Sequential determination of limbic and striatal behavioural function and dopamine neurochemistry in C57/BL6 mice

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INTRODUCTION
We have shown that dopamine mimetic drugs with different presynaptic mechanisms produce a unique pattern of changes ("neurochemical fingerprints") of dopamine (DA) and its metabolites in the brains of mice (Heal et al, this meeting; Abstract No. 843.16/O29). Here, we employed high and low doses of the dopamine releasing agent, (d-amphetamine), to determine in a single experiment its effects on locomotor activity, stereotyped behaviours and brain concentrations of dopamine and its metabolites (neurochemical fingerprint) in the striatum of mice.

STUDY PROTOCOLS
Studies were conducted according to the following protocols:

Protocol 1
- Individual C57BL/6 mice habituated for at least 60 min
- d-Amphetamine (1, 3 or 10 mg/kg ip) administered to mice with locomotor activity monitored for 60 min
- Locomotor activity was measured using photobeam meters with locomotor activity and stereotypy scored "blind"
- Animals killed at 60 min for measurement of monoamines and metabolites in the striatum

Protocol 2
- Individual C57BL/6 mice habituated for at least 60 min
- 3 mg/kg d-amphetamine injected at 0 min with a further 7 mg/kg ip injected at 30 min
- Locomotor activity was measured using photobeam meters with stereotypy scored "blind"
- Animals killed at 65 min for measurement of monoamines and metabolites in the striatum

Stereotypies
- Stereotypies (licking/biting/chewing) were scored as absent (0), marked sniffing, some licking (1), marked licking and biting (2) 30 min after dosing.

CONCLUSIONS
- The results from this investigation demonstrated that d-amphetamine given in divided doses produced behavioural and neurochemical data that were as robust and precise as when each component had been generated individually using single doses of d-amphetamine.
- This technique provides a rapid and efficient method to study the effects of drugs on limbic and striatal dopaminergic function and neurochemistry in mice.

REFERENCES
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