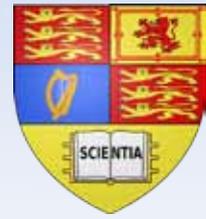


# THE BECKLEY FOUNDATION/IMPERIAL COLLEGE PSYCHOPHARMACOLOGICAL RESEARCH PROGRAMME



*Exciting new breakthroughs in the world of psychedelic research – a pioneering collaboration between Amanda Feilding, Director of the Beckley Foundation, David Nutt, Professor of Neuropsychopharmacology at Imperial College, London and Dr Robin Carhart-Harris, a Beckley Fellow at Imperial College*

**The Beckley-Imperial Programme works at the frontiers of research into psychoactive substances, their effects on the brain and consciousness, and their potential therapeutic benefits.** The Programme was established in 2009 with a brain imaging study using cannabis. The Programme specialises in relatively small-scale pilot studies that investigate novel fields of research hitherto neglected because of societal taboos. Through these pioneering studies we are opening up exciting new avenues of treatment and unveiling the mechanisms by which psychedelics produce their profound effects on consciousness.

Our recent series of studies into psilocybin began in 2009 and used the latest brain-imaging technology (fMRI and MEG) to investigate changes in blood supply to the brain, correlated with changes in brain activity and subjective experience, when volunteers received an intravenous dose of the drug.

## *Surprise finding*

Many users describe taking a psychedelic as a consciousness-expanding experience. To our surprise, our research showed that, in a state of rest, psilocybin *decreases* blood flow, particularly to the so-called *default mode network*. This network of highly interconnected brain regions has an extremely important function as a top-down control mechanism which sits at the top of the brain's hierarchy, reducing and co-ordinating the activity of other brain centres, and thus playing a vital role in the maintenance of a stable sense of self. Parts of the network act by *censoring* information, so that our experience of the world is limited to a manageable and familiar level. By reducing the blood supply to the *default mode network*, psilocybin allows a less constrained experience of the world to emerge, characterised by the loosening of the ego and the potential for enhanced creativity and mystical awareness.

## *Therapeutic potential*

The findings raise exciting possibilities for the therapeutic use of psilocybin. One of the 'hub' regions, the *medial prefrontal cortex*, is known to be chronically *over-active* in depression. This same region has its activity throttled by psilocybin because its blood supply is reduced. Another region (the *hypothalamus*), which is *over-active* in the agonising condition of cluster headaches, also has its activity reduced by psilocybin through decreased blood supply. Thus our research has already thrown light on potentially valuable new avenues of treatment for both these debilitating conditions.

## *Government grant*

These insights have generated a major Medical Research Council (MRC) grant for a study into the use of psilocybin in the treatment of depression, which has recently received ethical approval. This is the first time a government body has funded psychedelic research. We would like to thank the Beckley sponsors whose generous donations to the pilot studies have been rewarded with a ten-fold return from the MRC for our full-scale depression study.

## *Psilocybin and psychotherapy*

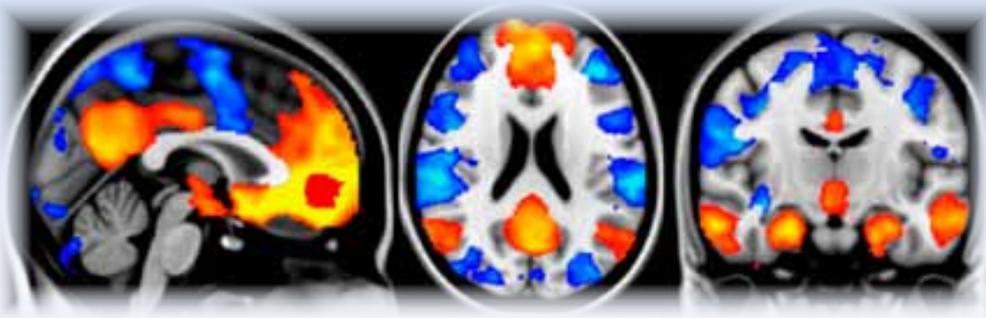
This study has proved very important in providing for the first time neuroscientific evidence of how and why psychedelics can act as valuable aids to psychotherapy for otherwise intractable conditions.

