



1,2,3,4-Tetrahydroisoquinoline has shown antidepressant properties in the modified rat forced swimming test

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Background:

The forced swimming test (FST) is the most widely used model for assessing pharmacological antidepressant activity [1,2]. 1,2,3,4-Tetrahydroisoquinoline (TIQ) and its derivatives are exogenous and endogenous amines present in the mammalian brain.

They may be natural regulators of monoaminergic systems with a visible neuroprotective potency how it was recently demonstrated in the rodent brain [3].

The aim:

To determine potential antidepressant properties of TIQ in comparison with a classic antidepressant drug, imipramine (IMI).

Materials and Methods:

ANIMALS

The experiments were carried out on male Wistar rats (Han, Charles River) weighting 240-270g, kept under standard laboratory food and tap water, at room temperature of approximately 22°C, in a natural day-night cycle.



THE BEHAVIORAL STUDY

60 min

The forced swimming test

decapitation & brain structures isolation

DRUGS

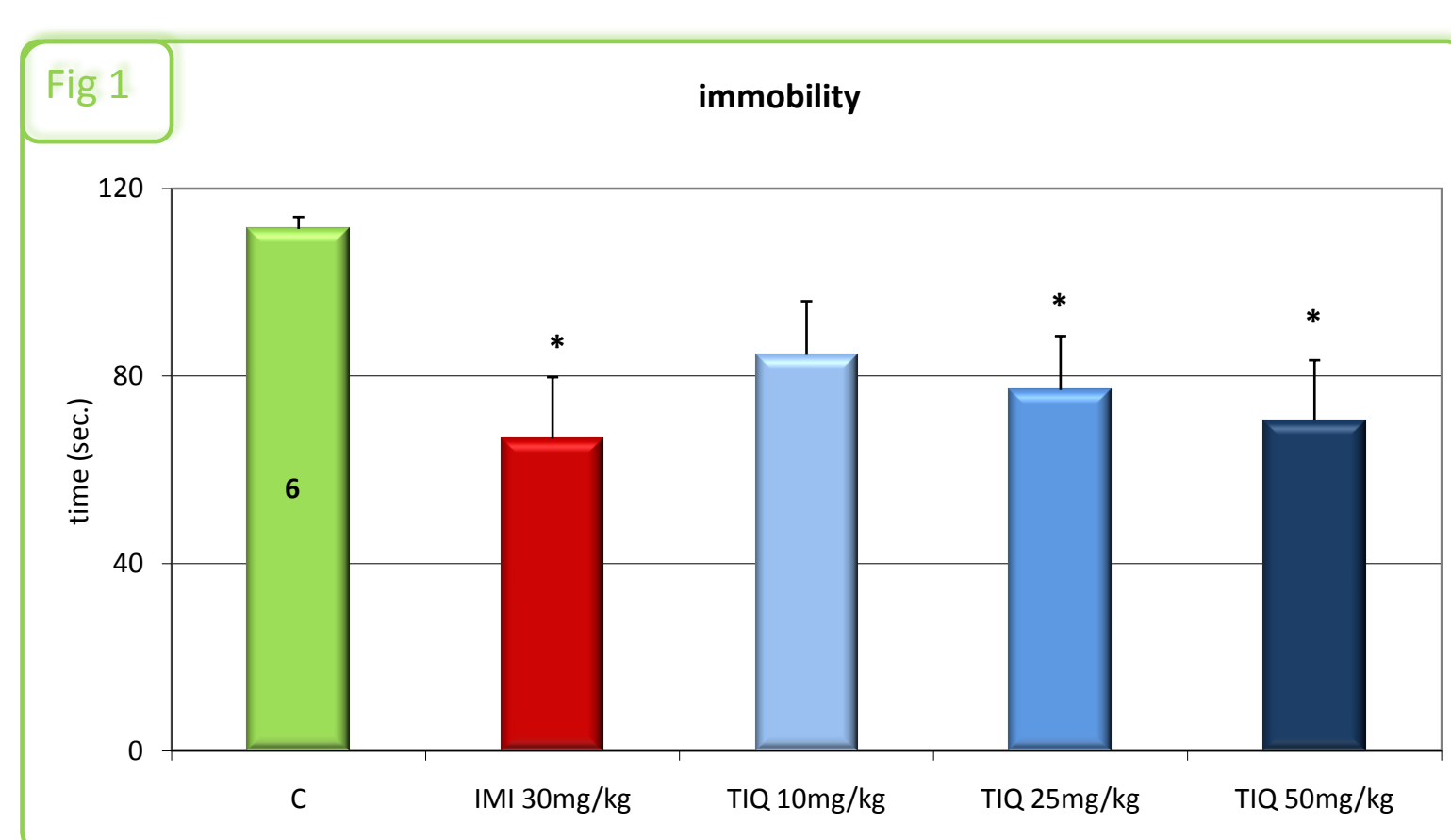
TIQ was given in doses:
×10 mg/kg i.p.
×25 mg/kg i.p.
×50 mg/kg i.p.

