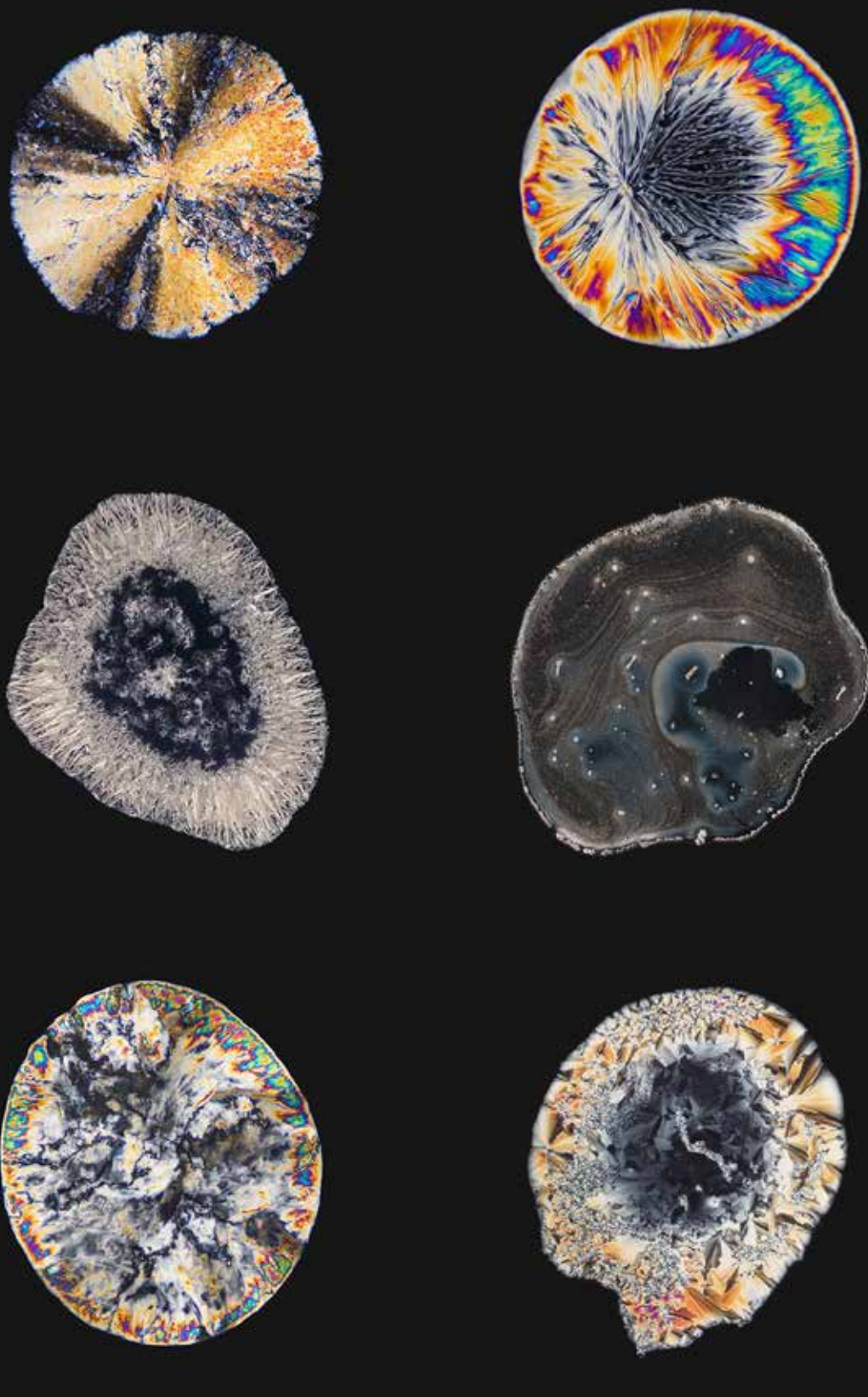


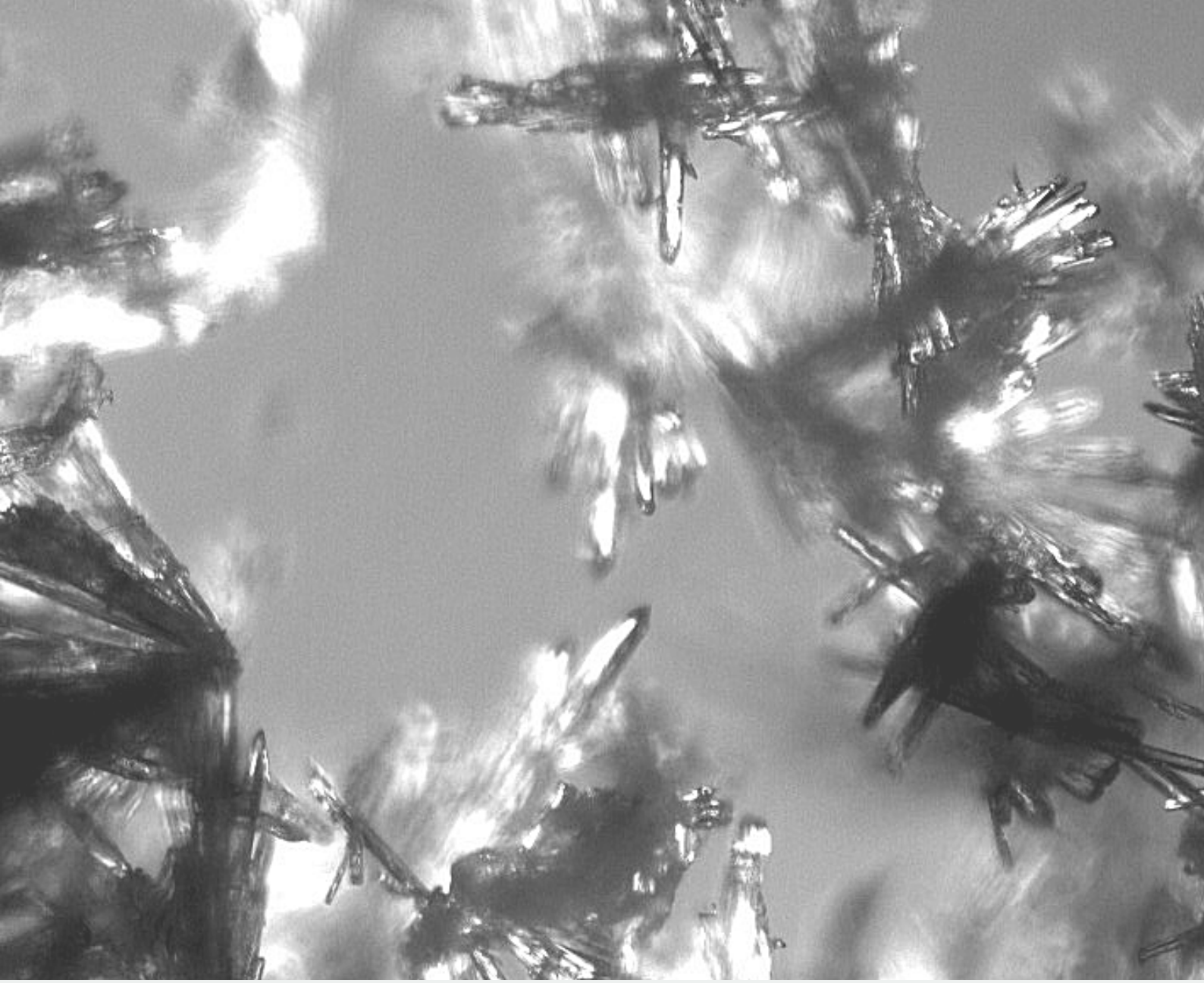
BECKLEY FOUNDATION SCIENTIFIC PROGRAMME

BECKLEY
FOUNDATION

The Beckley Foundation is a UK–based think tank and UN-accredited NGO founded by Amanda Feilding in 1998. We combine science and policy to further our understanding of consciousness, and to effect changes in global drug policy in order to improve public health. We are at the forefront of scientific research into the potential medical benefits of psychedelics, cannabis and MDMA, and are pioneering in our contribution to international drug policy reform.

