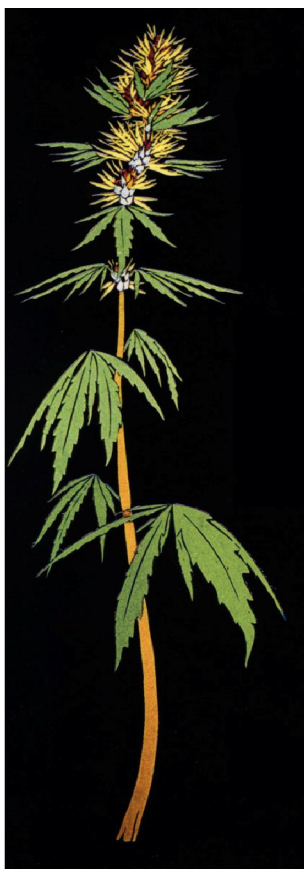


Cannabidiol (CBD) in Neuropsychiatric Disorders:

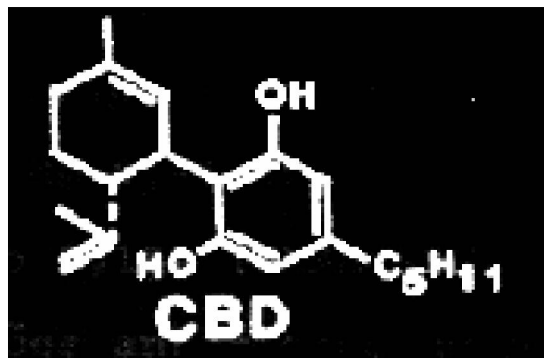
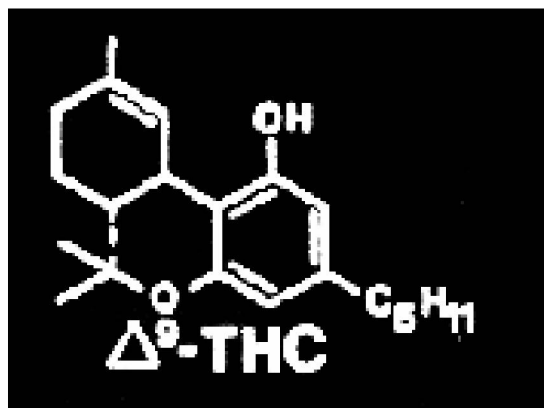
50 years of translational investigation

José Alexandre S. Crippa
Montevideo, 2014

Cannabis is more than simply Delta-9-THC



+ 80 cannabinoids



CBD and THC: main cannabinoids in Cannabis sativa with similar structures

Isolation, structure and partial synthesis of an active constituent of hashish. Y. Gaoni, Raphael Mechoulam. J. Am. Chem. Soc. 86, 1964: 1646.



Prof. Raphael Mechoulam
University of Jerusalem

Cannabidiol - CBD

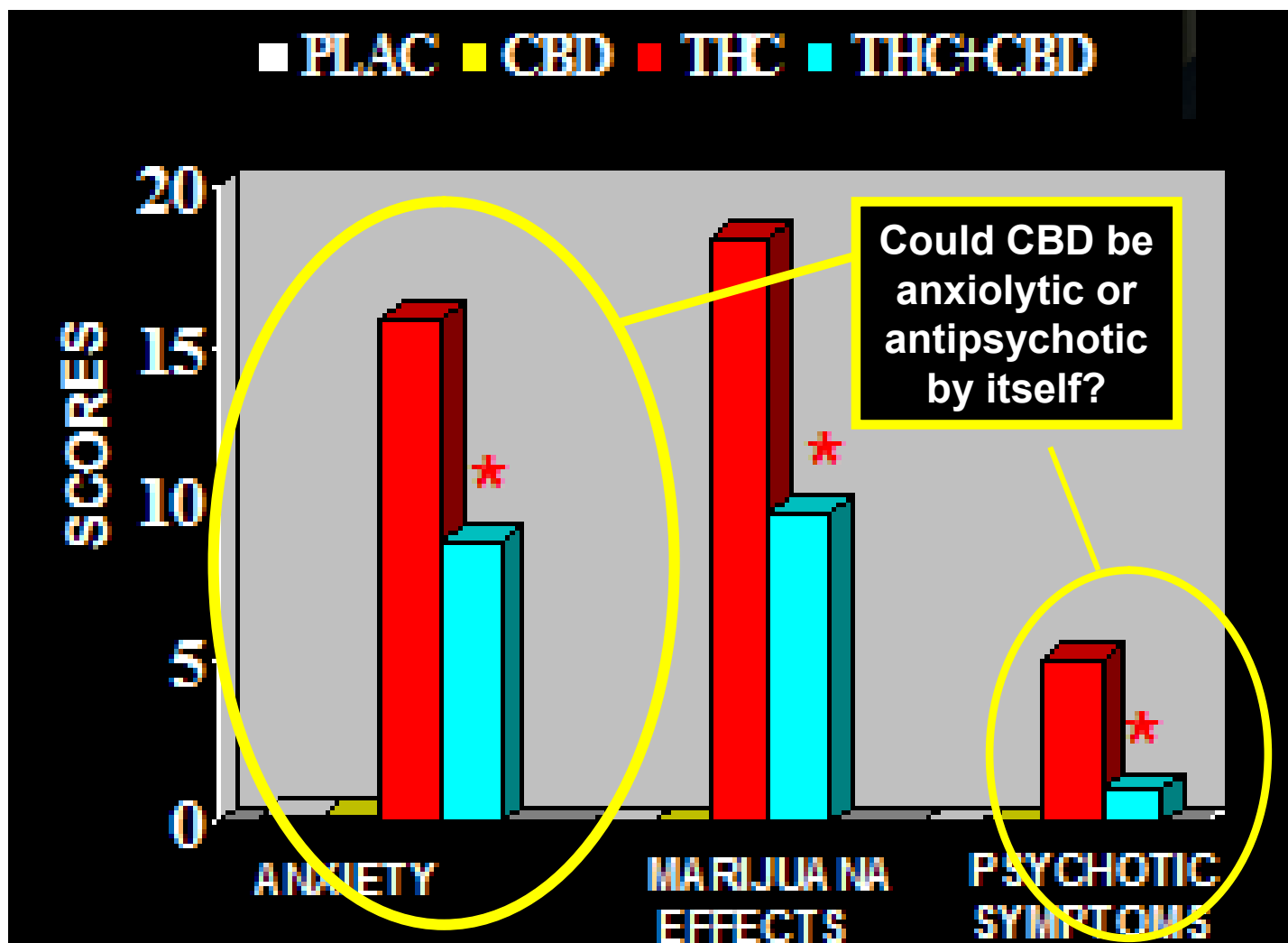
- Natural component of the *Cannabis* plant
- Constitutes up to 40% of marijuana extracts
- Devoid of typical psychological effects of THC
- Evidence for:
 - Anti-inflammatory
 - Analgesia
 - Anti-nausea
 - Hypnotic and sedative
 - Antipsychotic
 - Anticonvulsive
 - Neuro-protective
 - Anxiolytic
 - Others
- Antagonism of the Δ^9 -THC when both contents are administered concomitantly

Interaction THC x CBD

Healthy Volunteers

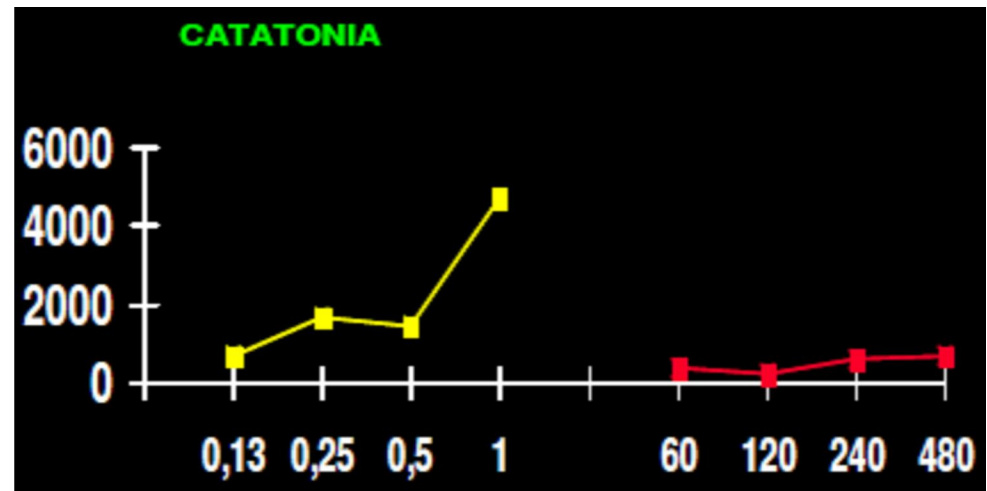
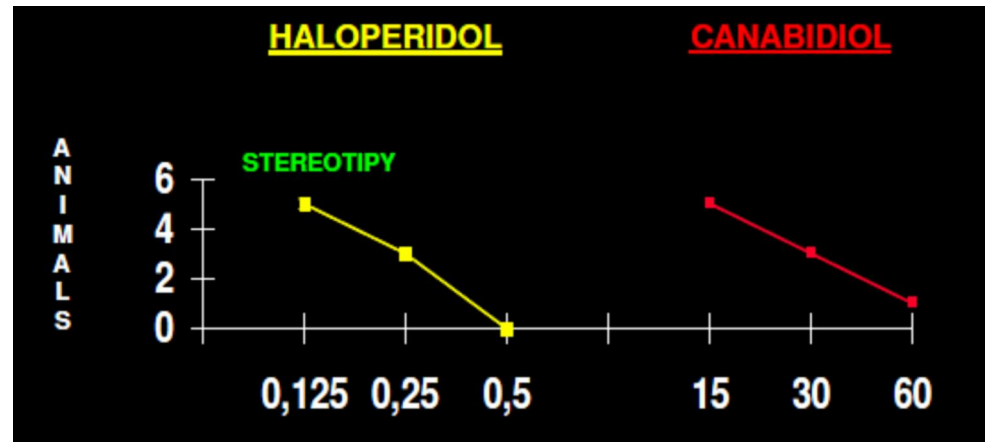
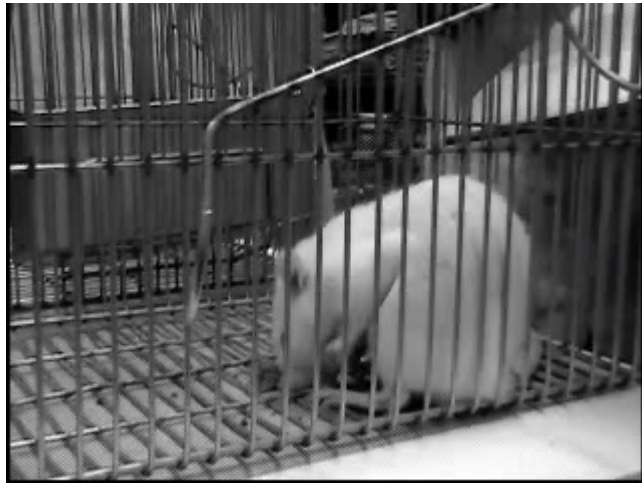


Prof. Antonio Zuardi
University of São Paulo



Zuardi e col., 1982 - *Psychopharmacology* 76 (3):245-250.

Cannabidiol has antipsychotic effects without inducing catatonia



Zuardi e col., 1991. *Psychopharmacology* 104:260-264.

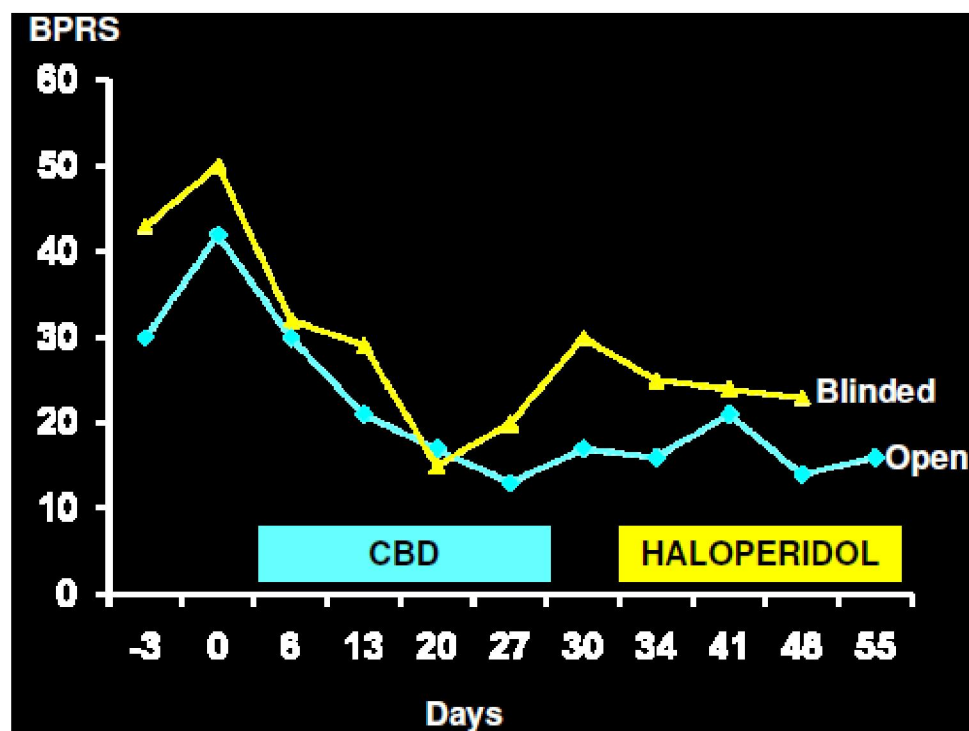
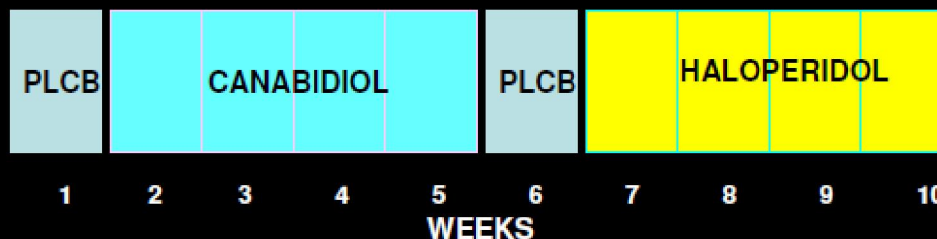
THE JOURNAL OF
CLINICAL PSYCHIATRY