THE BIOCHEMICAL STUDY

The concentration of DA, NA, 5-HT and their metabolites, as well as the rate of metabolism in rat brain structures was estimated using HPLC methodology with electrochemical detection.

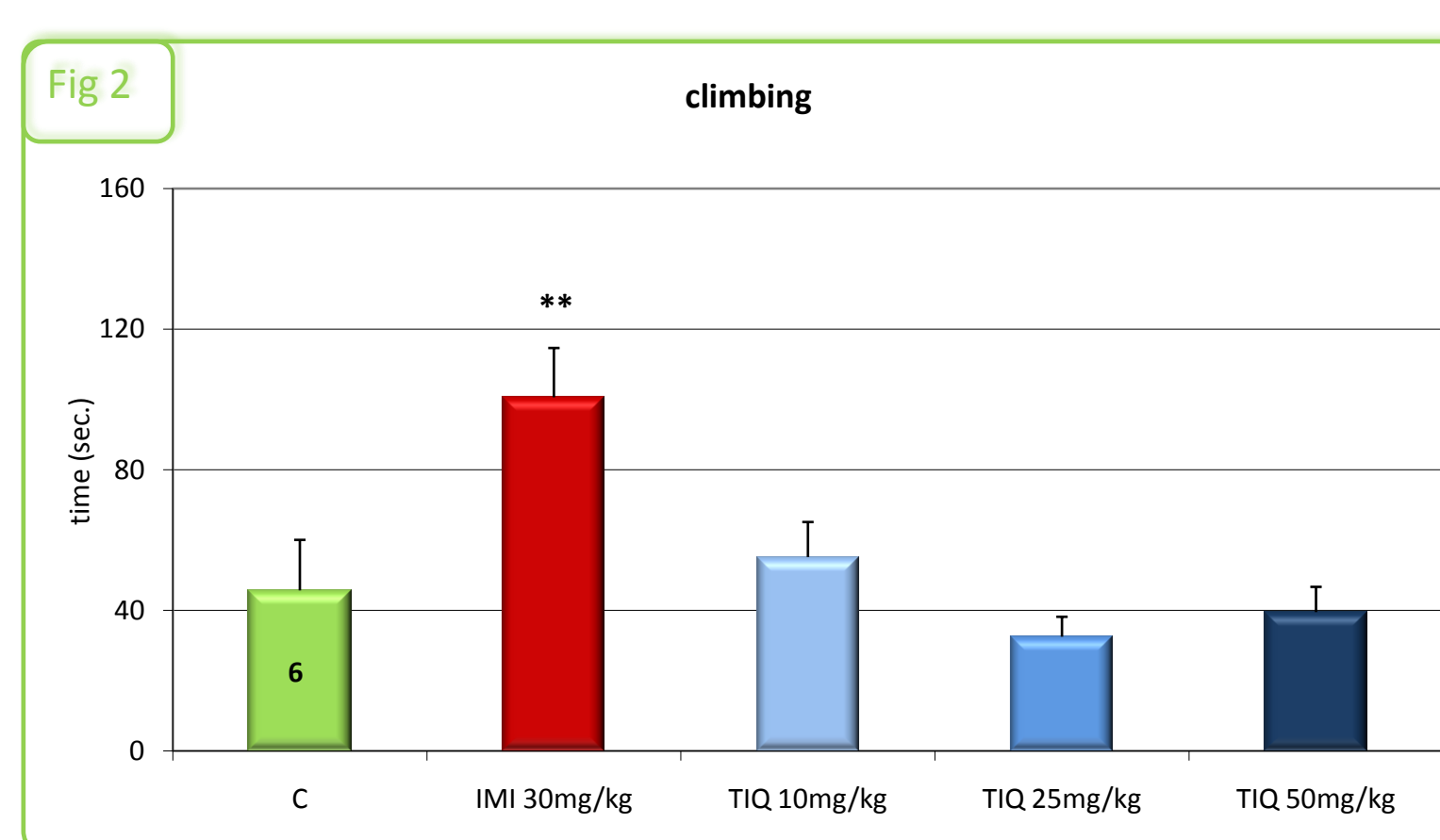
Results:

