台湾を訪れた12名の
熊大G-COEメンバー

シンポジウムが行われた台湾
トップの学術研究機関アカデミ
アシニカ内の「INSTITUTE OF
BIOMEDICAL SCIENCES」

人材育成の一環として
若手研究者も参加

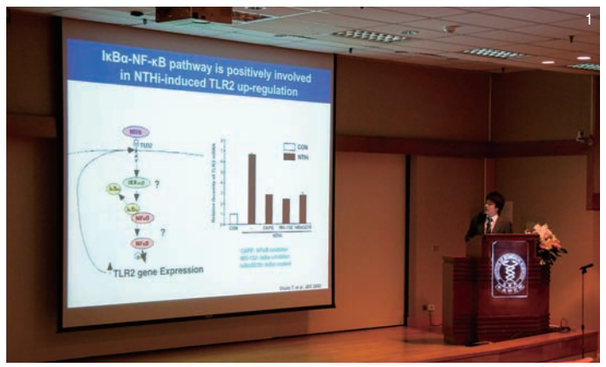
熊大G-COEでは、国際シンポジウムを若手研究者の育成において、貴重な機会と捉えています。若手研究者が海外で研究発表を行い、海外の研究者の発表を聞き、その考えに触れることは、短期間で留学に代わる経験を積むことに値するといっても過言ではありません。今回は、公募によって若手研究者2名を選出。この2名が経験したエントリーから準備期間、発表までのプロセス、そして現地での発表およびディスカッションは、大きな経験となりました。

国際シンポジウムで発表するのは初めてという若手研究者にとって、このような機会を与えられたことは、非常に貴重な経験となりました。熊大G-COEとアカデミアシニカの教授たちの発表を間近で聞き、そこで交わされる教授たちの専門領域を越えた議論を目のあたりにすることは、大きな刺激となります。

さらに、自分と同じポジションにいるアカデミアシニカの若手研究者の研究発表を聞き、その内容のみならず、研究に対する姿勢を自分と対比させることで、モチベーションをかきたてることにもなりました。

今年度初となった今回のシンポジウムは、熊大G-COEとアカデミアシニカの友好関係も深め、研究に関する情報を共有できたこと、若手研究者に貴重な経験を積ませたことなど、大きな成果を上げることができました。このような経験を、より多くの若手研究者に経験してもらうために、熊大G-COEでは「若手研究者研究成果発表旅費支援」などの事業を行い、若手研究者の育成に力を入れています。

今回のシンポジウムを皮切りに、今後も戦略的に国際交流事業を実施していきます。



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1. 若手研究者（熊大講師 首藤さん）の発表。堂々たるもの　2. 聴講に訪れたアカデミアシニカの研究者や学生たち　3. シンポジウムでは、活発な議論が交わされた（熊大COEリサーチ・アソシエイト 寺林さん）　4. 休憩時間は若手研究者同士のコミュニケーションの場（左：熊大COEリサーチ・アソシエイト 原田さん）　5. 広大な敷地のアカデミアシニカ内にはさまざまな研究所があり、高性能の研究器材や設備が整っている　6. 熊大G-COEのメンバー12名とアカデミアシニカのChen所長ら

論文紹介

熊本大学グローバルCOE の若手研究者による論文を紹介します。

Draxin is essential for tectum and retinocollicular axon projections.

Developmental Biology.332(2) 351-359 August 2009

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I have been working with a recently identified axon guidance molecule draxin which plays important role in the development of spinal and forebrain commissures (Islam et. al 2009, science 323, 388-393).In the midbrain of chick and mouse, draxin is expressed from early embryonic stage in a dorsal high to ventral low gradient. My data suggest that draxin might function as a repulsive guidance cue for the ventrally directed axon projection in chick early embryonic brain (Naser IB et al, 2009. Dev. Biol. 332, 351-359). Continuous expression of *draxin* even after the midbrains ventrally directed axon projections were completed led me to analyse the retinocollicular (tectum) projection in *draxin* knock out mice. Draxin was found to be essential for this well analyzed system. *draxin* is expressed in the mouse superior colliculas in a dorsal high to ventral low gradient during the time of retinocollicular map formation. Draxin inhibits neurite outgrowth from mouse retinal explant. *draxin* knock out mice shows clear mapping defect along the dorso-ventral and anterior-posterior axis of superior colliculas. I believe revealing draxin's function will have a high impact not only in the developmental neurobiology research field, but also in the wider context of cell biology since axon guidance molecules may also play important roles in, for example, morphogenesis, blood vessel formation, and in the immune system.

