



# THE BECKLEY FOUNDATION Cannabis and Psychedelics



Exploring Consciousness  
Pioneering Research  
Changing Minds

# The Psychedelic Renaissance

Since the mid-60s, the Beckley Foundation's founder and Executive Director Amanda Feilding has had a profound interest in what changes in cerebral circulation and brain function underlie different states of consciousness. To this end, she developed collaborations with leading scientists around the world, and began initiating and directing ground-breaking academic research on psychedelics and their mechanisms of action. Results have paved the way to a better understanding of consciousness and towards therapeutic applications for mental health conditions, especially those that rest on 'inflexible and excessively organised' patterns of brain activity, such as depression, anxiety, addiction, and PTSD.

## The Beckley/Imperial Research Programme

Collaboration between Amanda Feilding and Prof David Nutt (Co-Directors of the Programme) at Imperial College London

Our comprehensive collaborative Programme uses the latest developments in brain imaging technology and analysis methods to measure brain blood flow, functional connectivity, and neural oscillations (rhythmical activity or 'brain waves') during the psychedelic experience.

For the first time the brain on LSD has been revealed. Our previous studies were pioneering in capturing the patterns of brain network connectivity on psilocybin and MDMA.

The data affirmed the importance of the Default Mode Network (DMN) as the mechanism underpinning the 'ego' and illustrated the consistent principles of the psychedelic state: disintegration (loss of integrity within networks) and de-segregation (increased connectivity between networks), creating a looser state of consciousness.

Our brain imaging studies with psilocybin revealed that the stream of conscious experience that characterises the psychedelic state appears more fluid and dynamic, as well as showing a global decrease in cortical activation. The degree of this decrease was proportional to the intensity of the subjective effects of psilocybin. Overall, the imaging data indicate that psilocybin reduces the differentiation between brain networks, producing a 'disorganised' brain state and promoting the 'entropic brain' theory.

The insights provided by this research form a compelling addition to the evidence base for the therapeutic potential of psychedelics, and won the Programme a substantial grant from the Medical Research Council to investigate the effects of psilocybin in the treatment of depression. This pilot study has just been concluded and shows remarkably positive effects that last for months after a single dose.

LSD behavioural results revealed an enduring increase in openness and optimism of the subjects, and demonstrated that LSD enhances the emotional response to music, affirming LSD's potential as an adjunct to psychotherapy. The neuroimaging data confirm and extend the general principles of the effects of psychedelics discovered through our psilocybin research and add to our understanding of the underlying mechanisms behind 'ego-dissolution' and visual hallucinations.

Newly designed studies are now aiming to compare the effects of LSD to those of DMT in order to determine similarities and differences between their neural mechanisms and psychological effects.

Amanda Feilding is particularly interested in investigating the effects of LSD on creativity, one of the least understood aspects of brain function, and she has designed a study investigating intuitive pattern-recognition and problem-solving using the ancient game of GO.

## A Brief History of Psychedelics

Psychedelics have been used throughout history for social and spiritual purposes - there is much evidence suggesting that they have played a vital role in human cultural evolution, aiding the development of language, spirituality, music, art, and medicine.

After the discovery of LSD by Albert Hofmann in 1943, there was a burst of excitement in the medical and therapeutic worlds, and a wave of scientific studies started investigating psychedelics and their effects on the mind. It quickly became evident that these substances had the potential to inform our understanding of the psyche and contribute to the treatment of mental health conditions.

Then, in the early 1960s, LSD began to spread into the world at large, fuelling a cultural revolution and sparking a wave of interest in mysticism, healthy living, nurturing the environment, individual freedoms, and new music and art - the blooming of the counter-culture. The Establishment panicked, and turned to prohibition.

All research ended, and scientific progress came to an abrupt halt. Although in theory, scientific and medical research was allowed, in fact, the obstructions were so great, it became impossible: there was no funding, and no institution or scientist wanted to be associated with research that could damage their reputation and career.

This paradigm of censorship has now started to crumble, instigated by the work of organisations such as the Beckley Foundation. Society is acquiring a new, more balanced understanding of psychoactive substances and their role in teaching us about new avenues of treatment and ourselves. At last, psychedelics are a subject that can be discussed and even researched. The studies so far only hint at what lies beyond the newly opened door; the future holds much to look forward to.

Amanda Feilding



Below is a selection of some of our current psychedelic research collaborations. In order to develop our understanding of psychedelics and their benefit to society there is still so much research that needs to be done.

#### Pilot Study Researching Psilocybin for Smoking Cessation

Prof Roland Griffiths and Dr Matthew Johnson at Johns Hopkins University

This Beckley-sponsored pilot study was the first in modern times to investigate the efficacy of psilocybin as an aid to psychotherapy in overcoming nicotine addiction. The results were amazingly promising, with an unprecedented success rate of 80% abstinence at the 6-month follow-up. This is unique, and has led to a forthcoming expanded study, which includes brain imaging.

#### Brain Imaging Studies Investigating the Effects of Ayahuasca, DMT, and 5-MeO-DMT

Dr Jordi Riba at Sant Pau Hospital, Barcelona in collaboration with Amanda Feilding

The aim of this collaboration is to better understand the actions of ayahuasca, DMT, and 5-MeO-DMT at a molecular, structural, and functional level, and to examine these effects in both new and experienced users. One study seeks to determine where in the brain ayahuasca acts. Psychedelics have been found to target the serotonin system, but some effects may arise from interactions with other neurotransmitter systems.

