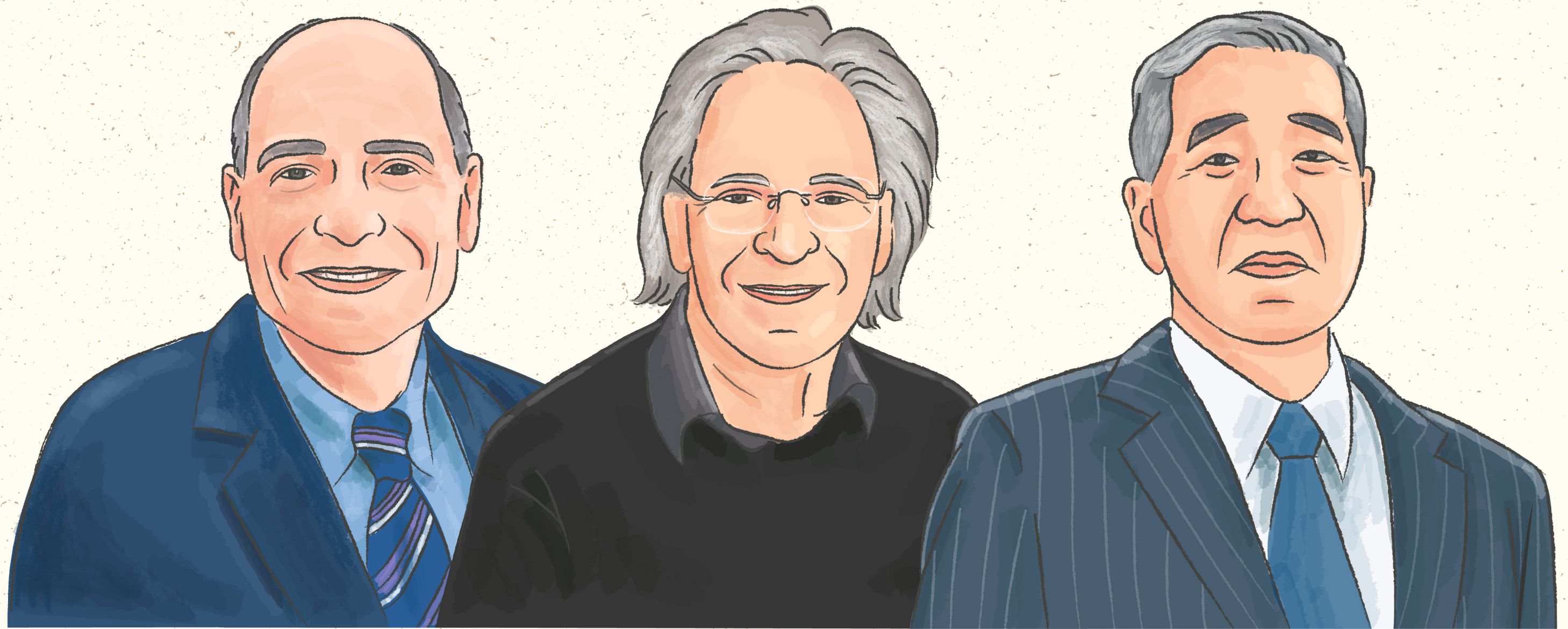


—• 2020 •—

Tang Prize

BIOPHARMACEUTICAL SCIENCE



◆ Charles Dinarello ◆ ◆ Marc Feldmann ◆ ◆ Tadamitsu Kishimoto ◆

Is inflammation good or bad?

An **inflammatory response** is a way our immune system combats infection.

But when the system goes on overdrive, **autoimmune** and **auto-inflammatory** diseases can happen.

