Comparison of Amygdalar Neuronal Networks that Regulate Fear Behaviors among Vertebrates

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ABSTRACT

INTRODUCTION

Amphibians. The amygdala is located in the medial temporal lobe. It is involved in regulating emotional behaviors, including behavior learning and motivation (Wright, 2012). It is also crucial for controlling basic survival skills such as feeding, flight, and fear. The lateral amygdala complex (LAC) receives input from all senses and integrates it to produce an appropriate response. The LAC has important behavioral outputs. The LAC has been shown to be involved in aversive and rewarding behavior.

METHODS

RESULTS

CONCLUSIONS

Behavioral analysis

Animals. Three species, each in a different clade of vertebrates (actinopterygii, amphibia, aves) were used. Dextro rerio (zebrafish) has an invertebrate brain, Xenopus tropicalis (Western-clawed frog, often called xenopus) and Gallus gallus domesticus (broiler chicken) have an avian brain. As a result, the amygdala for xenopus is dorso-lateral, and in xenopus and chick is lateral. There has already been extensive research on the Mux musculus (mouse), which is a valuable model for mammalian counterparts.

In situ hybridization (ISH)

In situ hybridization (ISH) is a technique that allows for precise localization of a specific segment of a gene within a histological section. Genes can be tagged with different nuclear acids, guanine, adenosine, thyamine, uracil, and cytosine. A histological section is made out of four different nuclear acids that are linked together to make a RNA strand. If the nucleus of a specific agent is brown, a complementary strand can be produced to bind to the RNA. Once the RNA binds to the complementary DNA strand, the DNA acts as a molecular beacon, allowing for the specific location of a specific gene.

Preparation

The brain of the animal is dissected and placed in gelatin. The gelatin is placed in a freeze solution containing 4% formaldehyde and buffered saline (FBS). The brain is embedded in Tissue-Tek and frozen. The brain is sectioned at 10-20 µm and placed on a slides. The slides are then hybridized and subjected to various procedures. The sections are then dehydrated and subjected to various procedures.

Day 1: The brain is cut into 10-20 µm sections using a freezing microtome. The sections are then hybridized and subjected to various procedures. The sections are then dehydrated and subjected to various procedures. The sections are then dehydrated and subjected to various procedures.

Day 2: The sections are washed with 1X SSC, 2X SSC, and 2X SSC and washed at 80°C.

Day 3: The sections are then rinsed with PBS and stained with a solution of DAPI. The sections are then rinsed with PBS and stained with a solution of DAPI.

RESULTS

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