Imperial College London

Treatment of Tissue Fibrosis

Itaconate and itaconate analogues capable of inhibiting succinate dehydrogenase can be used to treat or prevent tissue fibrosis.

Proposed use

Compounds for use in the treatment of fibrosis.

- Idiopathic pulmonary fibrosis
- Liver fibrosis, kidney fibrosis, intestinal fibrosis, cardiac fibrosis, myelofibrosis and/or skin fibrosis.

Problem addressed

Lung fibrosis often results in response to chronic respiratory disease, disturbing the normal architecture of the lungs, which ultimately leads to their dysfunction and failure. Current treatment options are poor, leading to poor prognosis. Particularly in idiopathic pulmonary fibrosis, with a median survival of 3 years post diagnosis. Fibrosis may also be a consequence of other diseases like certain forms of asthma

Technology overview

Itaconate is encoded by the gene *ACOD1* and plays a critical role in limiting fibrosis by inhibiting the enzyme succinate dehydrogenase. Patients with idiopathic pulmonary fibrosis have decreased expression of *ACOD1* and reduced levels of itaconate in the airways. This invention provides compounds, itaconate and itaconate analogues that inhibit succinate dehydrogenase to treat or prevent fibrosis

Intellectual property information

An IP package protecting Itaconate and Itaconate analogues for the treatment of fibrosis has been filed

- Itaconate: PCT application was filed in September 2020. PCT/GB2020/052218. National fillings in US, Australia, Canada and Japan are being pursued.
- Itaconate analogues: A PCT application was filed in March 2023. PCT/GB2023/050629

Link to published paper(s)

https://pubmed.ncbi.nlm.nih.gov/33097591/

Inventor information

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Benefits

- Itaconate has been shown to alleviate lung fibrosis in mice.
- Itaconate analogues show enhanced anti-fibrotic effects compared to itaconate
- Itaconate analogues are more soluble than itaconate.
- Improved patient survival and quality of life
- Likely to reduce disease progression.
- Can be applied to treat tissue fibrosis for a range of diseases.

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