# Establishing a Controlled Human Hookworm Infection Model at Leiden University Medical Center

Published: 14-03-2017
Last updated: 11-04-2024

Primary objective:To establish four healthy donors for future CHHI studies

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| **Ethical review** | Approved WMO |
| **Status** | Recruiting |
| **Health condition type** | Helminthic disorders |
| **Study type** | Interventional |

## Summary

### ID

NL-OMON42940

**Source**
ToetsingOnline

**Brief title**
CHHIL

### Condition

- Helminthic disorders

**Synonym**
Hookworm, Necator americanus

**Research involving**
Human

### Sponsors and support

**Primary sponsor:** Leids Universitair Medisch Centrum
**Source(s) of monetary or material Support:** Dioraphte foundation

## Intervention

**Keyword:** Hookworm, Human infection model

## Outcome measures

### Primary outcome

Detection of hookworm eggs by faeces microscopy (Kato-Katz) at any week between

week 9 to 12 post-infection.

### Secondary outcome

None

# Study description

### Background summary

With over 700 million people infected worldwide, hookworm is one of the most common and the most important parasitic infection of humans. Unfortunately, mass drug administration, the cornerstone of hookworm control programmes, is threatened by increasing drug failure and high reinfection rates. Novel anthelminthic drugs and vaccines are urgently needed to add to the hookworm control tools. Because there is no animal model for human hookworm infection, human studies are indispensable to screen novel drugs and vaccines for efficacy. A controlled human hookworm infection model would accelerate the development of novel vaccines and drugs for hookworm infection.
There is considerable experience with controlled human hookworm infections and the safety of such studies has been established. Controlled infection with human hookworm will lead to adverse events which are well tolerated and are temporary in their nature.
In this initial infection study, we will set up the CHHI model at the Leiden University Medical Centre and infect a limited number of healthy volunteers to act as donors for future CHHI studies.

### Study objective

Primary objective:
To establish four healthy donors for future CHHI studies

### Study design

This study is an open label intervention trial.

**Intervention**

Four volunteers will be exposed to 50 Necator americanus L3 larvae. Volunteers will be followed on a weekly basis until week 12 after infection. If volunteers develop a patent infection, defined by detectable egg production in stool by microscopy at any timepoint within week 9 to 12, they will be scheduled to donate faeces on request.
Two years after infection or if volunteers do not excrete eggs detectable by microscopy on week 9 to 12, volunteers will be treated with a 3-day regimen of albendazole to abrogate the infection. Retreatment with albendazole will be given to volunteers who remain positive for hookworm after treatment.
Six months after the treatment, volunteers will undergo their last visit.

**Study burden and risks**

Burden: Volunteers will visit the trial centre weekly until week 12 after infection. Between 12 weeks and 2 years, visits will be variable depending on the demand for hookworm eggs and availability of the volunteers. When treated with albendazole, volunteers will visit the trial centre on a weekly basis for 7 weeks. The amount of blood collected per volunteer during the first 12 weeks will be 500 mL. The amount of blood taken during the treatment phase will not exceed 300mL. Fecal samples will be taken at all visits. Physical examinations will be performed when clinically indicated and subjects will be asked to complete a diary of adverse events on a daily basis until week 12.
Risks: Volunteers will be exposed to 50 N. americanus once. Risks for volunteers are related to i) penetration of N. americanus larvae through the skin and ii) systemic and local signs & symptoms of hookworm infection (eg. abdominal pain, nausea). All participants will be treated with a 3-day course of albendazole, either at week 12 (when they do not secrete eggs) or at 2 years after infection. Clearance of infection is confirmed by faecal Kato-Katz and qPCR.
Benefits: There are no direct benefits for volunteers.

