

Studies on the potential behavioral and neurochemical effects of epigallocatechin gallate (EGCG) in an experimental model of depression.

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By

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List of abbreviations

5-Hydroxytryptamine (Serotonin)	5-HT
Acetylcholine	Ach
Catechol-O-methyl transferase	COMT
Cerebral cortex	CC
Chronic mild stress	CMS
Clonidine	CLO
Cyclooxygenase	COX
Dopamine	DA
Electroconvulsive therapy	ECT
Epicatechin	EC
Epigallocatechin	EGC
Epigallocatechingallate	EGCG
Flinders sensitive-line	FSL
Focal gliosis	g
Footshock-induced aggression	FIA
Forced swimming test	FST
γ -aminobutyric acid	GABA
Green tea extract	GTE
Green tea polyphenols	GTP
Hippocampus	hp
Hypothalamic-pituitary-adrenal axis	HPA
Imipramine	IMI
Intraperitoneal	IP
Meninges	m

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Medulla oblongata	mo
Monoamine oxidase	MAO
Monoamine oxidases inhibitors	MAOIs
Major depression	MD
Major depressive disorder	MDD
Noradrenaline	NA
Norepinephrine-dopamine reuptake inhibitor	NDRI
Norepinephrin	NE
Open-field test	OFT
Pro-inflammatory	PI
Selective serotonin reuptake inhibitors	SSRIs
Serotonin-norepinephrine reuptake inhibitors	SNRIs
Squares	Sq.
Standard error of mean	S.E.M
Tricyclic antidepressants	TCAs

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Abstract

Epigallocatechin-gallate (EGCG) is the most abundant and active green tea polyphenols responsible for most of green tea's role in promoting good health. This study was conducted to explore the anti-depressive and the neurochemical effect of EGCG in male albino rats. Adult male rats were randomly assigned to seven groups as follows: normal control group (saline i.p. for 21 days), depressed control group treated with clonidine (0.8mg/kg i.p.) for seven consecutive days started after 14 days of saline treatment and three depressed groups treated with Imipramine (15mg/kg, i.p.), EGCG (25 or 50mg/kg, i.p.) daily for two consecutive weeks starting after clonidine treatment and finally two groups treated with EGCG (25 or 50mg/kg, i.p.) daily for two consecutive weeks started after 7days of saline treatment. Results showed that behavioral performances of depressed control group were changed abnormally, and they were improved in EGCG treated groups. In the open-field test (OFT), the EGCG (50 mg/kg) treated rats increased the ambulation frequency, the rearing frequency, the latency time and the defecation. By forced-swimming test (FST), the study successfully established the model of depression, compared with the depressed control group, EGCG treated rats normalized all parameters. The difference between the EGCG treated group and the control group has no significance. EGCG treatment to depressed rats in a dose of 50mg/kg showed significant increase on latency to fight and significant decrease in jumping frequency but did not show any significant effect on rearing frequencies in the foot shock induced aggression (FIA) when compared to depressed control rats. In addition brain levels of serotonin, dopamine and norepinephrine were increased in EGCG treated groups. In histopathological examination, EGCG (50mg/kg) was superior to imipramine and EGCG (25mg/kg), and decreased COX-2 expression which may explain its antidepressant efficacy. So it was found that EGCG may have an antidepressive effect and that this effect is dose-related, that is, high dose of EGCG (50mg/kg) has a stronger effect.