Antipsychotic Effect of Cannabidiol

A. W. Zuardi, Ph.D., M.D.
S. L. Morais, M.D.
F. S. Guimarães, Ph.D., M.D.
São Paulo, Brazil
R. Mechoulam, Ph.D.
Jerusalem, Israel

J Clin Psychiatry 56:10, October 1995

19-year-old schizophrenic patient
CBD – progressively increased up to 1500 mg/day



Cannabidiol monotherapy for treatment-resistant schizophrenia

Journal of Psychopharmacology
20(5) (2006) 683–686
© 2006 British Association
for Psychopharmacology
ISSN 0269-8811
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London, Thousand Oaks,
CA and New Delhi
10.1177/0269881106060967

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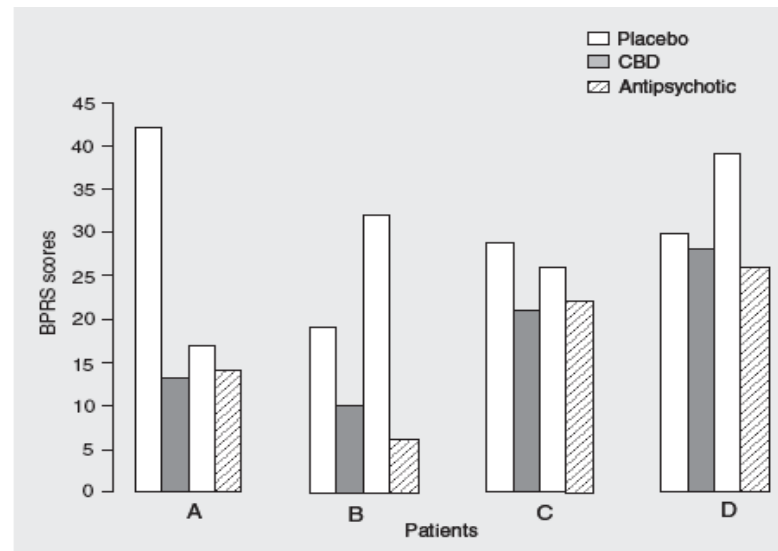
Serdar Murat Dursun *Neuroscience and Psychiatry Unit, University of Manchester, Manchester, UK.*

Silvio L. Morais *Department of Neuropsychiatry and Medical Psychology, Faculty of Medicine, University of São Paulo, Ribeirão Preto, São Paulo, Brazil.*

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Richard E. Musty *Department of Psychology, University of Vermont, Burlington, USA.*

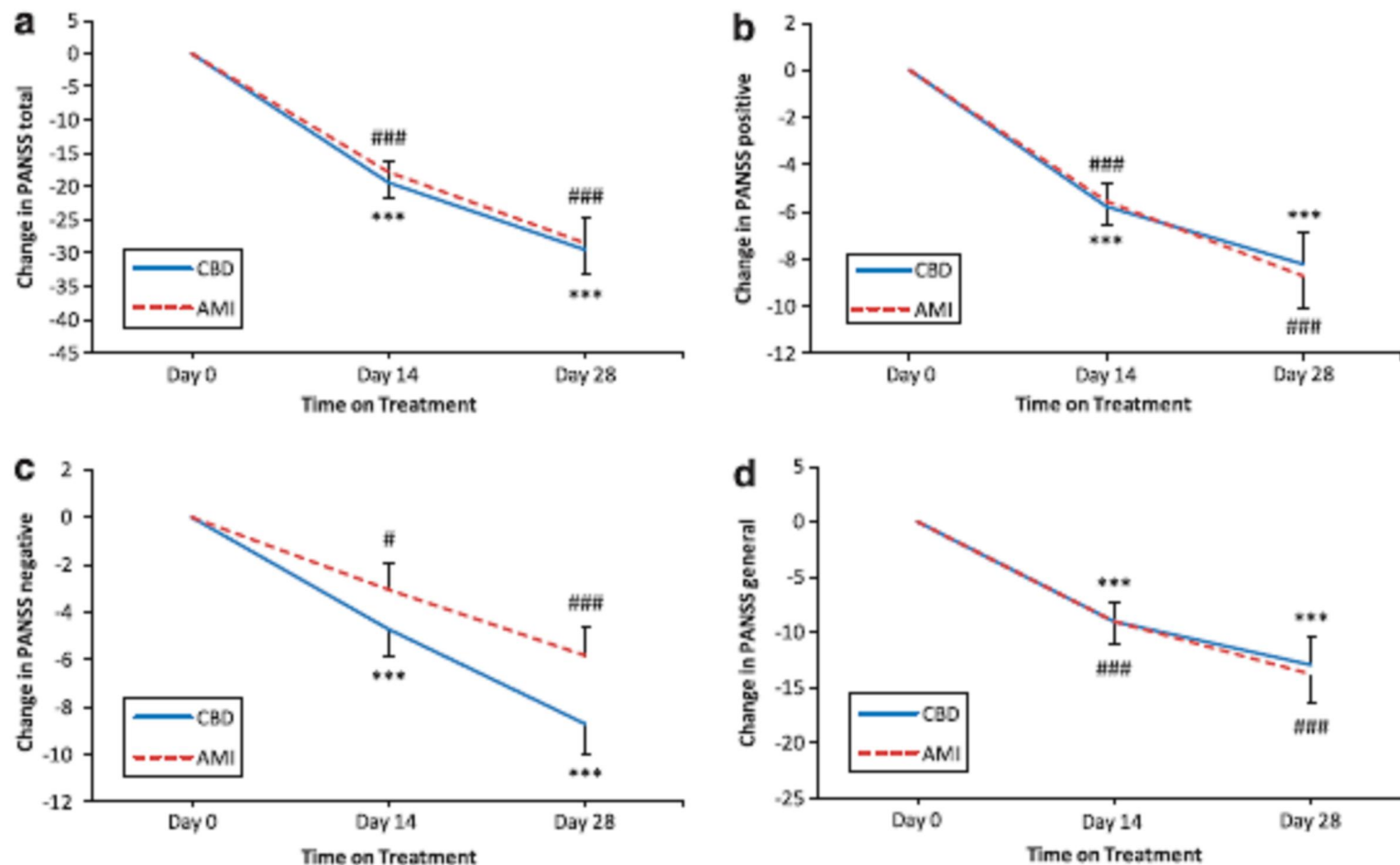
José Alexandre S. Crippa *Department of Neuropsychiatry and Medical Psychology, Faculty of Medicine, University of São Paulo, Ribeirão Preto, São Paulo, Brazil.*



Open-trial of CBD in acute schizophrenic patients

Cannabidiol enhances anandamide signaling and alleviates psychotic symptoms of schizophrenia

FM Leweke^{1,2}, D Piomelli^{3,4}, F Pahlisch^{1,3}, D Muhl^{2,3}, CW Gerth², C Hoyer^{1,2}, J Klosterkötter², M Hellmich⁵ and D Koethe^{1,2}



Side-effects

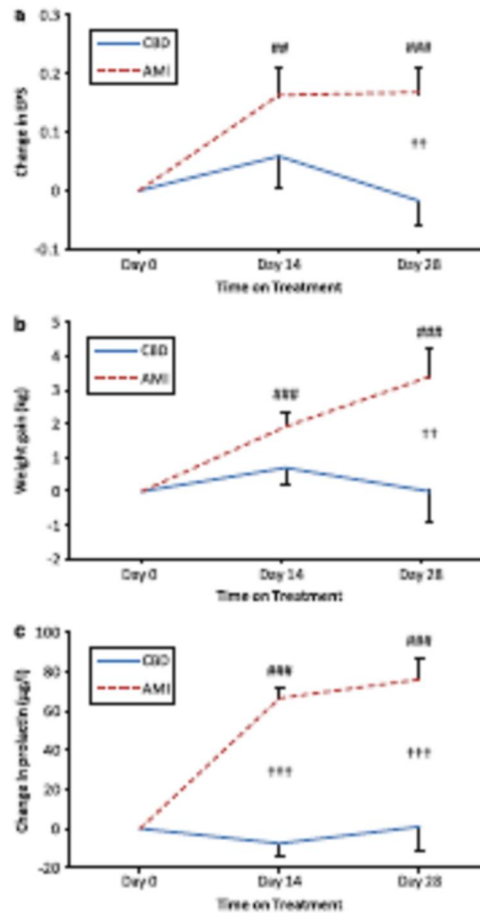


Figure 3 Changes from baseline in side effects determined using mixed effects repeated measures model analysis (adjusted for baseline). (a) Extrapyramidal Symptom Scale (EPS). (b) Weight gain. (c) Prolactin. Data show predicted means and s.e. at each week. Statistical significance is calculated between groups (* $P < 0.05$, ** $P < 0.01$ and *** $P < 0.001$) and vs baseline (that is, 0; CBD, *AMI; **AMI, ***AMI; $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$).

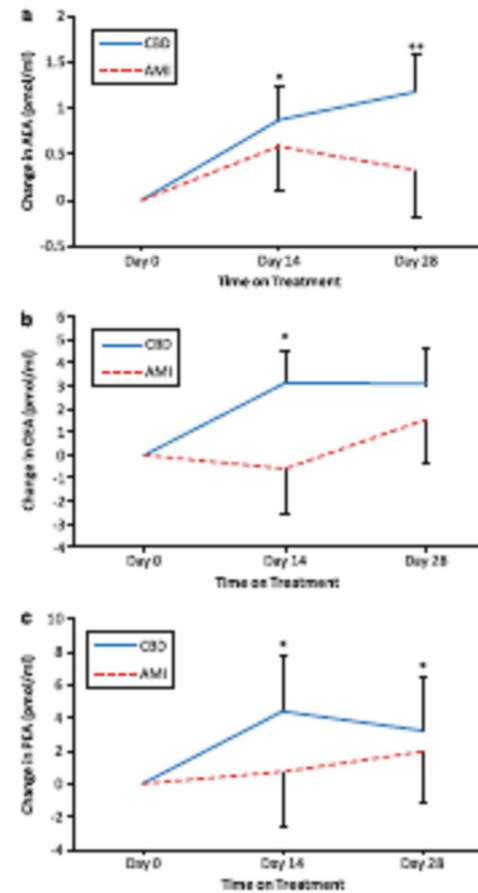
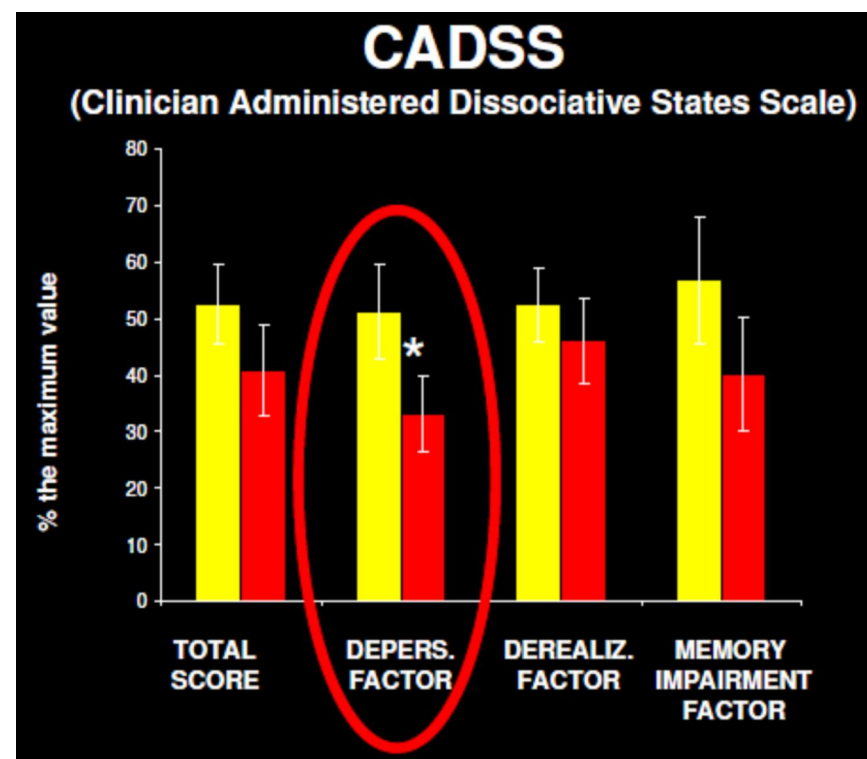
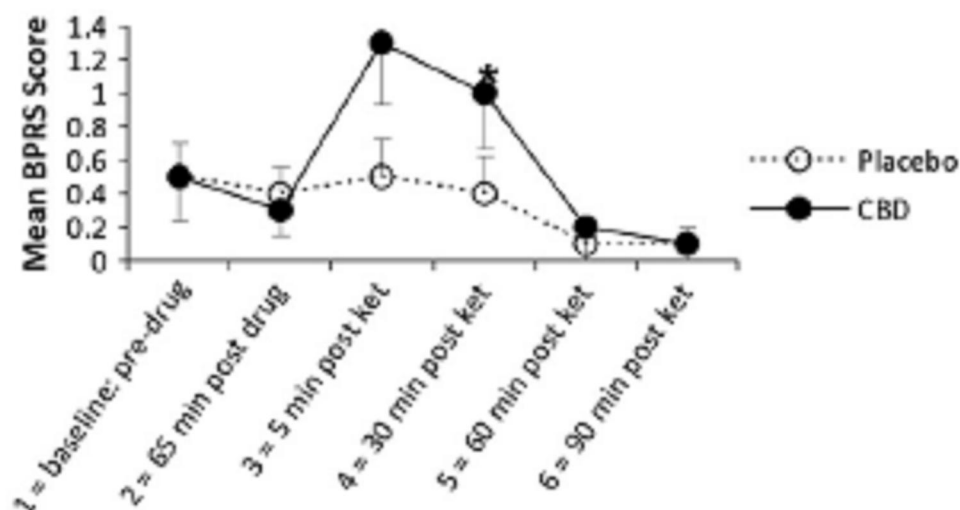


Figure 4 Changes from baseline in fatty acid amide hydrolase substrates determined using mixed effects repeated measures model analysis (adjusted for baseline). (a) Anandamide (AEA) in serum. (b) Oleoylthanolamide (OEA) in serum. (c) Palmitoylethanolamide (PEA) in serum. Data show predicted means and s.e. at each week. Statistical significance is calculated between groups (* $P < 0.05$, ** $P < 0.01$ and *** $P < 0.001$) and vs baseline (that is, 0; CBD, *AMI; **AMI, ***AMI; $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$).

