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STUDY OF DOPAMINE BINDING CHARACTERISTICS IN
DIFFERENT BRAIN REGIONS IN DIABETIC RATS

BY

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INTRODUCTION

Dopaminergic pathways appear to be involved in many important brain functions including control of movements, autonomic function, neuroendocrine function, and mental and emotional states (1). Alterations in the function of some of these dopaminergic tracts are involved in neurological and psychiatric diseases including Parkinson's disease, schizophrenia, Huntington's chorea and other hyperkinetic conditions (2).

Saller and Chiodo (3) found that acute administration of glucose caused the complete suppression of the discharge rate of dopamine containing neurons in substantia nigra, and therefore, glucose would be expected to decrease the rate of release and turnover of dopamine in postsynaptic target regions. On the other hand, Psychoyos et al (4) found that glucose activates tyrosine hydroxylases in rat striatal synaptosomes which may increase the rate of dopamine synthesis and release. Glucose has also been demonstrated to facilitate the uptake of dopamine into striatal synaptosomal preparations (5).

Therefore, there are some evidences to suggest that acute and chronic hyperglycemia should alter some dopaminergic function in the central nervous system (CNS) that may modify certain endogenous mood disorders, as well as the emotional changes and other complications accompanying diabetes mellitus (6). On the basis of the above observations, we try to examine the binding characteristics at postsynaptic dopamine receptor sites in diabetic rats to determine

whether chronic hyperglycemia produces any changes in dopamine receptors.

Since several drugs, i.e. chlorpromazine, bromocriptine, known to interact with dopaminergic receptors have been utilized for the treatment of various unrelated clinical disorders. Studies of dopaminergic receptor bindings in different brain regions using these drugs may give more information in characteristics of dopaminergic receptor in the central nervous system.

In addition, we also examine the potential relation between stereotyped behaviors induced by apomorphine and the density of dopamine receptors.