(e.g. **type 1 diabetes, rheumatoid arthritis, psoriasis, inflammatory bowel disease, lupus, and many more**)

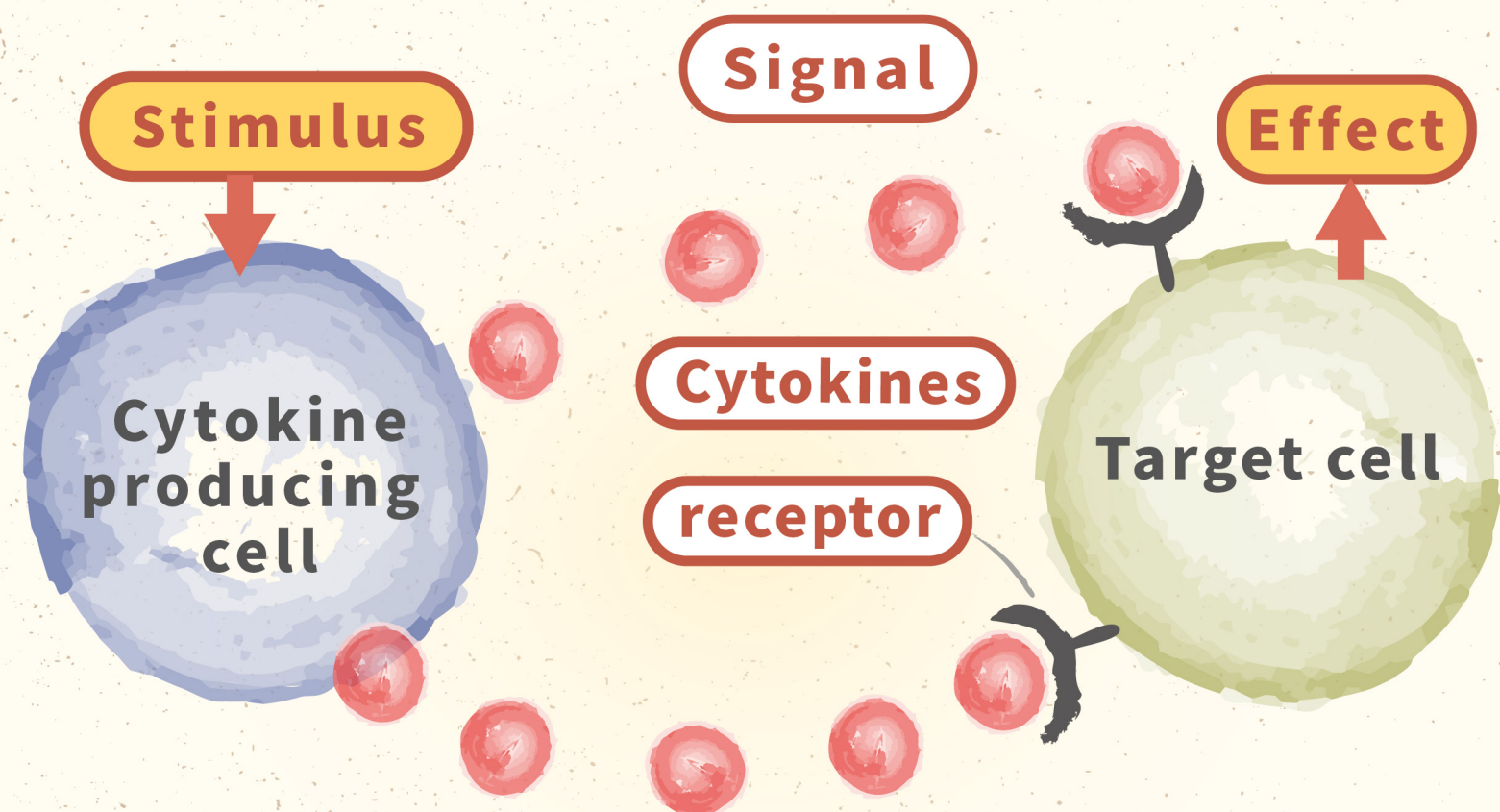
Severe complications can arise, and may even be fatal.



