ESA Patentverwertungsagentur
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Technology Offer

A-Ring-Aromatized Acetyl-Minocyclines

Background

The tetracycline derivative minocycline is a clinically used antibiotic and exhibits anti-inflammatory, neuroprotective and cytoprotective properties, which has been shown in various models such as Parkinson's diseases, Alzheimer's disease, ischemia, amyotrophic lateral sclerosis, traumatic brain injury, Huntington's disease, spinal cord injury, and multiple sclerosis. Because of the proven safety and the effective crossing of the blood-brain barrier minocycline is currently under clinical investigation for several neurodegenerative diseases. However, high dosages of this antibiotic are needed and routinely or prophylactic application will raise further problems such as bacterial resistance.

Novel substances

The aim was to improve the pharmacokinetics of minocycline in combination with the elimination of the antibiotic activity. The novel substances - Tetra- and Pentaacetylcycline (Figure 1) - show similar neuroprotective potential as minocycline but do not possess antibiotic activity. Intraperitoneal and surprisingly also oral application of Pentaacetylcycline in an *in vivo* mouse model of Multiple Sclerosis (Experimental Autoimmune Encephalomyelitis, EAE) revealed a relief of symptoms in the acute phase of the disease (Figure 2). These data are supported by histological investigations of inflammatory infiltrates in the spinal cord of EAE mice. Further *in vitro* studies on vitality, proliferation, and cytokine production of stimulated human T-lymphocytes as well as mouse splenocytes point out the high therapeutic potential of the provided compounds at comparably low concentrations (see also EP2659887). Thus, the probability of adverse side effects is reduced.
The data support the idea that the provided substances are promising candidates for the treatment of T cell-mediated autoimmune diseases. Moreover, they show good potential for application as immune suppressors in the context of transplantation. The obtained semi-synthetic substances are promising candidates for further neuro- and cytoprotective drug development.
The method for synthesis and purification of such derivatives of minocycline is also protected. A-Ring-aromatized single and multi-acetylated derivatives are synthesized in a one-step reaction.

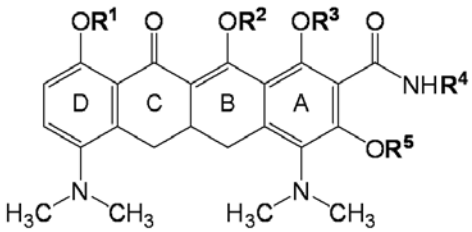

Figure 1

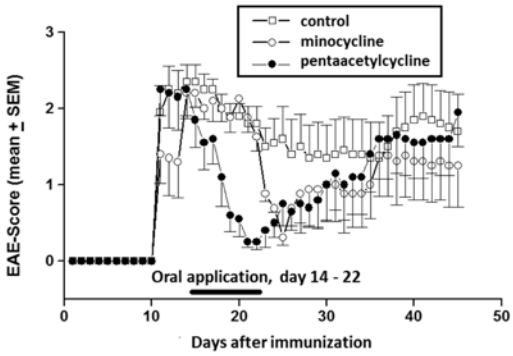

Figure 2

Commercialization

We are seeking to establish collaboration and licensing relationships to develop these substances for application as drugs.

Patent status

Patent providing substance protection granted.

www.inventionstore.de: Free e-mail service to access the latest IP-protected top technologies.

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