**Benzothiazole Derivatives as CK-1 Inhibitors for the Treatment of Amyotrophic Lateral Sclerosis**

CSIC has synthesized a family of benzothiazoles which acts as casein kinase 1 (CK-1) inhibitors. Therefore, these compounds are useful for the treatment of diseases related to circadian rhythm and neurodegenerative, inflammatory, autoimmune, neurological and psychiatric diseases where CK-1 is relevant. Furthermore, these compounds induce cell regeneration.

Pharmaceutical companies interested in a patent licence are sought for.

*An offer for Patent Licensing*

**CK-1, an innovative target for the treatment of ALS**

Casein kinase 1 enzyme, a kinase protein, is involved in numerous regulatory processes which are closely associated with many diseases: transoceanic syndrome, sleep disorders, multiple sclerosis, Crohn’s disease, bipolar disorders, depression, Alzheimer’s disease, frontotemporal dementia, glaucoma, pigmentary retinopathy, Parkinson and also CK-1 takes part in regenerative processes, such as cell regeneration in retina.

TDP-43 protein (TAR-DNA-Binding protein 43) is responsible for the appearance of abnormal protein aggregates in the cytoplasm of motor neurons from patients with ALS. The CK-1 enzyme promotes this aggregation by hyperphosphorylation of TDP-43. Therefore, its inhibition may be key in the treatment of ALS.

These benzothiazole derivatives inhibit effectively CK-1 enzyme. The inhibitory activity measurement was performed by employing the luminometric method of kinase-glo® with recombinant human enzyme CK-1δ. IC50 (concentration that inhibits 50% of activity) in vitro of the best compounds are in the nanomolar range (10 – 47 nM).

**Main innovations and advantages**

- New benzothiazole-benzylamides characterized by an inhibition potency of CK-1 enzyme in the nanomolar range.
- Benzothiazole compounds are a promising alternative in the search for treatments for currently incurable diseases
- They are able to cross the blood brain barrier, an essential property for any drug which has to act in the brain.

**Patent Status**
Patent filled in Europe and US

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