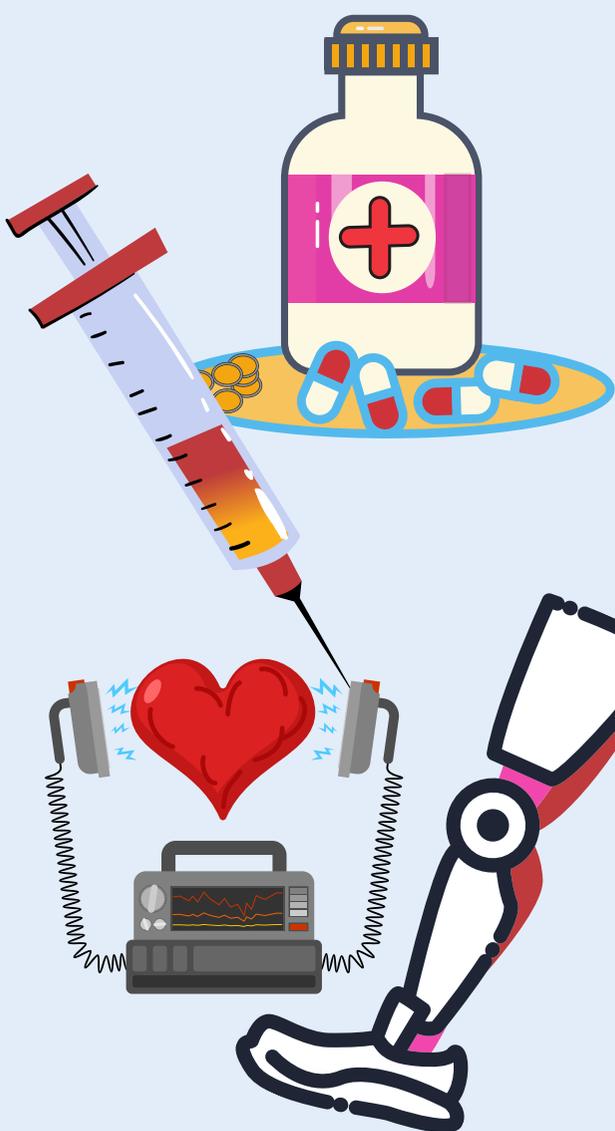
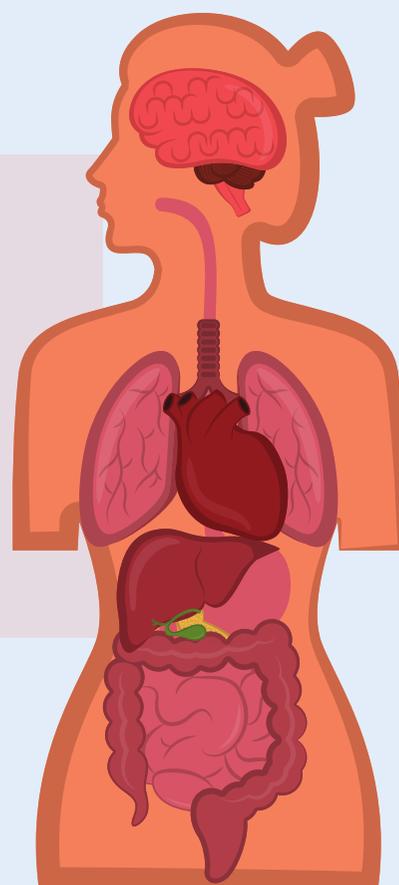


# Bio-artificial hybrids and medicine

The development of innovative medical tools and techniques now makes it possible to combine **biological** and **artificial** elements to recover from diseases.

## A perfect machine

The **human body** is a near-perfect machine that enables us to carry out a great many functions - even if we are sometimes unaware of it. We often become aware of this extraordinary organisation when, as a result of a **disorder**, something no longer works as it should.

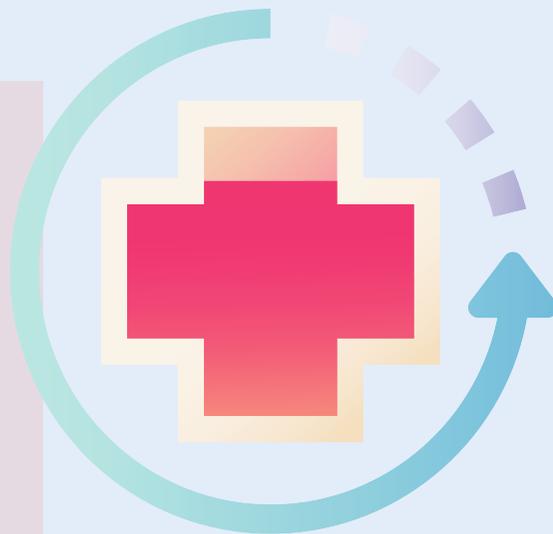


## The old paradigm

To treat disorders and diseases, the most studied and used medical approaches have been those based on **replacing** the missing or non-functional element with something artificial (a prosthesis, electronic stimulation, a molecule carried by a drug).

