

Morphological evidences of brain-derived neurotrophic factor as a neurohormone
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The most abundant member of the neurotrophin family, brain-derived neurotrophic factor (BDNF), exerts various physiological functions in the nervous system. Our previous studies demonstrated the existence of BDNF and its coexistence with pro-opiomelanocortin (POMC) and α -melanophore-stimulating hormone (α MSH) in secretory granules of melanotrope cells in the *Xenopus laevis* pituitary intermediate lobe. In this study, we investigated the presence of BDNF in the brain and pituitary neural lobe of *Xenopus*, immunohistochemically at the light and electron microscope level. With the tyramide signal amplification technique BDNF-immunoreactivity was found in perikarya and their ventrolaterally projecting fibers in the magnocellular nucleus. Fibers in the internal zone of the median eminence showed strong BDNF-immunoreactivity. At the light microscopy level, BDNF appears in the neural lobe of pituitary. At the electron microscopy level it appears to be limited to one type of neurohaemal axon terminal, where it occurs within round secretory granules. The second type of terminal, containing flat granules, was completely immunonegative. Double gold-immunolabeling reveals that BDNF is located in secretory granules together with mesotocin, one of the main 'classical' neurohormones in the amphibian neural lobe. This coexistence strongly indicates that BDNF is secreted, along with mesotocin, but not with vasotocin, into the circulation and acts as a neurohormone. Its target is unknown, but in view of the fact that BDNF is known to stimulate POMC biosynthesis and α MSH release by melanotrope cells, we suggest that BDNF release from the neural lobe acts as a stimulator of melanotrope cell activity.

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