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### Synthesis and biological evaluation of a novel Tc-99m radioligand for brain

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**T**he present study investigated eight rice lines (Rupsal, Background and aim: The synthesis, characterization and biological evaluation of N-Tolueneferrocenecarboxamide labeled with technetium-99m ( $^{99m}\text{Tc}$ -TTCC) is reported. Biological studies in Wistar rats showed the ability of  $^{99m}\text{Tc}$ -TPCC to cross the intact blood-brain barrier.

**Methods:** The *in vivo* behavior of  $^{99m}\text{Tc}$ -TTCC was evaluated in healthy wistar rats at different time points.

**Results:** *In vivo* biodistribution indicated that this complex had good brain uptake (1.32 % ID/g at 5 min and 0.65 % ID/g at 60 min) and good retention (about 50% of the activity was retained in the brain at 60 min post-injection).

Regional brain distribution study showed that hippocampus, where the 5-HT<sub>1A</sub> receptor density is high, had the highest

uptake (0.72% ID/g at 5 min *p.i.*) and the cerebellum, where the 5-HT<sub>1A</sub> receptor density is low, had the lowest uptake (0.12% ID/g at 5 min *p.i.*).

After blocking with 8-hydroxy-2-(dipropylamino) tetralin, the uptake of hippocampus was decreased significantly from 0.72% ID/g to 0.18% ID/g at 5 min *p.i.*, while the cerebellum had no significant decrease. This result indicates that  $^{99m}\text{Tc}$  complex has specific binding to 5-HT<sub>1A</sub> receptor.

**Conclusion:** A  $^{99m}\text{Tc}$ -TTCC has been successfully prepared in good yield. Based on the results reported here, we conclude that  $^{99m}\text{Tc}$ -TTCC is a lipophilic compound. The biodistribution studies in mice showed that this compound had a significant brain uptake.

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