

## P29 The Effect of Genistein and Daidzein on Anxiety Levels: In Comparison to Estrogen in Ovariectomized Rat

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### Introduction and Objective

Phytoestrogens (i.e. daidzein, genistein) are plant derived bioactive compounds with a chemical structure similar to 17  $\beta$ -estradiol (1). Therefore, they can bind to the estrogen receptor and act as receptor agonists or antagonists. It is known that there are 2 types of estrogen receptor, alpha (ER $\alpha$ ) and beta (ER $\beta$ ); in which both daidzein and genistein are preferably bound to ER $\beta$  (1). These receptors are unequally distributed in the body; ER $\alpha$  is predominantly located in the reproductive organs while ER $\beta$  is found at other sites including the brain. Since lack of estrogen is related to some psychiatric conditions such as anxiety and depression, it can be alleviated with estrogen replacement therapy (ERT)(2). However, in some cases the ERT is prohibited, for instance in hormone-dependent tumors; therefore, phytoestrogens may be an alternative consideration. Herein, we hypothesize that by binding to ER $\beta$ , daidzein and genistein is able to reduce anxiety comparably to estrogen, but has less effect on the reproductive organ of ovariectomized rats.

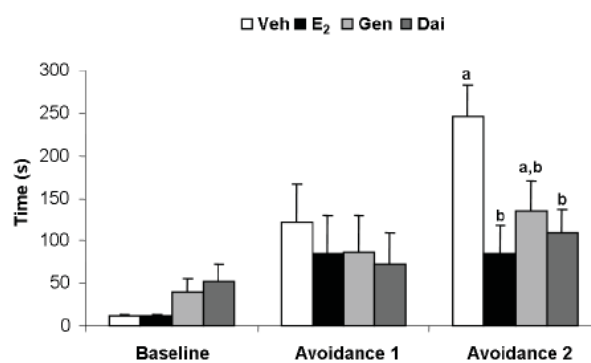
### Materials and Methods

Female Wistar rats were ovariectomized and divided into 4 groups: Veh (Vehicle; 10% DMSO in PG), E<sub>2</sub> (Estradiol; 10  $\mu$ g/kg), Gen (Genistein; 0.5 mg/kg) and Dai (Daidzein; 0.5 mg/kg). Four weeks after ovariectomy, all the rats were tested with an elevated T-maze (ETM), the well established model for measuring anxiety in rodents.

### Results and Discussion

Four weeks after ovariectomy, the ratio of uterine weight to body weight of the vehicle treated-ovx rats (Veh) was decreased significantly when compared to estrogen treated-ovx rats (E<sub>2</sub>) but not differed from genistein (Gen) or Daidzein (Dai) treated-ovx rats. As for the behavioral

tests, we found that rats treated with E<sub>2</sub> and daidzein had lowered levels of anxiety compared to the vehicle group as indicated by the decreased latency time of avoidance 2 in the ETM. For the Gen group, the avoidance 2 tended to be lower than Veh but was not different from Veh, E<sub>2</sub> or Dai groups.



From these findings, we can conclude that the phytoestrogen, daidzein (0.5 mg/kg) can reduce anxiety when tested with elevated T-maze in comparable to estrogen (10  $\mu$ g/kg) when given to ovx rats for 4 weeks. Moreover, it should be noted that genistein (0.5 mg/kg), another phytoestrogen, although it was not different from vehicle, tended to reduce anxiety, suggesting that higher dose of genistein may be required. Therefore, it is likely that phytoestrogen, for instance daidzein may be an alternative to estrogen in treating patients with conditions that estrogen is contraindicated since it has no effect on reproductive organs.

### References

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