CYTOTOXIC EFFECT OF LYSATES OF *ACANTHAMOEBA* SP. AND *ACANTHAMOEBA CASTELLANII* ON MCF-7 CELLS LINE.

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By
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PENGAKUAN DAN PENGESAHAN LAPORAN
PITA I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **CYTOTOXIC EFFECT OF LYSATES OF *ACANTHAMOEBA SP.* AND *ACANTHAMOEBA CASTELLANII* ON MCF-7 CELLS LINE** *oleh* **NURAZILA BINTI ZULKIFLY**, no. matrik: **UK 12344** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi Ijazah **SARJANA MUDA SAINS (SAINS BIOLOGI)**., Fakulti Sains dan Teknologi,Universiti Malaysia Terengganu.

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DECLARATION

I hereby declare that this research report entitled Cytotoxic effect of lysates of *Acanthamoeba sp.* and *Acanthamoeba castellanii* on MCF-7 cells line is the result of my own research except as cited in the references.

Signature : 
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Date : 13th May 2008

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ABSTRACT

MCF-7 cells are human breast cancer cells, the second most common types of cancer that cause death among women. The significance of this study is to investigate the potential of extracts of amoebae as anti-cancer agent. Previous study conducted by Iliana (2005) showed that the number of CEM-SS cells was decreased after treated with *Acanthamoeba* lysates. In other study, *Acanthamoeba* was found to contain proteolytic enzymes which caused the degradation of extracellular components of corneal cells. In the present study, lysates of two *Acanthamoeba* species namely *Acanthamoeba sp.* (SW) and *Acanthamoeba castellanii* (IMR) were treated in vitro on MCF-7 cells line. Various concentrations of *Acanthamoeba* lysates were incubated with the cells line in CO_2 incubator at 37°C for 72 hours. After incubation, the viability of MCF-7 cells was measured by Trypan Blue Exclusion Method. Data obtained were plotted to determine the IC_{50} values of each *Acanthamoeba* lysate against MCF-7 cells. IC_{50} is inhibitory concentration of amoeba lysates that can inhibit 50% of the growth of MCF-7 cells. In this study, the IC_{50} values for lysates of *Acanthamoeba sp.* is 104.70 μg/ml and *Acanthamoeba castellanii* is 74.13 μg/ml. The cytotoxic effect of lysates on morphology of MCF-7 cells was evident as the cells become rounded and detached from the flask's surface. Apoptotic body-like structure was also observed. Lysate of *Acanthamoeba castellanii* is more potent and suitable as anti-cancer agent for breast cancer compared to lysate of *Acanthamoeba sp.*

ABSTRAK

Sel MCF-7 adalah sel kanser payudara, merupakan sejenis kanser kedua yang menyebabkan kematian di kalangan wanita. Kepentingan kajian ini adalah untuk menyelidik keupayaan ekstrak dari amoeba sebagai agen anti-kanser. Kajian lepas yang dijalankan oleh Iliana (2005) menunjukkan bilangan sel CEM-SS berkurangan selepas dirawat dengan lisat *Acanthamoeba*. Dalam kajian lain, *Acanthamoeba* didapati mempunyai enzim proteolytik yang menyebabkan kerosakan pada komponen-komponen sel kornea. Dalam kajian ini, lisat dari dua spesis *Acanthamoeba* iaitu *Acanthamoeba sp.* (SW) dan *Acanthamoeba castellanii* (IMR) telah dirawat ke atas sel MCF-7 secara in vitro. Pelbagai kepekatan lisat *Acanthamoeba* telah dirawat ke atas sel kanser di dalam inkubator CO_2 pada suhu 37°C selama 72 jam. Selepas di inkubasi, bilangan sel MCF-7 yang hidup dikira dengan menggunakan Kaedah Trypan Blue Exclusion. Data kemudiannya di plot untuk menentukan nilai IC_{50} bagi setiap lisat *Acanthamoeba* ke atas sel MCF-7. IC_{50} adalah kepekatan lisat *Acanthamoeba* yang diperlukan untuk merencat 50% pertumbuhan sel MCF-7. Dalam kajian ini, nilai IC_{50} bagi lisat *Acanthamoeba sp.* adalah 104.70μg/ml dan nilai IC_{50} bagi lisat *Acanthamoeba castellanii* adalah 74.13μg/ml. Kesan sitotoksik lisat ke atas bentuk sel MCF-7 terbukti apabila sel-sel menjadi bulat dan tertanggal dari permukaan bekas. Struktur seakan jasad apoptotik juga dilihat. Lisat *Acanthamoeba castellanii* lebih berpotensi dan sesuai sebagai agen anti-kanser untuk merawat kanser payudara berbanding dengan lisat *Acanthamoeba sp.*