

NEUROPATHOLOGICAL SIGNATURES CONNECTING EARLY LIFE TRAUMA TO COMPULSIVE EATING BEHAVIOR AND OBESITY

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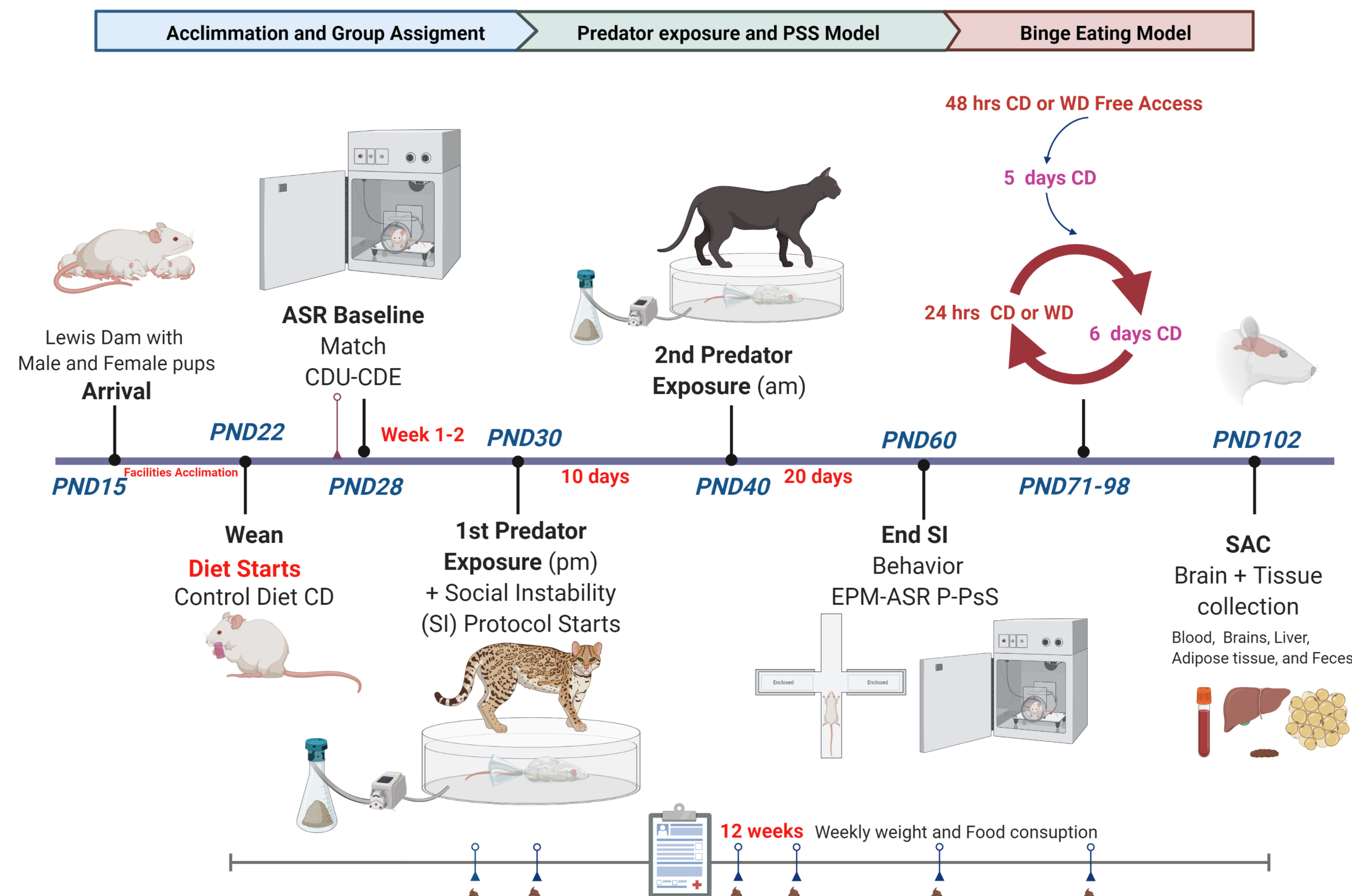
PSS, DIET AND BED EFFECTS