THE BEHAVIORAL STUDY

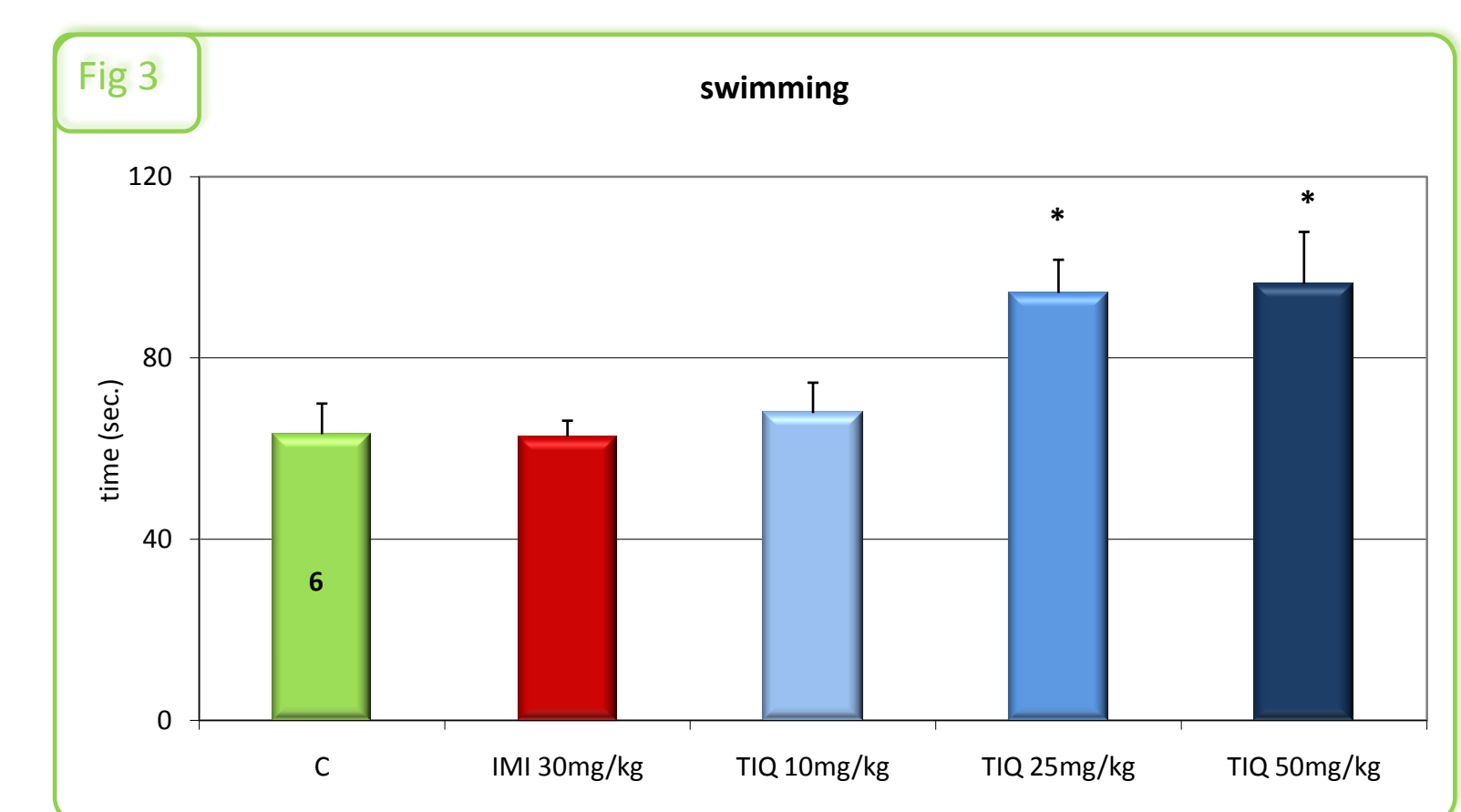


TIQ and IMI ↓ immobility time

The effect of TIQ on rat behavior in FST



IMI ↑ climbing time
(activation of NA system [2])