The interplay of cannabinoid and NMDA glutamate receptor systems in humans:
Preliminary evidence of interactive effects of cannabidiol and ketamine in healthy
human subjects

Jaime E.C. Hallak ^{a,e,*}, Serdar M. Dursun ^{b,e}, Daniel C. Bosi ^a, Ligia Ribeiro Horta de Macedo ^{a,e},
João Paulo Machado-de-Sousa ^{a,e}, João Abrão ^f, José A.S. Crippa ^{a,e}, Phillip McGuire ^{c,e}, John H. Krystal ^d,
Glen B. Baker ^{b,e}, Antonio W. Zuardi ^{a,e}



Cannabidiol for the treatment of psychosis in Parkinson's disease

Psychopharm

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23(8) (2009) 979-983
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10.1177/0269472709356519

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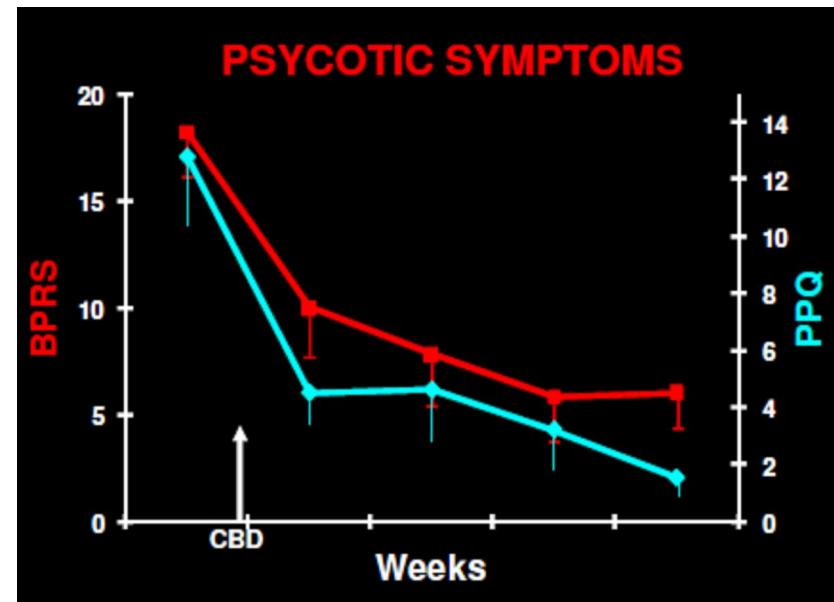
JAS Crippa *Department of Neuropsychiatry and Medical Psychology, Ribeirão Preto Medical School, University of São Paulo, São Paulo, Brazil.*

JEC Hallak *Department of Neuropsychiatry and Medical Psychology, Ribeirão Preto Medical School, University of São Paulo, São Paulo, Brazil.*

Open-label pilot study.
Six consecutive outpatient (four men and two women).
Eligible if:- Parkinson disease (PD).

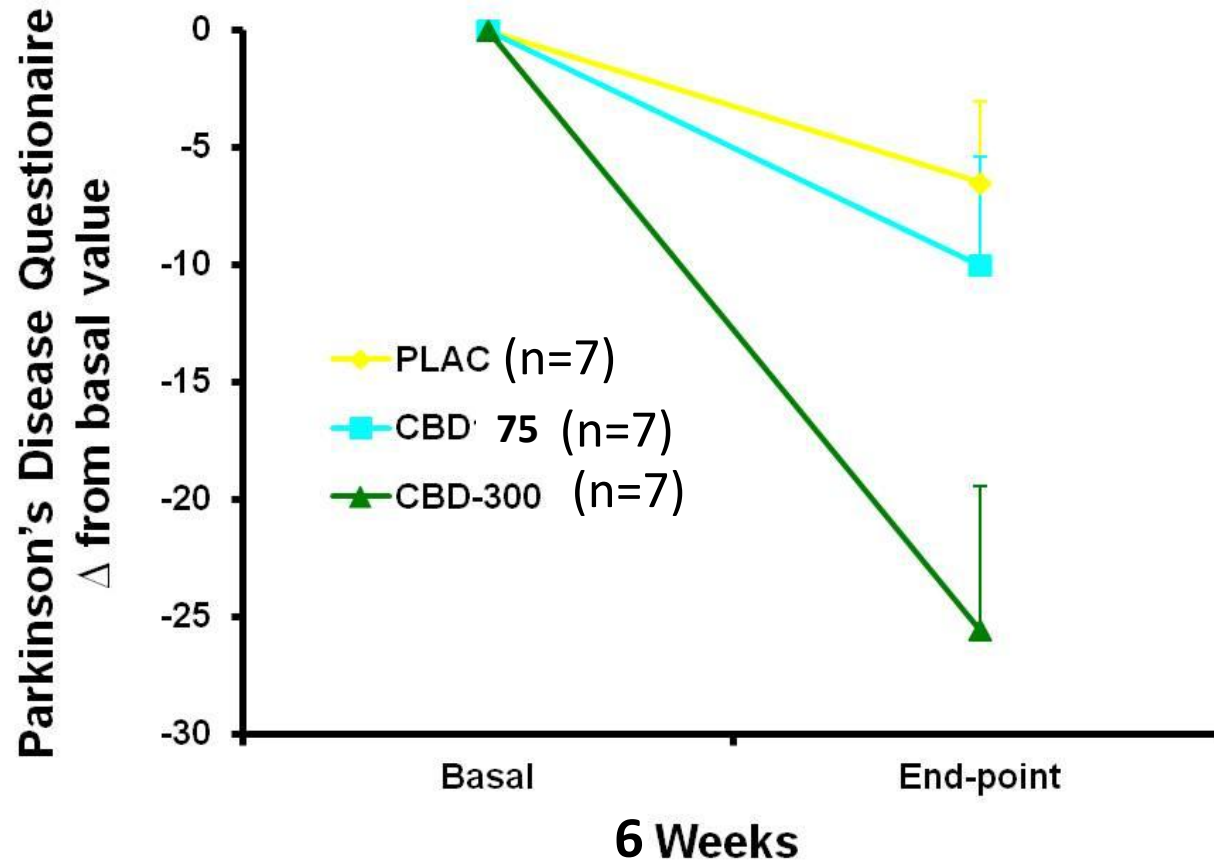
- Psychosis for at least 3 months.
- Stable dose of anti-PD for at least 7 days.

CBD (150 – 600 mg/day) in addition to their usual therapy.
Treatment for 4 weeks.



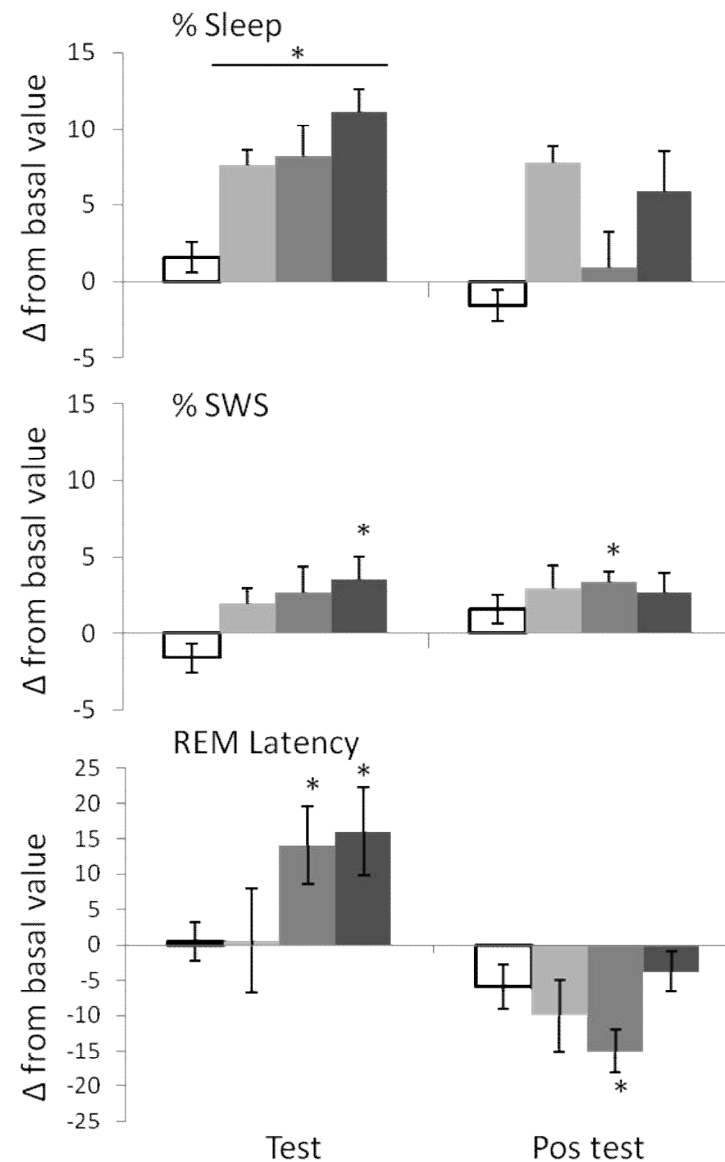
CBD was effective, safe and well tolerated for the treatment of the psychosis in PD

CBD in Parkinson's Disease



Chagas et al. In press

CBD increases total sleep time



Chagas, Crippa et al. 2013

CBD improves REM sleep behavior disorder

- REM sleep behavior disorder (RBD):
 - Parasomnia characterized by the loss of muscle atony during REM sleep
 - Associated with nightmares and active behavior during dreaming
 - Pharmacological management of RBD is limited (as the main drug used to treat the condition is clonazepam, a benzodiazepine with a long half-life. The use of benzodiazepines in elderly individuals is potentially problematic because of their adverse effects, which restrict the use of these drugs in patients with PD and RBD)



Chagas, Crippa et al. In press

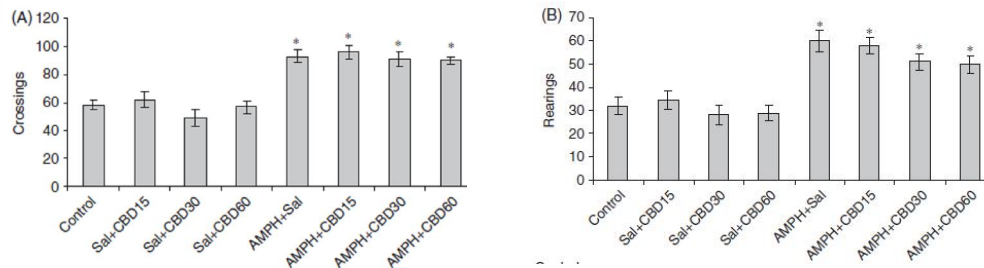
CBD improves REM sleep behavior disorder

Table 1. Description of patients with PD and symptoms compatible with RBD.

