

USE OF A TERC TELOMERASE APTAMER AS IMMUNOMODULATOR OF THE IMMUNE RESPONSE

A research team from UMU, FFIS and CIBER has identified a novel use of an aptamer of TERC telomerase with immunomodulator activity of the immune response, with potential activity in inflammatory and infectious diseases.

The Need

The lack of effective and targeted therapies for many inflammatory and infectious diseases highlights the urgent need to identify novel molecular mechanisms that could lead to innovative therapeutic strategies.

In this context, to date, no study has established a role for TERC in regulating intracellular bacterial resistance and inflammation resolution through modulation of the inflammasome in macrophages, representing an important knowledge gap with potential therapeutic implications.

The Solution

The present invention describes the use of a novel aptamer as a modulator of the immune response, with potential applications in inflammatory and infectious diseases.

Specifically, an RNA sequence derived from telomerase TERC is described in relation to its immunomodulatory activity and its ability to modulate inflammasome-related responses, supporting its potential as a candidate for the development of therapeutic approaches for a range of conditions associated with inflammation.

Innovative Aspects

- ✓ **Broad potential applicability:** Potential utility across a wide range of indications associated with inflammatory responses, including both inflammatory and infectious diseases.
- ✓ **Structural affinity and manufacturing advantages:** Favorable structural affinity and lower production complexity compared with other therapeutic approaches, such as therapeutic antibodies and antisense oligonucleotides.
- ✓ **Multifunctional mechanism of action:** A combination of activities, including the inhibition of sterile inflammation, attenuation of infection-induced inflammation, activation of the canonical inflammasome, and potential enhancement of granulopoiesis.
- ✓ **Macrophage specificity:** Preferential activity in macrophages, which may help limit the risk of systemic off-target effects.
- ✓ **Straightforward chemical synthesis:** The aptamer can be produced through relatively simple and scalable chemical synthesis, facilitating its potential development and manufacturing.

Stage of Development: Preclinical proof of concept established through in vitro studies and in vivo validation in zebrafish models of COVID, bacterial infection, acute inflammation and skin chronic inflammation.

Reduction of proinflammatory cytokines, increment of inflammasome activity, inflammation resolution and increase of survival rate.

Intellectual Property:

National Patent Application in 2026.



Aims

Seeking partners interested in licensing and/or co-development agreements to advance this technology toward clinical translation and commercialization.

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