The Scientific Programme develops and supports scientific research through an international network of collaborative partnerships with leading scientists and institutions. Studies focus on cannabis, psychedelics (psilocybin, LSD, ayahuasca, DMT), and MDMA. We investigate the action of these substances upon the human brain, using the latest developments in neuroscience and brain-imaging technology. The research aims to increase our scientific understanding of consciousness, and to use this knowledge to treat mental and physical illness, expand awareness and enhance well-being, openness and creativity.

The Policy Programme provides a rigorous, independent review of current global drug policies, whilst developing a scientific evidence-base on which to build balanced alternatives. The Programme's initiatives bring together leading international scientists, politicians and other experts to discuss the taboo issues around this complex subject. We promote the exploration of new regulatory models for protecting health and reducing harms caused both by the drugs themselves and the collateral consequences of prohibition. We collaborate globally with political leaders, most recently advising the Jamaican government in creating their emerging cannabis industry.



Many thanks to our donors!

Our Science and Policy Programmes, and the dissemination of new information to international organisations, governments, and the public, rely exclusively on the generosity of our supporters. The Beckley Foundation would like to sincerely thank its donors for their generous support, including the J. Paul Getty Jr. Charitable Trust and the Open Society Foundations. We ask all interested parties to help us develop and expand our programmes of work in science, policy, and communication.

Donations, of any amount, are greatly appreciated.

To donate, please visit **beckleyfoundation.org/donate**

LSD Crystals Photo by Nick Cozzi

AMANDA FEILDING AND THE BECKLEY FOUNDATION

The best way to overcome the taboo and re-integrate invaluable compounds like cannabis and the psychedelics into the fabric of society is by undertaking the very best scientific research.

Amanda Feilding

Amanda Feilding's contribution to psychedelic science and drug-policy reform has been pivotal and widely acknowledged. She has been called the 'hidden hand' behind both global drug-policy reform and the renaissance of psychedelic science.

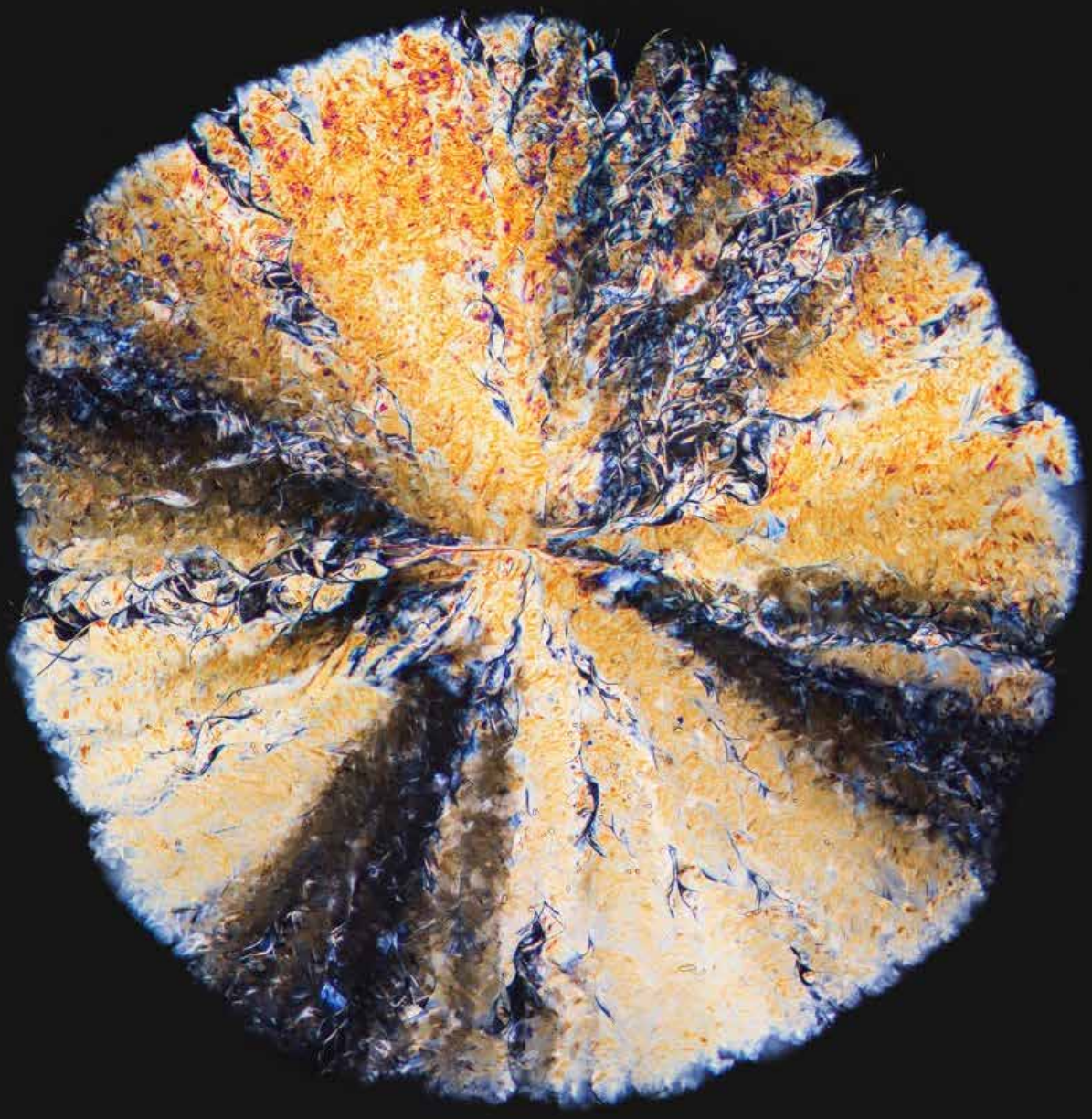
Amanda has always had a passionate interest in consciousness and its altered states. She studied comparative religions and mysticism at Oxford, and travelled widely in Egypt and the Middle East. In the 1960s, at the height of the first wave of scientific research into psychedelics, she was introduced to LSD. Impressed by its power to initiate mystical and other non-ordinary states of consciousness, including enhanced creativity and heightened awareness, she soon recognised its transformative and therapeutic potential. She started studying the mechanisms underlying the effects of psychedelic substances, and of other techniques to alter consciousness, and dedicated herself to exploring ways of harnessing their potential for the benefit of the individual and society.

In 1996, Amanda set up The Foundation to Further Consciousness, changing its name to the Beckley Foundation in 1998. She realised that cannabis and psychedelics could only be re-integrated into society through carrying out the very best scientific investigations into the mechanisms underlying their actions, and into their potential therapeutic and transformational effects. Through the Foundation, she set about using cutting-edge neuroscience and brain-imaging technologies to examine the physiological changes underlying altered states of consciousness. Her long-held aim is to further our understanding of brain-function under the influence of various psychoactive substances, so that we can better harness their great potential to improve the human state.

Having watched the development of the 'War on Drugs' with dismay, Amanda felt compelled to do whatever she could to draw attention to its devastating and unintended consequences. Collaborating with a network of scientists, political leaders and drug-policy analysts, she was among the first to begin creating a scientific evidence-base to help reform global drug policy, in order to better protect health, reduce harms and economic costs, and respect human rights.

From 1998, she initiated and hosted a series of seminars of international experts in the House of Lords, discussing key policy issues and drawing attention to the unmentioned topics of cannabis and psychedelics. These seminars and the papers arising from them were very influential in changing attitudes among thinkers and policy-makers internationally. Through the Foundation, Amanda helped bring about the creation of a scientific evidence-base to help reform global drug-policy and to open the doors to scientific research.

DMT Crystal, Cross polarisation microscope.
Photo by Maurice Mikkers, **medium.com/micrograph-stories**



The Beckley Foundation is one of the few organisations in the world that initiates and directs scientific research into cannabis and the psychedelics.

50

Over 50 papers have been published in influential scientific journals as a result of the Foundation's collaborative research projects.