## Unity is strength

Today the advancement of scientific knowledge and the development of increasingly sophisticated technologies has made possible **hybrid therapeutic approaches**, i.e. based on the interaction between **biological** and **artificial** elements, which seemed pure science fiction only a few years ago. The aim is no longer just to replace, but to **integrate** and **regenerate**.



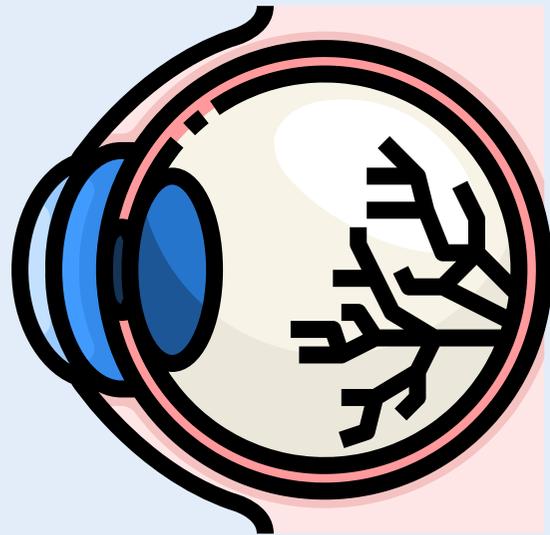


# Hybrid synapses for vision

The **HyVIS** project uses a nanotechnology-based approach to help people who have lost their sight due to retinal degenerative diseases.

## Broken communication

Degenerative **retinal diseases** affect light-sensitive **photoreceptors**, depriving the **inner retinal neurons** of synaptic input. The ability to see is thus impaired, if not completely compromised.

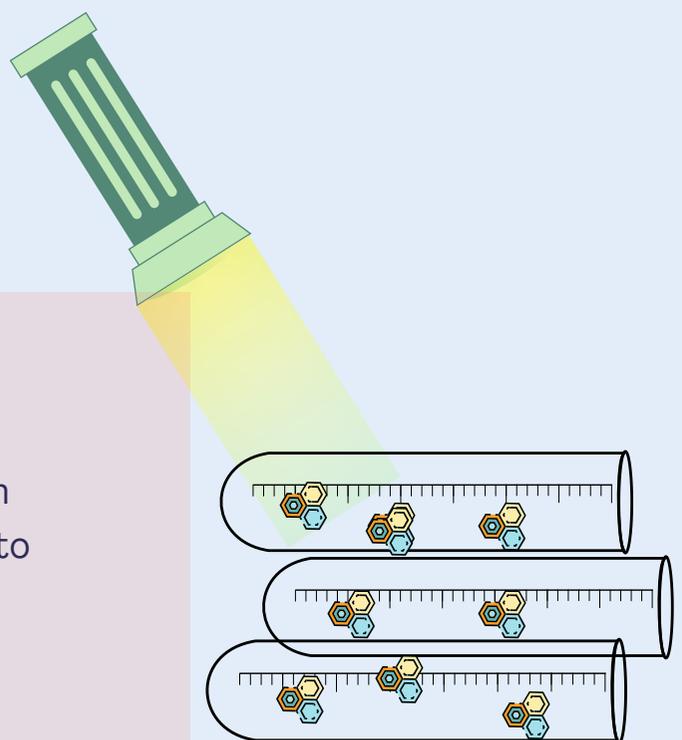


## HyVIS

The **HyVIS** project aims to stimulate these neurons using a highly innovative method with very **high spatial resolution**, which is able to recreate the connection between neurons through the creation of '**hybrid nano-synapses**'.

## The approach

The surviving retinal neurons are interfaced with **polymer-laden nano-channels**, which are able to **release neurotransmitters in response to an optical stimulus** ( i.e. light, just as happens in neurons that have been lost).



Find more about the HyVIS project, following its results and developments, on:



<https://hybrid-vision.eu>

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