

CYTOTOXIC EFFECTS OF LYSATES OF
ACANTHAMOEBIA POLYPRELATA (CCAP 1521/3A)
AND *ACANTHAMOEBIA* SP. (FHL ISOLATE)
ON VCF-7 CELLS

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Cytotoxic effects of lysates of Acanthamoeba polyphaga (CCAI 1501/3A) and Acanthamoeba sp. (HKL isolate) on MCF-7 cells / Zawahir Awang Kecek.

**PERPUSTAKAAN SULTANAH NUR ZAHIRAH
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PERPUSTAKAAN SULTANAH NUR ZAHIRAH UMT

CYTOTOXIC EFFECTS OF LYSATES OF *ACANTHAMOEBA POLYPHAGA*
(CCAP 1501/3A) AND *ACANTHAMOEBA SP.* (HKL ISOLATE)
ON MCF-7 CELLS

By
Zawahir Binti Awang Kechek

A research report submitted in partial fulfillment of
the requirement for the award of the degree of
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**PENGAKUAN DAN PENGESAHAN LAPORAN PITA I DAN II
RESEARCH REPORT VERIFICATION**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: CYTOTOXIC EFFECTS OF LYSATES OF *ACANTHAMOEBA POLYPHAGA* (CCAP 1501/3A) AND *ACANTHAMOEBA SP.* (HKL ISOLATE) ON MCF-7 CELLS oleh ZAWAHIR BINTI AWANG KECHEK, no. matrik: **UK12367** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperoleh ijazah **SARJANA MUDA SAINS (SAINS BIOLOGI)**, Fakulti Sains dan Teknologi, Universiti Malaysia Terengganu.

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11 MAY 2008

DECLARATION

I hereby declare that this research report entitled Cytotoxic Effects of Lysates of *Acanthamoeba polyphaga* (CCAP 1501/3A) and *Acanthamoeba sp.* (HKL isolate) on MCF-7 Cells is the result of my own research except as cited in the references.

Signature : 
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Date : 11/5/2008

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ABSTRAK

Kajian kesan sitotoksik dua jenis lisat *Acanthamoeba* ke atas sel kanser MCF-7 telah dijalankan. Amoeba yang digunakan dalam kajian ini ialah *Acanthamoeba polyphaga* (CCAP/3A) dan *Acanthamoeba sp.* (Isolate HKL). Kesan sitotoksik lisat *Acanthamoeba* ke atas sel kanser MCF-7 telah diuji menggunakan kaedah pewarnaan trypan blue. Rawatan lisat ke atas sel-sel tersebut telah dijalankan selama 72 jam sebelum ianya diwarnakan dengan menggunakan trypan blue. Keputusan yang didapati daripada kajian ini menunjukkan nilai kepekatan yang membunuh 50 peratus daripada populasi sel adalah berbeza di antara dua jenis lisat amoeba yang digunakan. Nilai IC_{50} lisat daripada *Acanthamoeba sp.* (Isolate HKL) ialah 42 $\mu\text{g/mL}$ manakala bagi lisat daripada *Acanthamoeba polyphaga* (CCAP/3A) ialah 89 $\mu\text{g/mL}$. Perbezaan nilai IC_{50} antara dua lisat ini mungkin berdasarkan kepada status kepatogenan sesuatu spesies tersebut. *Acanthamoeba sp.* (isolate HKL) merupakan spesies yang patogenik dan berasal daripada pesakit yang menghidap keratitis. Kajian-kajian terdahulu menunjukkan bahawa protein seperti ecto-ATPase dan enzim hidrolitik (protease dan phospholipase) menyumbang kepada kepatogenan amoeba. Daripada kajian ini, dicadangkan bahawa lisat yang berasal daripada *Acanthamoeba sp.* (isolate HKL) adalah lebih berpotensi dan lebih sesuai untuk dijadikan sebagai agen anti-kanser. Walau bagaimanapun, kajian lanjut perlu dijalankan bagi mengesahkan sejauh mana ianya berpotensi untuk dijadikan sebagai agen anti-kanser tanpa menghasilkan kesan sampingan kepada sel-sel lain.

ABSTRACT

Cytotoxic effects of two *Acanthamoeba* lysates were studied on MCF-7 cell line. The amoebae used are *Acanthamoeba polyphaga* (CCAP/3A) and *Acanthamoeba sp.* (HKL isolate). The cytotoxic effects of *Acanthamoeba* lysates were tested against MCF-7 cell line using Trypan Blue Exclusion method. The cells were exposed to the lysates for 72 hours before they were trypsinized and stained with the trypan blue dye. Results obtained in this study showed that the inhibitory concentration value that kills 50% of the cell population (IC₅₀) was different between the two amoeba lysates. The IC₅₀ value of *Acanthamoeba sp.* (HKL isolate) lysate is 42 µg/mL while for the *Acanthamoeba polyphaga* (CCAP/3A) is 89 µg/mL. The difference in these IC₅₀ values is probably due to their status of pathogenicity. The *Acanthamoeba sp.* (HKL isolate) was a pathogenic species and was isolated from a keratitis patient. Previous reports indicated that protein such as ecto-ATPase and hydrolytic enzymes (proteases and phospholipase) contribute to amoeba pathogenicity. From this study, it is suggested that the *Acanthamoeba sp.* (HKL isolate) lysate is more potent and thus it is suitable to become an anti-cancer agent. However, further study must be carried out to confirm its potential to become an anti-cancer agent without producing the side effects to non-target cells.