THE BECKLEY/IMPERIAL RESEARCH PROGRAMME

The *Beckley/Imperial Research Programme* has been a highly-productive partnership between Amanda Feilding and Prof David Nutt, co-founders and directors of the programme, and Dr. Robin Carhart-Harris, lead investigator. The collaboration began in 2005, when Amanda approached David – then at the University of Bristol – to form a partnership to investigate the effects of of psychedelics and cannabis on brain-function. In 2009, David moved to Imperial College London, and their collaboration became the *Beckley/Imperial Research Programme*.

The programme has carried out pioneering brain-imaging studies with psilocybin, MDMA and LSD, using fMRI and MEG, and developed cutting-edge analyses and mathematical modelling of network connectivity. This has greatly expanded our understanding of how

psychedelics work in the brain, and provided invaluable insights into the nature of different states of consciousness. The programme has now expanded with new scientists joining the team.

In 2012, the first findings of the psilocybin brain-imaging study were published to world acclaim, which later led to the *Medical Research Council* awarding a grant to study the effects of psilocybin in the treatment of depression. The pilot study has recently been completed and published in The *Lancet Psychiatry*, with remarkably positive results. 67% of subjects with treatment-resistant depression were in remission one week after taking psilocybin, and three months later 42% remained depression-free. This is an unprecedented achievement, as these subjects had been ill on average for 18 years, and had failed to respond to any other antidepressant treatments.

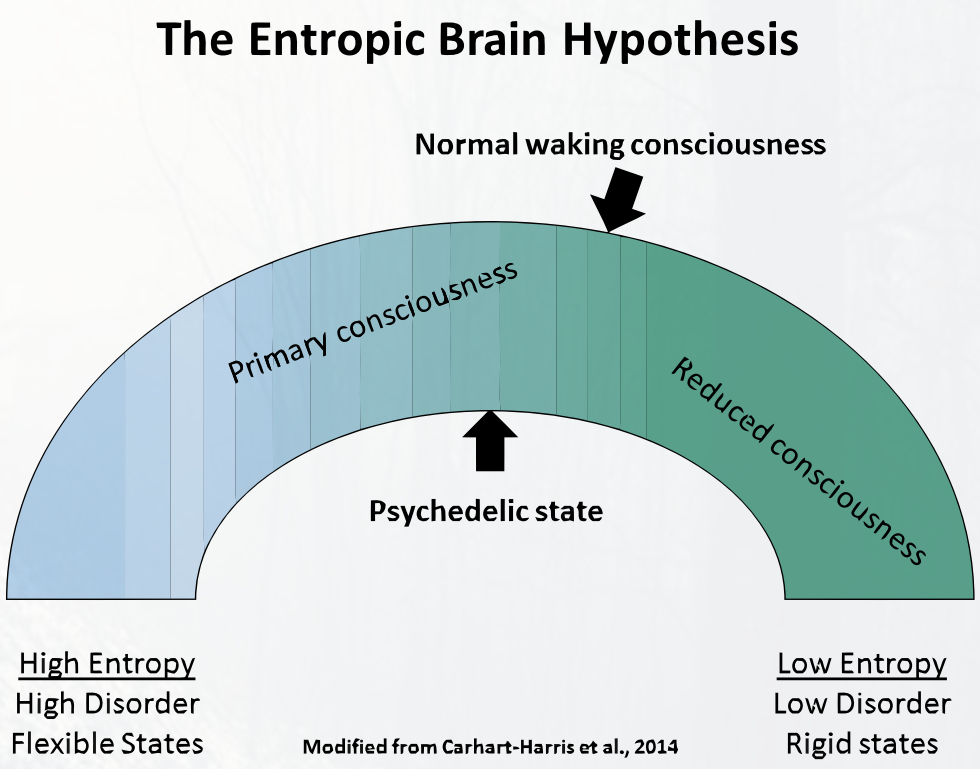
In 2012, the *Beckley/Imperial Research Programme* conducted the brain imaging study on MDMA ('Ecstasy'), as part of the Channel 4 programme *Drugs Live: The Ecstasy Trial*. The study examined, for the first time, how the resting brain responds to MDMA and also included

a series of cognitive tests investigating MDMA's effects on empathy, trust and memory. This provided fundamental information about the neural underpinnings of MDMA's effects, and its psychotherapeutic value. The programme, which was presented by Jon Snow, was viewed by over 2 million people.

In 2014, the *Beckley/Imperial Research Programme* started the first-ever brain imaging study with LSD, a long-standing ambition of Amanda's. Results revealed marked changes in brain blood-flow, neural activity, and network communication patterns that correlated strongly with the drug's hallucinatory and other consciousness-altering properties. These results have implications for the neurobiology of consciousness and for potential applications of LSD in psychological research as well as a tool for psychotherapy.

The findings from our research prompted the so-called 'entropic brain theory' (where 'entropy' refers to 'chaotic' or 'erratic' brain-activity). According to this model, during normal waking consciousness, the brain operates between a highly-ordered, low-entropy state and a highly-disordered, high-entropy state. This optimal position between perfect order and complete disorder allows the brain to function in an organised, yet flexible manner.

Psychedelic drugs are thought to increase the entropy of the brain, generating a more disordered, fluid state of consciousness. This more flexible state increases receptivity to new concepts and ideas, and allows for the breaking of rigid patterns of thought and behaviour, such as the ones found in depression or addiction.



BECKLEY / IMPERIAL RESEARCH PROGRAMME

Collaboration between Amanda Feilding, Prof David Nutt (Co-Directors of the Programme) and Dr Robin Carhart-Harris (lead investigator) at Imperial College London

LSD and creativity study

Led by Amanda Feilding

This groundbreaking study will explore the propensity of LSD to enhance creativity and intuitive pattern recognition, using the ancient game of GO as the test tool, together with the latest brain imaging technology.

Reconstruction of the visual hallucinations experienced on LSD

Led by Leor Roseman, collaboration between Berkeley University and the Beckley/Imperial Research Programme

Study participants will watch a few hours of videos as the training set. Then, a sophisticated artificial intelligence model will try to delineate what the subject is seeing with their eyes closed, thus reconstructing a video of the eyes-shut psychedelic imagery.

Psilocybin for depression

Led by Robin Carhart-Harris

Following the success of our small pilot study, in which two doses of psilocybin lifted the treatment-resistant depression of all twelve participants for three weeks, and for three months in five of the participants, we are planning to extend this research into a large scale, randomised, controlled study in order to establish the efficacy of the compound in this type of depression.

Human brain effects of DMT as determined by combined fMRI and EEG

Led by Chris Timmerman

The main objective of the study is to investigate the effects of (DMT) on human brain activity by using the simultaneous combination of the imaging methods: electroencephalography (EEG) and functional Magnetic Resonance Imaging (fMRI).

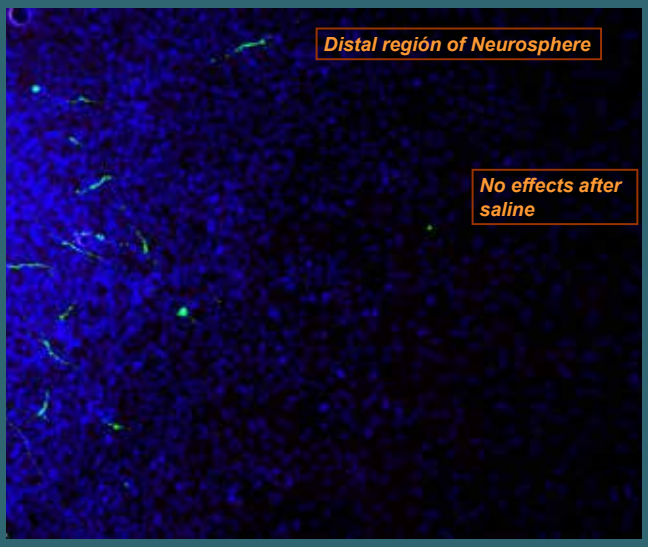
Effect of LSD and DMT on cortical pyramidal cell and vessel activity

Led by Tobias Buchborn and Thomas Knopfel

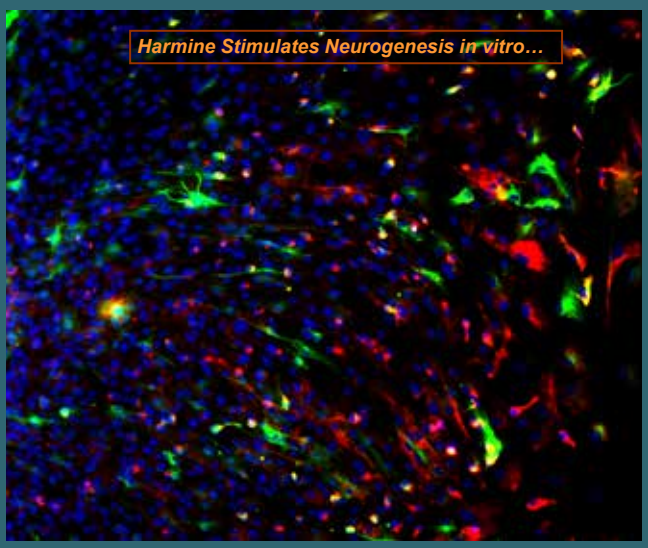
Using cutting-edge techniques of optogenetic electrophysiology, we will investigate the effects of LSD, DMT, and DOB on pyramidal cells as well as on the vascular system (haemodynamics) within the brain's cortex of waking mice. This research will be the first to 'zoom in' to the fine-grain, neuron-level details and see what happens after psychedelics bind to 5-HT2A receptors on the cortical pyramidal neurons.

THE BECKLEY/SANT PAU RESEARCH PROGRAMME

This collaboration between Jordi Riba and Amanda Feilding was initiated in 2013 to investigate the actions of ayahuasca, DMT, and 5-MeO-DMT at a molecular, structural, and functional level, and to examine their effects in both new and experienced users. Using pharmacological techniques and brain-imaging methods such as fMRI and spectroscopy, we are investigating the chemical, functional and structural changes in the brain that give rise to subjective effects, such as an increase in mindfulness capacities and other interesting psychological phenomena.

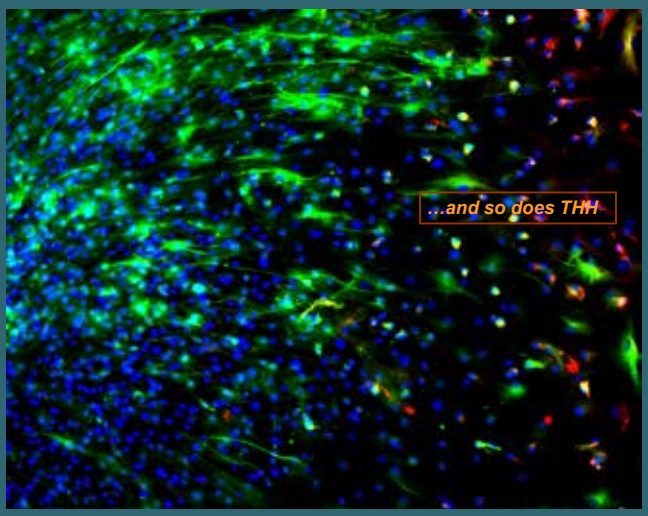


Our latest study, in collaboration with the Spanish National Research Council, revealed for the first time, the potential of components of the Amazonian hallucinogenic beverage ayahuasca to promote the birth of new neurons (neurogenesis). Preliminary results show that the addition of harmine and tetrahydroharmine to cell cultures containing neural stem cells dramatically increases the growth of new neurons and their maturation.



We are currently conducting additional experiments to discern the magnitude of the observed effects, as well as undertaking studies on live animals.

The replication of the present findings in vivo would open a totally new avenue of research for ayahuasca and its active principles. Potential applications could range from treating neurodegenerative disorders such as Alzheimer's, to redressing the brain damage associated with stroke or trauma.



Additional studies in development include:

- Investigating the safety, optimal dose, neurobiological and immunological effects of 5-MeO-DMT for the first time
- Investigating the phenomenology of experiencing 'entities' after DMT intake.

COLOR CODE

Blue staining: cell nuclei (marks all cells)
Green staining: young neurons
Red staining: mature neurons

FURTHER ONGOING STUDIES

BECKLEY/EXETER RESEARCH PROGRAMME

Co-directed by Amanda Feilding and Prof Celia Morgan

This exciting new Research Programme will investigate the therapeutic benefits of cannabis and its individual components using a validated battery of cognitive tests and brain imaging technology. The research will take place at the new Beckley/Exeter Cannabis Centre at the University of Exeter, and will include a lab to analyse the contents of different cannabis strains. We will work with partners in the US and Canada to bring the latest, innovative technology to cannabis testing in the UK and Europe. We will focus on both the primary cannabinoids – THC and CBD – and other cannabinoids, terpenes, flavonoids and compounds, and will investigate the synergy between them. Our aim is to create a personalised, precision cannabis-based medicine to ensure the optimal drug and delivery methods for each patient's condition.

We are starting with a study investigating the potential of CBD for smoking cessation. We will recruit 60 people and incorporate a brain imaging component before and after the CBD course. Tasks would include cue reactivity, attentional bias and prediction error.

We are also re-launching a large-scale survey of thousands of people on their pattern of medical cannabis use and the efficacy of different strains.

EFFECTS OF DIFFERENT CANNABIS STRAINS ON THE BRAIN

Collaboration with Prof Val Curran, University College, London

Brain-imaging is used to compare the effects of two different strains of cannabis - one with high THC content with minimal CBD, and the other with a balanced CBD/THC ratio - on brain-function. The research demonstrates that high-THC cannabis impairs certain brain networks, while CBD helps counteract some of these negative effects. These findings are important for developing harm-reduction strategies, given the popularity and availability of high THC cannabis in the UK.

PSILOCYBIN FOR SMOKING CESSATION

A Beckley-sponsored study with Prof Roland Griffiths and Dr Matt Johnson, Johns Hopkins University, USA

The initial pilot-study investigated the efficacy of psilocybin-assisted psychotherapy in overcoming nicotine-addiction. The results were extremely promising, with an unprecedented success rate of 60% abstinence at the 16-months follow-up. This pilot study has led to a forthcoming expanded study, which includes brain-imaging to study the neural mechanisms behind the effectiveness of psilocybin.

BECKLEY/SECHENOV RESEARCH PROGRAMME

Cerebral circulation and cranial compliance

Collaboration with Prof Yuri Moskalenko, Sechenov Institute of Evolutionary Physiology & Biochemistry, St. Petersburg

This long-standing research programme investigates cerebral circulation and the relationship between the changes in 'cranial compliance' and dementia. 'Cranial compliance' is an important physiological index of the health of cerebral circulation, and reflects the mobility of cerebrospinal fluid and blood flow. We have developed a non-invasive Cranial Compliance Monitor, which tracks the health of cerebral circulation. Currently we are optimising the methods and automating the procedure.

EFFECTS OF AYAHUASCA ON QUALITY OF LIFE, WELL-BEING, AND HEALTH

Collaboration with ICEERS

This project evaluates the long-term effects of ayahuasca experienced in a ritual setting in Western users. One of the main aims is the monitoring of the personal development, spiritual growth and mental health of all participants, in order to analyse the widely-reported long-term therapeutic benefits of ayahuasca taken in a supervised supportive setting. The results obtained from hundreds of participants over many years will greatly advance the current debate about ayahuasca's reported benefits and potential risks.

FUTURE STUDIES

We would be very grateful for any support you might be able to give to help fund further new studies which are already underway, or are in development. These include:

Research into CBD-Assisted psychotherapy for alcohol addiction with Dr. Michael Bogenschutz at New York University. The proposed study is a double-blind, randomized proof-of-concept study (n = 42 inpatients with moderate to severe alcohol use disorder, AUD) designed to contrast effects of short-term (4 days) treatment with CBD to those of placebo.

Exploring the synergy between cannabinoids and terpenoids with Johns Hopkins University. We are discussing a series of clinical trials investigating the modulatory activity of three terpenes: limonene, myrcene and pinene, upon the pharmacokinetics, pharmacodynamics and behavioural effects of THC and CBD.

Clinical trial testing MDMA for treatment of PTSD with Prof. Jonathan Bisson, Dr. Ben Sessa, and Dr. Mat Hoskins at Cardiff University. This study will investigate the effects of MDMA in war veterans and other patients suffering from Post-Traumatic Stress Disorder (PTSD). In addition to investigating whether MDMA allows emotionally overwhelming memories to become more tolerable – as might be expected from our earlier research – the study will use fMRI to study the neural mechanisms behind its effectiveness. This will be the first study to explore the mechanisms of how MDMA works as a therapeutic agent.

Clinical trial testing LSD for treatment of alcoholism with Dr. Michael Bogenschutz and his team at New Mexico University. This study will extend the clinical research carried out in the 1950s and 1960s, and build on the recent findings by Dr. Bogenschutz: that psilocybin decreased drinking and craving, and increased self-efficacy. To follow up this research, we are now preparing a ground-breaking double blind, placebo-controlled study of LSD-assisted treatment for alcoholism.

Neurovascular and neuroimaging effects 1p-LSD in the rat brain with Dr Chris Martin at Sheffield University. Pychedelics affect both neuronal activity and brain blood flow. What is not known is whether psychedelics work directly on blood vessels to increase/decrease blood flow, or this is secondary to neuronal activity. Understanding the contribution of either effect can have important implications for interpreting fMRI results.

WHAT DO WE KNOW ABOUT PSYCHEDELICS?

Insights from the Beckley Foundation Science Research Programme

1) SHORT- AND LONG-TERM BEHAVIOURAL EFFECTS

Psychedelics produce profound changes in mood, well-being and even personality traits, that persist for days, weeks or even years after taking them. Although psychedelics can elicit psychosis-like symptoms in the acute phase, our research demonstrates that they can improve psychological well-being in the mid- to long-term. The *Beckley/Sant Pau* research demonstrates that ayahuasca improves mindfulness capacities, by increasing self-forgiveness, reducing inner reactivity and judgemental attitude. Psychedelics can also induce profound mystical or spiritual-type experiences, that participants in the studies rate among the most profound in their lives. These peak experiences often bring about sustained positive changes in attitudes and behaviour. For example, smoking-cessation outcomes in the Beckley Foundation-sponsored *Johns Hopkins* study were significantly correlated with measures of mystical experience on session days, as well as retrospective ratings of personal meaning and spiritual significance of psilocybin sessions. These results suggest a mediating role of mystical experience in psychedelic-facilitated addiction treatment, but could also be extended to other applications.

2) MOLECULAR MECHANISMS OF ACTION

It is well-known that psychoactive properties of psychedelics are mediated through their action on serotonin -2A receptors. However, many psychedelics have affinity to other receptors. With Prof Jordi Riba, we are investigating what effects of ayahuasca remain when the 5-HT2A receptors are blocked. In a separate study we are also researching what other neurotransmitters interact with serotonin to produce characteristic consciousness altering effects, specifically focusing on glutamate.

3) RESTING-STATE NETWORK CONNECTIVITY AFTER PSYCHEDELICS

The results of our research from the *Beckley/Imperial Research Programme* have greatly increased our understanding of the changes in brain function underlying the effects of psychedelics. Brain networks, which are normally distinct and are organised according to their function (such as visual, auditory, motor, attention, default mode, salience etc.), lose their identity under the effect of psychedelics. The connectivity within individual networks decreases – we call this principle network disintegration. However, at the same time whole-brain integration increases. As networks become less independent, they start to communicate more with each other – this is the principle of network desegregation.

This means that the individual identities of brain networks are compromised as they 'blend' with each other, potentially explaining synaesthesia-like phenomena and mirroring the subjective experience of 'unity' or 'oneness' often felt with psychedelics. It is noteworthy, that the loss of the integrity of the default mode network (DMN - a very important brain network implicated in introspection, theory of mind, and thinking about the past and future) correlated with the subjective experience of ego-dissolution. Our results with another psychedelic, ayahuasca, corroborate this. As with LSD and psilocybin, ayahuasca also changes the DMN activity and connectivity, reducing the top-down cognitive control this network exerts over emotional, sensory and memory-related areas.

4) SENSE OF SELF AND EGO-DISSOLUTION

The phenomenon of 'ego-dissolution' after both LSD and psilocybin correlates with decreased default mode network (DMN) integrity, increased whole-brain integrity, and decreased neural synchrony within a particular region of the DMN - the posterior cingulate cortex (PCC). This supports the view that normal activity in the PCC is important for maintaining the sense of self and of ego-boundaries.

5) THE MECHANISMS BEHIND VISUAL HALLUCINATIONS

It is difficult to imagine a psychedelic experience without visual hallucinations, and yet the mechanisms behind them are only just beginning to be uncovered. The *Beckley/Imperial* LSD study sheds light on what happens in the brain when people experience complex dreamlike hallucinations. In the normal state of consciousness, information from our eyes is processed mainly in the visual cortex, a part of the brain at the back of the head dedicated to vision. However, when participants took LSD, many other brain areas contributed to the visions.

6) SYNERGY WITH MUSIC

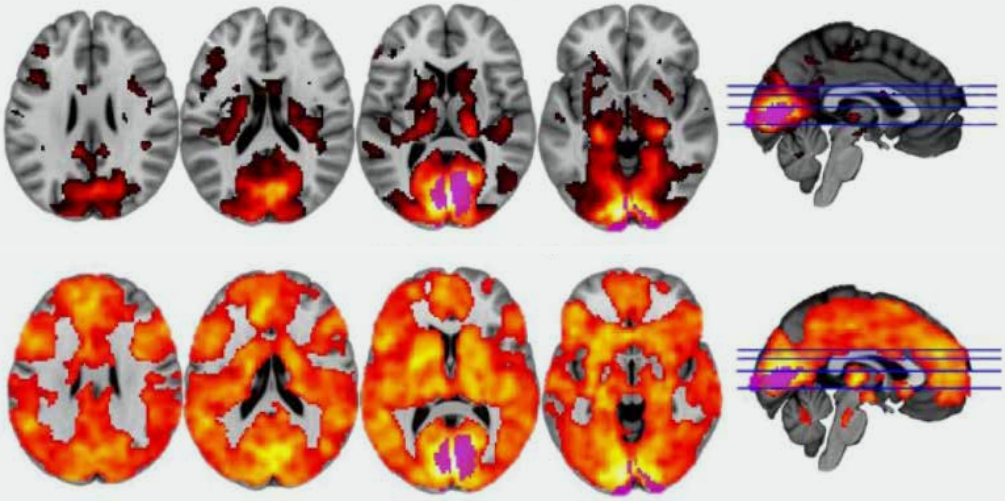
Psychedelic-assisted psychotherapy often includes music. Thanks to the work of the *Beckley/Imperial* Fellow Mendel Kaelen, we are starting to understand the mechanisms behind the synergistic effects of psychedelics (LSD and psilocybin) and music, uncovering how they work together to bring about profound changes required for successful therapy.

7) VAST THERAPEUTIC POTENTIAL

Clinical trials demonstrate that psychedelics have considerable value in overcoming addiction (see research by Roland Griffiths and his team for psilocybin for tobacco addiction, and by Michael Bogenschutz and his team for psilocybin and LSD for alcohol addiction), depression (Carhart-Harris and team investigating psilocybin), and anxiety associated with terminal illness (LSD study by Peter Gasser and colleagues).

8) OVERALL EFFECTS ON CONSCIOUSNESS

Under psychedelics consciousness becomes less constrained, more fluid and dynamic, allowing new connections, concepts, ideas and perceptions to form.



Increase in brain connectivity in the visual areas after LSD.

Top: placebo, bottom: LSD. Carhart-Harris *et al.*, 2016.

SELECTED SCIENTIFIC PAPERS

BECKLEY/IMPERIAL RESEARCH PROGRAMME

Co-directed by Amanda Feilding and David Nutt

Psilocybin for treatment-resistant depression: a feasibility study. Carhart-Harris RL, Erritzoe D, Kaelen M,..., Feilding A, Nutt DJ. *et al.* (2016). *The Lancet Psychiatry*

Neural correlates of the LSD experience revealed by multimodal neuroimaging. Carhart-Harris RL, Roseman L, Kaelen M, ..., Feilding A, Nutt DJ (2016). *PNAS*

LSD modulates music-induced imagery via changes in parahippocampal connectivity. Kaelen M, Roseman L, ...,Feilding A, Muthukumaraswamy S, Nutt DJ, Carhart-Harris R (2016). *European Neuropsychopharmacology*

Increased global cross-talk in the brain correlates with reports of ego-dissolution under LSD. Tagliazucchi E, Roseman L, Kaelen M, ..., Feilding A, Nutt DJ, Carhart-Harris R (2016). *Current Biology*

The entropic brain: a theory of conscious states informed by neuroimaging research with psychedelic drugs. Carhart-Harris RL, ..., Feilding A, Tagliazucchi E, ... Nutt DJ (2014). *Frontiers in Human Neuroscience*, 8(20), 1-22

Neural correlates of the psychedelic state as determined by fMRI studies with psilocybin. Carhart-Harris RL, Erritzoe D, ... , Feilding A, ..., Nutt DJ (2012). *PNAS,* 109(6), 2138-2143

Implications for psychedelic-assisted psychotherapy: functional magnetic resonance imaging study with psilocybin. Carhart-Harris RL, ..., Feilding A, ... & Nutt DJ (2012). *The British Journal of Psychiatry,* 200(3), 238-244

The Effects of Acutely Administered 3, 4-Methylenedioxymethamphetamine on Spontaneous Brain Function in Healthy Volunteers Measured with Arterial Spin Labeling and Blood Oxygen Level–Dependent Resting State Functional Connectivity. Carhart-Harris RL, ..., Feilding A, ... Nutt DJ (2015). *Biological Psychiatry* 78, 554-62

THE BECKLEY/SANT PAU RESEARCH PROGRAMME

Co-directed by Jordi Riba and Amanda Feilding

Ayahuasca: pharmacology, neuroscience and therapeutic potential. Domínguez-Clavé E, ..., Friedlander P, Feilding A, Riba J (2016). *Brain Research Bulletin*

Inhibition of alpha oscillations through serotonin 2A receptor activation underlies the visual effects of ayahuasca in humans. Valle M, ..., Friedlander P, Feilding A, Riba J (2016). *European Neuropsychopharmacology*

Exploring the therapeutic potential of Ayahuasca: Acute intake increases mindfulness-related capacities. Soler J, ..., Friedlander P, Feilding A, ..., Riba J (2015). *Psychopharmacology*, 1-7

COLLABORATION WITH JOHNS HOPKINS UNIVERSITY

Pilot study of the 5-HT2AR agonist psilocybin in the treatment of tobacco addiction. Johnson MW, Garcia-Romeu A, Cosimano MP, & Griffiths RR (2014). *Journal of Psychopharmacology,* 28(11); 983-92

COLLABORATION WITH UCL LONDON

Investigating the interaction between schizotypy, divergent thinking and cannabis use. Schafer G, Feilding A, Morgan CJ, ..., Curran HV (2012). *Consciousness and Cognition*, 21, 292-8

COLLABORATION WITH KING'S COLLEGE LONDON

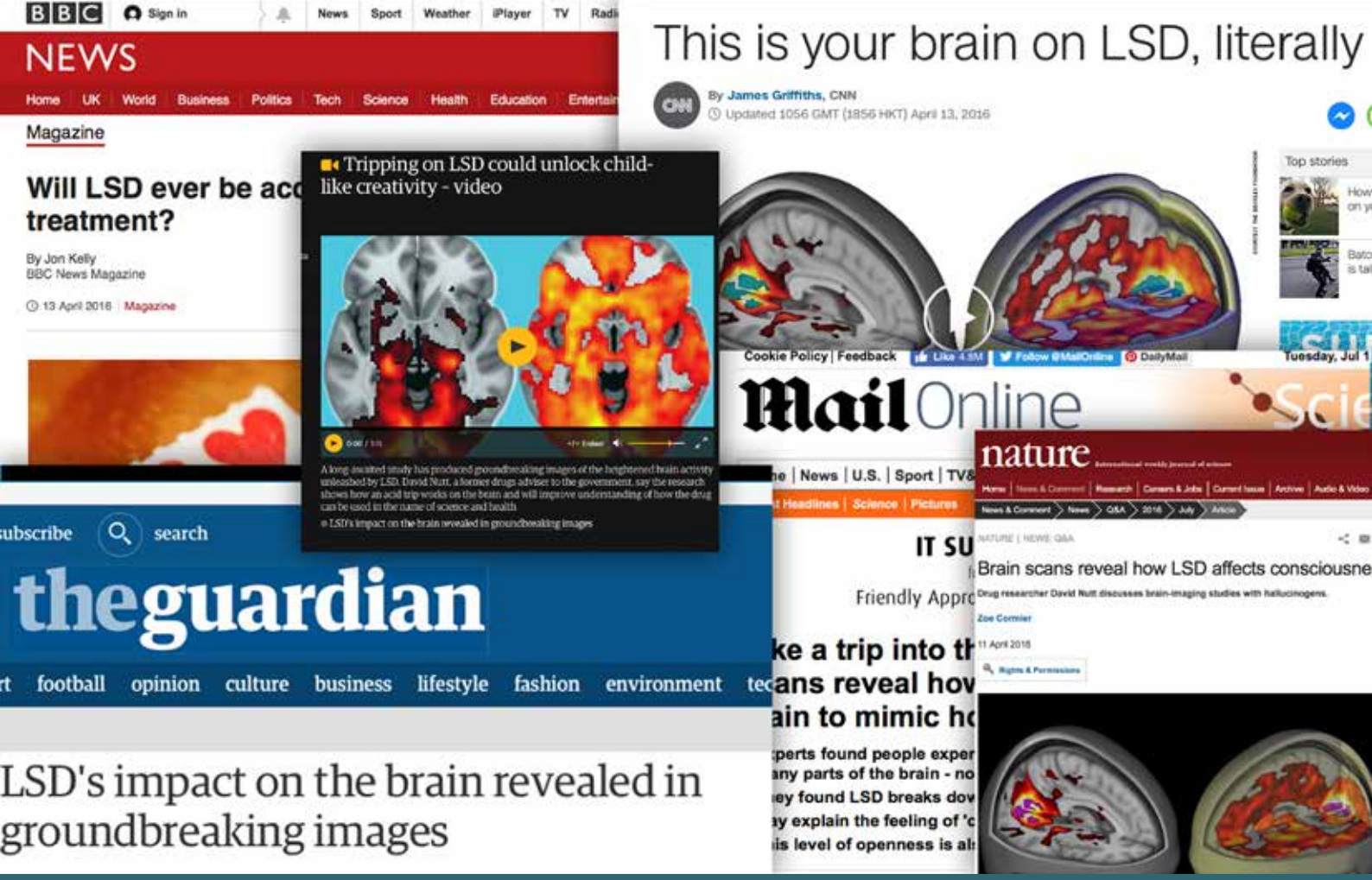
Cannabidiol inhibits THC-elicited paranoid symptoms and hippocampal-dependent memory impairment. Englund A, Morrison PD, ..., Feilding A, Kapur S (2013). *Journal of Psychopharmacology*, 27, 19-27

Communication breakdown: delta-9 tetrahydrocannabinol effects on pre-speech neural coherence. Stone JM, Morrison PD, ..., Feilding A, Murray RM (2012). *Molecular Psychiatry, 17, 568-569*

COLLABORATION WITH SECHENOV INSTITUTE OF PHYSIOLOGY

The effect of craniotomy on the intracranial hemodynamics and cerebrospinal fluid dynamics in humans. Moskalenko YE, Weinstein GB, Kravchenko TI, Mozhaev SV, Semernya VN, Feilding A, ... & Medvedev SV (2008). *Human Physiology,* 34(3), 299-305