Using pharmacological techniques and brain imaging methods such as MRI and Spectroscopy, we are also investigating involvement of the neurotransmitter glutamate in the effects of DMT, and the chemical and structural changes in the brain that give rise to subjective effects, such as mindfulness and the experience of 'entities'.

We are also examining long-term changes associated with ayahuasca use. An earlier study observed increased grey matter thickness in certain brain regions of people who used ayahuasca. We are now investigating whether there are further changes in those who continued to use it. We expect to find neuropsychological benefits and durable changes in brain structure, along with greater self-transcendence.

#### Long-Term Effects of Ayahuasca on Quality of Life, Well-Being, and Health

Ben de Loenen from ICEERS in collaboration with Amanda Feilding

The main objective of this project is to evaluate the long-term effects of ayahuasca on the quality of life, well-being, and health of Western users. The research involves participants at the Temple of the Way of Light, a Peruvian ayahuasca centre, and also monitors long-lasting changes. One of the main aims is to test the claims of the International Narcotics Control Board regarding ayahuasca and its addictive properties, and to advance the current debate about ayahuasca's potential risks and many reported benefits.

#### Study Investigating the Efficacy of LSD in the Treatment of Alcoholism

Dr Michael Bogenschutz at University of New Mexico in collaboration with Amanda Feilding

We will extend the clinical research carried out in the 1950s and 1960s, and build on the recent finding that psilocybin decreased drinking and craving for alcohol. To follow up this research, we are now preparing a ground-breaking double blind, placebo-controlled study of LSD-assisted treatment for alcoholism. Findings will be critical in showing how psychedelics can mobilise biological and psychological processes that are relevant to addictions.





# The Cannabis Revolution

Cannabis is by far the most widely cultivated, trafficked and used illicit drug, constituting roughly 80% of the world's illegal drug market. Its effects have prompted much scientific research, but this has historically focussed on the 'problematic' aspects of the drug, usually with a psychiatric, toxicological or criminological slant. The Beckley Foundation has produced a wealth of seminal publications, and high-level events, which examine the complex issues surrounding cannabis policy, and exploring new regulatory models which aim to protect health and reduce the extensive collateral harms to citizens brought about by the complex effects of prohibition.

The Beckley's Policy Programme has been instrumental in instigating international progress in drug policy reform. Amanda Feilding has been pivotal in this process and is currently advising Jamaica towards a regulated cannabis industry.

The prohibitionist approach of the last 50 years has obstructed research into potential medical benefits of cannabis, however, the global shift towards drug policy reform is now allowing cannabis to become the subject of renewed scientific interest. The Beckley Foundation is proud to be a key player in developing scientific research into cannabis and its components, and their far-reaching potential to improve health and well-being

Through the Beckley Foundation's Scientific Programme, Amanda Feilding, in collaboration with world-leading scientists, designs and directs ground-breaking research on cannabis, using the latest developments in neuroscience and brain imaging technology.

Below is a selection of some of our recent cannabis research. We are now planning many more studies: probing deeper into the anxiolytic and anti-psychotic effects of cannabidiol (CBD); synergistic effects of terpenes and tetrahydrocannabinol (THC); re-discovering and researching lost Jamaican cannabis strains; and investigating the effectiveness of CBD for treating addictions - to name but a few.

## [Brain Imaging to Investigate the Effects of Different Cannabis Strains](#)

Prof Valerie Curran at University College London collaborating with Amanda Feilding

This programme uses brain imaging (fMRI) to compare two different strains of cannabis: one with high THC content and minimal CBD, and the other with a balanced CBD / THC ratio. We have found that high-THC cannabis impairs certain brain networks, while CBD helps counteract some of the negative effects of THC. These findings are important for developing harm-reduction strategies, given that in the UK, 80% of the cannabis sold is high-THC, low or no CBD.

## [Investigating Cannabinoids as Anti-Cancer Agents](#)

Dr Manuel Guzman at Madrid Complutense University collaborating with Amanda Feilding

This programme investigates the anti-cancer properties of cannabis and individual cannabinoids (such as THC and CBD) that have been found to exhibit anti-tumour effects in animal models and in vitro studies of cancer. We are now preparing a clinical trial across sites in Spain to test whether cannabinoids can help fight tumour growth in cancer patients.

## [Studies Examining the Effects of CBD and its Relationship to THC](#)

Dr Paul Morrison at King's College London collaborating with Amanda Feilding

This research collaboration was among the first to explore CBD's anxiolytic and anti-psychotic properties. Studies investigated topics such as the neuroprotective potential of CBD, the pro-psychotic effects of THC and ability of CBD to block them, and altered time perception.

## [Drug Surveys, and Laboratory Studies Relating Cannabis to Patterns of Thought](#)

Prof Celia Morgan at University College London collaborating with Amanda Feilding

Our 2012-2013 survey assessed perceived harms and benefits of psychoactive substances. It found that users perceive cannabis as a much less harmful drug than alcohol, tobacco or prescription opiates. Another study looked at the connections between cannabis and creativity and currently a study is underway investigating CBD as an aid in overcoming nicotine addiction.



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