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:

<table>
<thead>
<tr>
<th>Disease-site</th>
<th>Whole body</th>
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<tbody>
<tr>
<td>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.</td>
<td>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.</td>
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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.
What are immunotherapies?

Immunotherapies are a type of treatment that takes advantage of different kinds of cells that work together to keep us safe. These cells make up the immune system, which protects our body against threats, such as tumoral cells. It’s made of different components: protective cells that combat infections, and other cells that target cancerous cells. Immunotherapies use different molecules to boost the immune system or alternatively to target the disease. 

1. 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.

2. 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.

3. Funders & Partners

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Contact

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