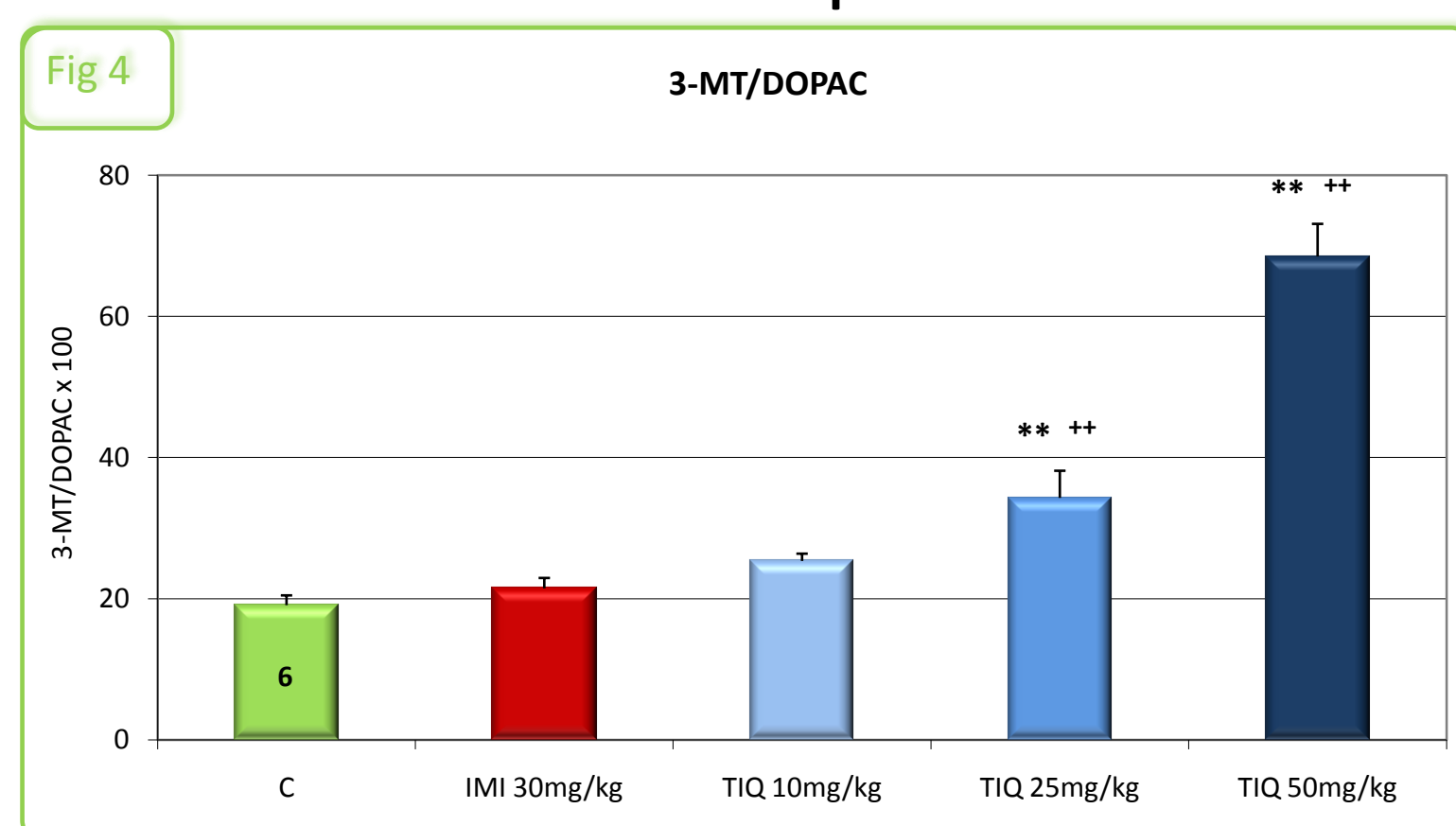


TIQ ↑ swimming time
(activation of 5-HT system [2])

