



**3rd REGIONAL CONFERENCE
ON MOLECULAR MEDICINE
2009**

ASSOC. PROF. DR. FARIDAH YUSOF
Deputy Dean (Research)
Research Management Centre
International Islamic University Malaysia

**Genomics, Proteomics
and ... The 'omics' :
DREAMS vs REALITY**

- 2 - 4 May 2009 •
- Renaissance Hotel, Kota Bharu, Kelantan •
- Malaysia •

PROCEEDINGS

Organized by :
Institute for Research in Molecular Medicine (INFORMM), USM
In collaboration with
Universiti Teknologi MARA (UiTM)
Malaysian Society for the Advancement of Pharmacogenetics (MSAP)



First Printing April 2009
Copyright Universiti Sains Malaysia
ISBN 978-983-44297-0-6

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic, mechanical or biological, including cloning, photocopying, recording, or any information storage and retrieval system, without written permission from the Chairman, Regional Conference on Molecular Medicine 2009.



Published By:

INSTITUT PENYELIDIKAN PERUBATAN MOLEKUL
UNIVERSITI SAINS MALAYSIA

in Collaboration with

PENERBIT UNIVERSITI SAINS MALAYSIA

Printed By:

DOCNAN INDUSTRIES SDN. BHD.



Editorial Committee

Prabha Balaram (Chief Editor)
Phua Kia Kien (Assistant Editor)
Amutha Santhanam
Chen Yeng
S. Sasidharan
Gan Siew Hua
Kirnpal Kaur
Khoo Boon Yin
Sanjaya KC
Hazliza Ali



Neuroprotective Properties of Palm Vitamin E against Glutamate Toxicity

Musa I^{1,2}, Khaza'ai H¹, Mutalib MSA² and Yusof F³

¹Department of Biotechnology Engineering, Kulliyah of Engineering, International Islamic University Malaysia, 50728 Kuala Lumpur, Malaysia; ²Department of Biomedical Sciences, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia; ³Department of Nutrition and Dietetic, Faculty of Medicine and Health Sciences, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia.

Introduction: Glutamate is the main excitatory amino acid transmitter in mammalian central nervous system, which can be excitotoxic and has been suggested to play key role in most forms of neurodegenerative disease such as Parkinson's and Alzheimer's. Previous studies demonstrated that vitamin E increased the viability of cells that had undergone glutamate injury. Our previous work also showed that palm vitamin E clearly accelerated the recovery of nerve injury in the animal model.

Aim: In this study, we would like to observe the neuroprotective properties of vitamin E against glutamate toxicity. Glial cells, CRL2020 were used in our study has high concentration in the brain compared to neurons suggesting that these cells may have an important role in the nervous system.

Methodology: The first part of this study was to determine the dose response and time course study of glutamate toxicity in glial cells. Cell viability was determined based on the MTT assay which is a colorimetric assay that measures the reduction of yellow 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide by mitochondrial succinate dehydrogenase. Later, cells were supplemented with different concentration of tocotrienol rich fraction (TRF) before and after glutamate challenge.

Results: Treatment of glial cells with 10 mM glutamate resulted in >30% loss of cell viability within 24 hours. Supplementation of TRF before glutamate challenge protected the cells against the glutamate toxicity (prophylactic). However, cell viability was reduced by 18-25% when TRF was given 10 minutes after glutamate exposure which indicated that it only provide protection if the cells were pre-treated with TRF.

Conclusions: These results suggest that vitamin E has the potential to be used as preventive treatment against glutamate toxicity. For the future study, we intend to study the cell recovery through the expression of neuron specific enolase (NSE) which is one of the known markers for neurodegenerative diseases.

Keywords: *Glutamate, Vitamin E, Tocotrienol Rich Fraction (TRF), Glial cells*