Patient	Symptoms	Polysomnography	Cannabidiol dose	Frequency of symptoms before treatment	Frequency of symptoms after treatment
1	Swearing, talking, yelling, pushing, kicking, punching and gesturing	Compatible	75 mg	2 – 4 x week	0
2	Yelling, talking, laughing, gesturing, pushing and kicking	Patient did not enter REM sleep during exam	75 mg	2 – 4 x week	0
3	Talking, yelling, singing, pushing, punching and kicking	Patient refused to undergo exam	75 mg	7 x week	0
4	Laughing, kicking, pushing and punching	Compatible	300 mg	2 – 4 x week	1 x week

Effects of cannabidiol on amphetamine-induced oxidative stress generation in an animal model of mania

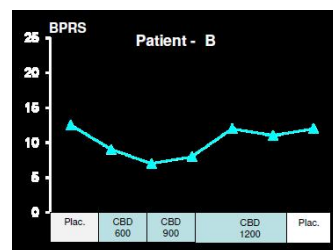
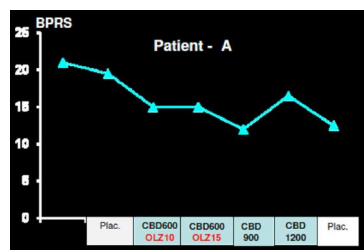
Journal of Psychopharmacology
0(00) 1–7
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Case report

Cannabidiol was ineffective for manic episode of bipolar affective disorder

Journal of Psychopharmacology
24(1) (2010) 135–137
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SAGE Publications Ltd,
Los Angeles, London,
New Delhi and Singapore
10.1177/0269881108095521



Short report

Effects of cannabidiol on schizophrenia-like symptoms in people who use cannabis

Celia J. A. Morgan and H. Valerie Curran

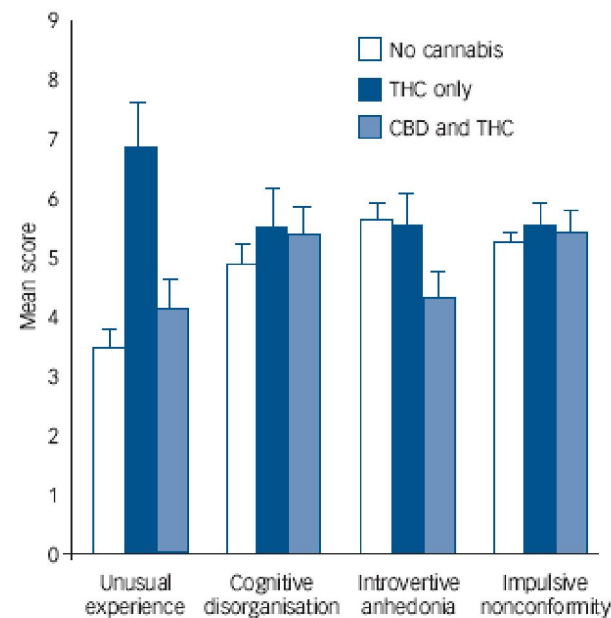


Fig. 1 Scores on the Oxford Liverpool Inventory of Life Experiences factors categorised by cannabis group. CBD, cannabidiol; THC, Δ^9 -tetrahydrocannabinol.

Paris Hilton was right!



“Socialite Paris Hilton (25) has launched a campaign to have the Cannabidiol content of Marijuana increased.

A reduction in the amount of the Cannabidiol a non-psychoactive cannabinoid which has antipsychotic properties has been identified by Paris Hilton as a major factor contributing to the psychotic breakdowns of Britney Spears”

Psychological Medicine, Page 1 of 10. © Cambridge University Press 2011
doi:10.1017/S0033291711001322

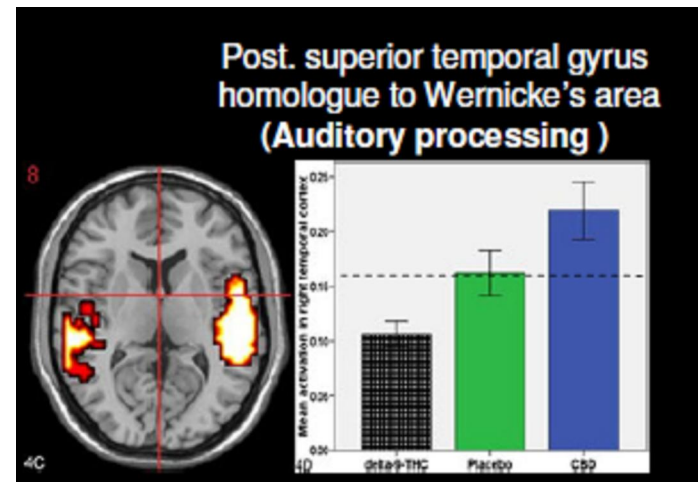
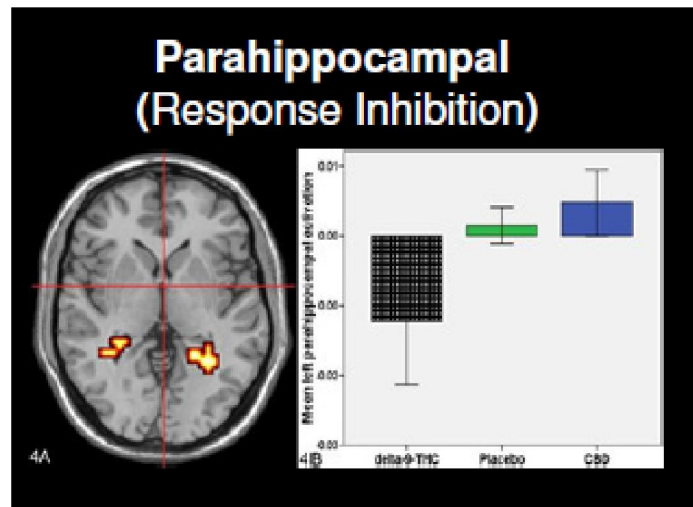
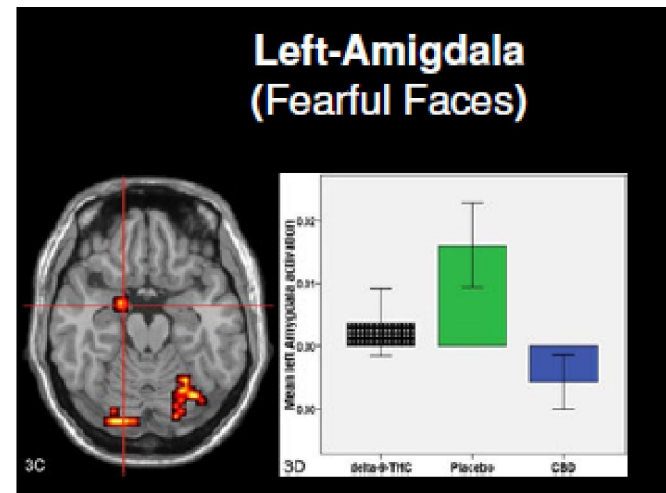
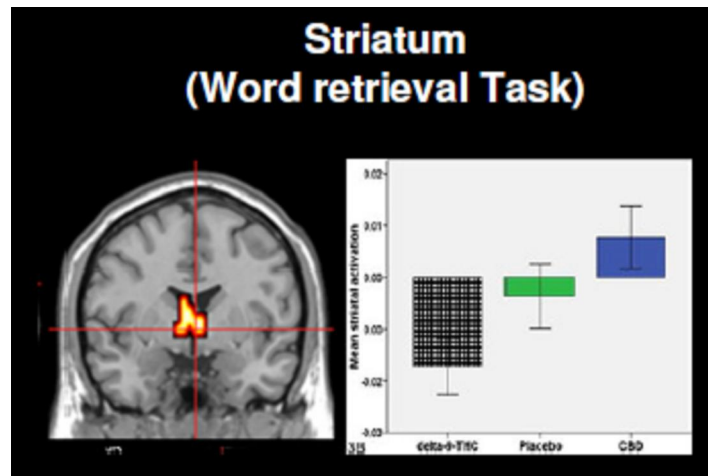
ORIGINAL ARTICLE

Sub-chronic impact of cannabinoids in street cannabis on cognition, psychotic-like symptoms and psychological well-being

**Morgan et al, Psychol Med,
Ahead of Print 29 July 2011**

“These findings raise concerns for the harms stemming from use of varieties such as 'skunk', which lack any CBD but currently dominate the supply of cannabis in many countries”.

Opposite effects of THC and CBD on human brain function



Cannabidiol and Anxiety

Rev Bras Psiquiatr. 2012;34(Supl1):S104-S117



Revista Brasileira de Psiquiatria

RBP Psychiatry

Official Journal of the Brazilian Psychiatric Association
Volume 34 • Supplement 1 • June 2012



ARTICLE

Cannabidiol, a *Cannabis sativa* constituent, as an anxiolytic drug

Alexandre Rafael de Mello Schier,¹ Natalia Pinho de Oliveira Ribeiro,¹
Adriana Cardoso de Oliveira e Silva,^{1,2,4} Jaime Eduardo Cecilio Hallak,^{3,4}
José Alexandre S. Crippa,^{3,4} Antonio E. Nardi,^{1,4} Antonio Waldo Zuardi^{3,4}

<i>Humans</i>		
Zuardi et al. (1982)	Decreased STAI scores elevation induced by THC (healthy volunteers)	+
Zuardi et al. (1993)	Decreased VAS factor anxiety scores after public speaking (healthy volunteers)	+
Crippa et al. (2004)	Decreased VAS factor anxiety scores before SPECT procedure (healthy volunteers)	+
Fusar-Poli et al. (2009)	Decreased skin conductance fluctuation in task with fearful face during an fMRI procedure (healthy volunteers)	+

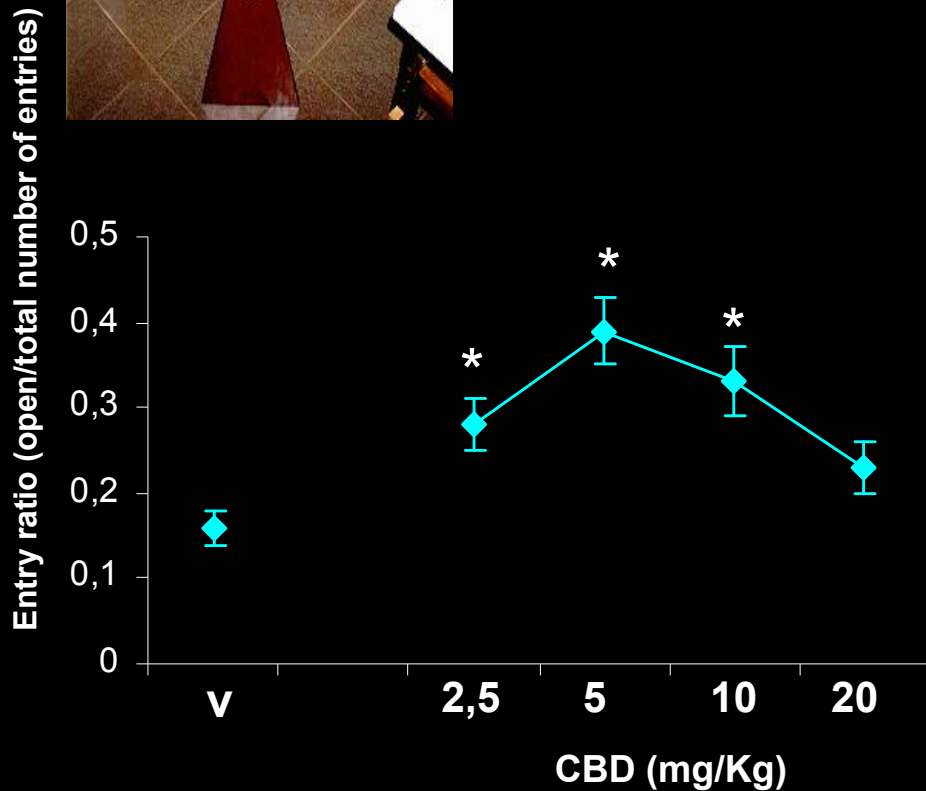
Anxiolytic effects of CBD has bell-shaped dose response curve

Study	Model	Anxiolytic effect
<i>Animal</i>		
Silveira Filho and Tufik (1981)	Conflict test	—
Zuardi and Karniol (1983)	Conditioned emotional response paradigm	+
Onaivi et al. (1990)	Elevated plus maze test	+
Guimarães et al. (1990)	Elevated plus maze test	+
Moreira and Guimarães (2006)	Vogel conflict test	+
Resstel et al (2006)	Contextual conditioned fear	+
Campos and Guimarães (2008)	Elevated plus maze test and the Vogel conflict test	+
Bitencourt, Pamplona, Takahashi, (2008)	Conditioning context	+
Campos and Guimarães (2009)	Elevated plus maze test	+
Resstel et al (2009)	Restraint stress	+
Soares et al (2010)	Elevated T maze	+
Lemos, Resstel and Guimarães (2010)	Contextual conditioning fear	+
Casarotto et al (2010)	Marble-burying test	+
Gomes, Resstel and Guimarães (2011)	Vogel conflict test	+
Deiana et al (2012)	Marble-burying test	+
Uribe-Mariño et al (2012)	Prey vs predator paradigm	+
Campos et al (submitted)	Elevated T maze	+

Crippa et al., *RBP Psychiatry*, 2012

Antianxiety effect of cannabidiol in the elevated plus-maze

F.S. Guimarães¹, T.M. Chiaretti¹, F.G. Graeff³, and A.W. Zuardi²



Anxiolytic effect of CBD in the EPM (with a bell-shaped dose response curve)



Saline



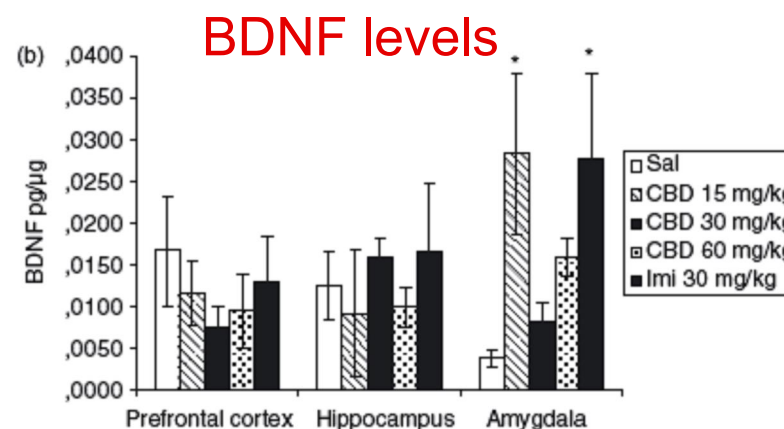
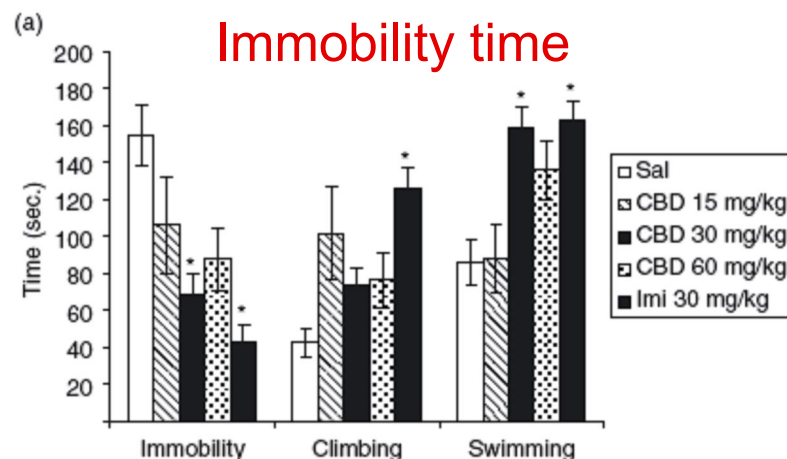
Diazepam

Guimarães et al., *Psychopharmacology* 1990

Administration of cannabidiol and imipramine induces antidepressant-like effects in the forced swimming test and increases brain-derived neurotrophic factor levels in the rat amygdala

Réus GZ, Stringari RB, Ribeiro KF, Luft T, Abelaíra HM, Fries GR, Aguiar BW, Kapczinski F, Hallak JE, Zuardi AW, Crippa JA, Quevedo J. Administration of cannabidiol and imipramine induces antidepressant-like effects in the forced swimming test and increases brain-derived neurotrophic factor levels in the rat amygdala.