Critical factors in inflammatory diseases

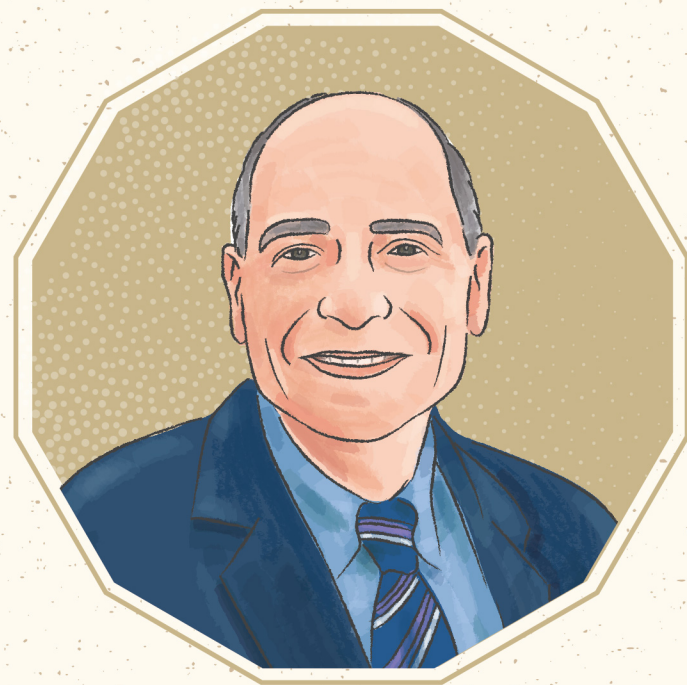
The three laureates identified the critical role of “cytokines” in inflammatory reactions, **namely tumor necrosis factor (TNF), interleukin-1 (IL-1), interleukin-6 (IL-6).**

- Cytokines are messengers of the immune system. They act through cell surface receptors to deliver messages among cells.



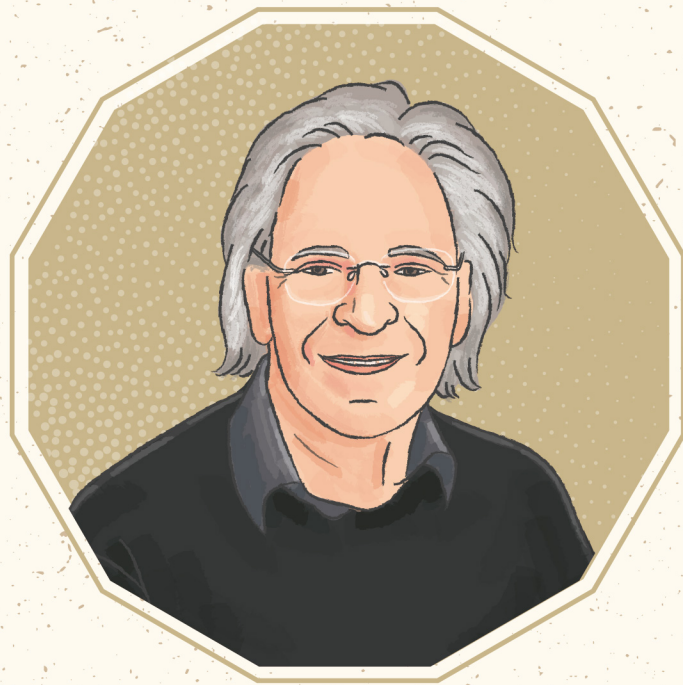
Their Contributions

👑 They are awarded the Prize for the development of cytokine-targeting biological therapies for the treatment of inflammatory diseases.