THE BEHAVIORAL STUDY

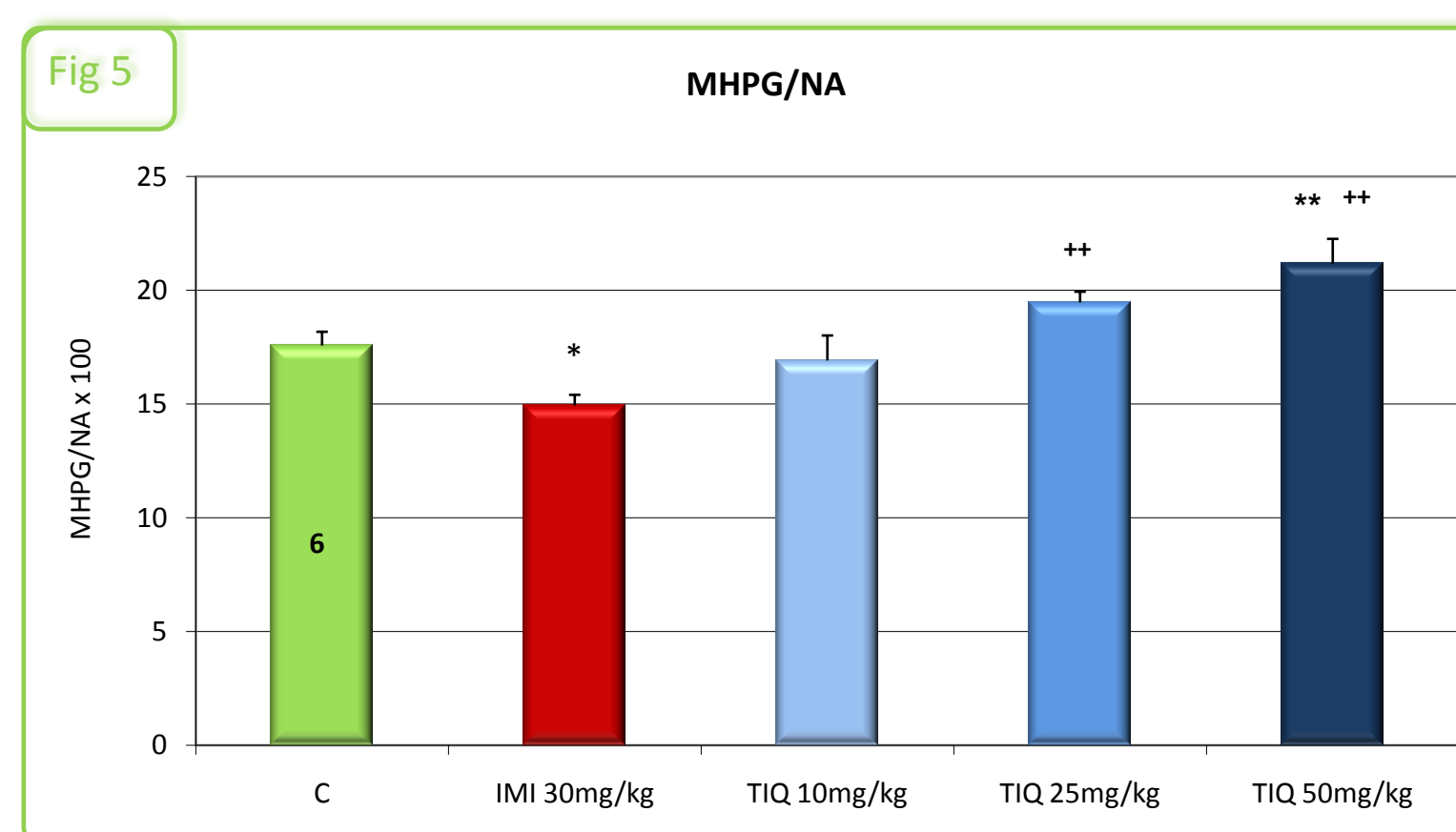
The inhibition of DA re-uptake in rat striatum