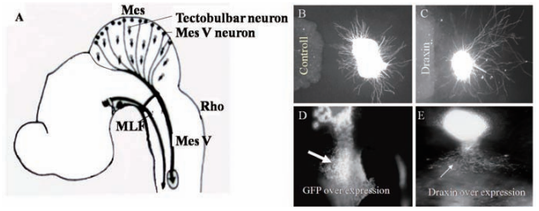

Fig 1: (A) Schematic representation of ventrally directed axonal tracts in chick midbrain (Chédotal et al., 1995). Mesencephalic (Mes) V neurons (black circles) present near the dorsal midline. They start to project axons towards ventral direction from stage 14 and turn caudally in the ventral tectum. Tectobulbar neurons (open circles) also project axons toward ventral direction and turn caudally before reaching the tegmentum and follow the path of medial longitudinal fascicles. Dorsal tectum explants from E4 embryos were co-cultured with mock transfected COS cell aggregate (B) and draxin transfected COS cell aggregate (C). Quantification of the axonal growth of dorsal tectum explants cultured in collagen with mock-transfected COS cells or draxin transfected COS cells show a repulsive activity of draxin. Significant differences were observed among proximal sectors in the case of draxin compared with control cases. Vector GFP DNA (D) or draxin cDNA (E) were over expressed in the ventral side of the tectum. Overlay picture shows that growth of axons was long and straight through the GFP vector over expressed site (D, arrow). In fig E, tectum axons were misrouted and stop by the over expressed draxin (E, arrow).

Evolutionary history and functional characterization of androgen receptor genes in jawed vertebrates.

Endocrinology.150(12) 5415-5427 December 2009

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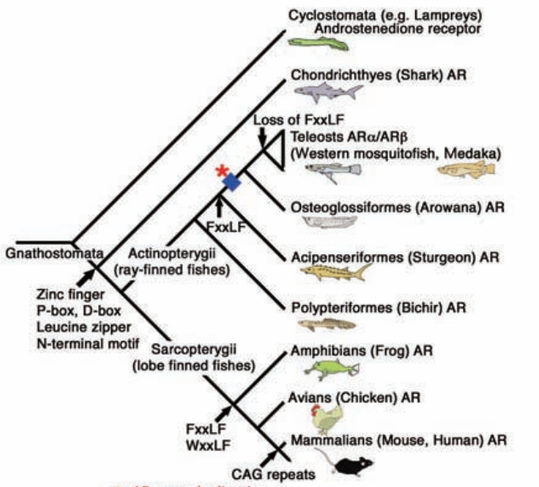
Vertebrates show diverse sexual characters in sexually attractive and reproductive organs, which are regulated by steroid hormones, particularly androgens. However the evolutionary history of *Androgen receptor (AR)* gene remains largely unknown on the basis of phylogenic and functional analyses. To elucidate the evolutionary history and functional diversification of *AR* genes in vertebrates, we cloned the *AR* cDNAs from a shark, basal ray-finned fishes (Actinopterygii), namely bichir and sturgeon (Acipenseriformes), and teleosts including a basal teleost, arowana (Osteoglossiformes). Molecular phylogenetic analysis revealed that the gene duplication event that gave rise to two different teleost *ARs* (α and β) likely occurred in the actinopterygian lineage leading to teleosts after the divergence of Acipenseriformes but before the split of Osteoglossiformes, which is compatible with the phylogenetic timing of teleost-specific genome duplication (TSGD). Searching for *AR* genes in the medaka genome indicated that the teleost *AR* gene duplication has been associated with the duplication between chromosomes 10 and 14. Our functional analysis revealed that the shark AR activates the target gene via androgen response element (ARE) by classical androgens. The teleost ARα showed the unique intracellular localization with a significantly higher transactivating capacity than that by teleost ARβ. These findings indicate that the most ancient type of AR, as activated by the classical androgens as ligands, emerged before the Chondrichthyes-Osteichthyes split, and the *AR* gene was duplicated during the TSGD event. We report here for the first time the accurate evolutionary history of *AR* gene and functional characterization of *AR* duplicates in teleost lineage.



The common ancestor of all extant jawed vertebrate contains the most ancient type of AR, and teleosts have two functionally different ARs duplicated with TSGD.