Social status regulates GnRH1 neuron size in medaka

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It has been reported that gonadotropin-releasing hormone (GnRH1) expression in the hypothalamic-preoptic area (POA) varies with social status and reproductive state in some species. To determine whether the same is true in medaka fish, we compared GnRH1 expression between dominant (D) and subordinate (S) males. Four size-matched males of medaka were contested for 20 min and 3 weeks, and the most and the least aggressive animals were obtained as D and S, respectively, based on the number of aggressive behavior. After the respective contests, brain sampled from D and S males examined for GnRH1 transcription by *in situ* hybridization, and the size of GnRH1 soma in POA was compared between D and S males. Testes from D and S fish were sectioned and the number of spermatid was counted. GnRH1 soma size was significantly higher in D males than in S males at any time points analyzed. Furthermore, D males obtained from long-term contests showed appreciable higher size of GnRH1 soma compared with those from short-term contests. The significantly high number of spermatid was shown only in D males from long-term contests. These results suggest that stable social dominance induces GnRH1 expression in POA, which causes spermatogenesis in male medaka.