THE BIOCHEMICAL STUDY



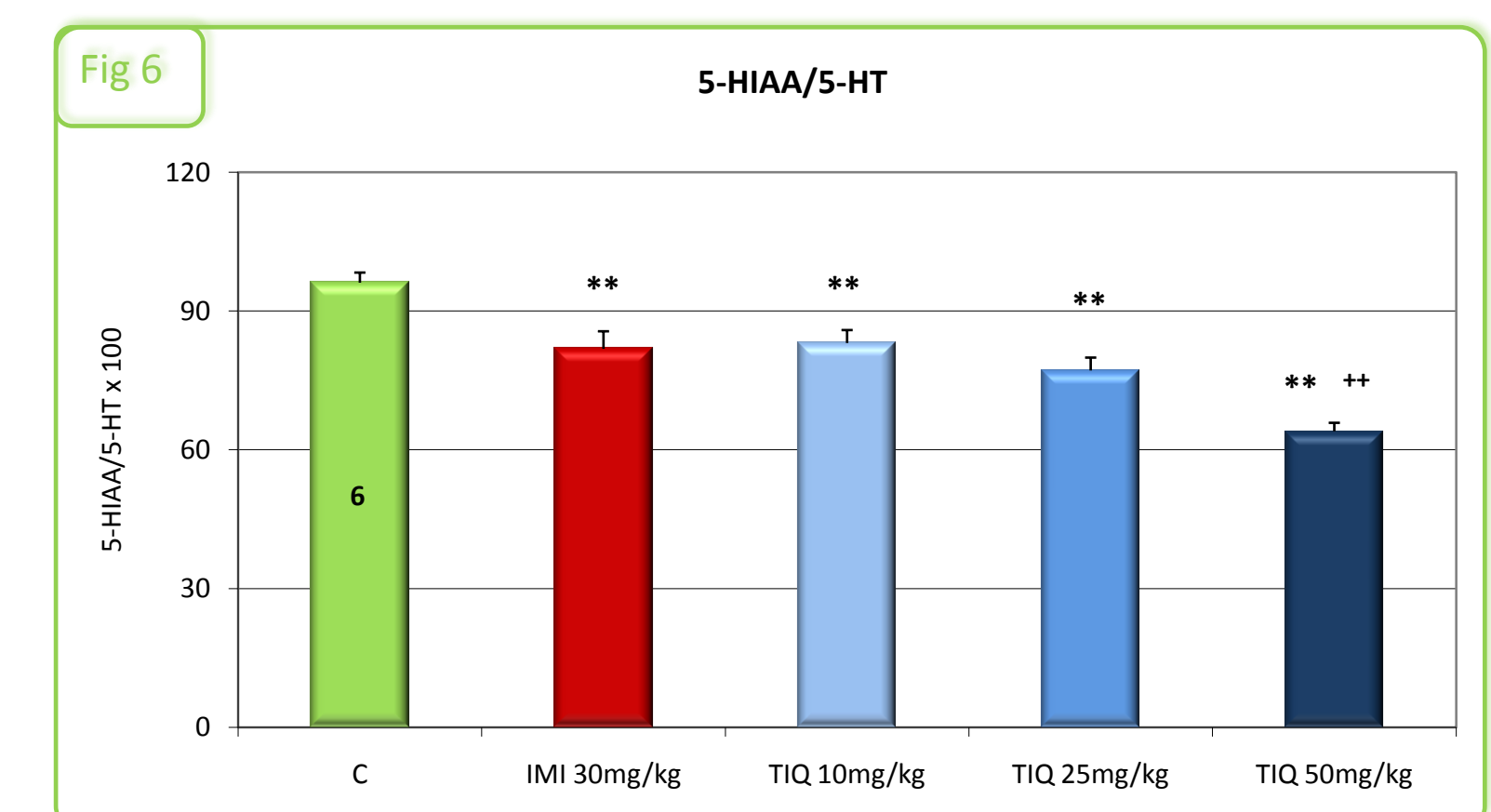
TIQ (activation of DA, NA, 5-HT systems)

The rate of NA metabolism in rat brainstem



IMI (activation of NA, 5-HT systems)

The rate of 5-HT metabolism in rat striatum



THE BIOCHEMICAL STUDY

Conclusions:

TIQ possesses marked antidepressant-like effect in FST with potency comparable to imipramine.

In that light and additionally taken into account its neuroprotective potential of action in the brain TIQ may be useful in clinical practice as antidepressant drugs in patients.

References:

- [1] Porsolt RD, Le Pichon M, Jalfre M (1977) Depression: a new animal model sensitive to antidepressant treatments. *Nature* 266:73-732
- [2] Detke MJ, and Lucki I (1996) Detection of serotonergic and noradrenergic antidepressants in the rat forced swimming test: the effects of water depth. *Behav Brain Res* 73: 43-46
- [3] Antkiewicz-Michaluk L, Łazarkiewicz JW., Patsenka A, Kajta M, Ziemińska E, Salińska E, Wąsik A, Gołombiowska K, Vetulani J (2006) The mechanism of 1,2,3,4-tetrahydroisoquinolines neuroprotection: the importance of free radicals scavenging properties and inhibition of glutamate-induced exotoxicity. *J Neurochem* 97: 846-856

