1st WORLD CONGRESS ON HEALTHY AGEING

19 – 22 March, 2012

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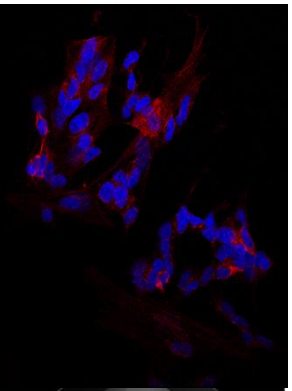

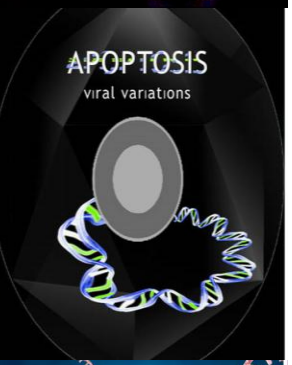

Gamma-tocotrienol (γT3) protects human neuroblastoma SH-SY5Y cells against buthionine sulfoximine-induced cell death

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UNIVERSITI KEBANGSAAN MALAYSIA
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UMBI
INSTITUT PERUBATAN MOLEKUL UKM
UKM MEDICAL MOLECULAR BIOLOGY INSTITUTE

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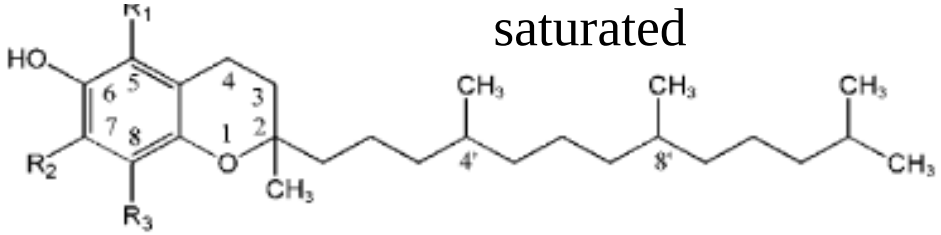
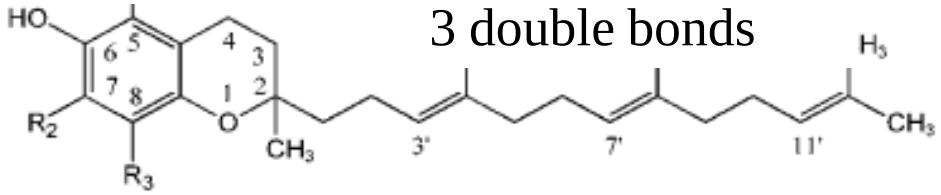
Vitamin E

❖ antioxidant

Tocopherol (T)



Tocotrienol (T3)



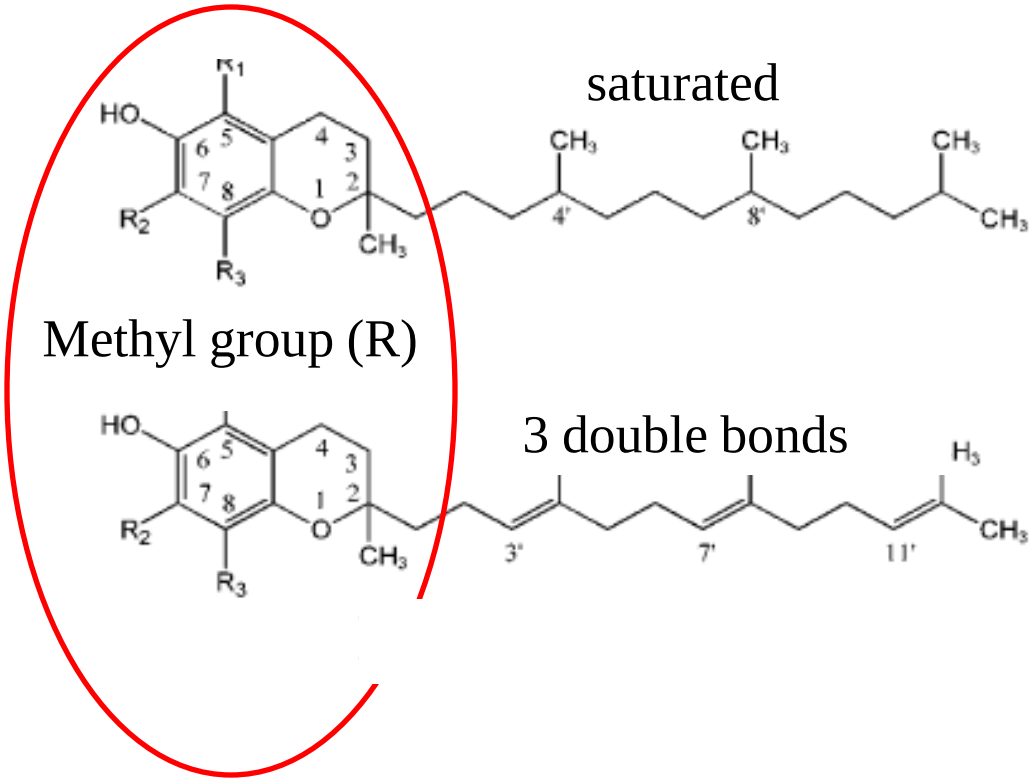
The Encyclopedia of Vitamin E; Osakada et al. 2004