Gislaine Z. Réus¹, Roberto B. Stringari¹, Karine F. Ribeiro¹, Tatiana Luft¹, Helena M. Abelaíra¹, Gabriel R. Fries², Bianca W. Aguiar², Flávio Kapczinski², Jaime E. Hallak³, Antônio W. Zuardi³, José A. Crippa³, João Quevedo¹



CBD (30 mg/kg) reduced the immobility time and increased BDNF levels in the FST similarly to the prototype antidepressant imipramine

Anti-Aversive Effects of Cannabidiol on Innate Fear-Induced Behaviors Evoked by an Ethological Model of Panic Attacks Based on a Prey vs the Wild Snake *Epicrates cenchria crassus* Confrontation Paradigm

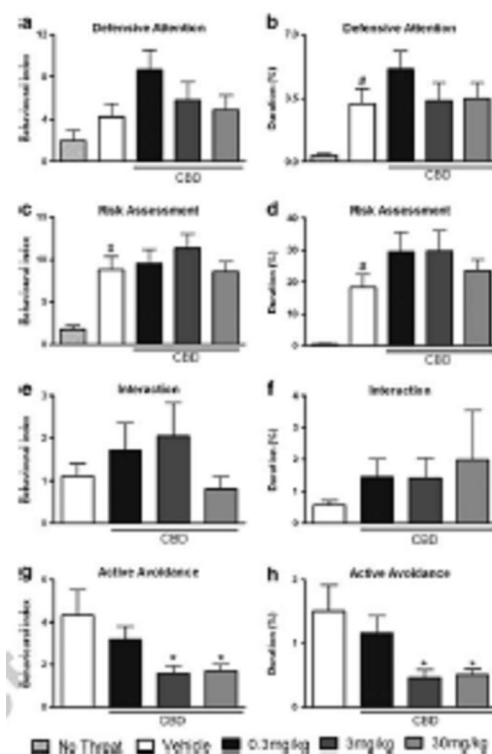
Neuropsychopharmacology (2011), 1–10

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www.neuropsychopharmacology.org



Andrés Uribe-Mariño^{1,2}, Audrey Francisco¹, Maria Angélica Castiblanco-Urbina^{1,2}, André Twardowsky¹, Carlos José Salgado-Rohner¹, José Alexandre S Crippa^{3,4}, Jaime Eduardo Cecílio Hallak^{3,4}, Antônio Waldo Zuardi³ and Norberto Cysne Coimbra^{*,1,2}



Neural basis of anxiolytic effects of cannabidiol (CBD) in generalized social anxiety disorder: a preliminary report

José Alexandre S Crippa^{1,2}, Guilherme Nogueira Derenusson^{1,2}, Thiago Borduqui Ferrari^{1,2}, Lauro Wichert-Ana³, Fábio LS Duran⁴, Rocio Martin-Santos^{2,5}, Marcus Vinícius Simões^{3,6}, Sagnik Bhattacharyya⁵, Paolo Fusar-Poli⁵, Zerrin Atakan⁵, Alaor Santos Filho^{1,2}, Maria Cecília Freitas-Ferrari^{1,2}, Philip K McGuire^{2,5}, Antonio Waldo Zuardi^{1,2}, Geraldo F Busatto⁴ and Jaime Eduardo Cecílio Hallak^{1,2}

Journal of Psychopharmacology

0(0) 1–10

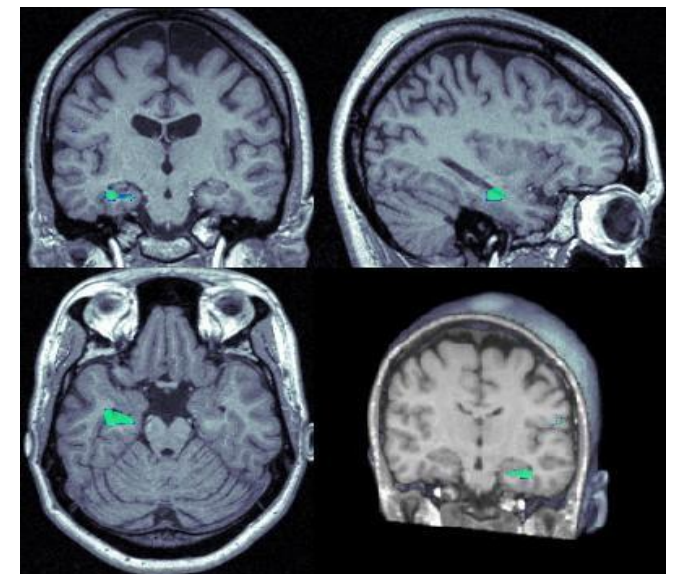
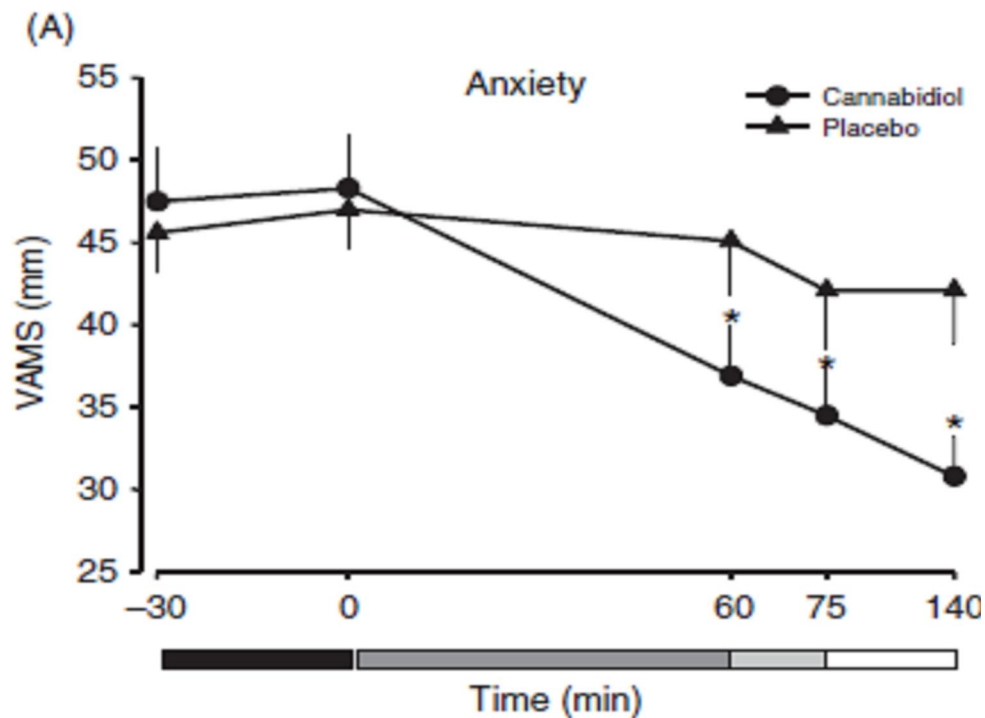
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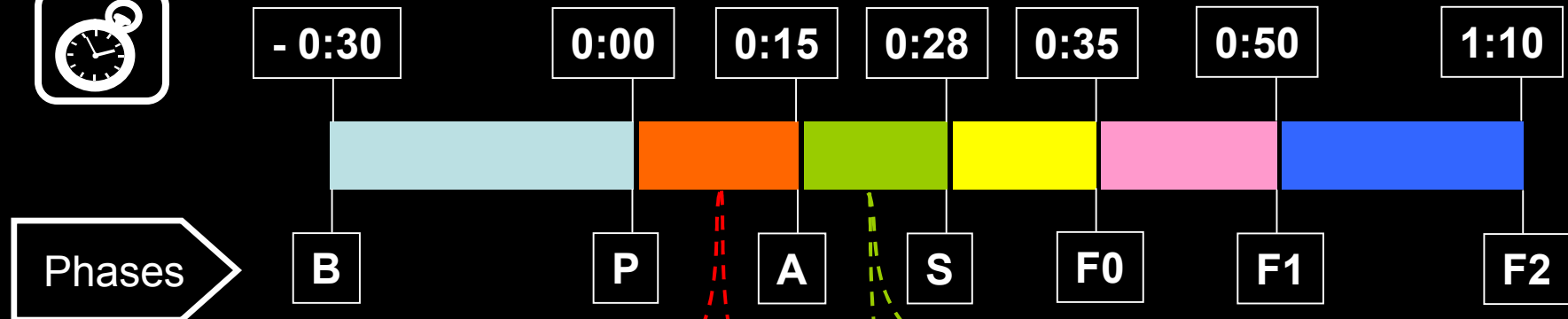
DOI: 10.1177/0269881110379283

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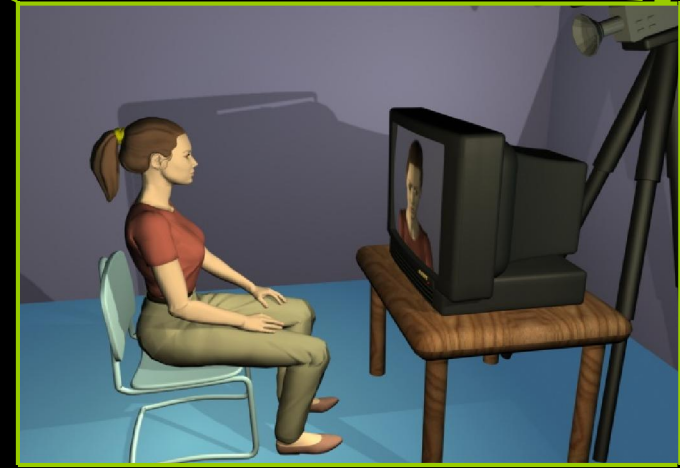


CBD reduced rCBF in the left parahippocampal gyrus

The Simulated Public Speaking Test



B: baseline
P: pre-stress
A: anticipatory
S: performance
F: post-stress



Cannabidiol Reduces the Anxiety Induced by Simulated Public Speaking in Treatment-Naïve Social Phobia Patients

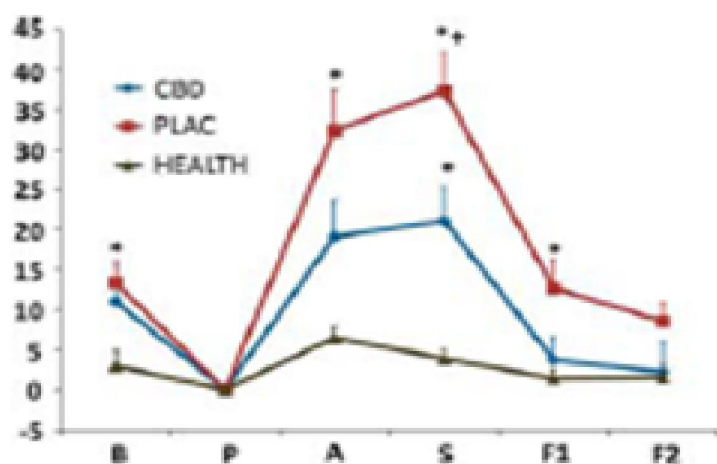
Neuropsychopharmacology (2011), 1–8

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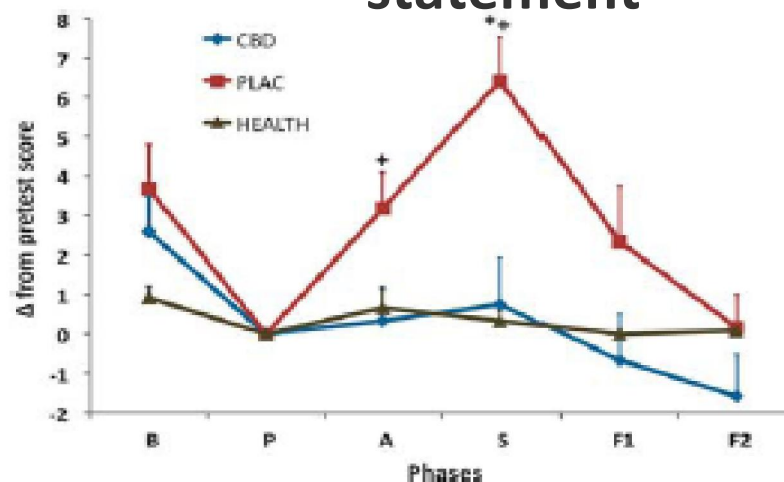


