# Immune Image

Imaging techniques to enhance immunotherapies

## 1 | What are immunotherapies?

The **immune system** protects our body against external invaders, such as viruses, and from internal threats, such as tumoral cells. It's made of different kinds of cells that work together to keep us safe.

**Immunotherapies are a type of treatment** that take advantage of these natural defences to fight diseases. Immunotherapies use different molecules that can boost the immune system or alternatively take immune cells from the patient, improve them in the laboratory and inject them back into the patient's body. No matter the strategy, all immunotherapies share a common goal: **to improve the response of the immune system**.

### How can we know if they work?

Each patient disease is different, and so is their **response** to the treatment. To decide on the best alternative, doctors study the state of the immune system in the patient's **whole body**, but also in the **exact body sites** that are affected by **the disease**. Currently, the available diagnostic techniques can't provide all these data:

**Disease-site**

**Tissue biopsies** take a sample from the specific site where the disease is located, but they don't tell us about the general immune status of the patient.
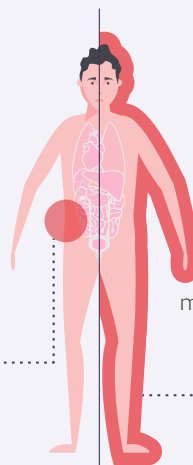
**Whole body**

**Blood-based tests** can find out about the general immune status of a patient, but they may not show what is happening at the location that manifests the disease.

## 2 | Improving patient's diagnosis

The **Immune-Image project** is seeking to develop a **new strategy** to help doctors diagnose patients with conditions where the immune system is key. The Immune Image researchers are developing methods to **visualize the immune response before, during, and after immunotherapy**. **They will be able to study it**, both at a general scale and at the disease site, and in a **non-invasive manner**, facilitating the personalisation of the treatment to each patient.
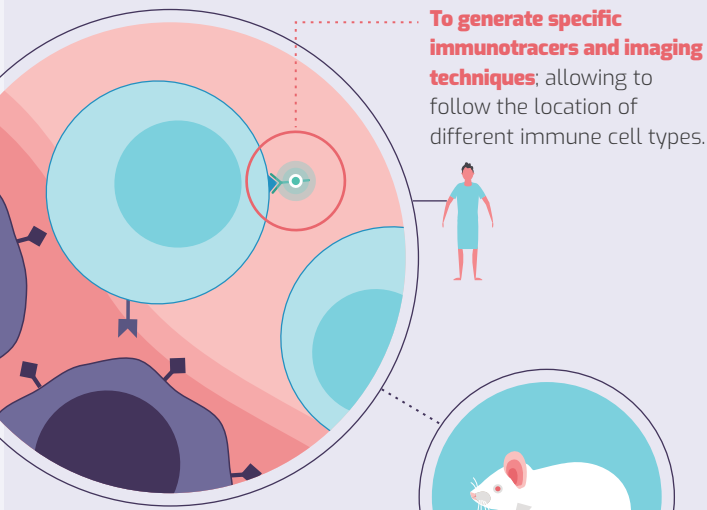
### About us

The Immune-Image project brings together **22 key entities across 9 countries** including **academic and medical institutions**, **pharmaceutical companies** and a **patient organisation**.

# 3 | Tracking the immune system

The Immune-Image approach takes advantage of a unique characteristic of immune cells: each has unique molecules on its surface, which can be detected using molecules that specifically bind to them, called **immunotracers**. These molecules are labelled and can be detected by **lab equipment that can reconstruct an image of our body and highlight where these cells are present**. This approach is called **molecular imaging**. This way, it's possible to **identify and track** some patient's immune cells in a **non-invasive manner.**

**The Immune-Image project involves three different methods:**

**To generate specific immunotracers and imaging techniques**; allowing to follow the location of different immune cell types.

**To test them in animal models;** assessing if immunotracers are **safe** and the **efficacy of** imaging *in vivo*.
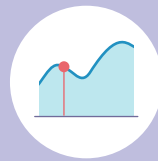
**Clinical trials;** confirming the safety and clinical potential of a selection of validated immunotracers **on volunteers**.
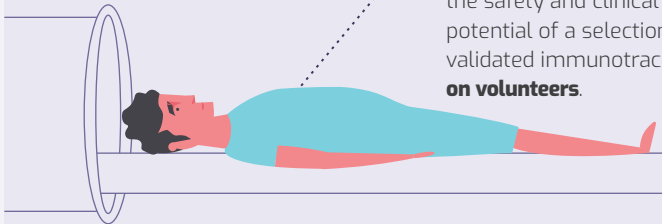
# 4 | Benefits for the patient

**Immunotherapies** are a promising treatment for **cancer** and **inflammatory diseases**. Boosting imaging technologies will allow us to better understand these therapies, and help them to be applied as soon as possible.

## Easier access to information

Practitioners will be able to study the efficacy of immunotherapies, with **non-invasive methods**, at **high resolution** and in **real time**. This knowledge will be a way to reduce failure of treatment.

## Getting the big picture

This approach provides practitioners with data at a whole-body level and at the disease site. This will allow them to better **evaluate the response to the immunotherapy**.

## Personalised therapies

The project will provide with a wide range of new imaging strategies for different immune cells. Therefore, it will be easier to **tailor immunotherapies** to each **patient**.

## Development of new treatments

Immunotracers will **speed up the development of new drugs** to help patients that do not respond well to current treatments.

# 5 | Funders & Partners

**Consortium**

Pfizer · VUB Vrije Universiteit Brussel · VIB · Roche · umcg · BAYER · cea · Antaros Medical · EUROPEAN CANCER PATIENT COALITION · Vall d'Hebron Institut de Recerca VHIR · EBERHARD KARLS UNIVERSITÄT TÜBINGEN · VHIO Vall d'Hebron Institute of Oncology · Takeda · WWU MÜNSTER · Janssen Immunology PHARMACEUTICAL COMPANIES OF Johnson&Johnson · LAWRENCIUM LEGAL · ttopstart a PNO life sciences & health group · lygature pioneering medicine. together. · ImaginAb · NOVARTIS · Amsterdam UMC University Medical Centers · UNIVERSITY OF CAMBRIDGE

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