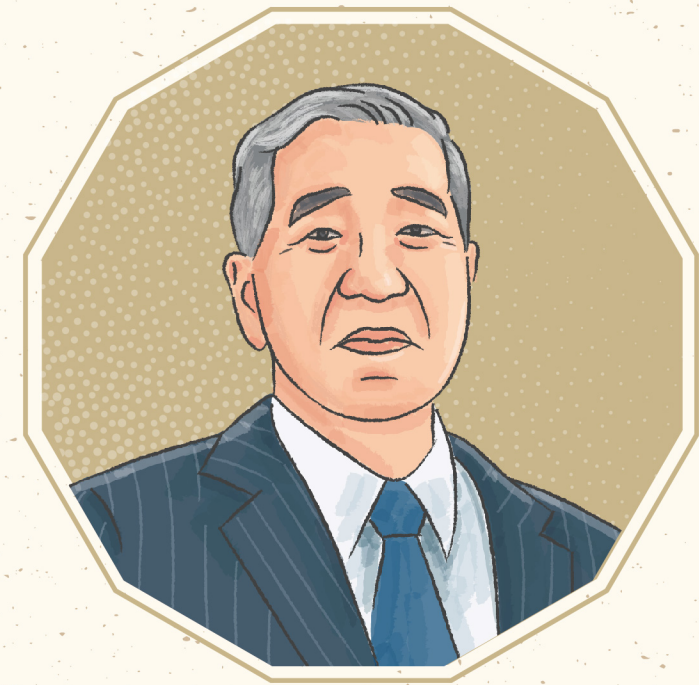
Charles Dinarello 🍊

Identified and cloned IL-1 β , a central mediator in fever and inflammation. He is considered one of the founding fathers of cytokines.



Marc Feldmann 🍋

Achieved groundbreaking success in blocking TNF with an antibody for the treatment of rheumatoid arthritis.



Tadamitsu Kishimoto 🍌

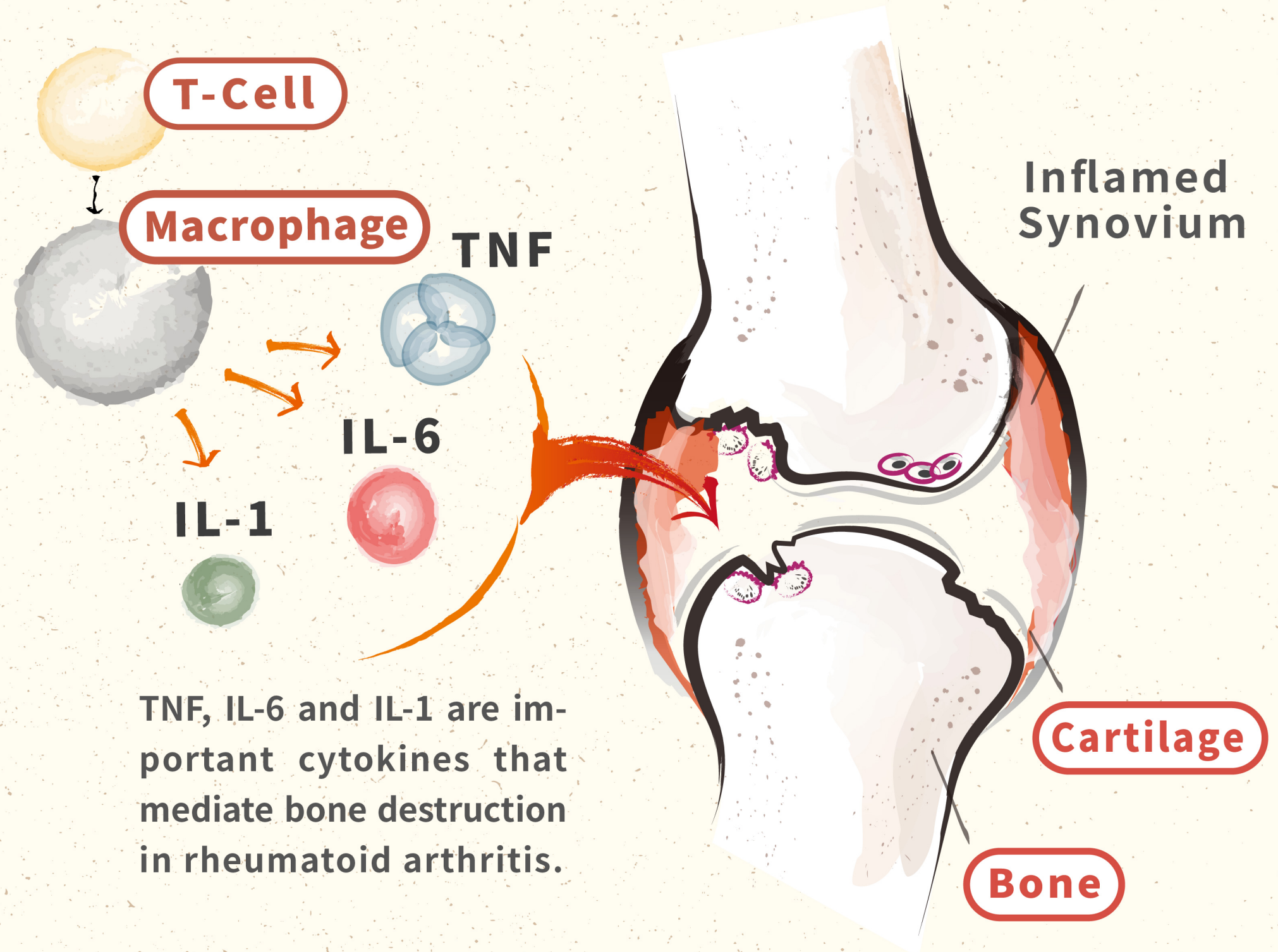
Identified and cloned IL-6 and its receptor, and also developed an inhibiting antibody against the receptor, taking basic research all the way through to clinical application.