Mateus M Bergamaschi^{1,2,3}, Regina Helena Costa Queiroz^{2,3}, Marcos Hortes Nisihara Chagas^{1,3}, Danielle Chaves Gomes de Oliveira^{1,3}, Bruno Spinosa De Martinis^{3,4}, Flávio Kapczinski^{3,5}, João Quevedo^{3,6}, Rafael Roesler^{3,7}, Nadja Schröder^{3,8}, Antonio E Nardi^{3,9}, Rocio Martín-Santos^{3,10}, Jaime Eduardo Cecílio Hallak^{1,3}, Antonio Waldo Zuardi^{1,3} and José Alexandre S Crippa^{*,1,3}

Anxiety

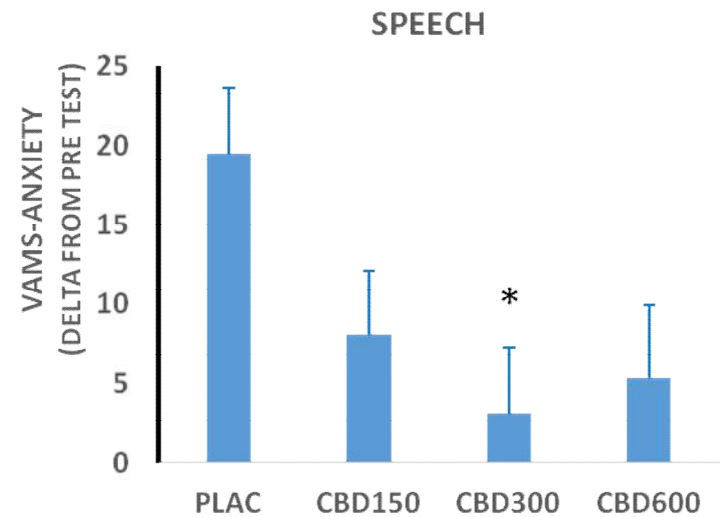
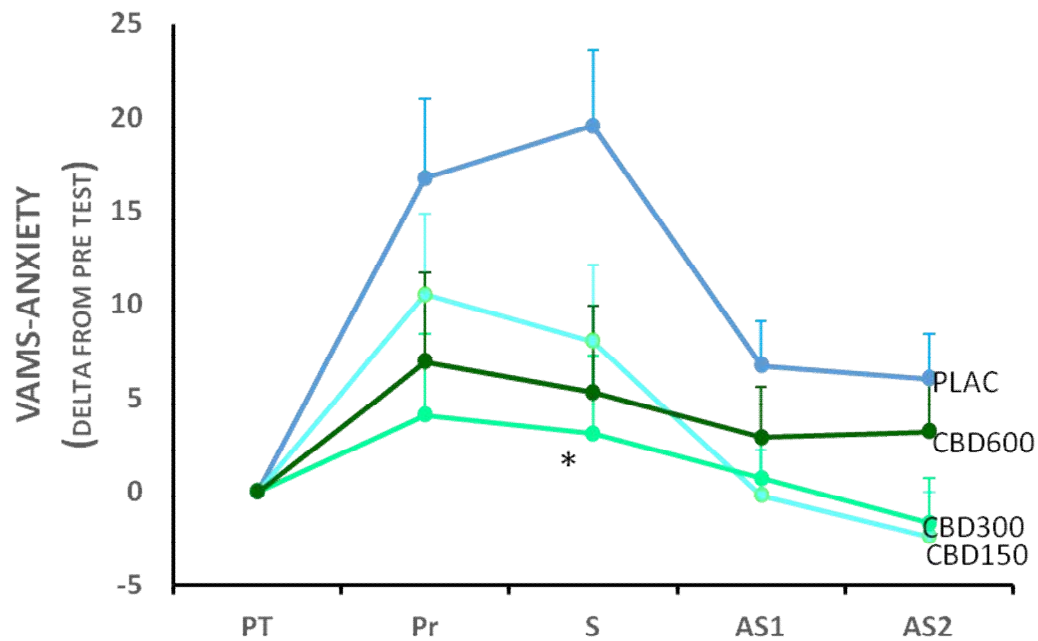


Negative Self-statement



CBD and The Simulated Public Speaking Test

Inverted 'U'-shape





Cannabidiol for the treatment of *cannabis* withdrawal syndrome

J. A. S. Crippa* MD, PhD, J. E. C. Hallak* MD, PhD, J. P. Machado-de-Sousa* PhD, R. H. C. Queiroz† PhD, M. Bergamaschi‡ PhD, M. H. N. Chagas* MD, MSc and A. W. Zuardi* MD, PhD

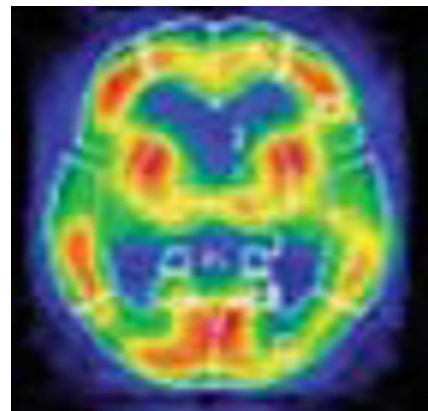
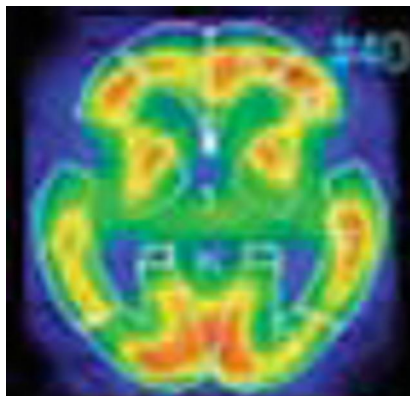
CANABIDIOL



NO WITHDRAWAL SYMPTOMS ASSESSED BY THE:

- Marijuana Withdrawal Symptom Checklist
- Withdrawal Discomfort Score
- Hamilton anxiety scale (HAMA)
- Clinician-Administered Dissociative States Scale

Cannabis Withdrawal Syndrome



INCREASED GLOBAL CBF AFTER CBD TREATMENT

Cannabis Withdrawal Syndrome

nature
International weekly journal of science

With pot now legal, there's a new problem

Marijuana is going mainstream in the US. On 1 January, Colorado became the first state in the country to allow recreational use of the drug. Washington is set to do the same within the next few months, and many others are considering similar measures.

Critics of these moves say that legalizing marijuana will increase consumption, leading to an uptick in substance use problems. And with more than 4 million Americans already dependent on or abusing marijuana—making cannabis the number 3 recreational drug after alcohol and tobacco—scientists and public health officials are increasingly fretting over the dearth of available pharmacologic treatments for marijuana addiction. “Every day we are growing more concerned about the number of people seeking treatment,” says Ivan



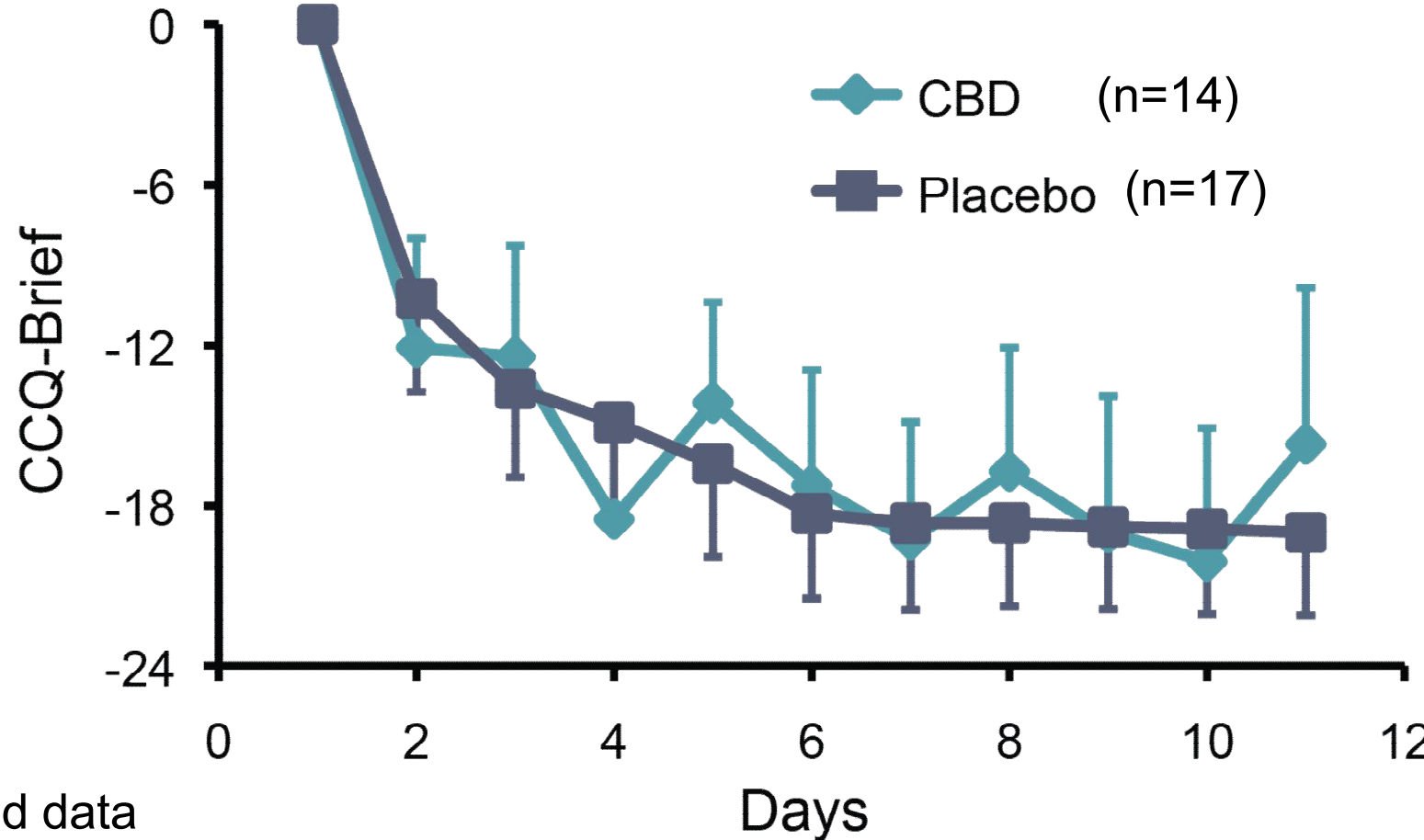
Roach

Antagonists based on the natural effects of marijuana itself, like pregnenolone, have had more success. José Crippa, a neuroscientist at the University of São Paulo in Brazil, has been studying how cannabidiol, another chemical present in marijuana, can counteract the effects of THC. The two compounds both target the type 1 cannabinoid receptor (CB1) but seem to have opposite effects. Crippa and his colleagues successfully used cannabidiol to treat withdrawal symptoms in a 19-year-old woman⁵. Now, Crippa has partnered with researchers in California to test the psychoactive compound in larger groups of patients. “It’s funny that one compound in the plant can help to recover from addiction to another,” says Crippa.

ROCHELLE PRESS/NEWS.COM

CBD for Craving Treatment in Crack Users

- 31 crack users
- Oral CBD 300 mg/day



Zuardi et al., unpublished data

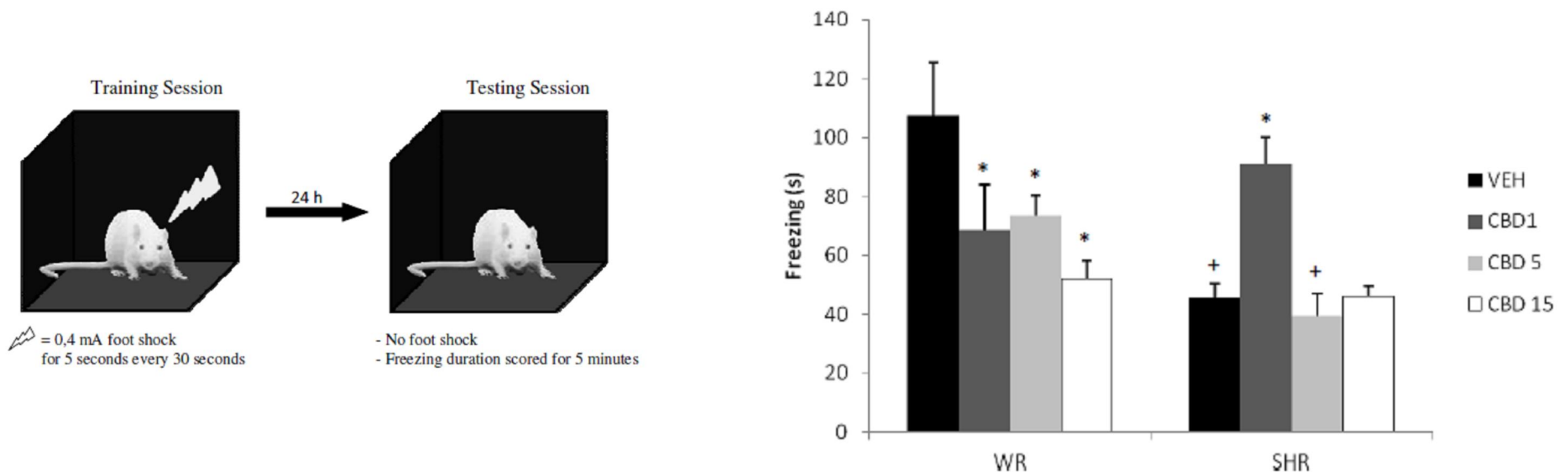
Spontaneously hypertensive rats (SHR)

