Regulatory compounds of synaptic transmission for the treatment of neurological diseases

The CSIC and IRYCIS (Ramón y Cajal Institute for Health Research) have developed a group of compounds. These compounds have the ability to regulate the number of synapses that are formed between neurons, as well as the probability that neurotransmitters are released from these, because they have the capability of modulate the interactions that take place between the regulatory proteins NCS-I and Ric8a that regulate these two independent processes. Due to these neuromodulatory properties, these compounds are useful for the treatment of neurological diseases as Alzheimer's disease, Huntington or Parkinson's diseases among others.

Industrial partners from the ophthalmic or pharmaceutical industry are being sought to collaborate through a patent license agreement.

An offer for Patent Licensing

Fighting the effects of neurological diseases using chemical compounds that increase the numbers of synapsis

The proteins NCS-I and Ric8a interact forming protein complexes that are fundamental for the formation of synapses and the release of neurotransmitters from these ones. Our chemical compounds, which have a structural nucleus of acylhydrazone, facilitate and stabilize the formation of this protein complex with dual function. It has been tested in different neurodegenerative models of Alzheimer in Drosophila, that the supply of these compounds in the diet, restore the number of synapses (see Figure 1) and the motor activity is fully recovered (Figure 2). Due to the very high conservation of the mechanisms and regulatory proteins of these processes between Drosophila and mammals, very promising results are expected in the treatment of neurological diseases in humans such as Alzheimer, Huntington or Parkinson with these compounds, where there is a drastic reduction in the number of synapses and in the release of neurotransmitters.

Main innovations and advantages

- No other compounds have been described that increase the number of synapses through the NCI / Ric8a complex.
- The regulation of the NCI / Ric8a complex is fundamental due to its dual role on the number of synapses and the release of neurotransmitters, which very significantly increases the potential of these compounds as a therapeutic agent in long-term treatments of neurological diseases.
- There are high expectations that these compounds will serve as pharmacological agents for the treatment of neurological diseases produce by the reduction in the number of synapses and neurotransmitters released.

Patent Status

Priority patent application filed

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