# The lifespan of human neutrophils, eosinophils, basophils and monocytes under homeostatic conditions

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| **Ethical review** | Approved WMO |
| **Status** | Recruitment stopped |
| **Health condition type** | Other condition |
| **Study type** | Observational invasive |

## Summary

### ID

NL-OMON34718

**Source**
ToetsingOnline

**Brief title**
Leukocyte lifespan

### Condition

- Other condition
- Allergic conditions

**Synonym**
Chronic immune diseases and basic knowledge on the human immune system

**Health condition**

fundamentele kennis mbt normale afweer

**Research involving**
Human

## Sponsors and support

**Primary sponsor:** Universitair Medisch Centrum Utrecht
**Source(s) of monetary or material Support:** het Nederlands Astma Fonds

## Intervention

**Keyword:** deuterated glucose, innate immunity, leukocyte, lifespan

## Outcome measures

### Primary outcome

Granulocyte and monocyte post-mitotic pool transit times and lifespans in

normal healthy volunteers

### Secondary outcome

None

# Study description

### Background summary

Remarkably little is known about the lifecycle of the cells of the innate immune system: monocytes, neutrophils, eosinophils and basophils. Knowledge about this lifecycle is important for fundamental insights in the immune system and also for the understanding of pathologies of inflammatory diseases. An important difficulty is the development of new medications is is the lack of knowledge on the basal characteristics of the cells that cause chronic inflammation: how fast they are produced, how long they remain in the blood and tissues and where they are cleared. Little is described in literature regarding these topics. In the 60's and 70's studies were performed on the lifespans of innate immune cells, but with inadequate techniques. These data probably underestimate the lifespans of these cells, but they are still mentioned in modern tekst books.

### Study objective

The results of this study will lead to an improved insight in the lifecycle of these cells and our results will be of importance for more insight in chronic inflammatory diseases. For example, it will improve our ability to interpret the results from previous and future intervention studies that block survival

and production of leukocytes.

**Study design**

On day one the volunteers will go to the clinic on an empty stomach.
First we will withdraw 20ml of blood for baseline measurements of glucose levels and DNA deuterium enrichment.
After that, the volunteers will be orally administered 1g of deuterated glucose per kilogram bodyweight in 12 doses over a period of 6 hours. Also, after 1, 3 and 6 hours after the first administration we will withdraw two drops of blood by skinprick to determine the amount of deuterated glucose in the blood of the volunteer.
During this day, the volunteer will receive low-carb breakfast and lunch.

At 5 more timepoints, the volunteer will come to the clinic to donate 20ml of blood. The exact days after intake of glucose differ for each volunteer but will not be in weekends or more than two days in a row. (A clear scheme of the withdrawals can be found in the "onderzoeksprotocol", paragraph 3.2.)
From the collected blood DNA will be isolated and white blood cell populations will be separated using high performance FACS sorting. DNA from these cells will be isolated and analysed for deuterium enrichment using a combination of gas chromatography and mass-spectometry.
These data will be fed to a mathematical model, which can calculate the half-lives of the cells.

**Study burden and risks**

Risks:
The glucose used is considered safe, so risks are negligible

Burden:
Subject will pay five visits to the clinic for blood withdrawl. Each visit, 20ml of blood will be withdrawn, which can be easily missed by adults.
Besides, subjects will spend one day in hospital for one blood withdrawal and the intake of 1g/kg bodyweight of glucose

Taken together, we think that the risks vor volunteers are minimal and the burden is low.

# Contacts

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# Trial sites

## Listed location countries

Netherlands

# Eligibility criteria

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

## Inclusion criteria

18-40 years

## Exclusion criteria

• Any infection (eg. HIV, Hepatitis, STDs)
• Smoking
• Asthma or COPD
• Hay fever or allergies
• Auto-immune diseases
• Use of medication, excluding: anticonceptives and pain killers (if used less than once a week)
• exuberant alcohol consumption (for males > 36 glasses per week, for females >24 glasses per week)
• Drug use
• History of cancer

# Study design

## Design

**Study type:** Observational invasive

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|---|---|
| Masking: | Open (masking not used) |
| Control: | Uncontrolled |
| Primary purpose: | Basic science |

## Recruitment

NL

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|---|---|
| Recruitment status: | Recruitment stopped |
| Start date (anticipated): | 30-11-2011 |
| Enrollment: | 6 |
| Type: | Actual |

# Ethics review

Approved WMO

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|---|---|
| Date: | 20-05-2011 |
| Application type: | First submission |
| Review commission: | METC Universitair Medisch Centrum Utrecht (Utrecht) |

# 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 | NL31552.041.10 |