An animal model to study schizophrenia



- Basal PPI deficit specifically reverted by the atypical antipsychotic clozapine
- SHRs present impaired social interaction that is specifically ameliorated by atypical antipsychotics
- Display hyperlocomotion attenuated by antipsychotics and potentiated by amphetamine
- Deficit in contextual fear conditioning (CFC) that is reversed specifically by antipsychotics and potentiated by psychostimulants and ketamine

Antipsychotic Profile of Cannabidiol in an Animal Model of Emotional Context Processing in Schizophrenia

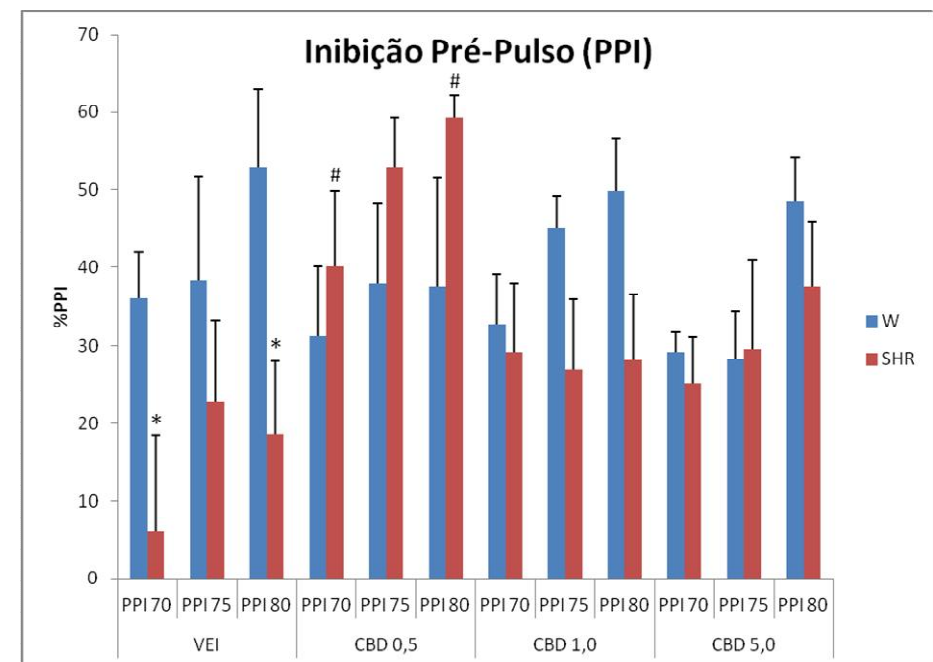
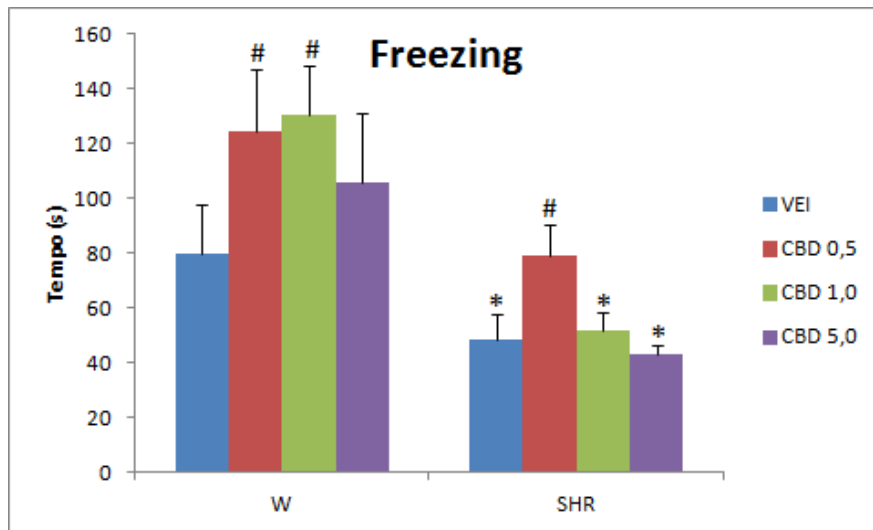


- SHR showed a decreased freezing response when compared to WR that was attenuated by 1 mg/kg CBD
- All CBD-treated WR presented a decreased freezing response when compared to control rats

Suggest a potential therapeutical effect of CBD to treat the emotional processing impairment presented in schizophrenia.

Is Cannabidiol capable to prevent Psychosis ? An Animal Model of Emotional Context Processing and PPI in Schizophrenia

- SHR rats were treated from 30 to 60 day of birth and assessed at 90 day



Abilio et al, in preparation

Chronic Administration of Cannabidiol to Healthy Volunteers and Epileptic Patients¹

Jomar M. Cunha, E.A. Carlini, Aparecido E. Pereira, Oswaldo L. Ramos, Camilo Pimentel, Rubens Gagliardi, W.L. Sanvito, N. Lander and R. Mechoulam

15 secondary generalized epilepsy with temporal focus, resistant to treatment.

2 independent groups:-
Placebo X CBD (200-300)

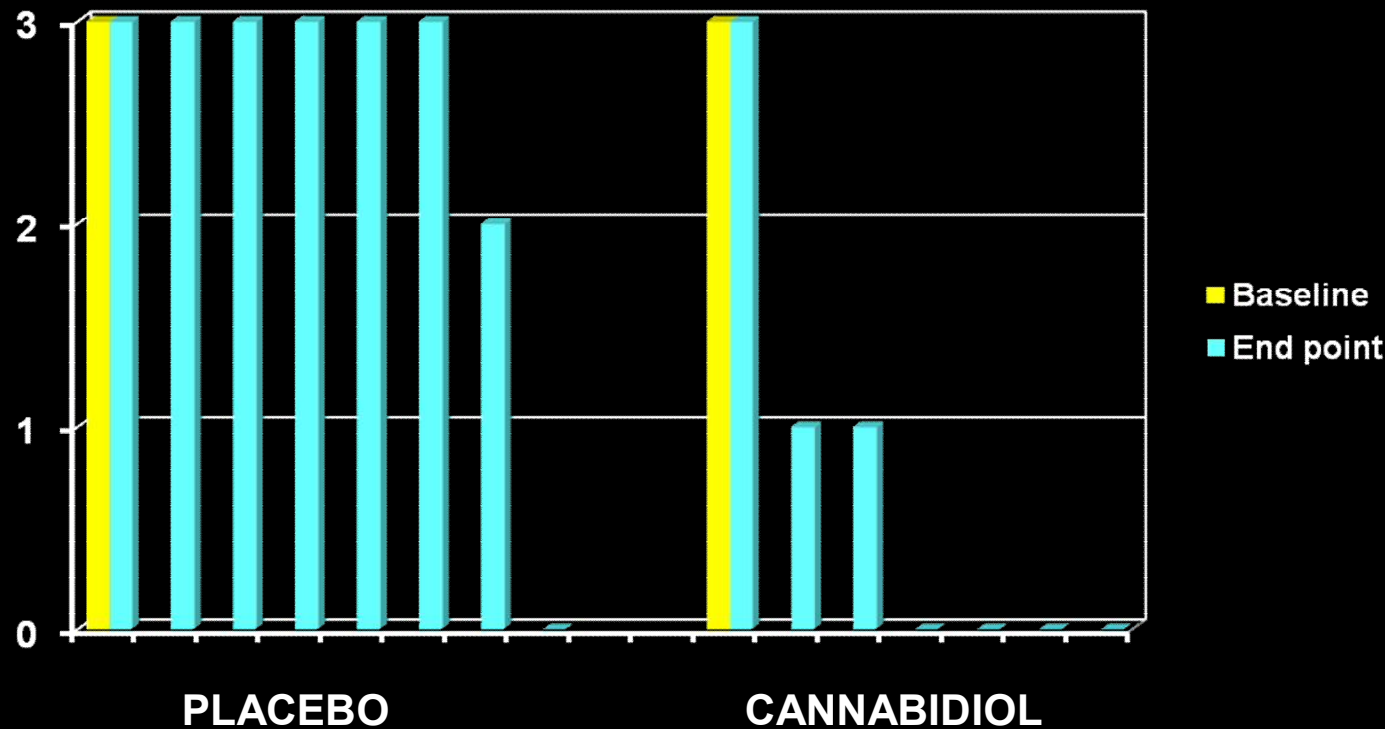
Administered for as long as 4 ½ months.

No reduction in convulsive crises and no self-reported subjective improvement

Only self-reported subjective improvement

Absence of generalization of crises and self-reported subjective improvement

Total absence of convulsive crises and self-reported subjective improvement



2009

An Overview at the IACM meeting in Cologne

Mechoulam on Cannabidiol

The emerging significance of cannabis components other than THC was again a prominent theme when the International Association of Cannabis as Medicine met in Cologne in early October, 2007. The IACM was founded in 1997 by Franjo Grotenhermen, MD (as the German ACM); it is a smaller organization than the ICRS and its focus is more clinical, less pharmacological.

Mechoulam thought his study of cannabis would be “a minor project, it will be finished off in six months.”

Raphael Mechoulam of the Hebrew University, Jerusalem, Faculty of Medicine gave a talk on cannabidiol on the occasion, he noted, of his 45th year of involvement in the field. In the Fall of 1962 Mechoulam had just gotten his PhD in chemistry and was looking for a research project that might lead to tenure at the Weizmann Institute. He chose to analyze the components of cannabis, he said, thinking “it’s a minor project, it will be finished off in six months.”

“There is a fantastic collabo-

a lipid. Sophisticated analytical techniques and brilliant, dedicated lab workers (“They should not be married so they can work 24 hours a day, seven days a week”) enabled Mechoulam to isolate a cannabinoid produced by the body itself —arachidonoyl-ethanolamide or AEA, which his colleague William Devane dubbed “anandamide,” incorporating the Sanskrit word for “bliss.”

“There is almost no physiological system that has been looked into in which endocannabinoids don’t play a certain part.”

Mechoulam’s lab isolated a second endogenous compound, arachidonoyl glyceride, or 2-AG, which is more abundant in the body but less potent than anandamide. Although their structures are different, AEA, 2-AG and THC have similar pharmacological effects.

The receptors to which they bind weave in and out of the cell membrane and are coupled to a protein that triggers events within the cell leading to slowed release of neurotransmitters. (Think of a tiny doorknob twisting on the outside

the serotonin receptors. No wonder, then, that CBD plays a role in many clinical conditions.

Conditions treatable by CBD

Mechoulam described an experiment led by Paul Consroe and colleagues in Brazil in which CBD was tested as a treatment for intractable epilepsy. Patients stayed on the anticonvulsants they had been on (which hadn’t eliminated their seizures) and added 200mg/day of CBD or a placebo. Of the seven patients getting CBD over the course of several months, only one showed no improvement; three became seizure-free; one experienced only one or two seizures, Mechoulam recalled; and two experienced reduced severity and occurrence of seizures.

“Nobody has done any work on cannabidiol in the clinic on epilepsy, and I just wonder why.”

“So it seemed a very promising approach,” said Mechoulam, “but unfortunately, nothing has been done ever since. To the best of my knowledge, nobody has done any work on cannabidiol in the clinic on epilepsy, and I just won-

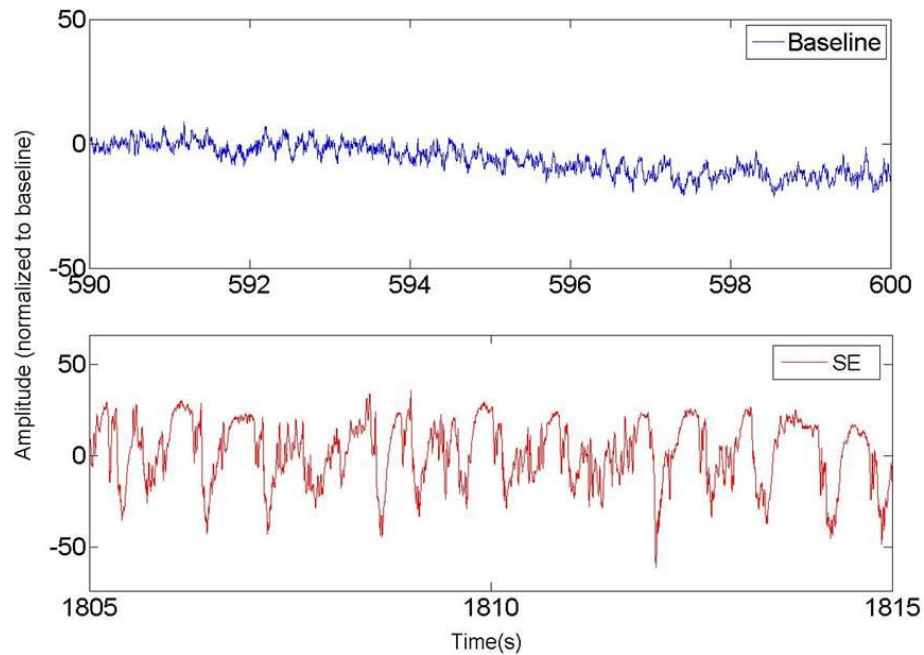


Raphael Mechoulam

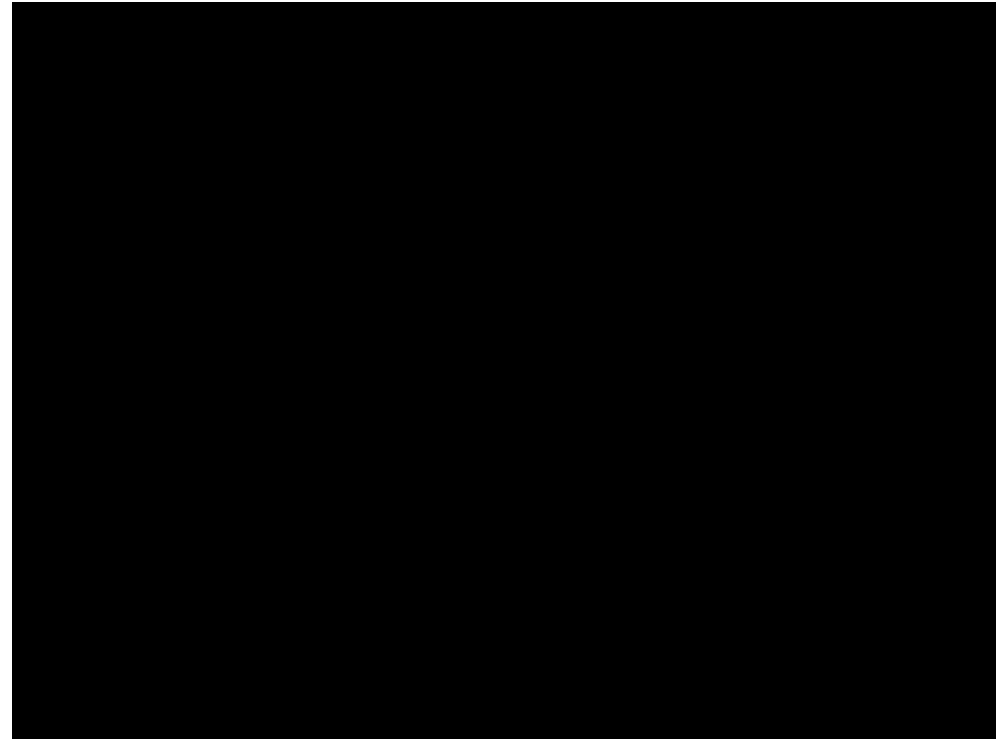
more CBD,” Mechoulam said. “We should try it with humans in a few years.”

He went on: “What about sleep? I’m jumping from thing to thing to show you that CBD does quite a lot of things and I’m not sure that all of them are accord-

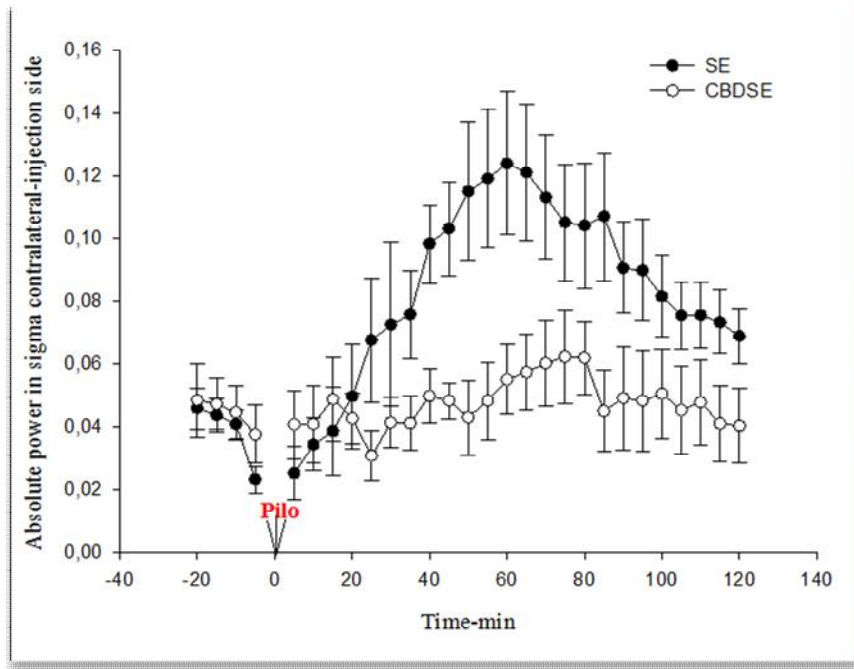
Cannabidiol and Epilepsy



Oscillatory brain activity before (baseline) and after IHPILO treatment



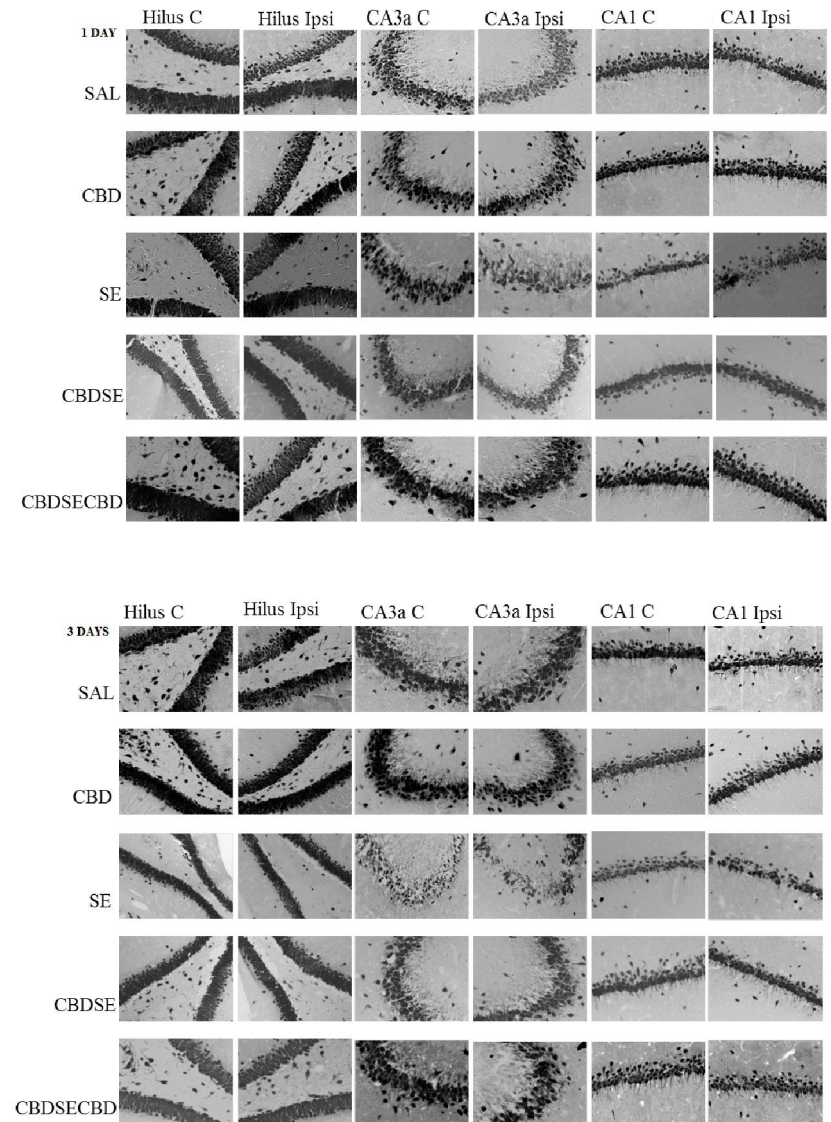
Cannabidiol and Epilepsy



increased SE latency (1) and (2) lower seizure

Oscillatory brain activity before (baseline) and after IHPILO treatment

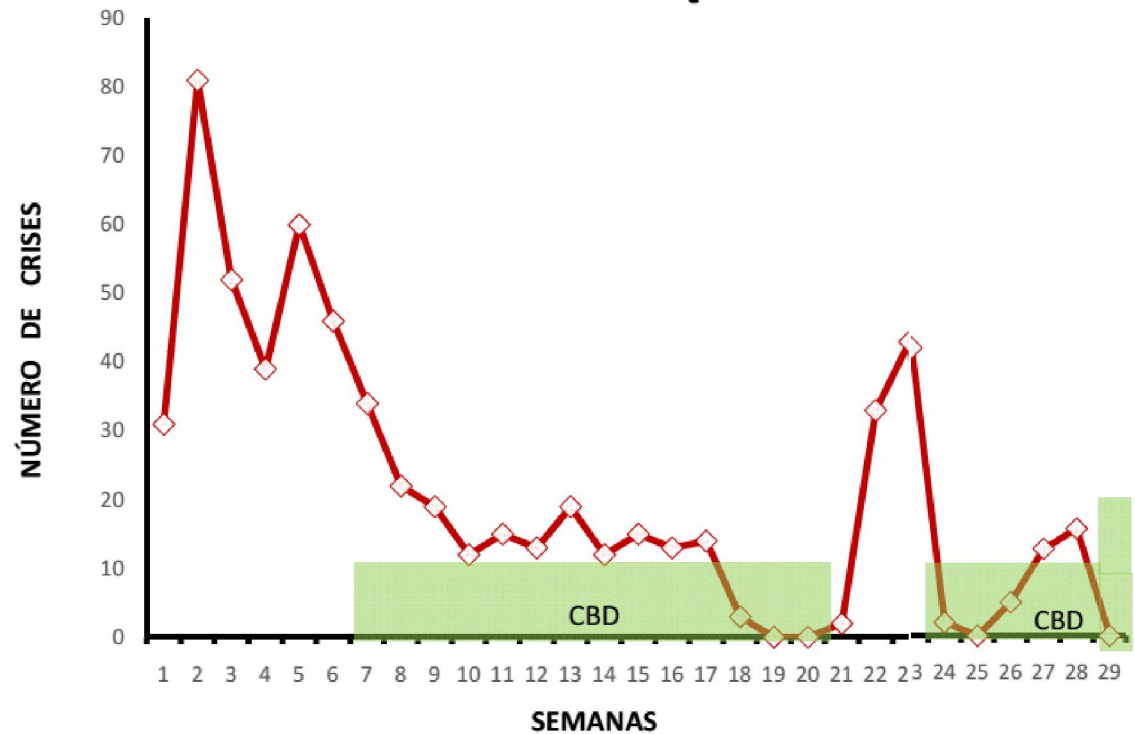
Cell density and Number of cellular degeneration



Cannabidiol and Epilepsy (CDKL5 Sd.)



A.F, 5 years





“Minha filha tinha 60 convulsões por semana. Semana passada, teve três. É uma coisa milagrosa.”

Katiele Bortoli Fischer, 33
mãe da Anny, 5; sobre o uso de extrato de maconha com canabidiol. Brasília (DF)

SUPER
INTERESSANTE

Saiba mais sobre maconha medicinal
no especial “A Revolução da Maconha”.
Lançamento: 27.02



ILEGAL

Direção: Tarso Araújo e Raphael Erichsen



Fantástico debate o uso da maconha em tratamentos de saúde

Derivado é proibido no Brasil. Saiba mais no programa deste domingo (30).



FOLHA DE S.PAULO

★ ★ ★ UM JORNAL A SERVIÇO DO BRASIL

equilíbrio e saúde

Justiça autoriza importação de remédio derivado de maconha para criança com epilepsia

MONIQUE OLIVEIRA
DE SÃO PAULO

03/04/2014 © 19h36

Pela primeira vez no Brasil, um paciente conseguiu uma liminar para usar e importar medicamento derivado da *Cannabis sativa*, nome científico da maconha.



"Acompanhei à Anny e sei da evolução da doença e dos benefícios do CBD", diz José Alexandre Crippa, psiquiatra da USP de Ribeirão Preto que já estudou os benefícios do canabidiol para uma série de enfermidades, incluindo ansiedade, transtornos do sono, Parkinson e epilepsia.

Others

- Diabetes
- Multiple Sclerosis
- Alzheimer
- Tardive Dyskinesys
- Rheumatoid Arthritis
- Fibromialgia
- Neuroblastoma
- Among others



*"When science starts to manipulate molecular fractions and look more closely at **CBD**, we will certainly have more surprises in respect to the benefits of Cannabis. It shall be the wonder of our time, as was penicillin in the past"*

20/JAN/2014

Prof. Lester Grinspoon

*Associate Professor Emeritus of Psychiatry Harvard
Medical School*



MEMORANDUM OF UNDERSTANDING

MEMORANDUM OF UNDERSTANDING BY AND BETWEEN THE UNIVERSIDADE DE SÃO PAULO (BRAZIL) AND THE HEBREW UNIVERSITY OF JERUSALEM (ISRAEL), WHICH AIMS AT PROMOTING ACADEMIC COOPERATION BETWEEN THE PARTIES.

The UNIVERSIDADE DE SÃO PAULO, located at Cidade Universitária "Armando de Salles Oliveira", São Paulo, Brazil, herein represented by its Rector Professor Doctor JOÃO GRANDINO RODAS and The HEBREW UNIVERSITY OF JERUSALEM, herein represented by its Rector Professor Sarah Stroumsa, based on the shared understanding that cooperation between both institutions will further research and other academic and cultural activities, do hereby resolve to execute this Memorandum of Understanding, which shall be governed by the following terms and conditions:

**THE HEBREW UNIVERSITY OF
JERUSALEM**

Sarah Stroumsa

SARAH STROUMSA

Rector

Date: *21/5/12*

Electronic Acknowledgement Receipt	
EFS ID:	14640134
Application Number:	61750043
International Application Number:	
Confirmation Number:	8789
Title of Invention:	FLUORINATED CBD COMPOUNDS, COMPOSITIONS AND USES THEREOF

Conclusions



- Although the mechanisms of CBD are still unknown, a considerable body of evidence suggests that it has antipsychotic, anxiolytic and other properties
- Clinical trials with CBD and its new derivatives are clearly needed to confirm these possible effects in the treatment of different neuropsychiatric conditions

