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Journal of Microencapsulation
Volume 31, Issue 6, 2014, Pages 600-608

## Cellular uptake of Nigella sativa oil-PLGA microparticle by PC-12 cell line (Article)

Doolaanea, A.A.[a], Mansor, N.I.[a], Mohd Nor, N.H.[a], Mohamed, F.[abc]

[a]Department of Pharmaceutical Technology, Faculty of Pharmacy, International Islamic University Malaysia (IIUM), Kuantan, Malaysia
[b]International Institute of Halal Research and Training (INHART), Kulliyyah of Engineering, Kuala Lumpur, Malaysia
[c]IKOP Sdn. Bhd., Pilot Plant Pharmaceutical Manufacturing, Faculty of Pharmacy, IIUM, Kuantan, Malaysia

### Abstract

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The aim of this study is to investigate the cell uptake of Nigella sativa oil (NSO)-PLGA microparticle by neuron-like PC-12 cells in comparison to surfactants; hydrophilic (Tween 80 & Triton X100) and hydrophobic (Span 80). Solvent evaporation was used to precisely control the size, zeta potential and morphology of the particle. The results revealed varying efficiencies of the cell uptake by PC-12 cells, which may be partially attributed to the surface hydrophobicity of the microparticles. Interestingly, the uptake efficiency of PC-12 cells was higher with the more hydrophilic microparticle. NSO microparticle showed evidence of being preferably internalised by mitotic cells. Tween 80 microparticle showed the highest cell uptake efficiency with a concentration-dependent pattern suggesting its use as uptake enhancer for non-scavenging cells. In conclusion, PC-12 cells can take up NSO-PLGA microparticle which may have potential in the treatment of neurodegenerative disease. © 2014 Informa UK Ltd.

### Author keywords

Hydrophobicity Microparticles Neurodegenerative Nigella sativa oil PLGA Surfactant Uptake

### Indexed keywords

EMTREE drug terms: herbaceous agent neuroprotective agent Nigella sativa oil polyglactin polysorbate 20 polysorbate 80 sorbitan oleate surfactant triton x 100 unclassified drug caraway oil hexose lactic acid octoxinol polyglycolic acid polylactic acid-polyglycolic acid copolymer polysorbate surfactant vegetable oil

EMTREE medical terms: article black cumin controlled study drug delivery system drug uptake evaporation hydrophilicity hydrophobicity microencapsulation mitosis nonhuman particle size PC12 cell line zeta potential animal chemistry Neurodegenerative Diseases rat

MeSH: Animals Hexoses Lactic Acid Neurodegenerative Diseases Octoxynol PC12 Cells Plant Oils Polyglycolic Acid Polysorbates Rats Surface-Active Agents

### Chemicals and CAS Registry Numbers:

polyglactin, 26780-50-7, 34346-01-5; polysorbate 20, 12244-25-6, 9005-64-5; polysorbate 80, 8050-83-7, 9005-65-6; sorbitan oleate, 1338-43-8; hexose, 93780-23-5; lactic acid, 113-21-3, 50-21-5; octoxinol, 9002-93-1; polyglycolic acid, 26009-03-0, 26124-68-5, 26202-08-4; polysorbate, 9005-63-4;

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Co-encapsulation of Nigella sativa oil and plasmid DNA for

caraway oil; Hexoses; Lactic Acid; Octoxynol; Plant Oils; Polyglycolic Acid; polylactic acid-polyglycolic acid copolymer; Polysorbates; sorbitan monooleate; Surface-Active Agents


## Funding details

| Funding number | Funding sponsor | Acronym |
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Funding text

This work was funded by Ministry of Science, Technology & Innovation of Malaysia (MOSTI) (Grant ID: 02-01-08-SF0101).

**ISSN:** 02652048
**CODEN:** JOMIE
**Source Type:** Journal
**Original language:** English
**DOI:** 10.3109/02652048.2014.898709
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Mohamed, F.; Department of Pharmaceutical Technology, Faculty of Pharmacy, International Islamic University Malaysia (IIUM), Malaysia; email:farahidah@iium.edu.my

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