# Contacts

**Public**
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# Trial sites

## Listed location countries

Netherlands

# Eligibility criteria

**Age**
Adults (18-64 years)
Elderly (65 years and older)

## Inclusion criteria

1. 1. Subject is aged * 18 and * 45 years.
2. Subject has adequate understanding of the procedures of the study and agrees to abide strictly thereby.
3. Subject is able to communicate well with the investigator, is available to attend all study visits.
4. Subjects are able to respond to phone or email within 24 hours during the first 12 weeks of the study.
5. Subject agrees to refrain from blood donation to Sanquin or for other purposes throughout the study period.
6. For female subjects: subject agrees to use adequate contraception and not to breastfeed for the duration of study.
7. Subject has signed informed consent.

## Exclusion criteria

1. 1. Any history, or evidence at screening, of clinically significant symptoms, physical signs or abnormal laboratory values suggestive of systemic conditions, such as cardiovascular, pulmonary, renal, hepatic, neurological, dermatological, endocrine, malignant, haematological, infectious, immune-deficient, psychiatric and other disorders, which could compromise the health of the volunteer during the study or interfere with the interpretation of the study results. These include, but are not limited to, any of the following:

* History of severe asthma or other health conditions that may require future steroid use;
* body weight <50 kg or Body Mass Index (BMI) <18.0 or >30.0 kg/m2 at screening;
* positive HIV, HBV or HCV screening tests;
* the use of immune modifying drugs within three months prior to study onset (inhaled and topical corticosteroids and oral anti-histamines exempted) or expected use of such during the study period;
* Having one of the following laboratory abnormalities: ferritine <10ug/L, transferrine <2.04g/L or Hb <7.5mmol/L for females or <8.5mmol/L for males.
* history of malignancy of any organ system (other than localized basal cell carcinoma of the skin), treated or untreated, within the past 5 years;
* any history of treatment for severe psychiatric disease by a psychiatrist in the past year;
* history of drug or alcohol abuse interfering with normal social function in the period of one year prior to study onset.
2. Known hypersensitivity to or contra-indications for use of albendazole. Including co-medication known to interact with albendazole metabolism (e.g. carbamazepine, phenobarbital, phenytoin, cimetidine, theophylline, dexamethasone)
3. Known type 1 hypersensitivity to amphotericin B or gentamicin.
4. For female subjects: positive urine pregnancy test at screening.
5. Positive faecal PCR or Kato-Katz for hookworm at screening, any known history of hookworm infection or treatment for hookworm infection or possible exposure to hookworm in the past.
6. Being an employee or student of the department of Parasitology of the LUMC.
7. Current or past scars, tattoos, or other disruptions of skin integrity at the intended site of larval application.
8. Subjects with planned travel to hookworm-endemic areas with a stay in non-hygienic environment during this trial

# Study design

## Design

**Study type:** Interventional

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| Masking: | Open (masking not used) |
| Control: | Uncontrolled |
| Primary purpose: | Other |

## Recruitment

NL

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|---|---|
| Recruitment status: | Recruiting |
| Start date (anticipated): | 04-05-2017 |
| Enrollment: | 4 |

| | |
|---|---|
| Type: | Actual |

## Ethics review

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|---|---|
| Approved WMO Date: | 14-03-2017 |
| Application type: | First submission |
| Review commission: | METC Leiden-Den Haag-Delft (Leiden)<br><br>metc-ldd@lumc.nl |

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| Approved WMO Date: | 20-06-2017 |
| Application type: | Amendment |
| Review commission: | METC Leiden-Den Haag-Delft (Leiden)<br><br>metc-ldd@lumc.nl |

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|---|---|
| Not approved Date: | 14-05-2019 |
| Application type: | Amendment |
| Review commission: | METC Leiden-Den Haag-Delft (Leiden)<br><br>metc-ldd@lumc.nl |

## Study registrations

### Followed up by the following (possibly more current) registration

No registrations found.

### Other (possibly less up-to-date) registrations in this register

No registrations found.

## In other registers

| Register | ID |
| --- | --- |
| CCMO | NL60355.058.16 |
| Other | volgt |