Biomechanical properties of the human cranium: aging aspects. Moskalenko YE, Vaĭnshteĭn, GB, Halvorson P, Kravchenko TI, Feilding A, Ryabchikova NA, ... Panov AA (2008). *Journal of Evolutionary Biochemistry and Physiology,* 44(5), 605-614



RECENT COVERAGE OF BECKLEY IN THE MEDIA

Online and Print Media

- LSD: over **3,500 articles** in international and national press, including *The Sunday Times, The Guardian, Washington Post, Telegraph, CNN, Scientific American*
- Psilocybin for Depression: **1,740 articles** including *The Guardian* (**54,000 shares**) *The Spectator, The Mail Online, The Mirror* and *The Sun*
- Ayahuasca and Neurogenesis: Articles in *The Daily Express* and *IFL Science* (**40,800 shares**)

Television and Video

- LSD: live coverage on *BBC News* and *CNN*
- Psilocybin and Depression: *BBC Newsnight*
- *Guardian* Video: LSD revealed in groundbreaking images (over **6 million views**)

Podcasts and Radio

- Psychedelic Research: *Memory Motel, Altered States: Philosophy Talk* (Stanford University)
- New Psychoactive Substances: *BBC Breakfast, Talk Radio, Talk Radio* (Europe)

Social Media

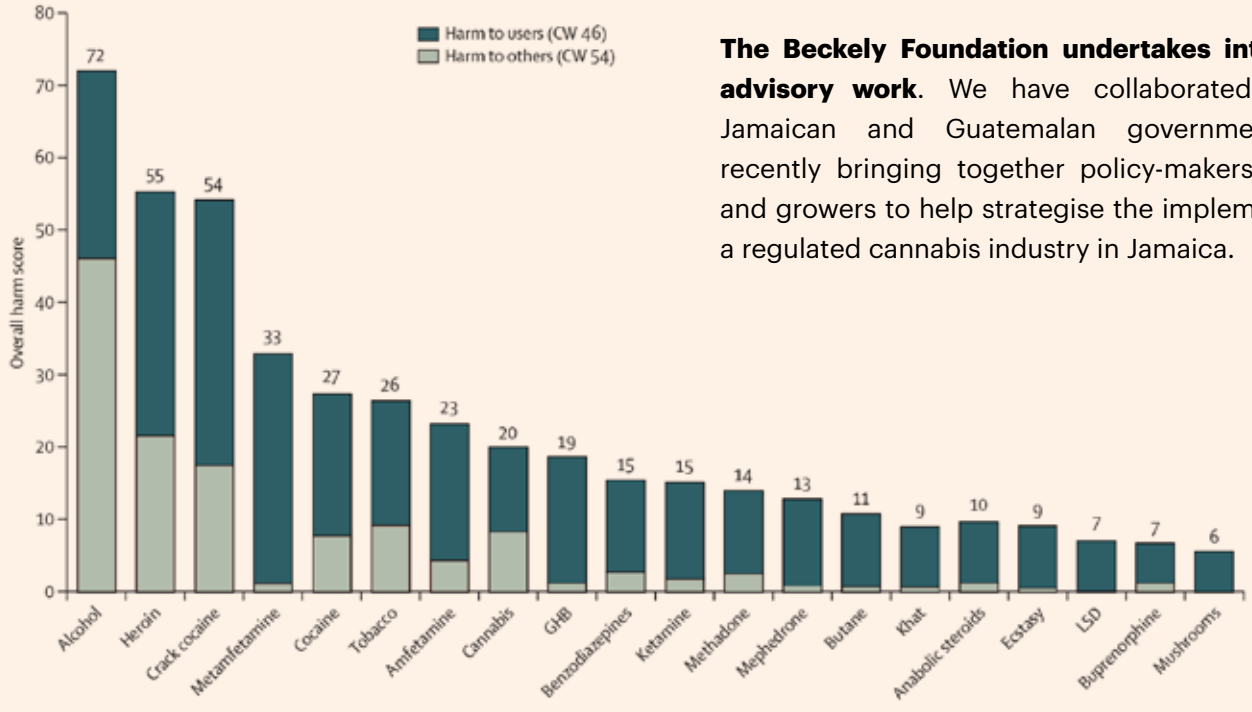
- Twitter: Tweets earn **533,000 impressions** per month. Followers include politicians, international journalists, healthcare professionals, academic researchers and leading research institutions
- Facebook: Post reach of up to **50,000**. Fans include scientists, policymakers, top journalists and medical cannabis campaign groups

POLICY PROGRAMME

The 'War on Drugs' continues to cause worldwide devastation. Prohibition costs taxpayers billions each year, yet policies have failed to eliminate drug use, instead increasing the risks and harms associated with drug taking. The sale of illicit drugs is one of the largest international trades in the world, estimated to be worth over $350 billion a year. Unregulated and mired in criminality, this highly profitable trade is associated with escalating violence, corruption, incarceration and suffering.

For nearly 20 years, the Beckley Foundation has pushed for drug policy reform, with the aim of minimising the harms caused by the drugs themselves, and the collateral damage resulting from current prohibitionist drug-control policies.

The Policy Programme provides a rigorous, independent review of current global drug policies, and is developing a scientific evidence-base on which to build balanced alternatives. It brings together leading international scientists, politicians and other specialists to discuss the taboo issues around this complex subject and to explore new regulatory models designed to diffuse drug-associated harms and protect public health.



Drugs ordered by their overall harm scores, showing the separate contributions to the overall scores of harms to users and harm to others

A Selection of Achievements in Drug Policy Reform

Society & Drugs: A Rational Perspective (2002 - 2011). The series of policy-focused seminars brought together leading policy-makers, academics and other experts to discuss national and global drug policy issues.

The International Drug Policy Consortium (IDPC) and the **International Society for the Study of Drug Policy (ISSDP)** were both launched in 2004 by Amanda Feilding. Both flourished into influential organisations which have now become independent.

The Global Cannabis Commission (2008) and the **Global Initiative for Drug Policy Reform (2011)**, were both formed under Amanda's guidance. They have produced highly influential recommendations and reports. In total, the Foundation has produced over 40 books, reports, and briefing papers on global drug policy issues.

The Beckley Foundation's Public Letters (2011 and 2016). The 2011 Public Letter was signed by 9 Presidents, 13 Nobel Laureates, and a host of other international luminaries. It is considered one of the key milestones in the history of drug policy reform. The 2016 Public Letter was launched at the United Nations Headquarters in New York, at the UN General Assembly Special Session on drugs.

The Beckely Foundation undertakes international advisory work. We have collaborated with the Jamaican and Guatemalan governments, most recently bringing together policy-makers, scientists and growers to help strategise the implementation of a regulated cannabis industry in Jamaica.

THE BECKLEY FOUNDATION'S GLOBAL INITIATIVE FOR DRUG POLICY REFORM

The Beckley Foundation's Global Initiative for Drug Policy Reform brings together countries interested in reform, countries that have successfully implemented alternative drug policies, together with the Global Commission on Drug Policy. The Global Intiative was launched in 2011 at the House of Lords in London, at a meeting joint-hosted by the Beckley Foundation and the All-Party Parliamentary Group on Drug Policy Reform.

The initiative develops alternative approaches to drug control as well as more humane, cost-effective, and evidence-based drug policies. It achieves these aims by collecting, commissioning, and disseminating evidence to the public and governments.

A Selection of Publications Resulting from the Initiative

Roadmaps to Reforming the UN Drug Conventions (2012) explains in detail how the UN Drug Conventions could be amended to give countries greater freedom to tailor their drug policies to their invididual needs, such as decriminalisation and regulation.

Licensing and Regulation of the Cannabis Market in England and Wales: Towards a Cost-Benefit Analysis (2013) was the first report to quantify the fiscal and social benefits of a regulated and taxed cannabis market.

In 2011, to coincide with the launch of the Global Initiative for Drug Policy Reform, Amanda launched the Beckley Foundation Public Letter, which calls for the reform of failed drug policies, and encourages an open debate on alternative approaches.

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DR JORDI RIBA, PhD

Associate Professor of Pharmacology at the Universitat Autònoma de Barcelona (UAB), Associate Researcher at the Drug Research Center of the Sant Pau Hospital in Barcelona.

IN MEMORIAM

DR ALBERT HOFMANN, PhD

Discoverer of LSD and founding member of the Beckley Foundation's Scientific Advisory Board until he passed away in April 2008 at the age of 102.

DR ALEXANDER SHULGIN, PhD

Pharmacologist, chemist, and psychoactive drug researcher. Author of PiHKAL, TiHKAL, and The Shulgin Index.

DR RONALD SANDISON, MD

British psychiatrist, psychotherapist and pioneer for the clinical use of LSD in psychiatry.

THE GLOBAL WAR ON DRUGS HAS FAILED
IT IS TIME FOR A NEW APPROACH

WE THE UNDERSIGNED call on Governments and Parliaments to recognise that:

Fifty years after the 1961 UN Single Convention on Narcotic Drugs was launched, the global war on drugs has failed, and has had many unintended and devastating consequences worldwide.

Use of the major controlled drugs has risen, and supply is cheaper, purer and more available than ever before. The UN conservatively estimates that there are now 250 million drug users worldwide.

Illicit drugs are now the third most valuable industry in the world, after food and oil, estimated to be worth over $350 billion a year, all in the control of criminals.

Fighting the war on drugs costs the world's taxpayers incalculable billions each year. Millions of people are in prison worldwide for drug-related offences, mostly personal users and small-time dealers.

Corruption amongst law-enforcers and politicians, especially in producer and transit countries, has spread as never before, endangering democracy and civil society. Stability, security and development are threatened by the fallout from the war on drugs, as are human rights. Tens of thousands of people die in the drug war each year.

The drug-free world so confidently predicted by supporters of the war on drugs is further than ever from attainment.

The policies of prohibition create more harms than they prevent. We must seriously consider shifting resources away from criminalising tens of millions of otherwise law abiding citizens, and move towards an approach based on health, harm-reduction, cost-effectiveness and respect for human rights. Evidence consistently shows that these health-based approaches deliver better results than criminalisation.

Improving our drug policies is one of the key policy challenges of our time. It is time for world leaders to fundamentally review their strategies in response to the drug phenomenon.

At the root of current policies lies the 1961 UN Single Convention on Narcotic Drugs. It is time to re-examine this treaty which imposes a 'one-size-fits-all' solution, in order to allow individual countries the freedom to explore drug policies that better suit their domestic needs.

As the production, demand and use of drugs cannot be eradicated, new ways must be found to minimise harms, and new policies, based on scientific evidence, must be explored.

Let us break the taboo on debate and reform. The time for action is now.

Yours faithfully,

President Juan Manuel Santos
President of the Republic of Colombia

President Otto Pérez Molina
President of the Republic of Guatemala

President Jimmy Carter
Former President of the United States, ***Nobel Prize*** *winner*

President Fernando H. Cardoso
Former President of Brazil

President César Gaviria
Former President of Colombia

President Vicente Fox
Former President of Mexico

President Ruth Dreifuss
Former President of Switzerland

President Lech Wałęsa
Former President of Poland, ***Nobel Prize*** *winner*

President Alexander Kwaśniewski
Former President of Poland

George P. Schultz
Former US Secretary of State

Desmond Tutu
Archbishop, ***Nobel Prize*** *winner*

Mario Vargas Llosa
Writer, ***Nobel Prize*** *winner*

Dr. Kary Mullis
Chemist, ***Nobel Prize*** *winner*

Professor Sir Harold Kroto
Chemist, ***Nobel Prize*** *winner*

Professor John Polanyi
Chemist, ***Nobel Prize*** *winner*

Professor Kenneth Arrow
Economist, ***Nobel Prize*** *winner*

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Sting
Musician and actor

Yoko Ono
Musician and artist

Carlos Fuentes
Novelist and essayist

Gilberto Gil
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Sean Parker
Founding President of Facebook, Spotify

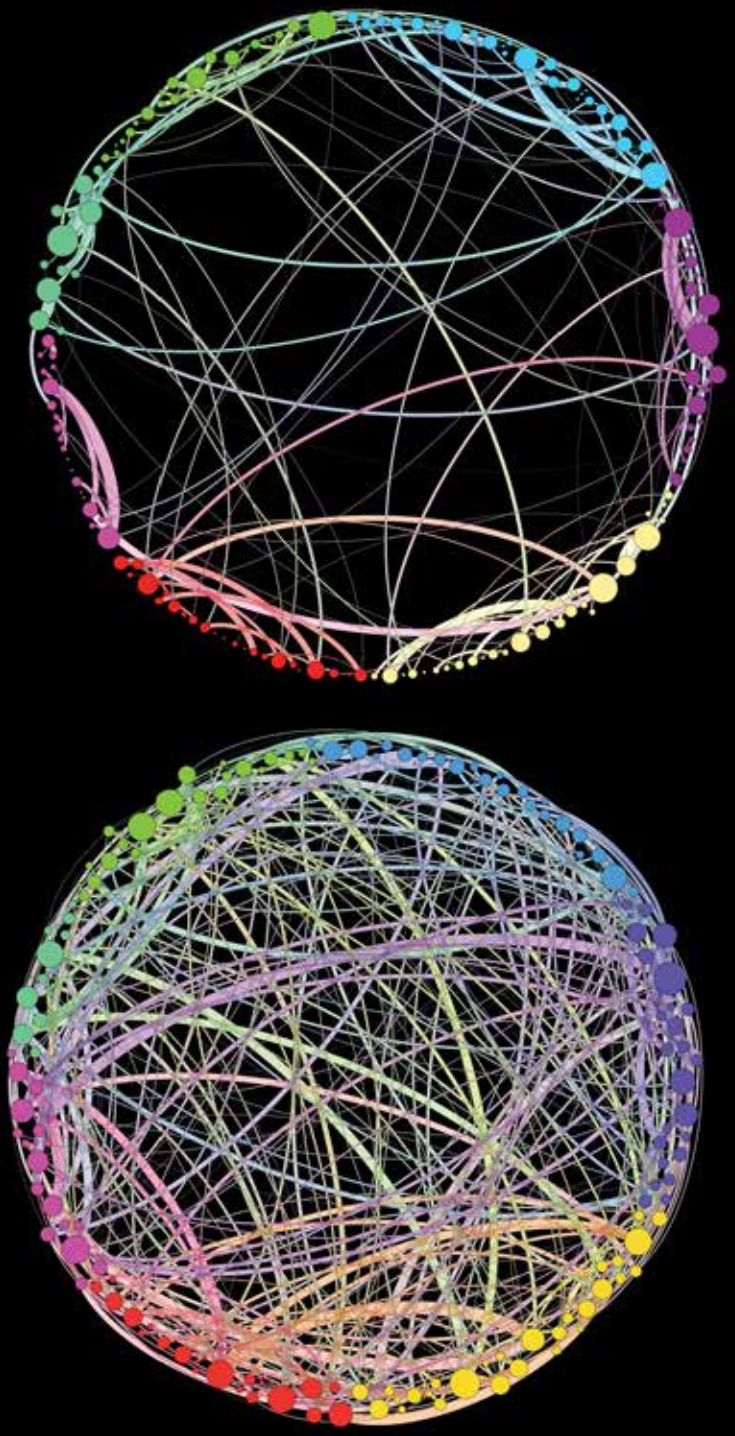
Thorvald Stoltenberg
Former UN High Commissioner, Refugees

Louise Arbour, CC, GOQ
Former UN High Commissioner, Human Rights

Javier Solana, KOGF, KCMG
Former Secretary General, EU Council

Professor Noam Chomsky
Professor of Linguistics & Philosophy, MIT

Amanda Feilding
Director, the Beckley Foundation



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The Beckley Foundation is registered as a charity in the UK Nº SC033546

Image on front cover: Microscopic crystal cross polarisation; DMT, MDMA, Amphetamine, LSD, 2CB, GHB - Photo by Maurice Mikkers
Image on the back cover: Brain communication patterns on placebo (top) and psilocybin (bottom) - Image from Petri et al. (2014)