Cytokines and Inflammation

Rheumatoid arthritis is one of the most common autoimmune diseases.

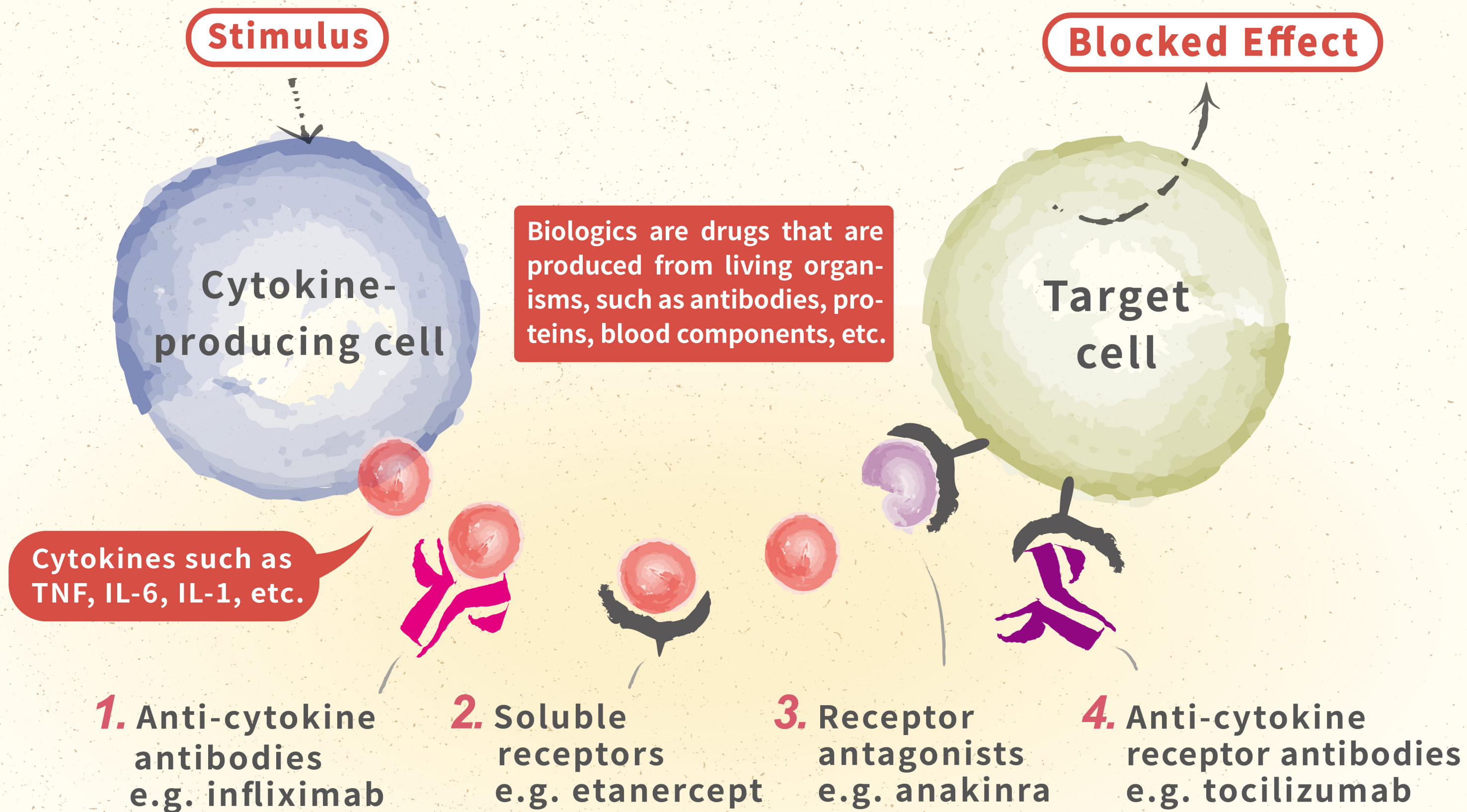
TNF、IL-6、IL-1 are three major pro-inflammatory cytokines. Too much of them can cause disease.

