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Dr. Yasunori Murakami is a neurobiologist in the field of the evolutionary morphology. He is interested in the evolutionary process of the vertebrate brain, and has studied the developmental plan of chordate brains including the amphioxus, lamprey, turtles, and mouse. Through these research works, he has authored 26 original papers in international journals, and has been invited five times for delivering lectures in international meetings or symposia. Recently, he has joined as a member of the mega project on Global Center of Excellence Program sponsored by the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan.

Ecotoxycology of the Developing Vertebtate Brain

Vertebrate brain shows remarkable diversity among animal groups (Fig.1). My major interest is to identify the evolutionary process of the vertebrate brain. It has been well known that changes of the developmental program cause morphological modification of the body plan. Therefore, in our laboratory, we have studied the developmental mechanism of several vertebrate brains by using molecular biological techniques. We have already identified that the basic architecture of the vertebrate brain had already been established in a common vertebrate ancestor. However, in the telencephalon, the agnathan lamprey lacks the *LjNkx2.1* expression domain in the ventral region, corresponding to the pallidum of gnathostomes. It may be related to the apparent absence of pallidum in lamprey and also suggest the possibility that pallidum was acquired in gnathostomes after agnathan-gnathostome split. Since pallidum functions as the center for several brain functions, the establishment of pallidum region leads the vertebrate telencephalon into the higher integration center. We have also been studying the development and evolution of the vertebrate trigeminal system. Through these analyses, we found a direct correlation between brain segment and trigeminal sensory map and a 'whisker–to–barrel' trigeminal pathway relaying tactile information from the face to the cerebral cortex (Fig.2). This finding suggests that the brain segmentation provides a basis for the establishment of the functional sensory circuit. In future, we would like to expand this intriguing concept into other research fields. Recently, we have joined as the member of the global COE program of Ehime university. We are now analyzing the toxic effects of several environmental pollutants on the vertebrate nervous system. As mentioned above, since vertebrate hindbrain plays a key role on brain development, this region will be a good model for studying the ecotoxicology of several pollutants. I believe that these analyses may provide interesting concepts in the field of the environmental science.

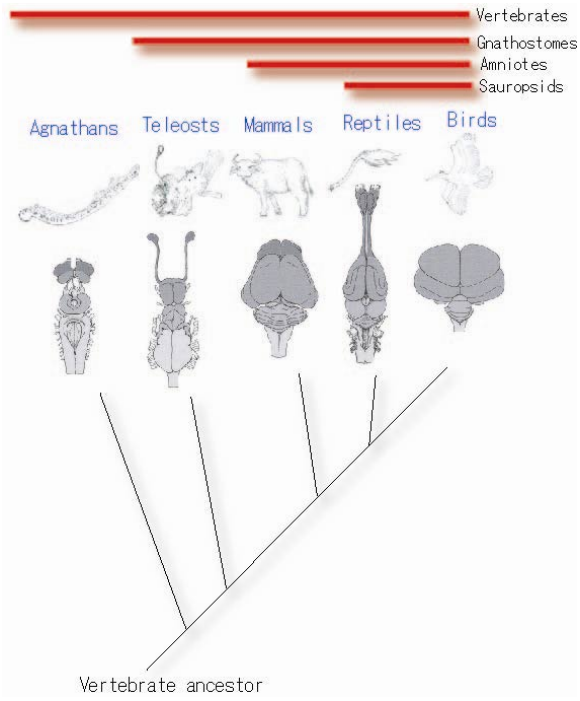

Fig.1 Diversity of vertebrate brain. Vertebrate brain is diverse in different species.

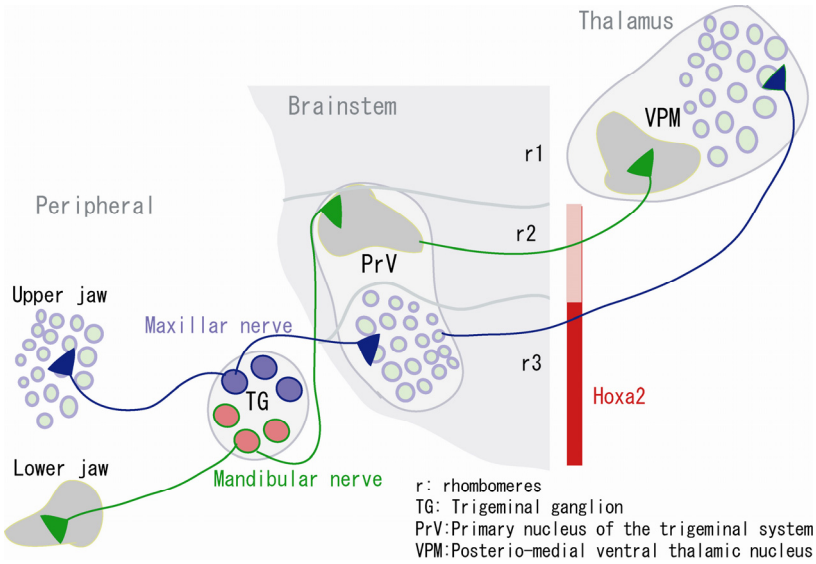

Fig.2 Organization of the vertebrate trigeminal system. Each trigeminal nerve which originate from trigeminal ganglion (TG) projects into the hindbain with a rhomnomere (r) specific manner.