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研究 生(中)	呂佳玲
研究 生(英)	Chia-Ling Lu
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其他 題名	
指導 教授 (中)	陳擎霞 張繼堯
指導 教授 (英)	Ching- Hsia Chen Chi-Yao Chang
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摘要(中)	<p>生長激素是一種腦下垂體分泌的內分泌激素，除了參與生長發育、生殖和代謝的調節機制外，在魚類也參與滲透壓離子通透的調控機制。生長激素基因的表現主要受到一種在腦下垂體表現的轉錄因子—Pit-1 的調控。胚胎發育早期即有生長激素與 Pit-1 轉錄因子的表現，甚至在胎盤或卵巢組織中也可偵測到這兩種基因的表現。本實驗之研究目的是利用原位雜交法與免疫組織化學法來觀察生長激素與 pit-1 在魚類發育時基因表現的情形並探討生長激素的表現的最早起源是否由母系所提供。本實驗分別以斑馬魚與香魚作為實驗材料，一方面觀察生長激素基因在斑馬魚胚胎發育期間的表現，另一方面觀察香魚發育過程中，生長激素與 pit-1</p>

	<p>兩種基因的表現。在斑馬魚胚胎發育中，從一個細胞期即可偵測到生長激素 mRNA 至胚胎發育 36-45 小時(即 pharyngula 胚期)，生長激素 mRNA 開始只可在腦部中央位置中偵測到。在香魚胚胎發育中，可在第 5 天香魚胚胎中偵測到 pit-1 mRNA 在腦部中央位置表現，而生長激素 mRNA 則在第 9 天香魚胚胎的相同位置偵測到。在檢測成熟斑馬魚卵巢組織時，則發現在不同成熟度的魚卵中也有生長激素基因的表現。此外，以人工採得之成熟斑馬魚魚卵，也可偵測到生長激素 mRNA 的存在。另外，在孵化後第三天之香魚苗中，除了腦部中央位置有 Pit-1 蛋白質表現外，其腹部近脊椎部位也有 Pit-1 蛋白質的表現。由上述結果推測，在魚類發育中，生長激素最早表現於卵巢組織中，並以母系遺傳方式，提供成熟魚卵早期所需之生長激素，之後隨著胚胎發育，漸漸發育出腦下垂體組織並進一步表現生長激素，以供發育需要。而在胚胎發育中，Pit-1 可能會參與生長激素基因專一表現於卵巢組織和腦下垂體中。</p>
<p>摘要 (英)</p>	<p>Growth hormone (GH), a protein secreted from the pituitary gland, plays important roles in many respects of physiological regulation, including growth, development, reproduction and metabolism, as well as osmotic regulation in fish. The expression of GH gene is mainly regulated by a pituitary transcriptional factor, Pit-1. It is reported that the expression of GH and Pit-1 can be detected in early embryonic stages. Even in placenta and ovary, the expression of these two genes can be detected, also. In this study, we performed the whole mount in situ hybridization and immunohistochemical method to follow up the expression of GH and pit-1 genes during the fish developmental stages, and to clarify if the earliest expression of GH gene is due to the maternal effect. In this study, we used zebrafish (<i>Danio rerio</i>) to detect the GH gene expression during the embryonic development. We also used ayu (<i>Plecoglossus altivelis</i>) as an animal material to detect the expression of GH and pit-1 genes. During the zebrafish embryonic developmental stages, we observed GH mRNA as early as one-cell stage, and through 36 to 45 hours post-fertilization (pharyngula stage) in which the GH mRNA was detected in the middle region of brain. In ayu, the pit-1 mRNA was detected in the middle region of brain on day 5 post-fertilization, and GH mRNA was detected in the same site on day 9 post-fertilization. By immunohistological study of the ovary from adult zebrafish, GH gene expression was also detected in various maturation stages of oocytes. In addition, GH mRNA was also detected in manually collected mature zebrafish eggs. On the other hand, in 3-day old ayu fry, Pit-1 protein was detected in the middle region of brain, as well as the region between the vertebral and the abdominal site. According to the results, we suggested that during fish development, GH firstly expresses in maternal ovary and is transmitted to mature oocytes vertically to supply sufficient GH to eggs. Along with the embryo development, the pituitary gland matures and expresses GH. Moreover, Pit-1 may also involve in the tissue-specificity of GH gene expression in the ovary and pituitary glands.</p>
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