Guadalupe Valverde Aguilar et al., Pharmaceut Reg Affairs 2017, 6:1(Suppl)
DOI: 10.4172/2167-7689-C1-025

Release of dopamine encapsulated in a TiO_2 matrix in the striatum improves the motor activity in hemiparkinsonism model of the rat

Guadalupe Valverde Aguilar[1], **Patricia Vergara Aragón**[2], **Martha Chico Vázquez M T A**[1], **Mónica R Jaime Fonseca**[1] and **Patricia Santiago Jacinto**[2]
[1]CICATA- Instituto Politécnico Nacional, México
[2]Universidad Nacional Autónoma de México, Mexico

Statement of the Problem: Parkinson´s disease is a neurodegenerative disorder characterized by progressive loss of dopaminergic neurons in the substantia nigra causing dopamine depletion in the striatum. The purpose of this research was to evaluate the temporal stability of dopamine encapsulated in a titanium dioxide (TiO2) matrix synthesized by sol-gel method under atmospheric conditions. The formation of the oxidation products from dopamine were analyzed by color change of the microimplant, optical absorption and infrared spectroscopy. The evaluation *in vivo* on the locomotor activity in the open field test of hemiparkinson rat model was studied.

Material & Methods: a) TiO2 precursor solution. A mixture of Tetrabutyl orthotitanate and diethanolamine which prevent the precipitation of oxides and stabilize the solutions was obtained with deionized water. Tetraethyleneglycol was added to the above solution under stirring. b) TiO2/DA solution. To 20 ml of TiO2 solution prepared in section (a), the Dopamine was added and the sol was stirred at room temperature under darkness. The states of dopamine oxidation were evaluated using infrared spectroscopy. Forty Wistar rats were divided into 4 groups: Sham, Lx (hemiparkinsonian), Lx + TiO2/DA matrix, and TiO2/DA matrix only. Induced rotation test and locomotor activity task were performed on days 0, 1, 21, 90 days after the insertion of the TiO2/DA in the caudate nucleus.

Findings: Results show that the TiO2 matrix can protect the dopamine inhibiting its chemical instability and retarding its oxidation gradually. Less induced rotations and better performance in the locomotor activity during the 90 days of the experimental evaluation suggest that probably dopamine successfully stabilized and it was released from its reservoir in the striatum.

Conclusion: Advantages of this treatment are its easy and fast elaboration, low cost and immediate benefits on the motor disturbances presented by the animals with hemiparkinsonismo.

Biography

Guadalupe Valverde Aguilar obtained her PhD in Physics (2003) at Institute of Physics, UNAM. Her Post-doctoral stay was made in UCLA, USA for two years. Her research is focused on electrical and optical properties from amorphous and nanostructured sol-gel materials. Her field of research includes photoluminescence, drug delivery, photoconductivity and hydrogen production. She has published 58 papers in international journals.

valverdeag@gmail.com

Notes: