Development of “Lifestyle Drugs” for Men and Women

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AGAH Annual Meeting 2012, Leipzig, March 01 - 02

Lifestyle drugs

Smart drugs, Quality-of-life drugs, Vanity drugs etc.

Lifestyle?

Lifestyle-Drugs?

Active development?

Discovery by chance?

Lifestyle

A lifestyle is a characteristic bundle of behaviors that makes sense to both others and oneself in a given time and place, including social relations, consumption, entertainment, and dress. The behaviors and practices within lifestyles are a mixture of habits, conventional ways of doing things, and reasoned actions

„Ein Lebensstil ist [...] der regelmäßig wiederkehrende Gesamtzusammenhang der Verhaltensweisen, Interaktionen, Meinungen, Wissensbestände und bewertenden Einstellungen eines Menschen“ (Hradil 2005: 46)

Different definitions in social sciences, philosophy, psychology or medicine

Lifestyle

Many “subdivisions”

LOHAS:	“Lifestyles of Health and Sustainability“
LOVOS:	“Lifestyles of Voluntary Simplicity“
SLOHAS:	“Slow Lifestyles of Happiness and Sustainability”
PARKOS:	“Partizipative Konsumenten“

…….

…….

…….

Lifestyle drugs

Lifestyle drug is an **imprecise term** commonly applied to medications which treat non-life threatening and non-painful conditions such as **baldness, impotence, wrinkles, or acne**, without any medical relevance at all or only minor medical relevance relative to others.

Desire for increase of personal well-being and quality of life

It is sometimes intended as a pejorative, bearing the implication that the scarce medical research resources allocated to develop such drugs were spent frivolously when they could have been better spent researching cures for more serious medical conditions.

Proponents, however, point out that improving the patient's subjective quality of life has always been a primary concern of medicine, and argue that these drugs are doing just that. It finds broad use in both media and scholarly journals.

Neuro enhancement

Vol 450|20/27 December 2007 nature

COMMENTARY

Professor's little helper

The use of cognitive-enhancing drugs by both ill and healthy individuals raises ethical questions that should not be ignored, argue **Barbara Sahakian** and **Sharon Morein-Zamir**.

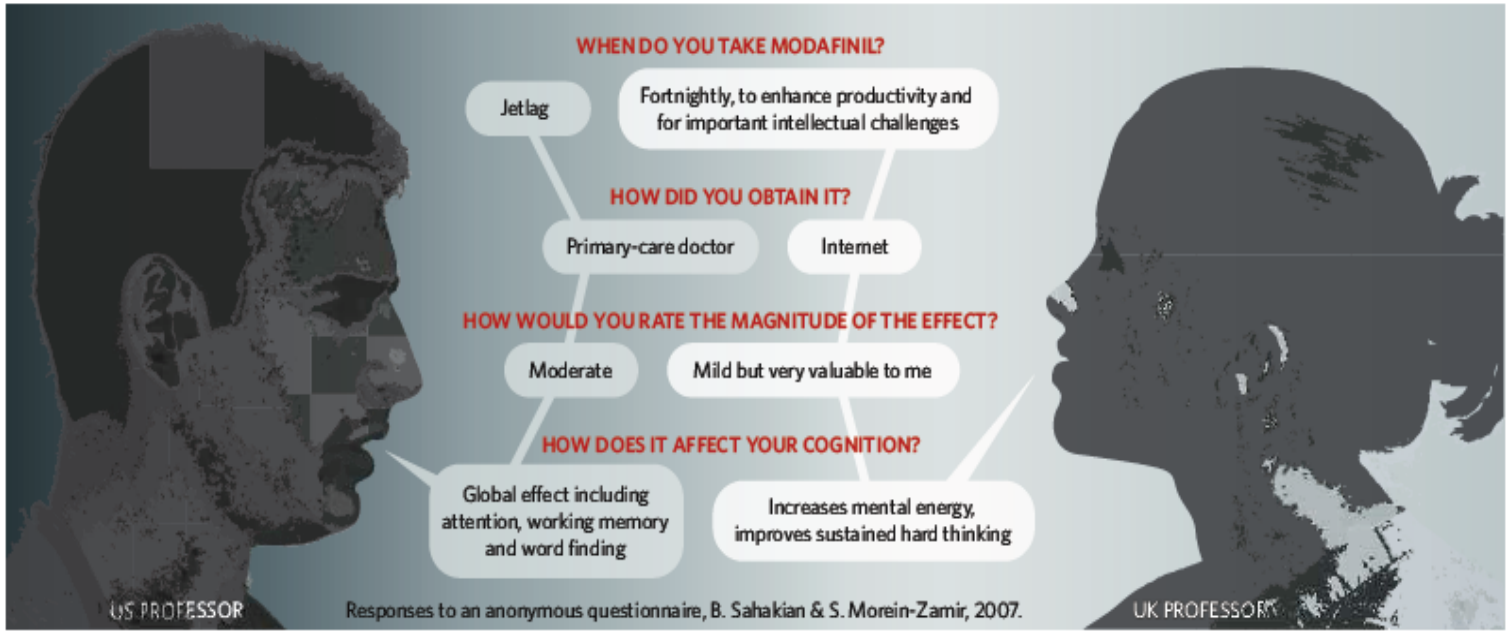
Today there are several drugs on the market that improve memory, concentration, planning and reduce impulsive behaviour and risky decision-making, and many more are being developed. Doctors already prescribe these drugs to treat cognitive disabilities and improve quality of life for patients with neuropsychiatric disorders and brain injury. The prescription use of such drugs is being extended to other conditions, including shift-workers. Meanwhile, off-label and non-prescription use by the general public is becoming increasingly commonplace.

Although the appeal of pharmaceutical cognitive enhancers — to help one study longer, work more effectively or better manage everyday stresses — is understandable, potential users, both healthy and diseased, must consider the pros and cons of their choices. To enable this, scientists, doctors and policy-makers should provide easy access to information about the advantages and dangers of using cognitive-enhancing drugs and set out clear guidelines for their future use. To trigger broader discussion of these issues we offer the following questions, to which readers can respond in an online forum. Now, on to the questions.

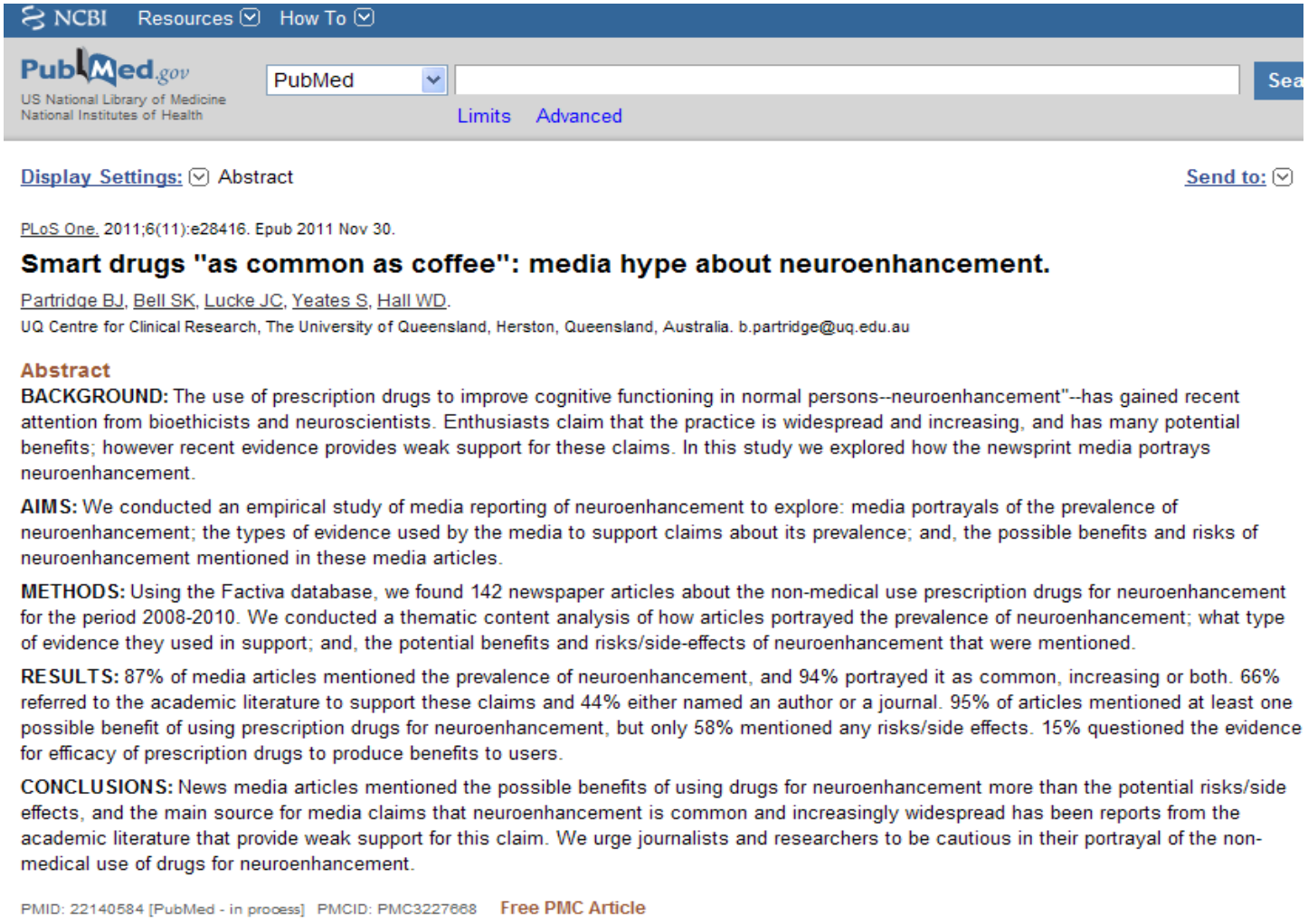
NIKOS/ZEFA/CORBIS

Morning pick-me-up: will drugs that help you stay alert become as widely acceptable as coffee?

Neuro enhancement



Neuro enhancement



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PLoS One. 2011;6(11):e28416. Epub 2011 Nov 30.

Smart drugs "as common as coffee": media hype about neuroenhancement.

Partridge BJ, Bell SK, Lucke JC, Yeates S, Hall WD.

UQ Centre for Clinical Research, The University of Queensland, Herston, Queensland, Australia. b.partridge@uq.edu.au

Abstract

BACKGROUND: The use of prescription drugs to improve cognitive functioning in normal persons--neuroenhancement"--has gained recent attention from bioethicists and neuroscientists. Enthusiasts claim that the practice is widespread and increasing, and has many potential benefits; however recent evidence provides weak support for these claims. In this study we explored how the newsprint media portrays neuroenhancement.

AIMS: We conducted an empirical study of media reporting of neuroenhancement to explore: media portrayals of the prevalence of neuroenhancement; the types of evidence used by the media to support claims about its prevalence; and, the possible benefits and risks of neuroenhancement mentioned in these media articles.

METHODS: Using the Factiva database, we found 142 newspaper articles about the non-medical use prescription drugs for neuroenhancement for the period 2008-2010. We conducted a thematic content analysis of how articles portrayed the prevalence of neuroenhancement; what type of evidence they used in support; and, the potential benefits and risks/side-effects of neuroenhancement that were mentioned.

RESULTS: 87% of media articles mentioned the prevalence of neuroenhancement, and 94% portrayed it as common, increasing or both. 66% referred to the academic literature to support these claims and 44% either named an author or a journal. 95% of articles mentioned at least one possible benefit of using prescription drugs for neuroenhancement, but only 58% mentioned any risks/side effects. 15% questioned the evidence for efficacy of prescription drugs to produce benefits to users.

CONCLUSIONS: News media articles mentioned the possible benefits of using drugs for neuroenhancement more than the potential risks/side effects, and the main source for media claims that neuroenhancement is common and increasingly widespread has been reports from the academic literature that provide weak support for this claim. We urge journalists and researchers to be cautious in their portrayal of the non-medical use of drugs for neuroenhancement.

PMID: 22140584 [PubMed - in process] PMCID: PMC3227668 Free PMC Article

Attempt of classification

Nootropica

Psycotropic drugs

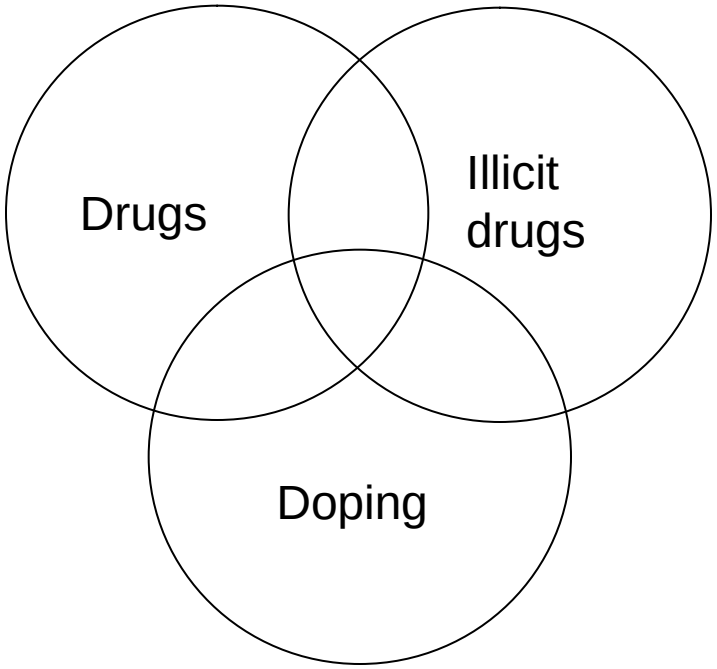
Hormones

„Ecodrugs“

Others

Harth et. Al, Gerontology 2009;55:13

Lifestyle drugs



Nootropica

Smart Drugs, neuro enhancer, memory enhancer, cognitive enhancer, intelligence enhancer

Antidementia in strict sense

Pharmaceutical products
Dietary supplements
Nutraceuticals
Functional foods
Other substances

Nootropica

Examples of pharmaceutical products

Dimethylaminoethanol (DMAE, Norcholin, Deanol)
Hydergin® (Dihydroergocornin, -toxin)
Piracetam (GABA-derivative)
Pramiracetam
Oxiracetam
Aniracetam
L-Carnitine
Vincamin (MA like racetams)
Vinpocetin
Idebenone (Q10 analogon)
Cyprodenate (DMAE precursor)
Meclofenoxate (DMAE ester)
Yohimbine (Alpha antagonist)

Harth et. Al, Gerontology 2009;55:13

Psychotropic drugs

Subgroups

Antidepressants

Neuroleptics

Tranquilizers

Mood stabilizer

Psychostimulants

Hallucinogens

Harth et. Al, Gerontology 2009;55:13

Psychotropic drugs

Examples

γ-Hydroxybutyrate (GHB)

Ketamine

Fluoxetine

Selegiline

S-Adenosyl-methionine (SAM)

Methylphenidate

Adrafinil/Modafinil

Sibutramine

L-Tryptophan

Serotonin

Dexfenfluramine

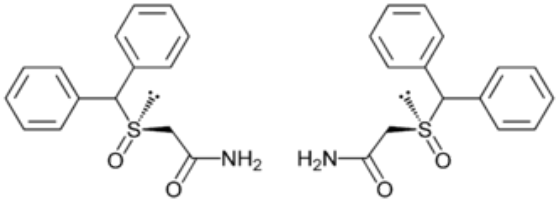
Ecstasy (XTC)

Ondansetron

Parlodel

Harth et. Al, Gerontology 2009;55:13

Modafinil



Treatment of narcolepsy

Shift work sleep disorder

Excessive daytime sleepiness associated with obstructive sleep apnea

Vigil (D)
Modasomil (A, CH)
Provigil (USA)
Alertec (CAN)
Generikum (A)

„Brainbooster“

Prolongation of exercise time up to exhaustion

Listed by World Anti-Doping Agency

Hormones

Dehydroepiandrosterone (DHEA)

Pregnenolone

Melatonin

Desmopressin (DDAVP)

Norethisterone

Contraception drugs

Human growth hormone

Human chorionic gonadotropin

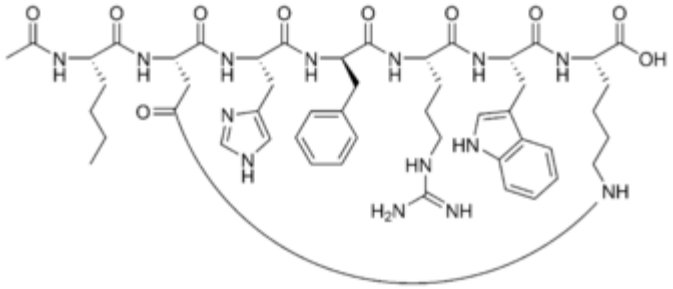
Anabolic steroids

Bremelanotide

Harth et. Al, Gerontology 2009;55:13

Hormones

Bremelanotide



Cyclic hepta-peptide lactam analog of alpha-melanocyte-stimulating hormone (alpha-MSH), activating melanocortin receptors MC3-R and MC4-R in the CNS

Developed from Melanotan II as sunless tanning agent

9 of 10 male volunteers reported sexual arousal and spontaneous erections as side effects

Discontinuation of development due to RR elevations

New Phase II studies with subcutanous drug delivey system

Genuine aphrodisiac because of central action in male and female

Human Growth Hormon

Somatropin

„Fountain of youth“

Shortening of lifetime?

Restlife full of well-being and without complaints

Application for at least 6 month to see real benefits (~1mg/d)

After 2 month improvement of sleep and mental clarity

Available as oral spray or as injectable

β-HCG

Human chorionic gonadotropin

Weight loss agent (together with diet plan, according to Dr. A.T.W. Simeons)

Regular injections of 120 to 200 IU (6 d/w)

PoC not confirmed by clinical trials

By AAS taking athlets used to restore testicular size (mimicking LH)

Ecodrugs

Biogenic drugs, Natural drugs, „Head shop“ drugs

Absinth (Artemisia absinthum)

Echinacea (Echinacea purpurea)

Kava-kava (Piper methysticum)

Herbal ecstasy (Ephedra sinica)

Ritual spirit (Ecstasy)

Guarana (Paullinia cupana)

Chinese herbs

Rose of Sharon

Vitamins

Minerals

Amino acids

Gingko biloba

Others

Dextromethorfane (DXM)

Metformin

Propranolol

Coenzyme Q

Orlistat (Xenical®)

Nimodipine

Centrophenoxin (Lucidril®)

Clenbuterol (Spiropent®)

NADH

Phenytoin

Deprenyl (Selegiline)

Bupropion (Zyban®)

Harth et. Al, Gerontology 2009;55:13

Dextromethorphan

Dextromethorphan *Antitussivum*

(+)-3-Methoxy-N-methylmorphinan

HWZ:	3,5 h Met. 3 h	HD:	(ja)	HP:	

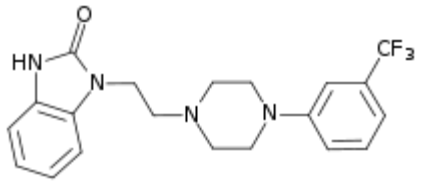
Präparateliste

Suchergebnis: **10** Präparate

Liste umschalten zu "Präparateliste mit Preispackungsangaben"

45.B.2.1.	Basoplex® Erkältungs-Kapseln *Ap* **Basoplex® Erkältungs-Kapseln** (Komb)	RIEMSER
45.B.2.1. FS	Cetebe® antiGrippal Erkältungs-Trunk Forte *Ap* **Cetebe® antiGrippal Erkältungs-Trunk Forte** Granulat (Komb)	GlaxoSmithKline Consumer Healthcare
24.1.1.B.1.1.2. FS	Hustenstiller-ratiopharm® Dextromethorphan *Ap* **Hustenstiller-ratiopharm® Dextromethorphan** Hartkapseln (Mono)	ratiopharm
24.2.B.1. FS FS	Silomat® DMP/-DMP gegen Reizhusten *Ap* **Silomat® DMP** Lutschpastillen (Mono) *Ap* **Silomat® DMP gegen Reizhusten** Lutschpastillen (Mono)	Boehringer Ingelheim
24.1.1.B.1.1.2. FS	Silomat® DMP INTENSIV gegen Reizhusten *Ap* **Silomat® DMP INTENSIV gegen Reizhusten** Hartkapseln (Mono)	Boehringer Ingelheim
45.B.2.1.	WICK® DayMed Erkältungs-Kapseln für den Tag *Ap* **WICK® DayMed Erkältungs- Kapseln für den Tag** (Komb)	WICK Pharma
24.2.B.1.	WICK Husten-Pastillen gegen Reizhusten mit Honig *Ap* **WICK Husten-Pastillen gegen Reizhusten mit Honig** (Mono)	WICK Pharma
24.1.1.B.1.1.2.	WICK Husten-Sirup gegen Reizhusten mit Honig *Ap* **WICK Husten-Sirup gegen Reizhusten mit Honig** (Mono)	WICK Pharma
45.B.2.2.	WICK MediNait®, Erkältungssirup für die Nacht *Ap* **WICK MediNait®, Erkältungssirup für die Nacht** (Komb)	WICK Pharma
45.B.2.2.	WICK MediNait Erkältungssirup mit Honig- und Kamillenaroma	WICK Pharma

Flibanserin



Initially tested to treat depression

5-HT1A receptor agonist and 5-HT2A receptor antagonist

Probably restores the balance between neurotransmitter systems

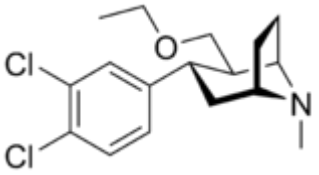
Excitatory activity is driven by dopamine and norepinephrine, while the inhibitory activity is driven by serotonin

Indication Hypoactive Sexual Desire Disorder (HSDD)

100 mg/day is the maximum dosage recommended

Development terminated in Oct 2010 following a negative report by the FDA

Tesofensine



Triple reuptake inhibitor of

Noradrenaline

Dopamine

Serotonin

Indirectly stimulating the cholinergic system in prefrontal cortex and hippocampus

Originally developed for the treatment of Alzheimer's disease and Parkinson's disease

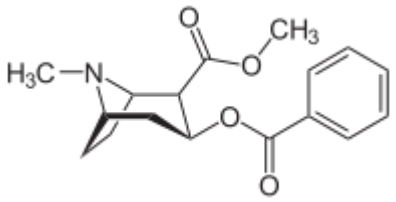
Die Polypill: alles niedrigdosiert zusammenmischen

Table 1 Effects of the Polypill on the risks of ischaemic heart disease (IHD) and stroke after two years of treatment at age 55-64

Risk factor	Agent	Reduction in risk factor	% reduction in risk (95% CI)*		Source of evidence
			IHD event	Stroke	
LDL cholesterol	Statin†	1.8 mmol/l (70 mg/dl) reduction in LDL cholesterol	61 (51 to 71)	17 (9 to 25)	Law et al[1]
Blood pressure	Three classes of drug at half standard dose	11 mm Hg diastolic	46 (39 to 53)	63 (55 to 70)	Law et al[16]
Serum homocysteine	Folic acid (0.8 mg/day)	3 µmol/l	16 (11 to 20)	24 (15 to 33)	Wald et al[9]
Platelet function	Aspirin (75 mg/day)	Not quantified			Table A on bmj.com
Combined effect	All		88 %	80 %	

Wald, Law: bmj.com 2003;326:1419

Cocain



DHEA

DHEA against:

AIDS

Allergies

Aging

Autoimmune diseases

Dementia

Diabetes

Obesity

Cardiovascular disorders

Osteoporosis

etc.....

DHEA

Institut für Klinische Pharmakologie
Klinikum Mannheim
Ruprecht-Karls-Universität Heidelberg

Doppelblinde, placebokontrollierte Crossover-Studie zur Untersuchung der Wirkung des Neurosteroids Dehydroepiandrosteron (DHEA) im ZNS unter Verwendung der funktionellen Magnetresonanztomographie (fMRI)

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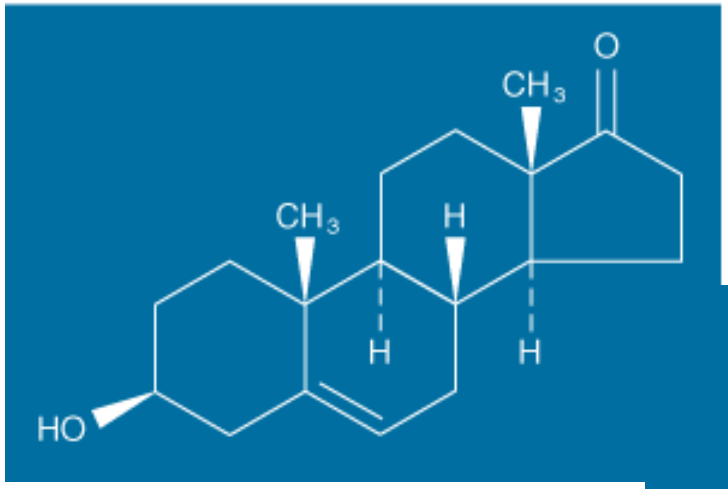
DHEA

FIGURE 1. Structure of DHEA.



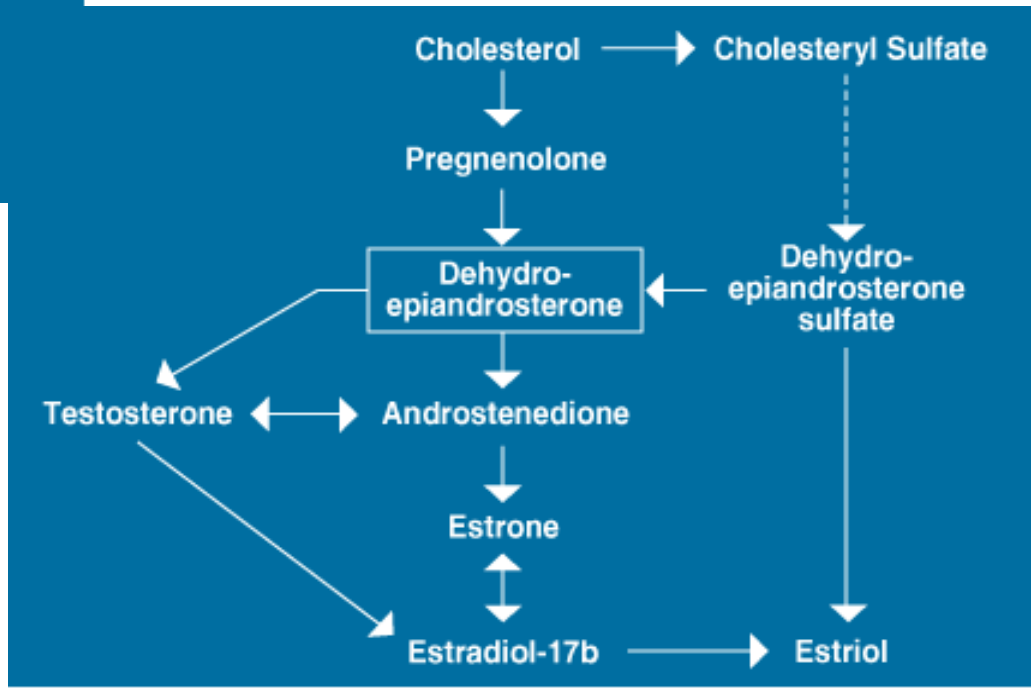


FIGURE 2. Biosynthetic Pathways of DHEA and its Metabolites.

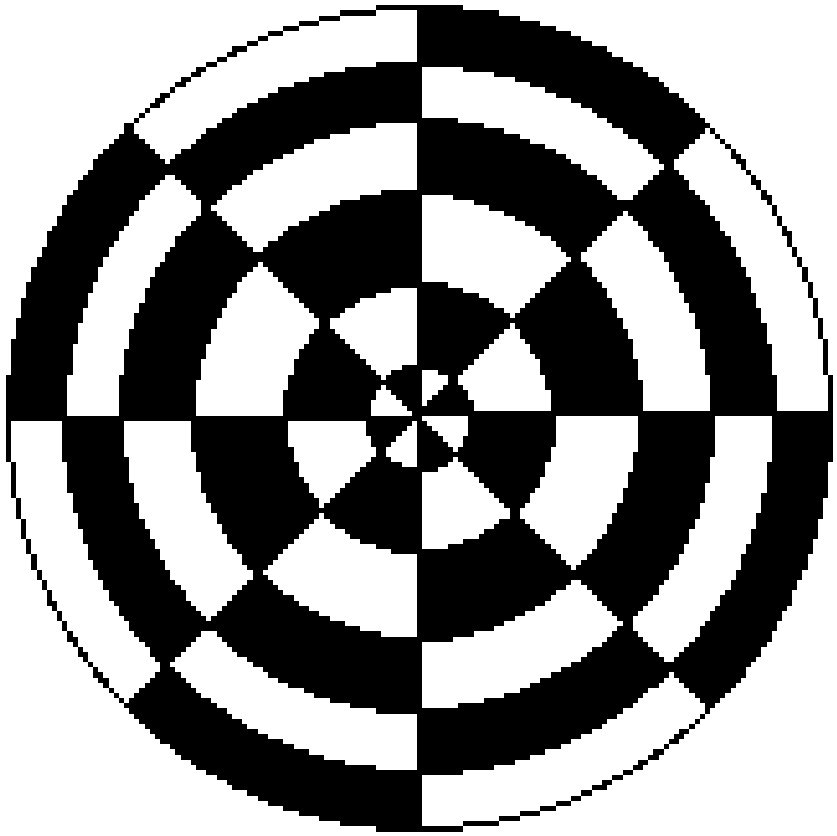
DHEA

Primäre Zielkriterien:

- **Änderung der BOLD-Response unter einem einfachen, standardisierten fMRI-Paradigma nach Gabe von DHEA oder Plazebo.**
- **Korrelation der BOLD-Response-Veränderung mit dem Ergebnis der neuropsychologischen Testreihe (Aufmerksamkeitsleistung, Visomotorik, visuelles Scanning)**

Sekundäre Zielkriterien:

- **Plasmaspiegel von DHEA und DHEAS**
- **Korrelation pharmakodynamischer Parameter mit GABA-A-Rezeptor-Polymorphismen**



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DHEA

Folgende Kontraste wurden berechnet:

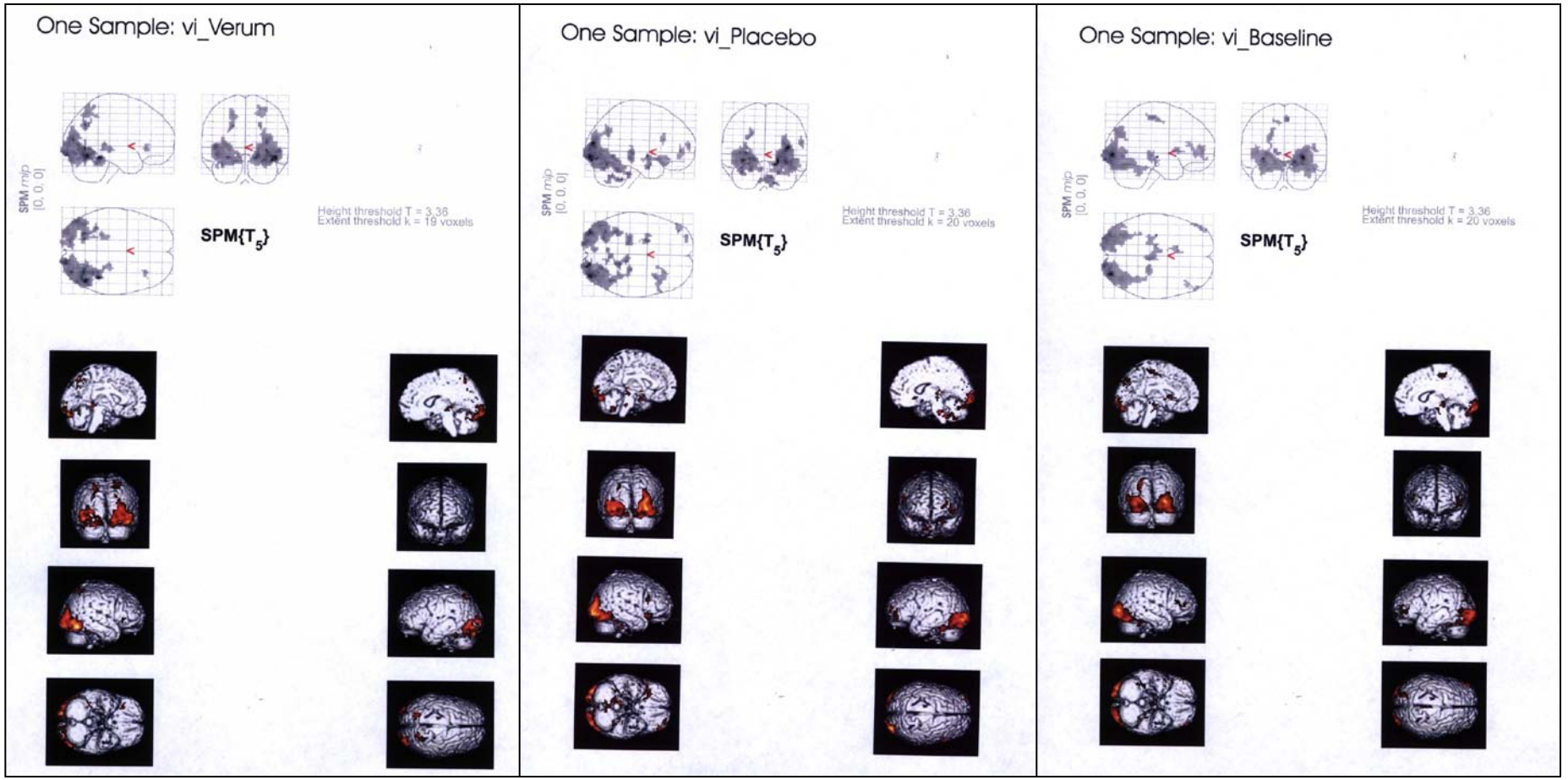
„vi“	Checkerboard (0, 1 und 6 Hz) gegen Baseline (Kreuz fixieren)
„eins“	Checkerboard invertiert mit 1 Hz
„sechs“	Checkerboard invertiert mit 6 Hz
„sechs>eins“	Wo besteht bei 6 Hz mehr Aktivierung als bei 1 Hz
„bewegt>fix“	Wo besteht bei 6 Hz und 1 Hz mehr Aktivierung als bei 0 Hz

Folgende Statistiken wurden berechnet:
[in SPM (Statistical Parametric Mapping)]

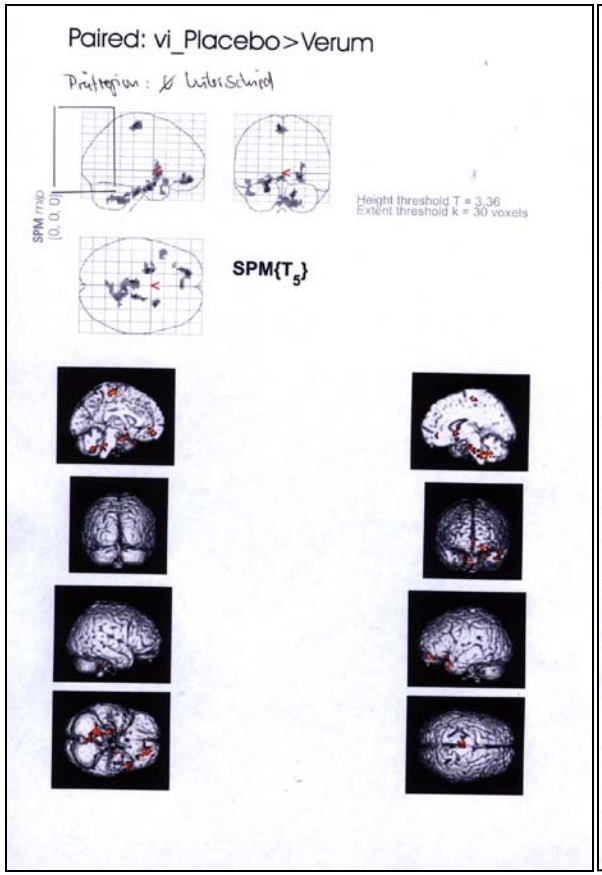
Einzelstatistiken für den Kontrast „vi“
Reteststabilität mit Hilfe des „vi“-Kontrastes
One Sample T-Tests für die einzelnen Sessions
Paired T-Tests für Interaktionen zwischen den Sessions

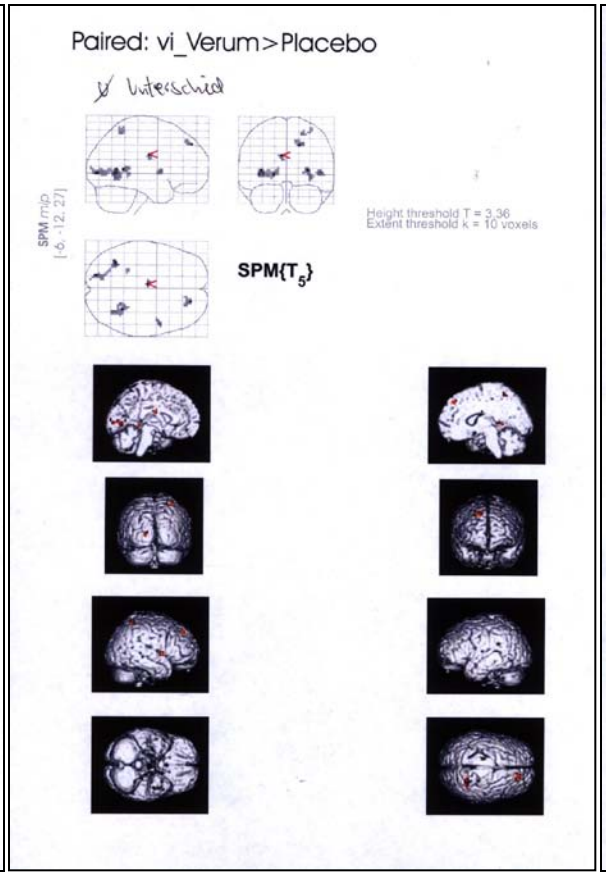
(z.B.: wo finden sich im Placebo-Arm im Vgl. zur Baseline mehr Aktivierungen unter 6 Hz im Vergleich zu 1 Hz?)

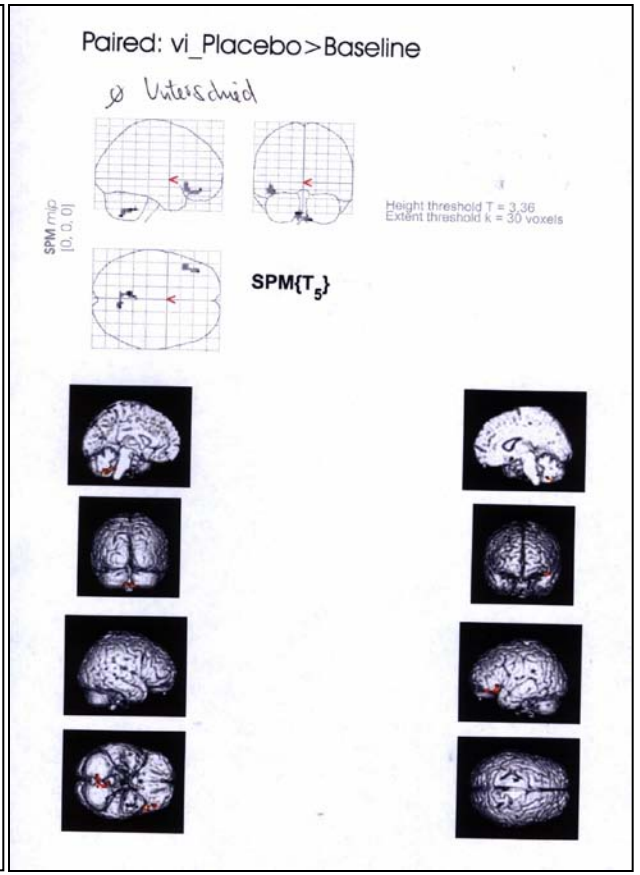
DHEA


One Sample: vi_Verum
SPM mip [0, 0, 0]
SPM{T5}
Height threshold T = 3.36
Extent threshold k = 19 voxels
One Sample: vi_Placebo
SPM mip [0, 0, 0]
SPM{T5}
Height threshold T = 3.36
Extent threshold k = 20 voxels
One Sample: vi_Baseline
SPM mip [0, 0, 0]
SPM{T5}
Height threshold T = 3.36
Extent threshold k = 20 voxels

DHEA


Paired: vi_Placebo>Verum
Prüfregion: ø Unterschied
SPM mip
[0, 0, 0]
Height threshold T = 3.36
Extent threshold k = 30 voxels
SPM{T5}


Paired: vi_Verum>Placebo
ø Unterschied
SPM mip
[-6, -12, 27]
Height threshold T = 3.36
Extent threshold k = 10 voxels
SPM{T5}


Paired: vi_Placebo>Baseline
ø Unterschied
SPM mip
[0, 0, 0]
Height threshold T = 3.36
Extent threshold k = 30 voxels
SPM{T5}

DHEA

Neuropsychologische Tests

D2	Aufmerksamkeits- / Konzentrationstest
TMT A	Trail Making Test visuelle Geschwindigkeit
TMT B	wie TMT A plus Arbeitsgedächtnis
CPT	Continuous Performance Test
TAP	Testbatterie zur Aufmerksamkeitsprüfung

DHEA

Results:

The neuropsychological tests show markedly enhanced performance with verum and with placebo compared to baseline.

However, there are no statistically significant differences between verum and placebo

DHEA

Explanations:

Practise effects and / or familiarization

Activation effects due to drug application

DHEA

Conclusion:

Without placebo control the published results probably would have been:

A single dose of 200 mg DHEA significantly increases performance in neuropsychological tests