This article was downloaded by:

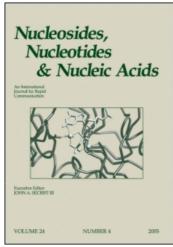
On: 27 January 2011

Access details: Access Details: Free Access

Publisher Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-

41 Mortimer Street, London W1T 3JH, UK



Nucleosides, Nucleotides and Nucleic Acids

Publication details, including instructions for authors and subscription information: http://www.informaworld.com/smpp/title~content=t713597286

Circadian Fluctuation in 3H-CHA Binding to Mouse Cerebral Cortex Membranes

C. Florio^a; A. M. Rosati^a; U. Traversa^a; R. Vertua^a

^a Institute of Pharmacology and Pharmacognosy, University of Trieste, Italy

To cite this Article Florio, C. , Rosati, A. M. , Traversa, U. and Vertua, R.(1991) 'Circadian Fluctuation in 3H-CHA Binding to Mouse Cerebral Cortex Membranes', Nucleosides, Nucleotides and Nucleic Acids, 10: 5, 1221 - 1222

To link to this Article: DOI: 10.1080/07328319108047284 URL: http://dx.doi.org/10.1080/07328319108047284

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: http://www.informaworld.com/terms-and-conditions-of-access.pdf

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

CIRCADIAN FLUCTUATION IN 3H-CHA BINDING TO MOUSE CEREBRAL CORTEX MEMBRANES

*Florio C., Rosati A.M., Traversa U., Vertua R.
Institute of Pharmacology and Pharmacognosy,
University of Trieste, Italy

Recent studies indicate that the density of several neurotransmitter receptors is submitted to circadian fluctuation (1). The pharmacological relevancy of these observations derives from the fact that the therapeutic efficacy of drugs may vary according to their administration schedule (2); moreover, also 24-hour rhythms, among which the timing peak of neurotransmitter receptors itself, may be altered by neuroactive drugs (3).

The present study was undertaken in order to ascertain whether adenosine A1 receptors are subdued to diurnal variations. Male mice, exposed for 4 weeks to a 12 hours light/dark cycle (light on at 07.00 hr), were killed at 3-hr intervals across a 24-hr period and crude membrane preparations were obtained from their cerebral cortices. Saturation experiments were performed, using the A1-specific adenosine analog [3H]-cyclohexyladenosine (3H-CHA). Computer-assisted analysis of saturation isotherms (3H-CHA ranging from 0.1 to 10.0 nM) indicated that the density of 3H-CHA labelled binding sites varied throughout the day; the diurnal pattern was characterized by a peak during the dark period, followed by a fall during the light period. The amplitude (defined as peak:nadir per cent) between 03.00 hr (Bmax 0.306 ± 0.01 pmol bound/10 mg wet weight) and 18.00 hr (Bmax 0.230±0.005 pmol bound/10 mg wet weight) was 33%. One way analysis of variance (ANOVA) indicated that the changes were significant (F=46, p<0.005). No significant difference was found among the Kd values, which ranged from 0.41 to 0.62 nM (mean \pm SEM of the eight Kd values 0.52 \pm 0.07).

1222 FLORIO ET AL.

Although the physiological relevancy of the timing of A1 cortical receptors remains to be established, a consideration may be advanced. It is widely accepted that endogenous adenosine may act as a natural anticonvulsant (4) and a reduced sensivity to convulsivants has been demonstrated when the cerebral A1 receptors were submitted to up regulation after chronic exposure to the adenosine antagonist theophylline (5); it is thus tempting to correlate the increase of the density of A1 receptors occurring in the cerebral cortex during the night, when the electrocorticogram activity of mice is higher, to the regulation of susceptibility to seizures by adenosine.

REFERENCES

- Kafka, M.S., Benedito, M.A., Blendy, J.A., Tokola, N.S. (1986)
 Chronobiol. Int. 3: 91-100
- Ollagnier, M., Decousus, H., Cherrah, Y. (1987) Clin. Pharmacokin.
 12: 367-377
- 3) Van Reeth, O., Vanderhaeghen, J.J., Turek, F.W. (1988) Brain Res. 444: 333-339
- 4) Dragunow, M. (1986) Trends Pharmacol.Sci. 7: 128-130
- 5) Szot, P., Sanders, R.C., Murray, T.F. (1987) Neuropharmacology **26**: 1173-1180