

^{99m}Tc-Spiperone Dithiocarbamate Kit, a Potential Diagnosis Agent for Dopaminergic D₂ Brain Pathologies: Biodistribution Studies

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Psychopharmacology has been discovering much about the D₂ dopamine receptors and their interrelationship with brain pathologies, such as Parkinson's disease, schizophrenia and Huntington's disease. Those biological receptors have high affinity for endogenous dopamine so that, in normal individuals, they contribute to bring free dopamine and free acetylcholine levels into equilibrium. *Post mortem* brain studies in schizophrenic individuals have shown that these patients have a large amount of D₂ receptors. Therefore, free dopamine (non complexed) levels are lower than those found in healthy individuals. On the other hand, Parkinson's patients generally have anatomical-pathological evidences, such as injuries in the *substantia nigra* and nigrostriatal dopamine fibers, so that dopamine decreases in these areas.

Thus, as D₂ antagonistic psychotropic agents have

strong affinity with those receptors, they are being transformed into radiopharmaceuticals to diagnose those central nervous system pathological diseases. The liposoluble spiperone dithiocarbamate complex is a potential diagnosis agent, due to its high affinity for the D₂ receptors. Besides, it is a photon emitter, allowing the use of the SPECT technique, which is considerably less expensive than PET procedures.

So, we have synthesized spiperone dithiocarbamate (SPDC) from spiperone, and its complexation with technetium-99m has been prepared with its reaction parameters, after being studied and improved.

The ^{99m}Tc-SPDC complex biodistribution study has been made in Wistar rats and the uptake of spleen, heart, liver, stomach, lung, kidney, blood, intestine and brain have been evaluated. Interesting results have been observed when we have blocked the D₂ receptors with Haloperidol, before injecting ^{99m}Tc-SPDC for the biodistribution study. In this condition, the *striatum*, cortex and *cerebellum* uptakes have become very low, thus suggesting the existence of a drug-receptor complexation. The plasma clearance curve has been based on Wistar rats data, and the know-how of the frozen kit has been achieved.