Background: Childhood trauma heightens the risk of severe weight gain and adult obesity. However, the neuropathological correlates of increased risk of obesity in individuals exposed to early-life trauma remain poorly understood. Preclinical findings from our laboratory support alterations to cortical structures that regulate top-down control of feeding behavior may account for this vulnerability. While both stress-related psychiatric and binge eating disorders are twice as prevalent in women as men, the neurobiological basis of this disproportionate incidence is not well understood. The present study evaluates neuroadaptations mediating the elevated risk of obesity and aberrant feeding behaviors in adolescents exposed to an obesogenic diet and trauma.

Methods: Male and female adolescent Lewis rats (n=96, 48M, 48F) were fed for twelve weeks with Western Diet (WD, 41% kcal from fat) or a matched control diet (CD, 13% kcal from fat) and exposed to a novel two-hit model of predator-based psychosocial stress (PSS) followed by intermittent access to Western Diet for a total of 3 cycles.

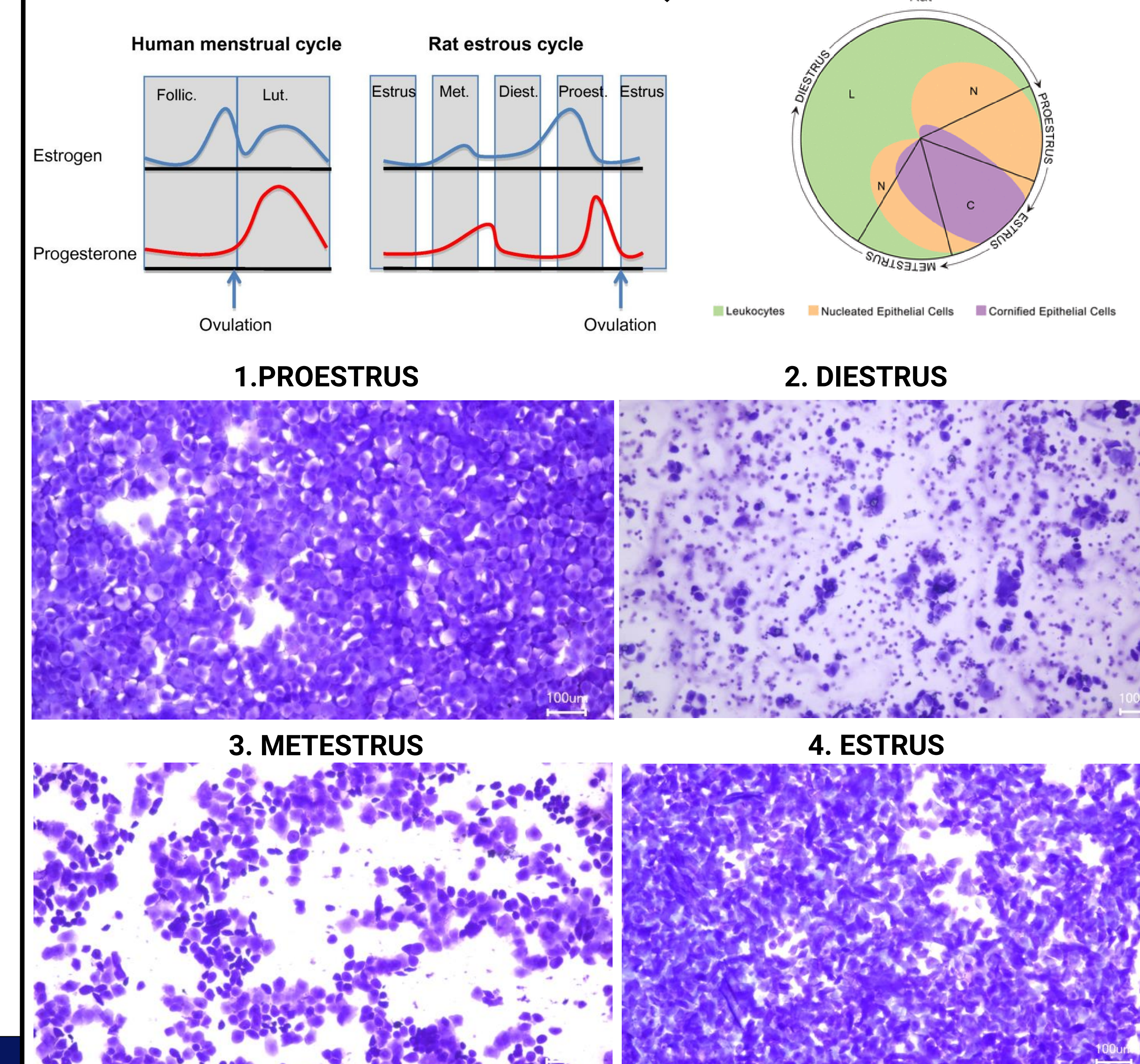
Results: Longitudinal assessment of behavioral effects and molecular markers showed that female rats were more susceptible to the effects of the PSS and WD. Female rats displayed robust binge eating-like feeding behaviors when intermittently exposed to WD. This phenotype was associated with heightened anxiety-related behaviors. Interestingly, trauma exposure dysregulated estrus cycle length and stage frequency.

