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Highlights:

- Systemic cocaine administration increases striatal norepinephrine in obesity-prone rats
- Striatal blockade of norepinephrine transporter via desipramine retrodialysis does not increase striatal norepinephrine levels in obesity-prone rats
- Systemic desipramine treatment leads to decreases in locomotor activity in obesity-prone rats when compared to obesity-resistant rats
- Desipramine decreases food intake at lower doses in obesity-prone rats than in obesity-resistant rats.

Abstract: Previous studies have demonstrated a role for norepinephrine (NE) in energy regulation and feeding, and basal differences have been observed in hypothalamic NE systems in obesity-prone vs. obesity-resistant rats. Differences in the function of brain reward circuits, including in the nucleus accumbens (NAc), have been shown in obesity-prone vs. obesity-resistant populations, leading many researchers to explore the role of striatal dopamine in obesity. However, alterations in NE transmission also affect NAc mediated behaviors. Therefore, here we examined differences in striatal NE and the response to norepinephrine transporter blockers in obesity-prone and obesity-resistant rats. We found that striatal NE levels increase following systemic cocaine administration in obesity-prone, but not obesity-resistant rats. This could result from either blockade of striatal norepinephrine transporters (NET) by cocaine leading to reduced NE reuptake, or