Vitamin E

❖ antioxidant

Tocopherol (T)
α-
β-
γ-
δ-

Tocotrienol (T3)
α-
β-
γ-
δ-



The Encyclopedia of Vitamin E; Osakada et al. 2004

Tocotrienols

- ❖ neuroprotection
- ❖ anticancer
- ❖ cardioprotective effects

palm oil

- ❑ gamma-tocotrienol (γT3)

(Sen et al. 2007)

Tocotrienols

- ❖ neuroprotection
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palm oil

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(Sen et al. 2007)

Cell Mol Neurobiol (2009) 29:485–496
DOI 10.1007/s10571-008-9340-8

ORIGINAL PAPER

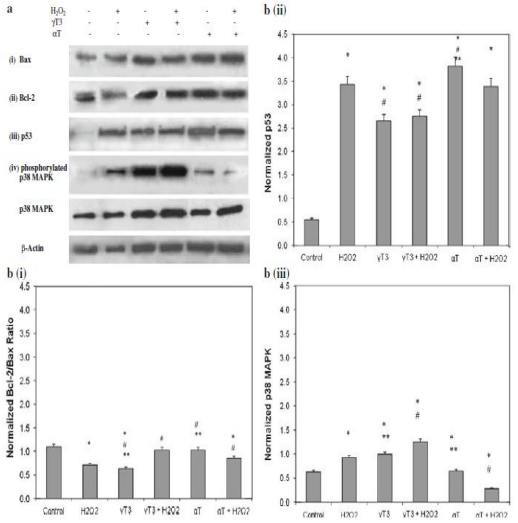
Is Vitamin E Toxic to Neuron Cells?

Sue Mian Then · Musalmah Mazlan ·
Gapor Mat Top · Wan Zurinah Wan Ngah

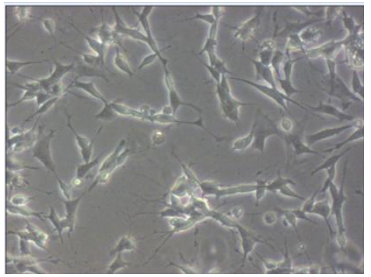
Previous findings

- γT3 protected rat astrocytes and neuron from oxidative stress-induced apoptosis

- Current study: to elucidate the role of γT3-mediated apoptosis pathway in human dopaminergic neurons

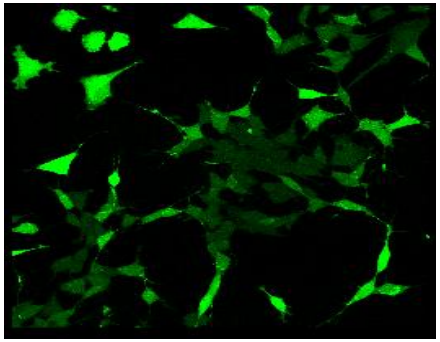


Methodology

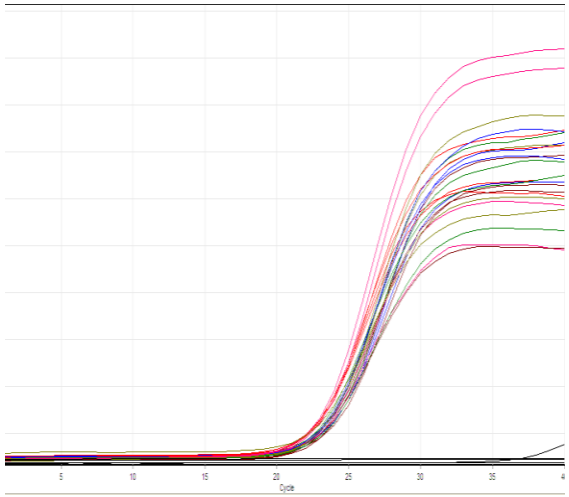


Untreated Control | BSO | BSO + γT3 | BSO + αT | γT3 | αT

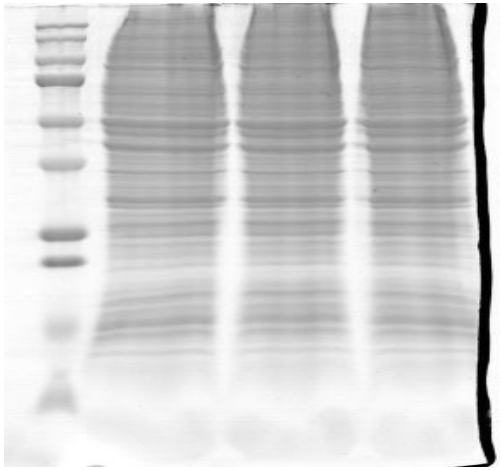
Cell-based assays:



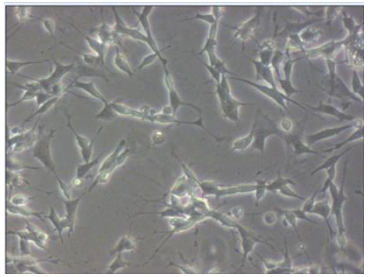
Gene expressions



Protein expressions and modification



Methodology

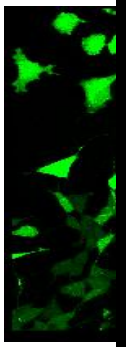


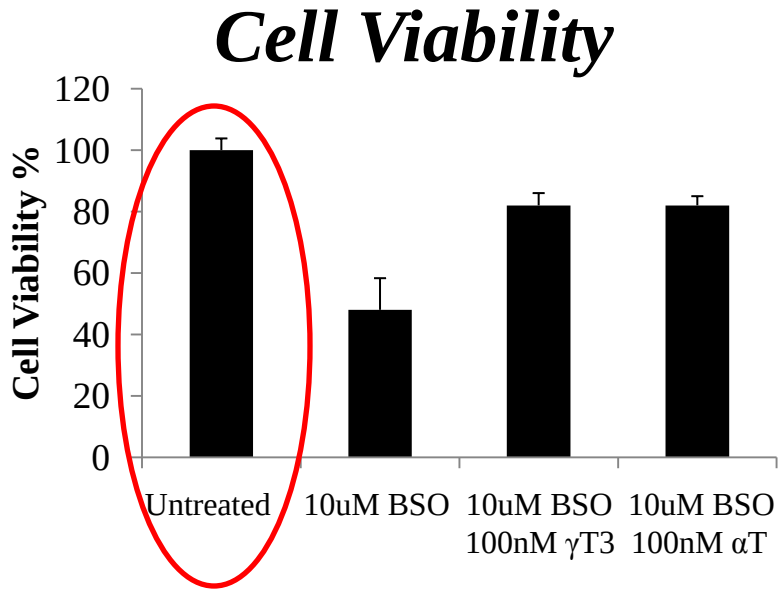
Untreated Control	BSO	BSO + γT3	BSO + αT	γT3	αT

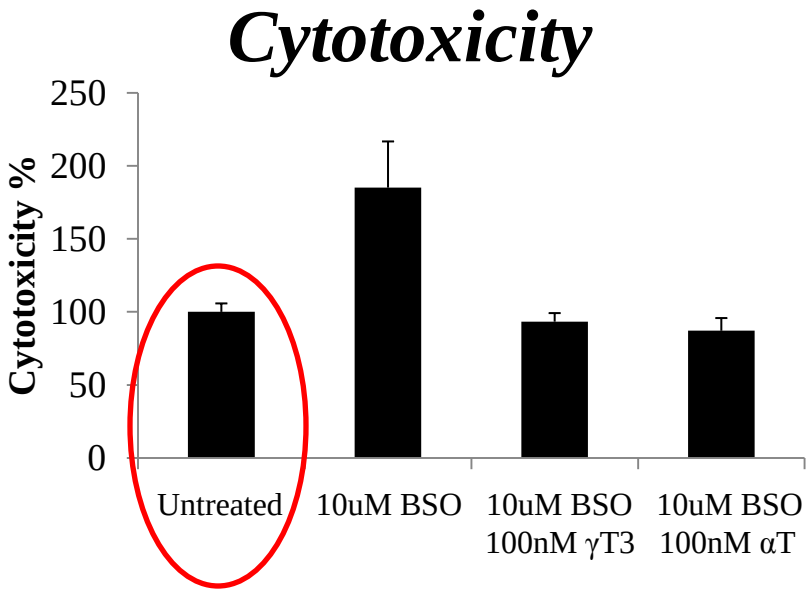
Cel **ions**
ons

BSO inhibits glutathione synthesis

αT as comparative isomer




Cell Viability
Cell Viability %
120
100
80
60
40
20
0
Untreated
10uM BSO
10uM BSO 100nM γT3
10uM BSO 100nM αT


Cytotoxicity
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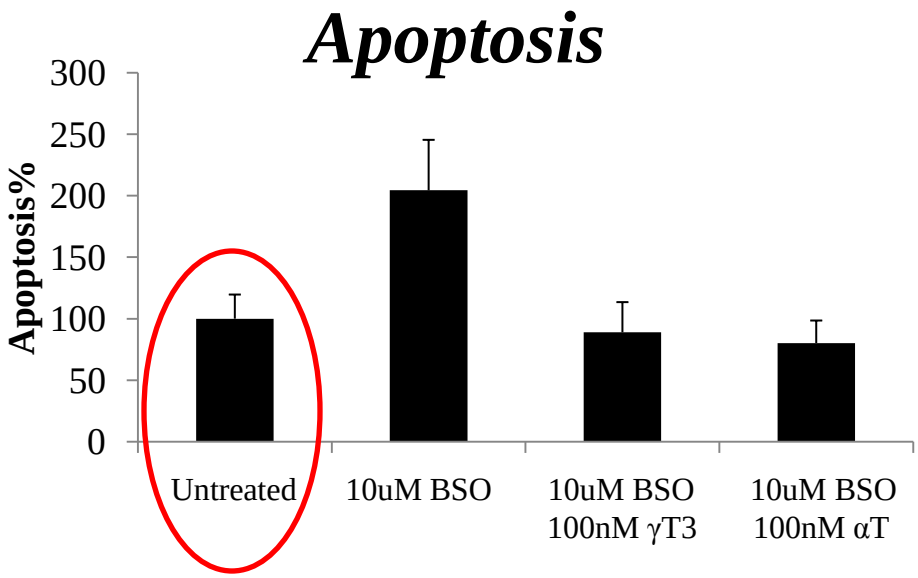
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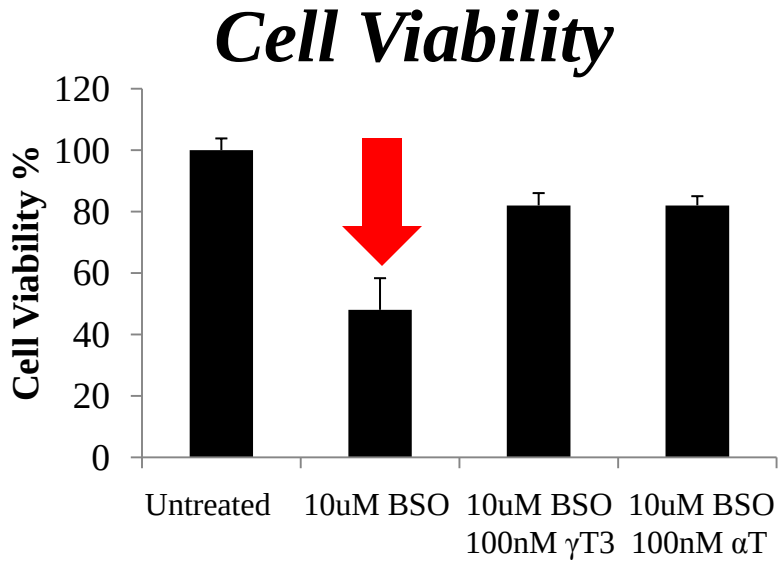
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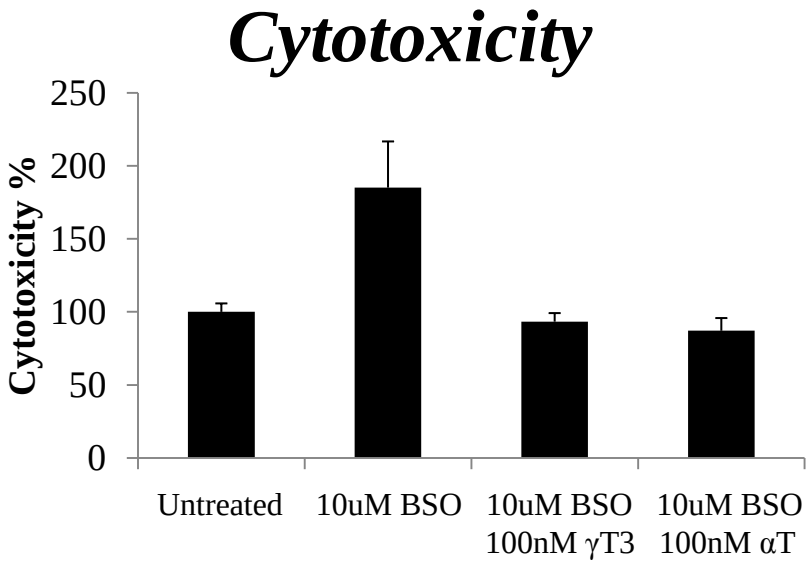
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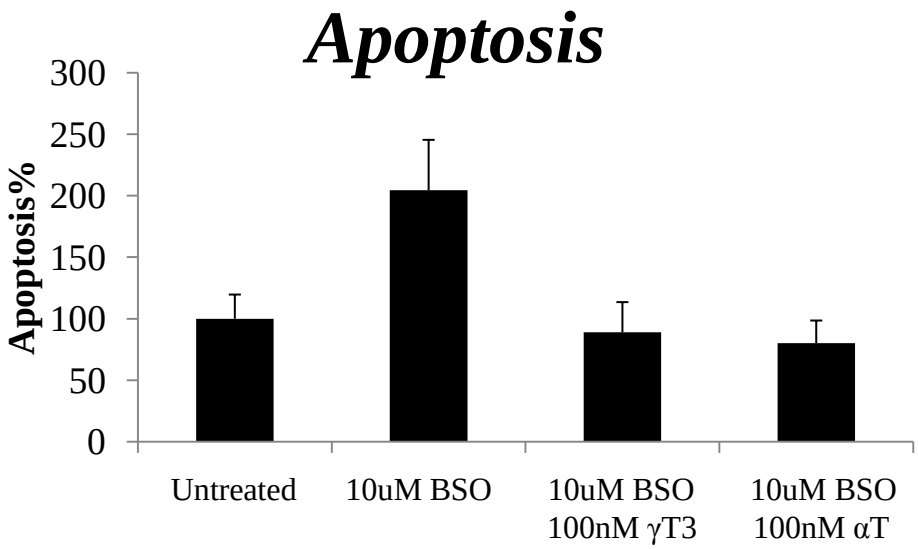
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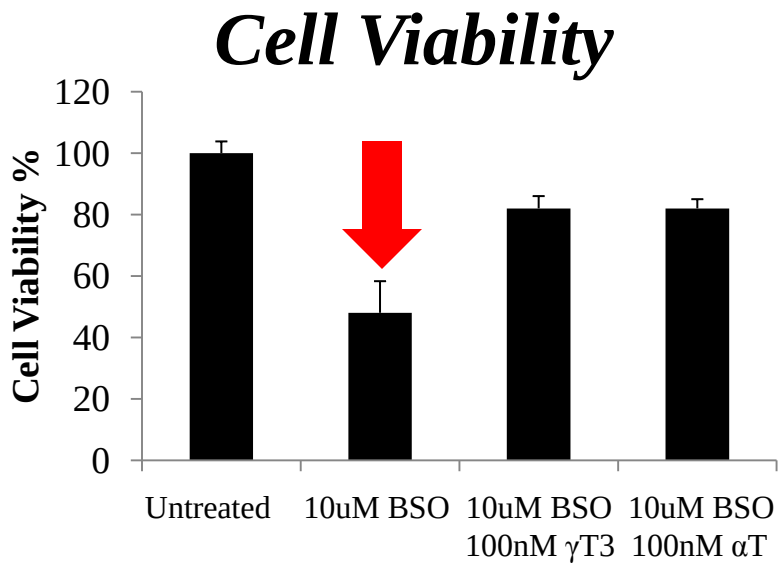
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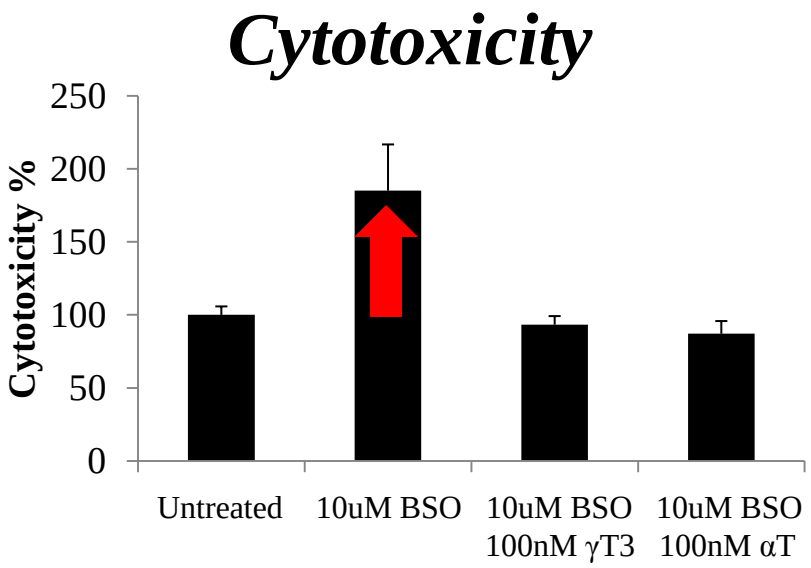
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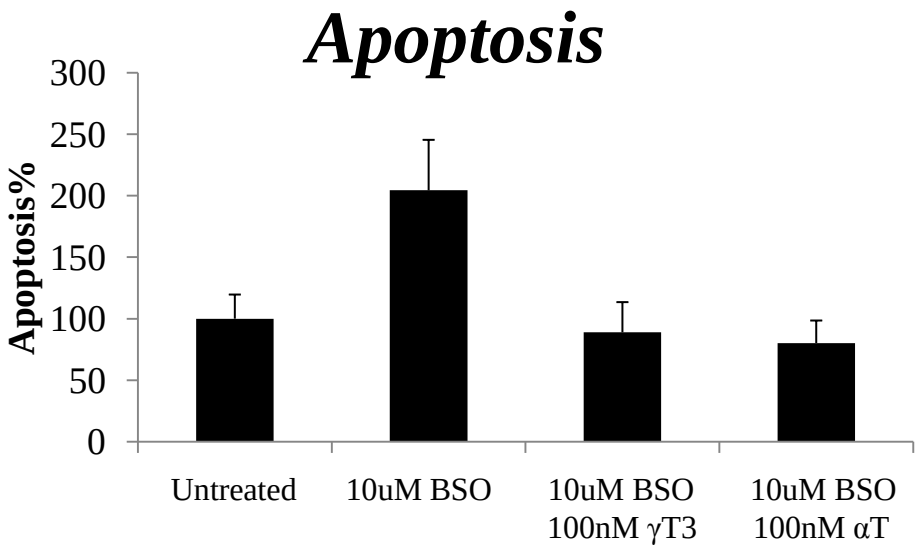
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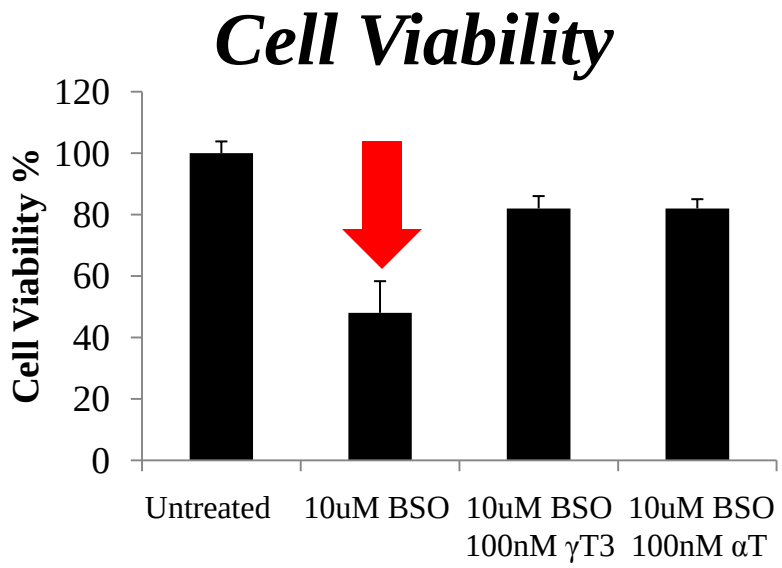
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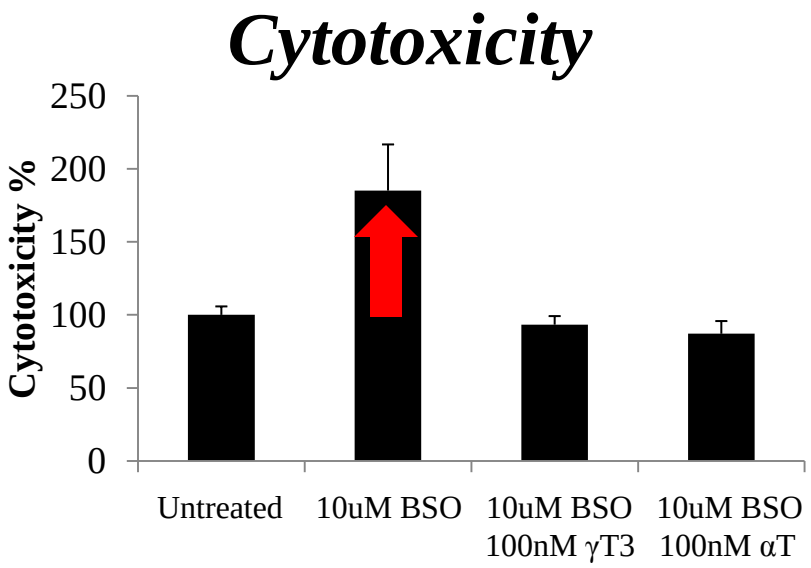
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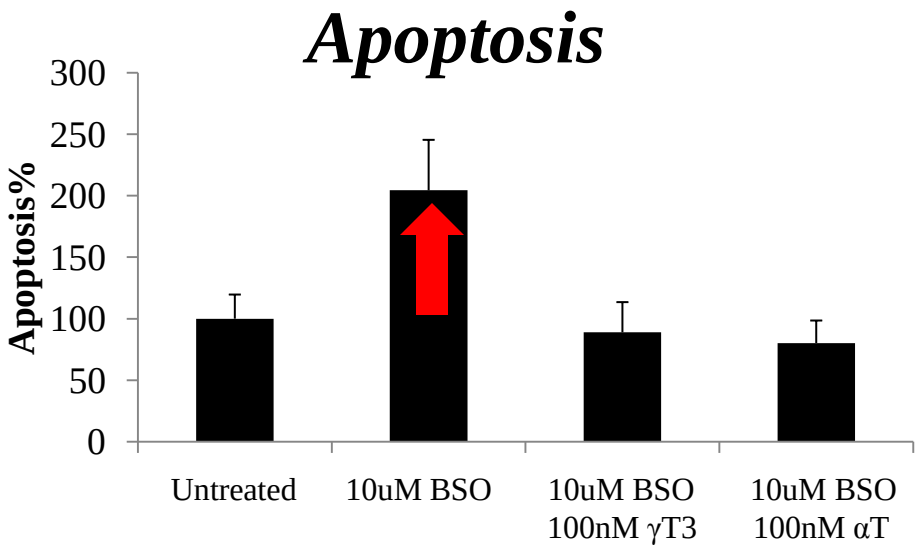
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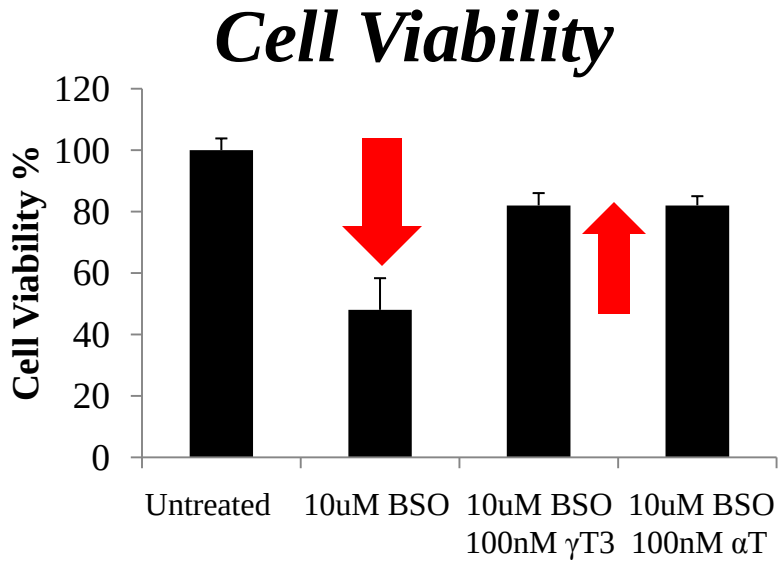
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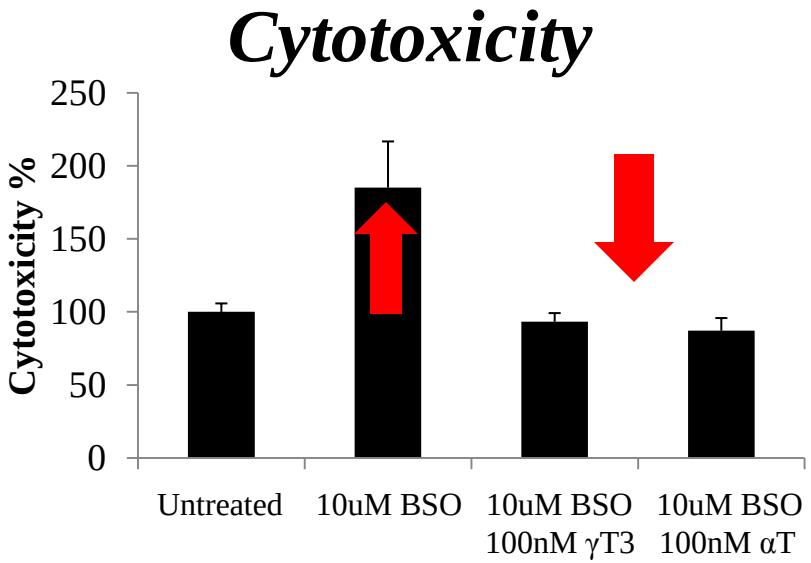
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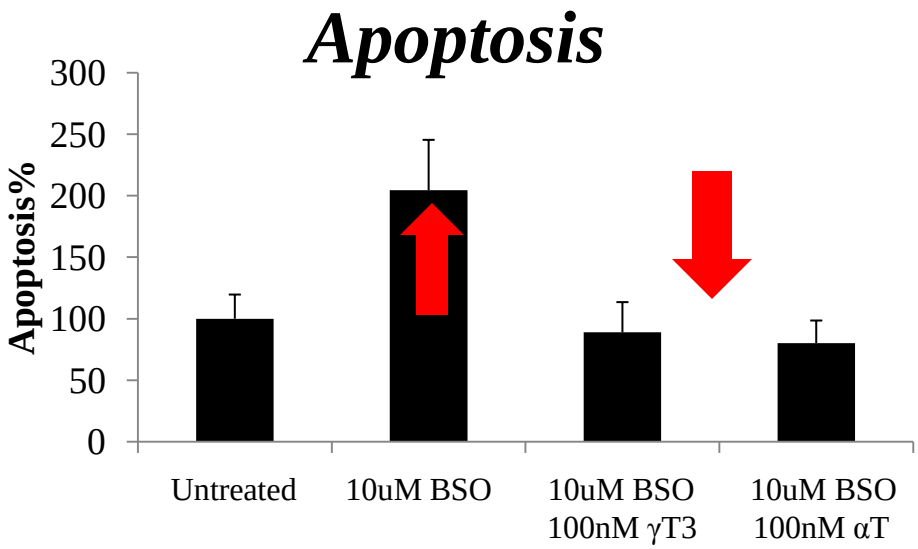
Apoptosis
Apoptosis%
300
250
200
150
100
50
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Untreated
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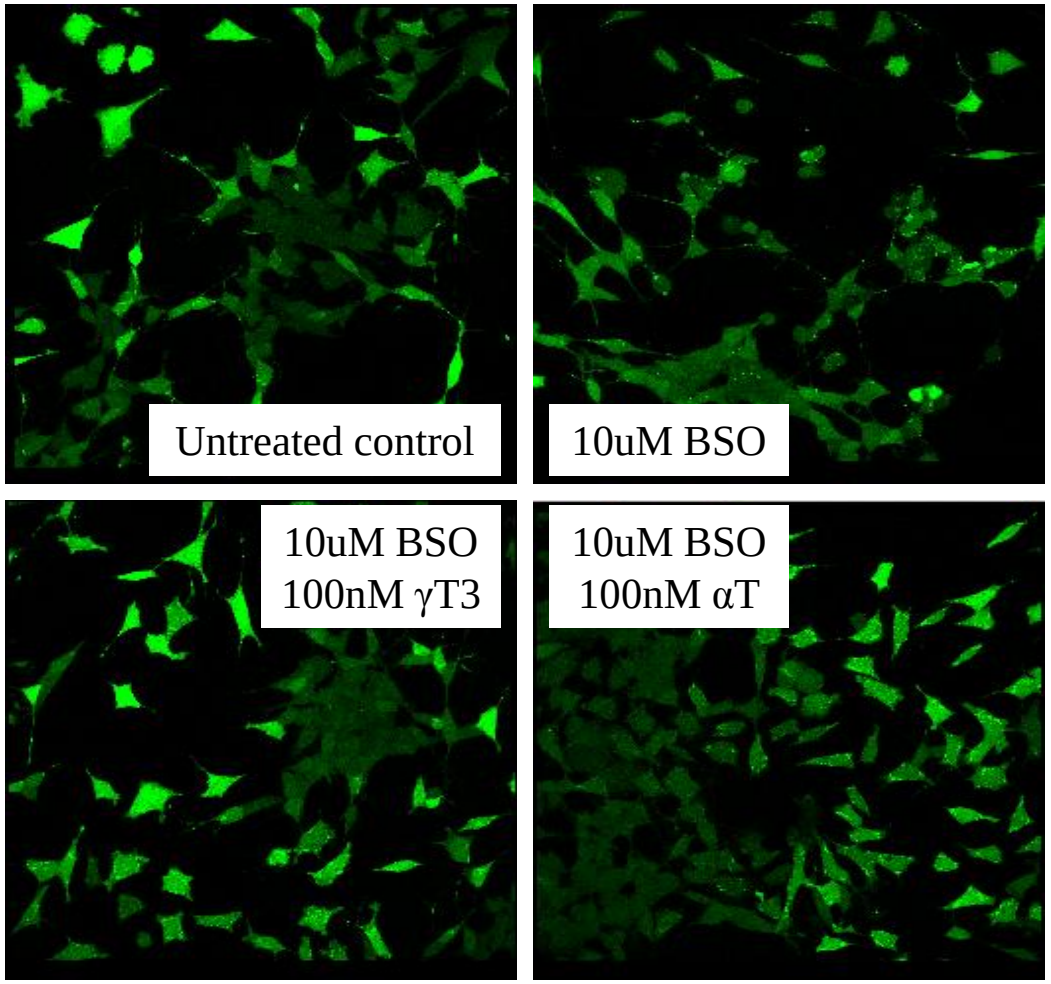
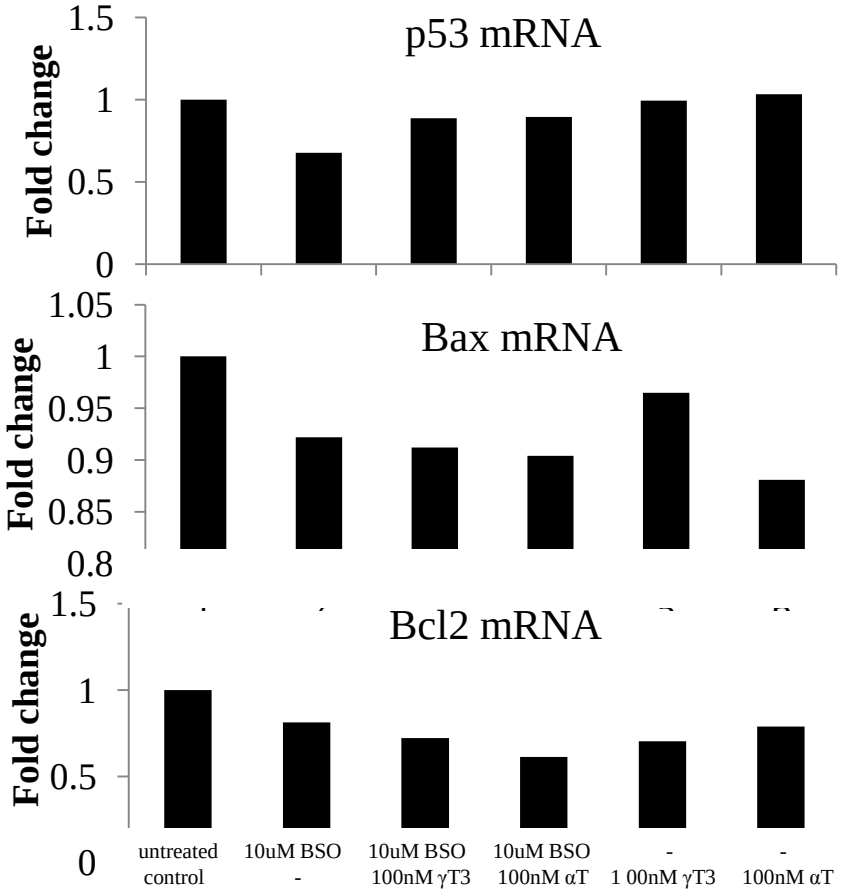
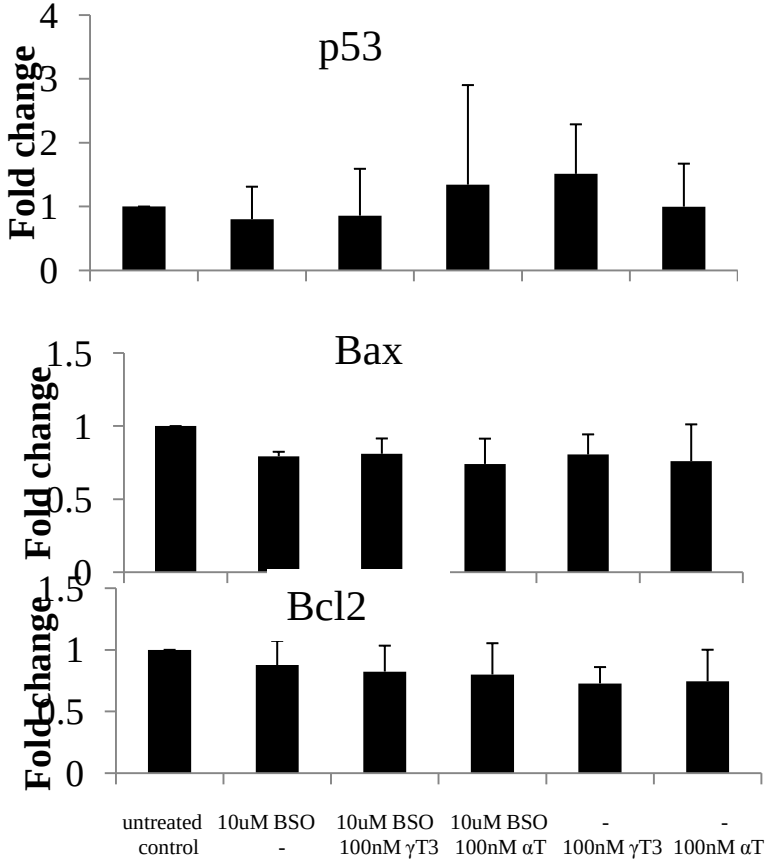
Reactive oxygen species (ROS) detection



Gene expressions



Protein expressions



n= 3 separate experiments

* $p < 0.05$, significantly different from treatment with untreated control

Conclusions

- not related to ROS
- BSO-induced cell death: ↓ p53 mRNA and Bax protein
- So what

Sum-up

- γT3 and αT as potent neuroprotectants
- the molecular action ?
- γT3 only: ↓ Bcl2 mRNA & protein
- Purpose?

Acknowledgement

Dr. Then Sue Mian

Prof. Musalmah Mazlan

Prof. Wan Zurinah Wan Ngah

UMBI's staffs and lab mates

UKM-JJ-03-FRGS0045-2010

Thanks you

References

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