PSYCOSOCIAL STRESS, DIET AND BINGE EATING MODEL

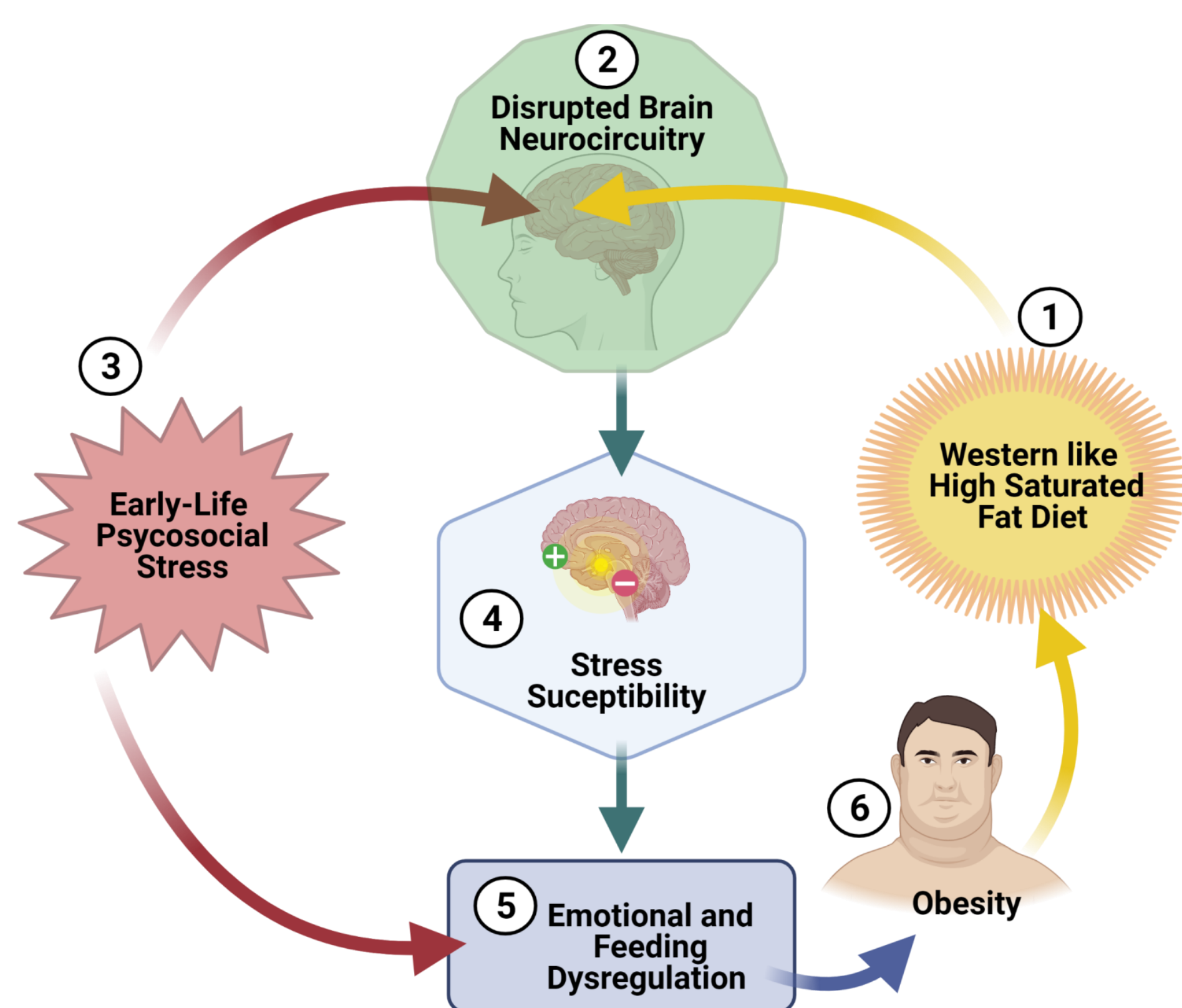


DIET AND STRESS IMPACT ON ESTRUS CYCLE

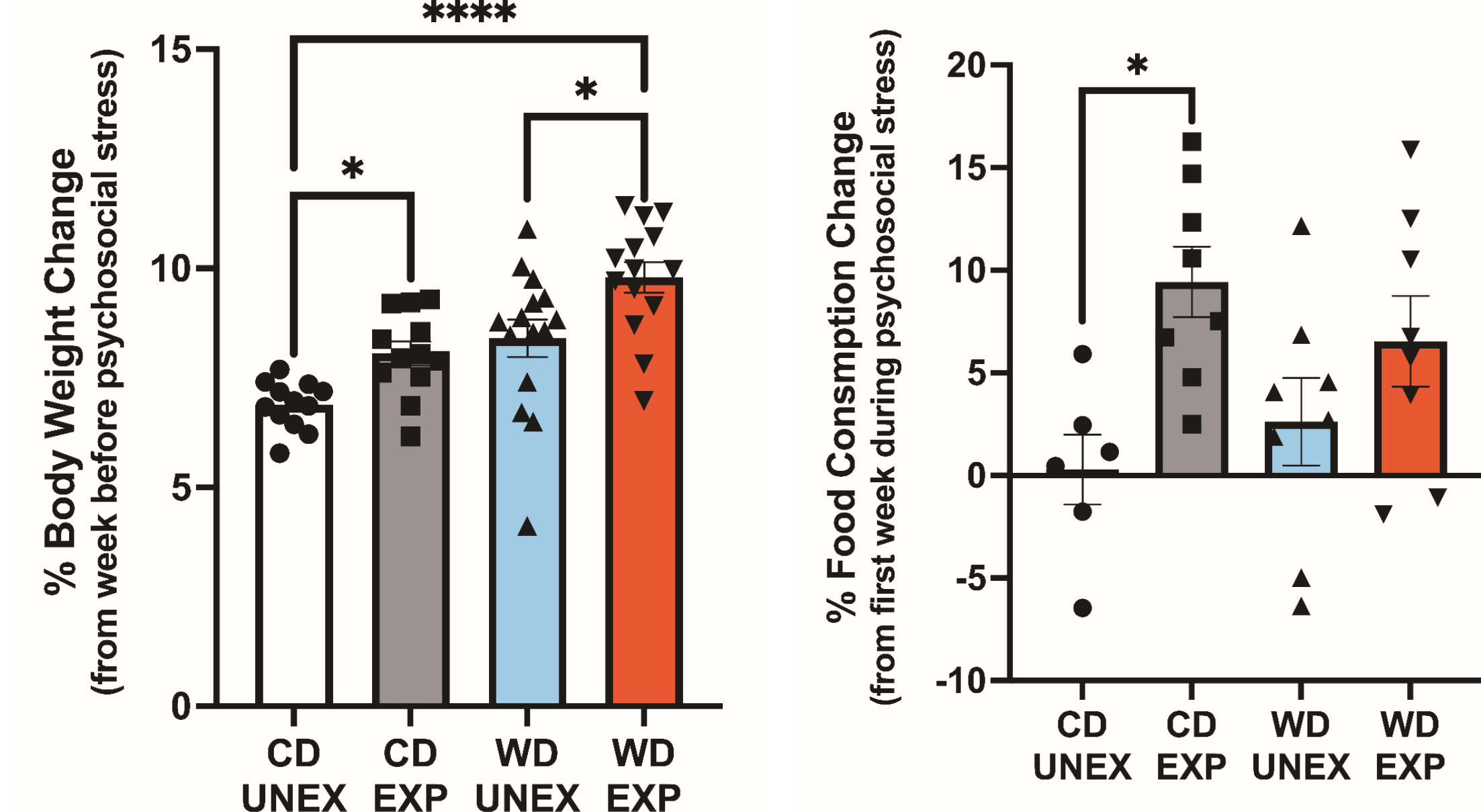
E. PSYCHOSOCIAL STRESS INDUCES ALTERATIONS IN ESTRUS STAGE LENGTH AND FREQUENCY



CONCEPTUAL FRAMEWORK

