UNIVERSITI SAINS MALAYSIA

Pejabat Pengurusan Dan Kreativiti Penyelidikan
Research Creativity and Management Office

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No. Fail : F0389
Tarikh : 2 Disember 2011

Dr. Salizawati Muhamad Salhimi
Pusat Pengajian Sains Farmasi
Universiti Sains Malaysia

Puan,

LAPORAN AKHIR SKIM GERAN PENYELIDIKAN FUNDAMENTAL (FRGS)
Tajuk Projek : The Role of Focal Adhesion Kinase (FAK) in Cancer
No. Akaun : 203/PFARMASI/671156

Dengan hormatnya perkara di atas dirujuk.

2. Terlebih dahulu saya ucapkan ribuan terima kasih di atas satu salinan laporan akhir untuk projek penyelidikan seperti tajuk di atas.

3. Adalah dimaklumkan walaupun projek ini telah selesai, kerjasama Jabatan Bendahari dipohon untuk menguruskan penutupan akaun projek pada selewat-lewatnya **31 Disember 2011**. Tempoh ini bertujuan untuk menyelesaikan semua urusan tuntutan dan bayaran yang telah dibelanjakan di dalam tempoh projek. Walau bagaimanapun, puan dinasihatkan supaya tidak mengeluarkan borang-borang pesanan baru di dalam tempoh ini.

4. Selanjutnya sila ambil perhatian terhadap perkara-perkara berikut sekiranya berkaitan:

(i) Semua penerbitan harus merakamkan penghargaan kepada **Skim Geran Penyelidikan Fundamental (FRGS)** dan puan dipohon mengemukakan satu salinan ke Pejabat ini.

(ii) Bahagian Penyelidikan & Inovasi boleh/akan mengagihkan semula peralatan yang telah dibeli menggunakan peruntukan geran ini seandainya terdapat penyelidik lain yang memerlukan peralatan tersebut.

5. Akhir sekali, tahniah di atas usaha dan kejayaan pihak puan dapat menyelesaikan projek ini dengan jayanya.

Sekian, terima kasih.

"BERKHIDMAT UNTUK NEGARA"
'Memastikan Kelestarian Hari Esok'

Yang menjalankan tugas,

HAH, HAR, SM

(AMRA OTHMAN)
Penolong Pendaftar
Unit Pengurusan Geran & Kontrak

LAPORAN AKHIR SKIM GERAN PENYELIDIKAN FUNDAMENTAL (FRGS)
Tajuk Projek : The Role of Focal Adhesion Kinase (FAK) in Cancer
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s.k. Dekan Penyelidikan
Pelantar Sains Fundamental
Pejabat Pelantar Penyelidikan
Universiti Sains Malaysia

Dekan
Pusat Pengajian Sains Farmasi
Universiti Sains Malaysia

Timbalan Dekan
(Ijazah Tinggi & Penyelidikan)
Pusat Pengajian Sains Farmasi
Universiti Sains Malaysia

Ketua Pustakawan
Perpustakaan Hamzah Sendut
Universiti Sains Malaysia

Disampaikan satu salinan laporan akhir projek untuk simpanan Perpustakaan

Penolong Bendahari Kanan
Unit Kumpulan Wang Penyelidikan
Jabatan Bendahari
Universiti Sains Malaysia

Pegawai Sains
Pelantar Sains Fundamental
Pejabat Pelantar Penyelidikan
Universiti Sains Malaysia

Mohon kerjasama pihak puan untuk menguruskan penutupan akaun projek selewat-lewatnya pada **31 Disember 2011** dan mohon kemukakan satu salinan penyata kewangan terakhir ke Pejabat ini untuk tujuan rekod

F0389

BORANG FRGS – P3(R)

Kod Projek :	FRGS/FASA2(1/2007/(Medical Science)/PFARMASI/671156

FINAL REPORT
FUNDAMENTAL RESEARCH GRANT SCHEME (FRGS)

Laporan Akhir Skim Geran Penyelidikan Asas (FRGS) IPT
Pindaan 1/2009

A

RESEARCH TITLE : **THE ROLE OF FOCAL ADHESION KINASE IN CANCER**
Tajuk Penyelidikan

PROJECT LEADER : **DR. SALIZAWATI MUHAMAD SALHIMI**
Ketua Projek

PROJECT MEMBERS (including GRA) : 1. **ASSOCIATE PROFESSOR DR. TENGKU SIFZIZUL B. TENGKU MUHAMMAD**
2. **PROFESSOR AISHAH ABD. LATIFF**
3. **MR. SALEH M. OMARI**
4. **MS. NITHYA NIRANJINI MUTTIAH**

Ahli Projek

B

ACHIEVEMENT PERCENTAGE

Project progress according to milestones achieved up to this period	0 - 50%	51 - 75%	76 - 100%
Percentage			/

RESEARCH FINDINGS

	Indexed Journal	*Non-Indexed Journal*
Number of articles/ manuscripts/ books	Three manuscripts prepared to be submitted to Tumor Biology, Journal of Experimental and Clinical Cancer Research and International Journal of Cancer Science.	none
Paper presentations	**International**	***National***
	none	1st Pharmaceutical Sciences Conference and Exhibition, 27-28 September 2010 (abstract accepted for oral presentation)
Others (Please specify)		

HUMAN CAPITAL DEVELOPMENT

Human Capital	Number	
	On-going	Graduated
PhD Student		
Masters Student	1*	
Undergraduate Students		
Temporary Research Officer		

Others (Please specify):

* Submitted thesis in June 2010, awaiting *viva voce*.

