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Additional Information on NGF

NGF is a member of the neurotrophin family of proteins that promote the growth and survival of neurons during development and the maintenance and function of adult neurons. NGF actions also extend to other kinds of non-neuronal cells, and NGF is now known to be involved in the balanced interplay between the nervous, endocrine and immune systems. (Manni et al., 2010) Early studies observed that anxiety caused by fighting among male mice triggered the release of large quantities of NGF from the submandibular salivary glands into the circulation, (Aloe et al., 1986; Maestripieri et al., 1990) and a subsequent study with humans found that soldiers experiencing their first parachute jump had large increases of plasma NGF in anticipation of the jump. (Aloe et al., 1994) Changes in peripheral levels of NGF and related neurotrophins have been associated with mood disorders, anxiety, and mechanisms affecting social bonding. (Cirulli et al., 2009)

NGF has been studied in saliva, and release of salivary NGF in mice has been found to be regulated through adrenergic stimulation. (Hazen-Martin & Simson, 1987; Partlow et al., 1981; Wallace & Partlow, 1976) NGF is found in human saliva in concentrations higher that those found in serum, suggesting that the human salivary glands are important sources of NGF production. (Nam et al, 2007; Komatsu et al., 2008; Ruhl et al., 2004) Most recently, studies have examined salivary NGF in relation to chronic migraine pain and as a marker related to stress responses among military personnel. (Jang et al., 2011; Murray et al., 2010a; Murray et al., 2010b) Although the exact origin of human salivary NGF has not been identified, BDNF, a closely-related member of the NGF family of proteins, has been found to be expressed in the acini and ducts of the human submandibular salivary glands. (Saruta et al., 2010) Additionally, human epidermal growth factor (EGF) has been reported to be produced by the acini of human parotid and submandibular glands. (Thesleff et al., 1988).

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