

Technology Offer

Regenerative Therapy of Inflammatory Diseases

Reference Number
TO 02-00056

The Challenge

Acute inflammation and - much more important - chronic inflammation like in rheumatoid arthritis (RA) are a major challenge for the public health system. The financial and social impact of RA is substantial, both for the public health authorities and for individuals. From an economic standpoint, the medical and surgical treatment for RA and the wages lost because of disability caused by the disease add up to billions of dollars annually. Daily joint pain is an inevitable consequence of the disease, and most patients also experience some degree of depression, anxiety, and feelings of helplessness. For some people, RA can interfere with normal daily activities and limit job opportunities. RA affects approximately 30 out of 100.000 people, which corresponds to about 2 million people in USA alone, and occurs mainly in the middle ages of 40 to 60 years.

RA is characterised by synovial inflammation and cartilage, bone and tendon destruction. It leads to an irreversible loss of joint function in affected individuals. Novel strategies to interfere with inflammation and to enhance tissue repair would have a significant impact for affected patients.

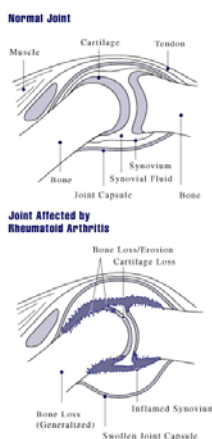
Contact:

Sabina Heim, Ph.D.
Technology Manager
Ascenion GmbH

T: +49 (0)531 6181-2090
F: +49 (0)531 6181-2098
E: heim@ascenion.de

The Technology

The invention is directed to methods and compositions in TAK-1 mediated regulation of Smad activity in the affected tissue. The signal mediator TAK-1 (transforming growth factor beta-activated kinase), a central mediator of inflammation, interacts with Smad protein resulting in a modulation of the Smad protein activity, including the BMP-mediated Smad activity. TAK-1 inhibition leads to downregulation of Smad protein activity, which results in corresponding downregulation of inflammatory processes and leads to stimulation of osteogenesis at the same time. This inventive method can be used for a regenerative therapy in chronic inflammatory diseases such as e.g. rheumatoid arthritis.



Source: National Institute of Arthritis and Musculoskeletal and Skin Diseases



Berlin
Braunschweig
Hamburg
Hannover
Munich

Commercial Opportunity

Advantages of the offered technology are:

- TAK-1 as molecular target for successful therapy of a variety of inflammatory diseases
- Innovative strategy for therapy of e.g. rheumatoid arthritis
- Stop of inflammation and at the same time stimulation of bone regeneration

Ascenion GmbH
Herzogstrasse 64
80803 Munich
Germany

Patent situation

Pending European, US and Indian patent applications based on WO 2004/087862.

Further Reading

Transforming growth factor-beta-activated kinase-1 (TAK1), a MAP3K, interacts with Smad proteins and interferes with osteogenesis in murine mesenchymal progenitors. Hoffmann et al. (2005), J. Biol. Chem.280; 27271-27283.

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