

## Identification of innexin2, Gap Junction channel Protein Expressed during Embryogenesis in the *Bombyx mori*

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### **Objectives**

Gap junctions are membrane channels that directly connect the cytoplasm of neighboring cells, allowing the exchange of ions and small molecules. Two analogous families of proteins, the *connexins* and *innexins* are the channel-forming molecular vertebrates and invertebrates, respectively. Here, we present the molecular cloning and sequences analysis of novel *innexins*, *Binx2*, expressed during *Bombyx mori* embryonic development.

### **Materials and Methods**

- Animal : *Bombyx mori* embryo
- ABI PRISM 377 autosequencer ( Perkin Elmer, USA )
- Northern Blotting
- RT-PCR ( Stratagene )

### **Results and Discussion**

Cell to cell communication plays an essential role during pattern formation and morphogenesis of the diverse tissues and organs of the body. Invertebrates, such as the *Bombyx mori*, the direct communication of closely apposed cells is mediated by gap junctions which are composed of oligomers of the *innexin* family of transmembrane channel proteins. We show 1813bp the complete cDNA sequence identified *innexin2* that are highly expressed in the egg of the *Bombyx mori* during embryogenesis. It has a 72bp 5'-UTR and a 747bp 3'-UTR flanking a predicted ORF. The amino acid sequence of the deduced protein was 78% identical (283/359aa) to the discovered *innexin2* of *Schistocerca Americana*. Here, we report a novel *innexin2*, termed *Binx2*, from the silkworm, *Bombyx mori*. *Binx2* is ubiquitously expressed in the various stage throughout the final larva stage, pre-pupa, pupa, egg. But, *Binx2* is weakly or not expressed in the hemocyte in the larva stage, silk gland in the pre-pupa, testis in the pupa and blastoderm formation in the egg. Our observation shows that *innexin2* is one of a set of embryonic gap junction proteins and that it is required for the normal temporal development.

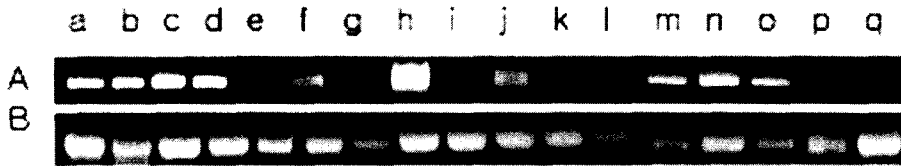


Fig 1. RT-PCR analysis of *Binx2* transcript in different fifth instar larva, pre-pupa, pupa, adult. A : RT-PCR product. B : B-actin, a-e : fatbody, midgut, ovary, testis, hemocyte of larva, f-l : fatbody, midgut, ovary, testis, brain, skin, silk gland of pre-pupa, m-n : fatbody, ovary, testis of pupa, p-q : female, male of adult.

### **Reference**

- Kathryn D. Curtin., Zhan Zhang., Robert J Wyman., 1999. *Drosophila* has several genes for gap junction proteins. GENE 232, 191-201
- Starich T., Sheehan M., Jadrlich J., Shaw J., 2001. *Innexins* in *C. elegans*. Cell Commun Adhes 8,311-314