E. 발생생물

E101

Sterilizing Effects of the Sap of *Nerium indicum* on Spermatogenesis of *Helicoverpa assulta*, the Oriental Tobacco Budworm (Noctuidae, Lepidoptera)

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We investigated the effects of sap of the common oleander, *Nerium indicum* (Apocyanaceae) on male fertility and spermatigenesis in the oriental tobacco budworm, *Helicoverpa assulta*. We found that continuous feeding of oleander sap during the larval period significantly affects fertility in males but not in females. This effect was also induced by direct injection of oleander sap into the hemocoel of 2-day-old pupae. Histological analyses of developing testes following oleander injection revealed a developmental delay and progressively more severe morphological abnormalities in the later stages of development. The effects of oleander sap on spermatogenesis in *H. assulta*were associated with greatly reduced levels of the two major polyamines, spermidine and spermine, in testis compared with saline-injected controls. In contrast, levels of putrescine, which is a precusor of both spermidine and spermine, and the activities of the enzymes ornithine decarboxylase and arginine decarboxylase, which are involved in the biosynthesis of putrescine, were initially elevated following oleander injection, but subsequently failed to undergo the induction thatnormally occurs during late pupal development.

E102

Morphological Evidence of the Importance of Epithelial Tissue during Mouse Tongue Development

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The morphogenesis of fungiform papillae occurs in a stereotyped pattern on the dorsal surface of the tongue in mice from embryonic day 12 (E12) to E17. The histological results and ultrastructural observations showed the development of specific structures in the epithelium into fungiform papillae. Prior to the morphological changes, the *Bmp-4* and *Shh* transcripts are expressed in a restricted area on the dorsal surface. These results suggest that the development of fungiform papillae requires an epithelium and mesenchyme interaction during morphogenesis. In order to obtain direct evidence of the epithelium and mesenchyme interaction during tongue papillae morphogenesis, the formation of fungiform papillae was examined after a recombination assay. From the recombination assay results, the E13.5 epithelial portion of the fungiform papillae could determine the position of the newly formed fungiform papillae with the epithelial signaling molecules. E13.5 was a critical stage for fungiform papillae morphogenesis. Fungiform papillae can be considered to be a small epithelial appendage, which are formed via the epithelium and mesenchyme interactions.

E103

Developmental Functions of Gap Junctions during Mouse Tongue Development

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Connexins, the family of proteins that form vertebrate gap junctions, have key roles during embryonic development. The development of fungiform papillae requires reciprocal dialogue between tongue epithelium and underlying mesenchyme, such as the tooth bud, limb bud, other epithelial appendages. Here, we examined the role of gap junctions during mouse fungiform papillae development. The specific structures in the epithelium as well as mesenchymal condensation were observed from E13 to E16, We examined expression patterns of connexin32 and connexin43, the results show that the spatio-temporal expressions is of evidence for proper formation of papillae. Furthermore, Octanol, uncoupler of gap junction, was treated to analyze the developmental functions of connexins using *in-vitro* organ culture. The expression patterns of signalling molecules are altered by inhibition of gap junctions. These results revealed that the gap junctions have essential roles for morphogenesis of fungiform papillae during mouse development.

E104

Presence of a Novel Functional Receptor for GnRH-II That Induces Intracellular Calcium Concentration in Prostate Cancer Cell

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We demonstrated the presence of two novel GnRH receptors (GnRHRs) in androgen-independent prostate cancer cell lines, ALVA 41, DU 145, PPC-1, and TSU-Pr1. Prostate cells showed a higher affinity for GnRH-II than GnRH-I. Interestingly, neither GnRH-II nor GnRH-I increased inositol phosphate (IP) production in prostate cancer cells, while the cells infected with adenovirus containing a conventional GnRHR increased IP production in response to GnRH-II, indicating that the receptors in prostate cancer cells are different from the conventional GnRH receptor. Despite no IP production, GnRH-I increased a intracellular Ca^{2+} concentration ($[Ca^{2+}]i$) through a Ca^{2+} efflux from extracellular source, while GnRH-II augmented $[Ca^{2+}]i$ by mobilizing Ca^{2+} from intracellular Ca^{2+} stores. Cetrorelix, a potent GnRH-I antagonist, also blocked GnRH-I-induced $[Ca^{2+}]i$ increase but also exhibited a partial agonism for the GnRH-I-responding receptor. Trptorelix-1, a GnRH-II antagonist completely inhibited the GnRH-II-induced $[Ca^{2+}]i$ increase, while it did not blocked the GnRH-I induced $[Ca^{2+}]i$ increase. GnRH-II was more potent than GnRH-I in stimulating the proliferation rate of prostate cells. Trptorelix-1 specifically inhibited GnRH-II-induced prostate cell proliferation. By using a photoaffinity labeling with ^{125}I-[Azidobenzoyl-D-Lys^6]GnRH-II, we observed that an 80-kD protein specifically bound to GnRH-II. These results provide the evidence for the presence of a novel functional receptor for GnRH-II and probably another novel receptor for GnRH-I in the prostate cancer cells, and suggest that Trptorelix is likely to be a potent therapeutic drug for the prostate cancers.