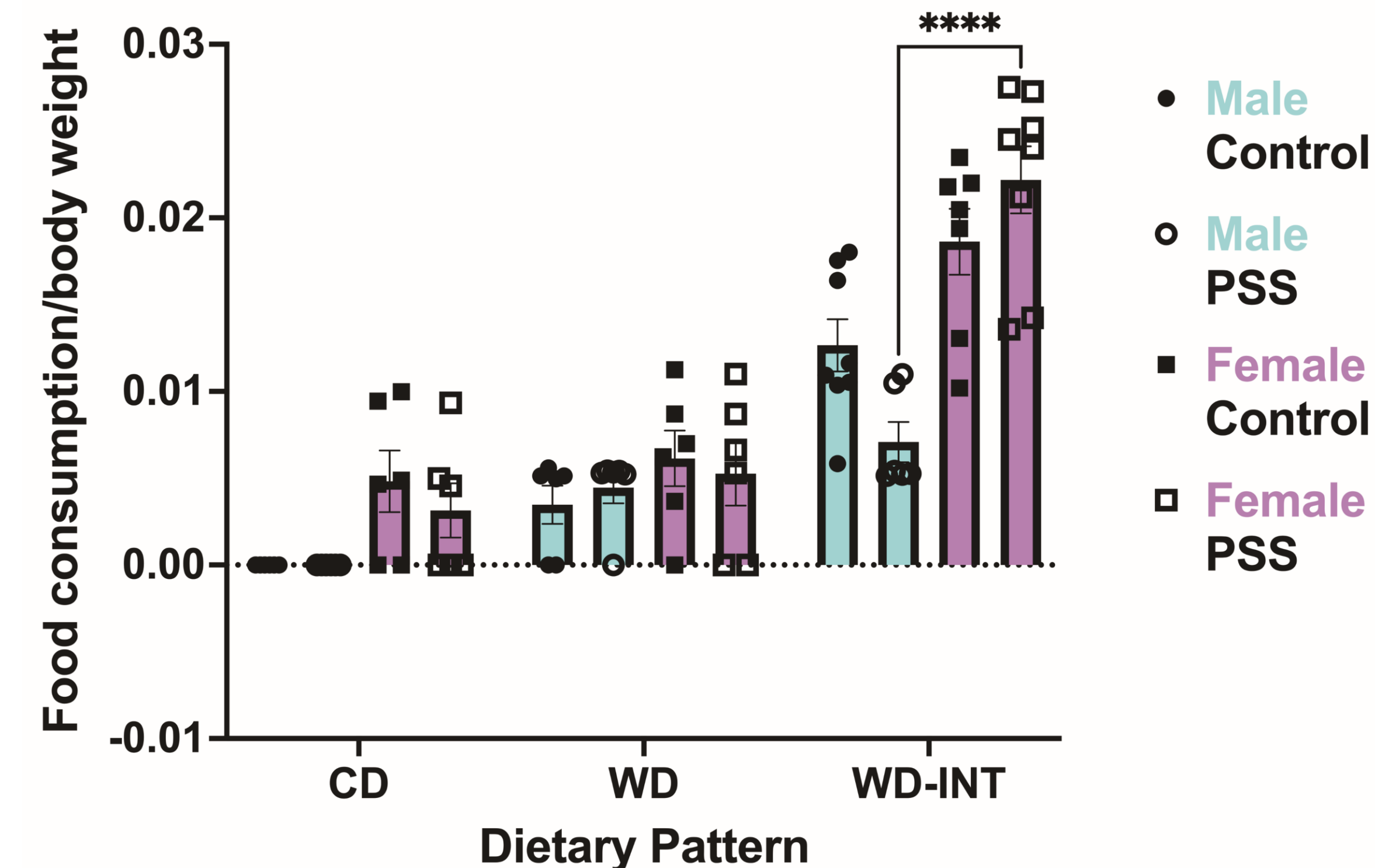


A. STRESS EFFECT IN WEIGHT AND FOOD CONSUMPTION

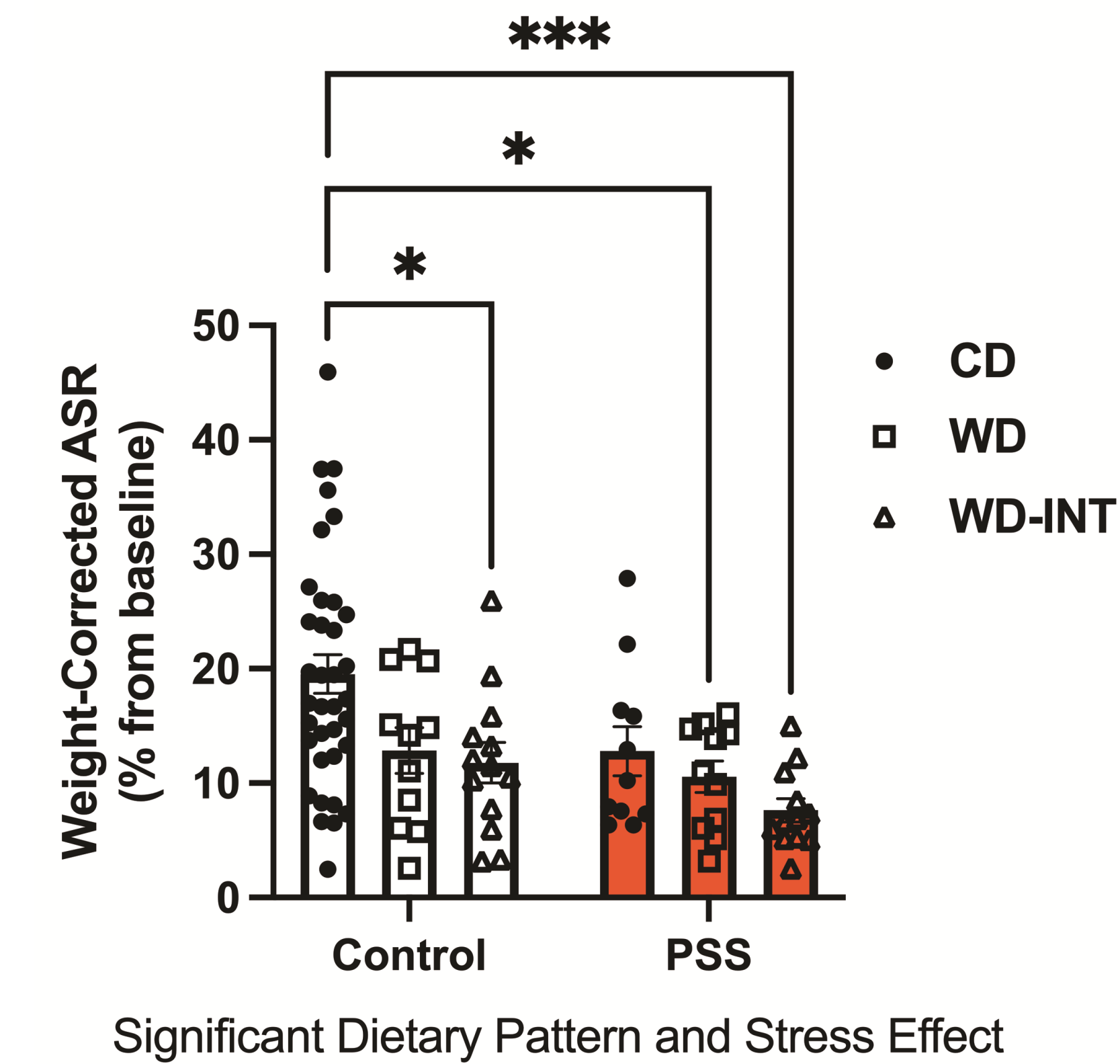


PSS, DIET AND BED HEIGHTENES BEHAVIORAL VULNERABILITIES

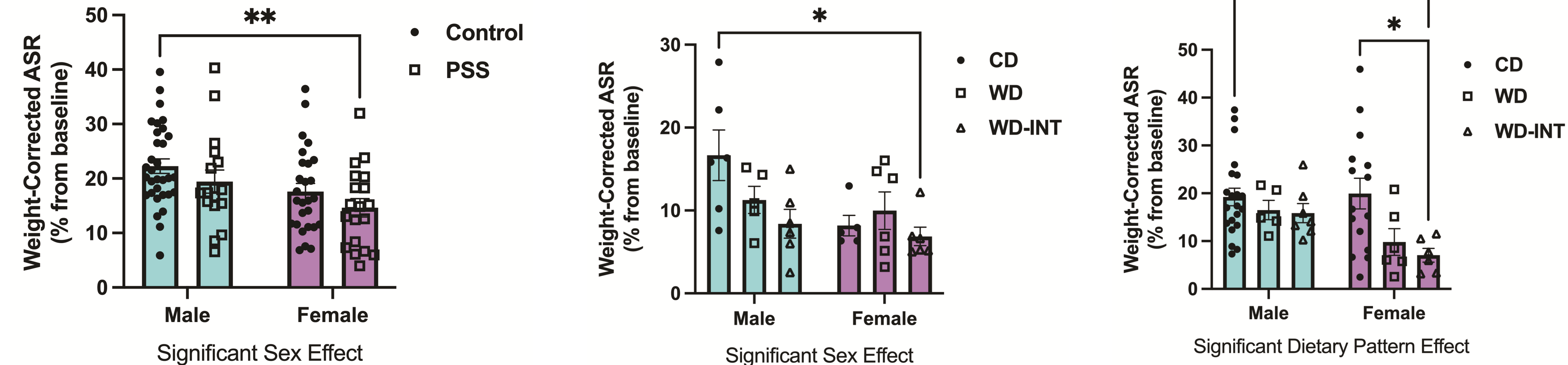
B. FOOD CONSUMPTION INCREASED IN WD INTERMITTENT DIETARY PATTERN



C. STRESS EFFECTS ON DIETARY PATTERN ON ASR RESPONSE



D. SEX AND DIETARY PATTERN EFFECTS ON ACOUSTIC STARTLE REFLEX RESPONSE



SYNERGISTIC EFFECTS OF WD, PSS AND ED

Our findings demonstrate that early-life stress and consumption of an obesogenic WD during adolescence heighten behavioral vulnerabilities associated with risk for anxiety and stress-related eating disorders. Our animal model recapitulates sex differences in traumatic stress responsivity, identifying sexual dysmorphisms linking neuroadaptive responses to early-life trauma, compulsive eating behaviors, and obesity.

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REFERENCES

Please scan the QR code for a detailed list of references
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