- There are other cytokines that are anti-inflammatory.



TNF, IL-6 and IL-1 are important cytokines that mediate bone destruction in rheumatoid arthritis.

Cytokine-targeting biologics can be used as a therapy



The era of cytokine-targeting biologics

Biologics are precision weapons with the least side effects, made possible because we now know the targets.

Biologics helped many patients **regain their lives** and were considered nothing short of miracles at the time of invention.

Approximately **5-10%** of the world's population suffers from inflammatory diseases.

The world's top-selling prescription drug is a cytokine-targeting biologic drug.

Alone in **the U.S.**, there is an estimated **24-50 million** patients who suffer from autoimmune diseases.



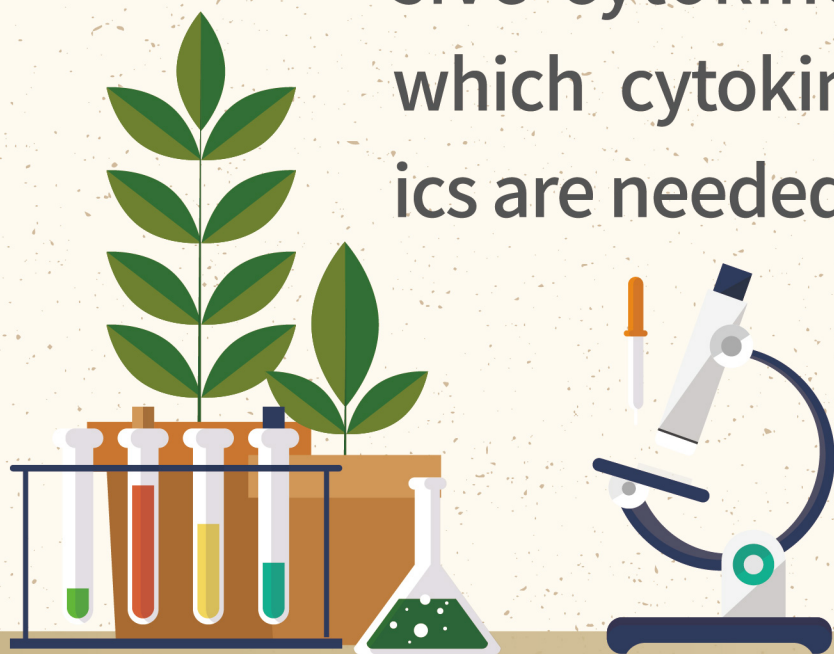
Wide range of applications

In addition to autoimmune diseases, cytokine-targeting biologics have shown importance in the treatment of the following two diseases:



Cancer

Immunotherapy, which is based on activating the immune system, is becoming a mainstream cancer treatment, but sometimes excessive cytokines are released in which cytokine-targeting biologics are needed.



COVID-19

Severe COVID-19 symptoms are usually caused by “cytokine storms”, in which cytokines are over-secreted. Cytokine inhibitors, especially **anti-TNF, IL-6 and IL-1**, hold great potential and are being tested in clinical trials worldwide.