Converted to MSc student from June 2009 to date, working on different project.

Temporary Research Assistant	1#
Total	2

C

Budget Approved *(Peruntukan diluluskan)* : **RM 150, 000. 00**
Amount Spent *(Jumlah Perbelanjaan)* : **RM 138, 582. 86**

Balance *(Baki)* : **RM 11, 417. 14**
Percentage of Amount Spent : 92.39 %
(Peratusan Belanja)

D

International

Activity	Date (Month, Year)	Organizer
EMBO Practical Course: Animal Models for Physiology and Disease	19th – 30th July 2010	European Molecular Biology Organisation (EMBO)
Seminar on the Use of Animal in Science: Ethical & Practical Considerations	21 July 2009	USM
4th Asian Association of Schools of Pharmacy-9th Malaysian Pharmaceutical Society Pharmacy Scientific Conference	10-13 June 2009	Malaysian Pharmaceutical Society-USM
FAPA-AASP Workshop on Pharmacy Practice and Education	12 June 2009	Malaysian Pharmaceutical Society-USM
Biologics Workshop	14-16 January 2009	USM-University of Queensland-UNSW

National

Activity	Date (Month, Year)	Organizer
Activity 1st National USM Seminar in Biobank 2010.	Date (Month, Year) 15-16 Jun 2010	Organizer Advanced Medical and Dental Institute, USM
UK-Malaysia Symposium on Drug Discovery and Development for Cancer	24th -25th February 2010	MOSTI – British High Commission Kuala Lumpur
Workshop on Confocal Laser Scanning Microscope	17th June 2010	Zeiss
Nikon A1R Confocal Microscopy Workshop	6th -8th October 2009	HUKM-Nikon
(e.g : Course/ Seminar/ Symposium/ Conference/ Workshop/ Site Visit)		

E

(i) We do not have automated cell counter that can be used for functional assays.
When we proposed the project we planned to use the the automated cell counter (Coulter) in our school. However the working volume needed for cell counting was 20mL which was too big for our Transwell migration and invasion assays. We found out that we need special insert which we have to buy from Coulter. We contacted the company that supposes to represent Coulter in Malaysia but we did not get any response. We also contacted the parent company in USA but were told to deal directly with the local company in Malaysia (which we did, repeatedly). This thing went on for over 1 ½ years and was never resolved. It is also unfortunate for us that the tender to buy a new automated cell counter (through IDB) which was approved in 2007 only came out in August 2010. We had also tried other alternatives to count the cells including manual counting with haemocytometer, staining with non-fluorescent and fluorescent dye and using spectrophotometer for quantification. However all of the methods we tried were either unreliable or too expensive for us to continue further. As a result of unavailability of automated cell counter, milestones 2 and 3 could not be achieved. We decided not to continue with apoptosis following RNAi transfection (milestone 4) because the data from milestone 4 is not complete without milestone 2 and 3. We also decided to expand our study on cell lines to include more variety of breast and colon cancer cell lines to partly compensate the unachievable milestone 2 and 3.

(ii) The antibodies work on frozen tissues but did not work on fixed tissues. Because of that, we had to buy tissue samples since we do not have access to frozen tissues. It is also unfortunate that frozen tissues that we collected from other colleagues were not of good quality.

F

We are in the process of collecting more frozen tissue samples for immunohistochemistry analysis. As it is the sample number is not sufficient for some of the work to be published. It is expected that the immunohistochemistry work will take a further six month to complete.

G

FAK is a non-receptor tyrosine kinase overexpressed in various types of tumours. In this study, total FAK and phosphorylated FAK at various residues in breast, colon, liver cancer and leukemic cell lines in comparison to normal cell lines were studied using Western blotting and immunofluorescent analyses. We propose that higher levels of phosphorylated FAK at Tyr 397 and Tyr 861 may contribute to breast cancer invasiveness. We also found that MDA-MB-231, breast cancer cells negatively expressing estrogen (ES) receptor, exhibited higher FAK phosphorylation at Tyr 397 and Tyr 861. Higher expression of phospho-FAK (Ser 910) was detected in the less invasive breast cancer cell lines, T-47D and MCF7, compared to the highly invasive MDA-MB-231. In regard to colon cancer, we found that moderately differentiated and less invasive colon cancer cell line, HT-29, expressed lower FAK level compared to the undifferentiated and more invasive colon cancer cell line, HCT 116. Contrary to total FAK, phospho-FAK (Tyr 397) was more expressed in HT-29 than in HCT 116. Phosphorylation at Ser 910 appeared to contribute to the less aggressive phenotypes of breast and colon cancers.

Date : 23/8/2010
Tarikh

Project Leader's Signature:
Tandatangan Ketua Projek

Dr. Salizawati Muhamad Salhimi
Senior Lecturer

H

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Name:
Nama:

Signature:
Tandatangan:

Date:
Tarikh: