Project Background

The main MDMA-induced adverse effect is disruption of normal thermoregulation leading to life threatening hyperthermia which is exacerbated by high ambient temperature and linked to chronic neurotoxicity. Although the focus of the majority of research on MDMA-induced loss of thermoregulation has been on brain serotonergic and dopaminergic systems, results obtained from our recent studies suggest an association between microglial activation and MDMA-induced hyperthermia. We have demonstrated that pre-treatment with minocycline, an antibiotic with glial attenuating properties, can significantly reduce the severity of MDMA-induced hyperthermia in rats. We have also demonstrated that minocycline’s ability to inhibit MDMA induced hyperthermia is time-dependent process and you need up to three days pre-treatment with minocycline to achieve maximum effects.

Project Aims

The overall aim of this project is to extend our understanding of the underlying mechanisms leading to the disruption of normal thermoregulation in rats and how minocycline reduces the hyperthermic response to MDMA. This project will examine rat plasma and brain minocycline concentrations following different pre-treatment periods and relate these concentrations to minocycline’s ability to inhibit MDMA induced hyperthermia and its anti-neuroinflammatory properties.

Methods and Techniques

We use a number of neuropharmacology techniques including in vivo radiotelemetry, microdialysis, immunohistochemistry, chronoamperometry and HPLC for sample analysis.

Project Available Date

February 2014

Co-Supervisors

- Dr Mark Hutchinson