

Date: 10.12.2020

To
The Teacher-in-Charge,
Parimal Mitra Smriti Mahavidyalaya,
Post-Mal, Dist-Jalpaiguri

**Subject: Request to perform collaborative research work with
Jadavpur University, Kolkata**

Respected Ma'am,

I would like to inform you that I wish to continue my research work in collaboration with Dr. Anup Kumar Ghosh, Professor & HOD, Department of Instrumentation Science, Jadavpur University, Kolkata. This work will not affect my allotted duties for this College.

I will be highly obliged if you kindly allow me to continue my research work.

Ritabrata Banerjee

Dr. Ritabrata Banerjee,
Assistant Professor, Department of Zoology,
Parimal Mitra Smriti Mahavidyalaya

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parimal mitra smriti mahavidyalaya

MAL, JALPAIGURI

Date: 15.12.2020

This is to certify that Dr. Ritabrata Banerjee, Assistant Professor, Department of Zoology is a bonafide teacher of this College and is serving this College 02.12.2019. The undersigned has No Objection if Dr. Ritabrata Banerjee continues his research work in collaboration with Dr. Anup Kumar Ghosh, Professor & HOD, Department of Instrumentation Science, Jadavpur University, Kolkata after doing his normal duties of this College.


15/12/2020
The Teacher-in-Charge,
Parimal Mitra Smriti Mahavidyalaya,
Post-Mal, Dist-Jalpaiguri

Teacher-in-charge
PARIMAL MITRA SMRITI MAHAVIDYALAYA
MAL, JALPAIGURI

Dr. Anup Kumar Ghosh
Faculty
Dept. of Instrumentation Science
Faculty of Science, Jadavpur University



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TO WHOM IT MAY CONCERN

It gives me immense pleasure to certify that Dr. Ritabrata Banerjee, Assistant professor of the Department of Zoology of Parimal Mitra Smriti Mahavidyalaya, Malbazar, Jalpaiguri, West Bengal- 735221 has been continuing his research work on Molecular Analysis of Human Postmortem Brain of Suicide Victims in collaboration with me [Prof. (Dr.) Anup Kumar Ghosh], Professor & Head of the department, Department of Instrumentation Science, Jadavpur University, Kolkata - 700032, West Bengal, since 2021 and published research articles in various International Peer-reviewed Scientific Journals related to Psychiatry and Neuroscience..

I wish him every success in life.

A. Ghosh
13.1.2021

Dr. Anup Kr. Ghosh
Head
Dept. of Instrumentation Science
Jadavpur University, Kol - 32

Gender-related Alterations in Neurochemical Milieu of Suicide: An Analysis in Human Postmortem Brain

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ABSTRACT: Depression is a wide spread, incapacitating psychiatric disorder, with 10-30% of women and 7-15% of men in a population being tremendously affected with this disease at any given time. Depression can lead to suicide, a tragic fatality at its worst. The neurobiology of suicide has been studied by numerous researchers, although the specific molecular and pathophysiologic pathways are still unclear. The goal of the current study was to determine whether there were any changes in the expressions of BDNF, TrkB, NGF, and/or TrkA in the postmortem brains of suicide participants' hippocampus and amygdala, and whether these changes were connected to gender-specific psychopathologic conditions of suicide. Expression profiles of neurotrophins and their cognate receptors were assayed by Western Blotting. mRNA levels were also measured by RT-PCR. In this study it was found that the protein and mRNA levels of neurotrophins and their receptors were much lower in the hippocampus and amygdala of male suicide subjects, whereas female suicide victims showed decreased levels of same factors only in the hippocampal area. It indicates a possible sex-specific effect in the regulation of BDNF and NGF expressions and important insights into the altered neurochemical milieu of suicide.

Keywords: Gender, Hippocampus, Amygdala, Suicide, BDNF, NGF, TrkB, TrkA.

INTRODUCTION

Every suicide is a tragedy. The term "suicide" refers to a purposeful attempt to self-harm that results in death. Somewhere in the World in every 40 seconds a person dies by suicide and many more attempt suicide (WHO, 2014). One of the most pressing challenges in mental and public health around the world is suicidal thoughts and attempts. According to the most recent data from the National Institute for Health Statistics (NCHS) and Center for Disease Control (CDC), suicide is the second greatest cause of death for people aged 15–19 and 20–24 in 2019 (Vargas-Medrano *et al.*, 2020). The prevalence of suicide rises with age in both men and women, and it exhibits a consistent trend across all age groups. In most nations, men die from suicide more frequently than women do (Brent and Moritz 1996; Chehil and Kutcher 2012). As the men are less likely to seek help for emotional problems, and express depression differently, used to choose more lethal methods of suicide (Rich *et al.*, 1988; Addis and Mahalik 2003). Particularly in high-income countries, where the average male-to-female ratio is 3.5:1, suicide rates for men are much greater than those for women (WHO, 2014). The disparity in suicide rates between men and women has been linked to psychosocial risk

factors such unemployment, retirement, and being single, although no other major risk factors were identified for women except their mental illness (Qin *et al.*, 2000; Tóth *et al.*, 2014).

Previous research claimed that the different suicide methods used by men and women are what causes the variation in suicide mortality between the sexes. Drug overdose, carbon monoxide poisoning, self-cutting and drowning etc methods are often chosen by women while men tend to use firearms, jumping from height, railway runover and hanging etc. Guns, height jumps, and hanging offer relatively little chance of surviving compared to drug overdose, carbon monoxide poisoning, or self-mutilation, which may help to explain variances in suicide death rates (Denning *et al.*, 2000; Shenassa *et al.*, 2003). However, gender-related neurobiology of suicide is still in dearth. These studies have provided significant new information regarding the altered neurochemical milieu of suicide that differs according to gender.

In line with other impairments of higher mental functions, depression appears to be in the hippocampus and amygdala, according to several neuroimaging, neuropsychiatric, and brain stimulation therapy investigations. The hypothalamus, hippocampus, amygdala, cingulate cortex, and other medial brain