverpool.ac.uk

Contact information

Type(s)
Scientific, Principal investigator

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Additional identifiers

Integrated Research Application System (IRAS)
356119

Central Portfolio Management System (CPMS)
67495

Study information

Scientific Title
Artificial intelligence-integrated Plasma Proteomic anaLysis to Improve risk Evaluation and Decision-making in LUNG cancer screening (APPLIED-LUNG)

Acronym
APPLIED-LUNG

Study objectives
The primary objective is to evaluate the performance of the OXcan test to triage the people eligible for lung cancer screening and identify people without lung cancer who do not need a low dose CT scan.

The secondary objectives are to:
1. To assess how often the OXcan test can correctly identify people with no lung cancer in those undergoing Lung cancer screening with a low dose CT scan.
2. To compare how often the OXcan test correctly identifies people with and without lung cancer compared with a low dose CT scan.
3. To assess how often the OXcan test can correctly identify people with and without lung cancer in people with indeterminate findings on low dose CT scan (e.g lung nodules)
4. To bank samples and clinical data from participants eligible for a low dose CT as part of the NHS Lung cancer screening programme to help improve screening for cancer and other diseases in the future.

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 19/12/2025, London - Dulwich Research Ethics Committee (Health Research Authority , 2nd Floor, 2 Redman Place, Stratford, London, E20 1JO, United Kingdom; +44 (0)2071048276; dulwich.rec@hra.nhs.uk), ref: 25/LO/0807

Primary study design
Observational

Study design
Single-centre observational prospective cohort study

Study type(s)
Screening

Health condition(s) or problem(s) studied
Lung cancer

Interventions
People attending a virtual NHS lung cancer screening appointment who are eligible for a low dose CT scan will be asked by a member of the direct care clinical team at the end of the consultation if they would be willing to be approached to take part in research and given brief information about what participation would involve. A summary about this research will be sent to the potentially willing research participants along with their low dose CT scan appointment information.

During the period of the study, potential research participants who have indicated they would be willing to be approached about research, will be approached by a suitably trained member of the research team at their low dose CT scan appointment and asked if they are willing to participate in this study.

In those who are willing to participate and following informed consent, blood will be taken, and saliva, sputum, mouth swabs and nasal swabs/scrapings may be taken. These research samples will be taken in addition to usual clinical treatment, however confer minimal additional risk or burden to the patient.

Blood samples:
A blood sample will be taken at the low dose CT scan appointment. Each blood sample will consist of up to 60ml of blood from 1 venesection. These blood samples are necessary to identify blood based protein markers to validate the OXcan blood test. Samples will also be stored for use in this study and future research.

Saliva and sputum:
A sample of sputum may be taken at the low dose CT scan appointment for research in lung cancer screening and screening for other diseases.

Mouth swabs and nasal swabs/scraping:
A mouth swab and nasal swab/scraping may be taken at the low dose CT scan appointment for research in lung cancer screening and screening for other diseases.

Low dose CT scans:
Information from the low dose CT scans performed as part of the NHS Lung cancer screening programme including linked-anonymised images and reports will be accessed to assess the study outcomes including diagnosis of lung cancer and identification of lung nodules. Participants will have a baseline low dose CT scan and depending on the findings could potentially have further CT scans at 3/12/24 months and every 2 years between the ages of 55-74. The average number of CT scans over the 10 years period is 8 per participant (baseline/3/12 months and 2/4/6/8/10 years).

For the purpose of this study participant outcome data will be followed up for 1 year and for the purpose of informing future research on a yearly basis for 10 years.

Active involvement of the participant in the study is complete after one visit when consent and samples are taken.

A review of patient notes including electronic case notes will enable correlation of clinical outcome in patients undergoing low dose CT scanning as part of NHS Lung cancer screening and the results of the OXcan blood test. This will be reviewed at the baseline visit, 3 months and 12 months.

Collection of other demographic and clinical information will enable the construction of a data-biobank containing clinical, radiological and biological information on study participants. This will enable evaluation of the OXcan test and also be used to inform future research. This will be updated on a yearly basis for 10 years.

Intervention Type
Device

Phase
Not Applicable

Drug/device/biological/vaccine name(s)
OXcan blood based proteomic test

Primary outcome(s)
1. Lung cancer is correctly identified by a positive OXcan test compared with a low dose CT scan at 3 and 12 months more than 75% of the time
2. No lung cancer is correctly identified by a negative OXcan test compared with a low dose CT scan at 3 and 12 months more than 99.5% of the time

Key secondary outcome(s)
1. Proportion of people without lung cancer who have a negative OXcan test at 3 and 12 months
2. Proportion of people with lung cancer who have a positive OXcan test at 3 and 12 months
3. Proportion of correctly or incorrectly identified lung cancer and no lung cancer compared to finding on low dose CT at 3 and 12 months
4. Proportion of correctly or incorrectly identified lung cancer and no lung cancer in 'indeterminate' CT scans at baseline
5. Proportion of correctly or incorrectly identified lung cancer and no lung cancer in CT scans showing small lung nodules (<8 mm) at baseline

Completion date

31/01/2039

Eligibility

Key inclusion criteria
1. Eligible for and attending for a LDCT scan as part of the NHS Lung cancer screening programme
2. Ability to understand the study procedures and provide written informed consent to participate in the study.

Participant type(s)
Population

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 Years

Upper age limit
100 Years

Sex
All

Total final enrolment
0

Key exclusion criteria
1. Participant with a contraindication for study procedures or sampling in the opinion of the investigator or research team
2. The absence/withdrawal of consent

Date of first enrolment
17/02/2026

Date of final enrolment
31/01/2029

Locations

Countries of recruitment
United Kingdom

England

Study participating centre
Liverpool Heart and Chest Hospital NHS Foundation Trust
Thomas Drive
Liverpool
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L14 3PE

Sponsor information

Organisation
University of Liverpool

ROR
https://ror.org/04xs57h96

Funder(s)

Funder type
Not defined

Funder Name
National Institute for Health and Care Research

Alternative Name(s)
National Institute for Health Research, NIHR Research, NIHRresearch, NIHR - National Institute for Health Research, NIHR (The National Institute for Health and Care Research), NIHR

Funding Body Type
Government organisation

Funding Body Subtype
National government

Location
United Kingdom

Funder Name
Oxford Cancer Analytics Ltd

Results and Publications

Individual participant data (IPD) sharing plan

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