# CHAPTER 1

# INTRODUCTION AND AIM OF THE WORK

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*Opioid receptors are present throughout the central nervous system but their number is especially high in some specific areas which have been known for a long time to be related to morphine activities, such as the limbic system (Hiller et al.,1973; Pert et al.,1975 & Simon, 1975).*

*Subsequent studies revealed also the presence of such receptors in the substantia gelatinosa of the spinal cord where the small diameter afferent "C" fibers take their central connections (Lamotte et al., 1976; Atweh & Kuher 1977). Similar receptors were found in the innervating structures of certain smooth muscles i.g., the guinea pig ileum and the mouse vas deferens (Creese & Snyder 1975; Simon & Hiller 1978).*

*Activation of opioid receptors results in a presynaptic modulation of neurotransmitter release in various peripheral tissues as well as in the central nervous system (Vizi, 1979; Langer, 1981; Starke, 1981; Chesselt, 1984 & Mulder et al., 1984).*

*Since the characterization of a multitude of neuroactive peptides present in the central nervous system, there has been considerable discussion as to whether these function as neurotransmitters or via a less conventional mode of information transfer.*

*Sim and Ramabadran (1985) have concluded that many of the opioids act via multiple opioids receptors which could produce varying and opposing effects on the ACh-induced contraction. However, the opiate receptors are highly plastic and there affinity is dependent on their conformation which in turn depends on the ionic environment (Simon & Hiller, 1978).*

*Morphine analgesia is antagonised by $Ca^{2+}$ (Kakunaga et al.,1966 & Harris et al., 1975). Guerrero et al. (1979) have concluded that B-endorphin can inhibit synaptosomal uptake of calcium.*

*The electrophysiological function of opioid receptors appears to be generation of inhibitory presynaptic or postsynaptic potentials by hyperpolarization via potassium channels (Kelly et al., 1990 & Loose & Kelly , 1990).*

*The aim of the present work was to study the effects of stimulation of opiate receptors by morphine and their blockage by naloxone on the response of the isolated rat phrenic nerve diaphragm preparation, bathed in normal krebs solution and in presence of variations of $Ca^{++}$, $K^{+}$ and $Na^{+}$ concentrations in the krebs solution, to repeated stimulation by electric shocks at a rate 1/sec.*