In the study, subjects were asked to recall events in their lives after taking either psilocybin or an inactive placebo. Psilocybin stimulated extremely vivid memories, as if subjects were actually reliving the events. The subjective experience corresponded with an activation of brain regions involved in vision and other sensory and emotional processing.

These findings are valuable in explaining why people trapped by repressed trauma may find psilocybin helpful in allowing them to vividly access distant traumatic memories and so work through them.

## *Understanding consciousness and mental illness*

Our research has also provided extremely valuable insights into the relationship between psychedelics and the 'ego'. Psychedelics change the brain in the most profound way, which can then be studied using brain imaging technology. Our results throw new light on mechanisms involved in conscious awareness, and how the breakdown of connectivity between brain regions underlies schizophrenia.



## BECKLEY/IMPERIAL PSYCHOPHARMACOLOGICAL RESEARCH PROGRAMME

### *MDMA and PTSD*

An MDMA (ecstasy) study investigating changes in cerebral blood flow, brain activity and memory recall has recently been completed. Based on the psilocybin research, the MDMA work also uses the latest fMRI brain imaging technology and correlates the results with the participants' subjective experiences.

Early results have shown that MDMA, as compared with placebo, *increases* brain activations in response to *positive* memories, correlating with an experience of vivid and lifelike recollection. By contrast, it *decreases* brain activation in response to *negative* memories. This finding provides a neuroscientific basis for the important potential of MDMA as an aid to psychotherapy in treating post-traumatic stress disorder: the drug allows painful memories to be more easily recollected, and therefore worked through, by diminishing the overwhelming emotional response which normally blocks access to the traumatic memory.

The study was featured in a two-part Channel 4 documentary, *Drugs Live*, on 26/27 September 2012.

We have prepared the protocol for a pioneering study into the effects of LSD on the brain, which has recently been granted ethical approval. We also plan to investigate the effects of other psychotropic substances including ayahuasca and new synthetic psychoactives, such as a safer analogue of MDMA which could prove very valuable as an aid for psychotherapy.

### *Cannabis*

We are now resuming our ground-breaking study into cannabis: how to minimise its harms and optimise its medical benefits, using whole-plant cannabis and the latest brain imaging technology.

The recent findings in the Beckley/Imperial Programme demonstrate why it is essential to expand research into the therapeutic potential of currently illegal psychotropic drugs. The taboo on these substances, which comes from their illicit status, has severely impeded both scientific research into how these ancient medicinal and spiritually-awakening compounds work, and clinical use of these substances for the treatment of some of modern man's many ills.

We ask all interested parties to help us develop and expand our programme of work. The time for this vital research has finally come...

### *Two important scientific publications in 2012*

**"Neural correlates of the psychedelic state as determined by fMRI studies with psilocybin"**, 2012, Carhart-Harris RL, Feilding A, Nutt D *et al*, *Proceedings of the National Academy of Sciences of the USA* 109:2138.

**"Implications for psychedelic-assisted psychotherapy: functional magnetic resonance imaging study with psilocybin"**, 2012, Carhart-Harris RL, Feilding A, Nutt D *et al*, *British Journal of Psychiatry* 200:238.

## OTHER BECKLEY FOUNDATION SCIENTIFIC COLLABORATIONS

The Beckley Foundation, established in 1998 by its founder Amanda Feilding, has built a global network of collaborative partnerships with leading scientists in order to develop the scientific understanding of consciousness and wellbeing. For example:

- Working with Professor Roland Griffiths at Johns Hopkins University we are conducting the first modern study to harness the profound psychological effects of a psychedelic in overcoming addiction.
- In a series of studies with Prof. Val Curran at University College London we are investigating the effects of cannabis and MDMA in order to improve their safety and explore their efficacy as medications.
- Working with Prof. Yuri Moskalkenko at the Sechenov Institute, St Petersburg we have developed a non-invasive device to monitor the health of cerebral circulation and techniques by which it may be improved.