the middle stage and expresed zygotic signals again. There were observations that provided a molecular explanation for the phenotypic and genetic relationships among trxG genes. In embryo, the presence of mRNA related their genes, which supported endogenous trxG genes, acted in the early stages of embryogenesis in Xenopus.

D111 Partial Characterization of Allatostatin cDNA in Midgut and Expression of Allatostatin Neuropeptide in Nervous System from the Silk Moth *Bombyx mori*

Dongkyung Sung, Jooyoung Jin and Bong Hee Lee
Division of Biological Sciences, Korea University, Seoul, Korea

The allatostatins (AST) are a family of peptides which were isolated in the process of finding substances which inhibit juvenile hormone synthesis by the corpora allata, a major endocrine organ of insects. The first AST to be identified were isolated in the cockroach Diploptera punctata Since then, AST have been isolated in a number of other insects including other cockroaches, moths, flies, crickets and locusts. In this study, we characterized allatostatin gene in midgut. and demonstrated that allatostatin producing neurons were detected brain and all ventral ganglia and endocrine cells that are allatostatin immunoreactive were found in the posterior midgut of silk moth *bombyx mori*

D112 Growth Properties in Primary Culture of the Deutocerebral Cells from the Silkworm *Bombyx mori*

Hun-Hee park, Hyun-Jung Ju and Bong Hee Lee
Division of Biological Sciences, Korea University, Seoul, Korea

Primary culture of differenting deutocerebral neuron has been investigated in the 5-stage pupae of the silk moth Bombyx mori. This investigation present a morphometric and statistical analyses of a large population of the deutocerebral neurons grown in the primary culture. Examination method of quantitative branching was used to characterize neuronal shape, comparing the change of both total neurite length and branching number in culture with 20-hydroxyecdysone or without it. It has been also shown that attachment of neurons to the culture substraum and outgrowth of axons were affected by lamine treatment. These results indicate different requirements of neurons for simple arttachment to the substratum.

D113 Immunolocalization of Allatotropin- and Allatostatin-Producing Neuron in Central Nervous System of the Lepidoteran Moth, Agrius convolvuli

Dongkyung Sung, Taekyun Kim and Bong Hee Lee
Division of Biological Sciences, Korea University, Seoul, Korea

Insect metamorphosis is controlled by precise hemolymph titers of juvenile hormone released from the corpora allata. The biosynthesis of juvenile hormone by corpora allata (CA) can be in turn regulated by either a stimulatory allatotropin (AT) or an inhibitory allatostatin (AS), which are synthesized in specifc brain cells and then transported to the CA via nerves in different insect species. In this investigation, localization of allatotropin- and allatostatin-producing neurons was demonstrated in the central nervous system of the 5th instar larvae from the lepidoteran moth, Agrius convuli. About 30 AT- and 70 AS-producing neurons were found in the brain whereas 2 to 10 AT- and about 30 AS-producing neurons were seen in the ventral nerve cord.