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Intra-nucleus accumbens gastrin-releasing peptide: The effects on reward processing and feeding behaviour

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Gastrin-releasing peptide (GRP) is the mammalian counterpart of the amphibian peptide bombesin (BB) and is known to act as a satiety peptide to suppress feeding. Receptors for GRP are widespread throughout the central nervous system with particular abundance in the nucleus accumbens (NAcc), a structure that is part of the mesolimbic dopamine pathway linked with reward. Our lab revealed that an injection of GRP (1.7 g/L) directed at the NAcc caused an immediate and significant release of dopamine. This finding provided evidence of involvement of GRP in reward processing. The objective of this experiment is to assess the effects of intra-NAcc microinjections of GRP (0.87, 1.7 g/L) and systemic d-amphetamine (1 mg/kg) in a behavioural paradigm linked to reward and motivation, operant responding for food reward using a progressive ratio (PR) schedule of reinforcement. It is hypothesized that GRP will increase the number of food rewards obtained. Sprague-Dawley rats were trained to lever press on a PR schedule of reinforcement for sugar pellet food reward followed by observation of feeding behaviour. Injections of GRP and d-amphetamine significantly increased the number of food rewards obtained, suggesting increased motivation for food reward, and did not affect feeding behaviour, suggesting involvement in pathway's distinct from the satiety pathway. This is likely through the activation of mesolimbic dopamine neurons, which can be investigated in future studies.

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