SENARAI SEMAKAN UNTUK BUKU LAPORAN AKHIR GERAN USM JANGKA PENDEK

NAMA PENYELIDIK UTAMA	: DR. ARAVAZHI ANANDA
NAMA CO-RESEARCHER	: PROF. AHMAD SUKARI HALIM MR. LAU HUT YEE.
TAJUK GERAN	: GROWTH CHARACTERISTICS OF HUMAN KERATINOCYTES IN VITRO AND ITS COMPARISON USING HUMAN AMNION MEMBRANE AND FIBRIN GLUE AS A SCAFFOLD
NO.AKAUN	:

SENARAI SEMAKAN SEMASA PENYERAHAN BUKU LAPORAN AKHIR
(Sila Tandakan (4) Pada Kotak Yang Berkenaan)

NO.	PERKARA	ADA	TIADA
1.	Borang Laporan Akhir Projek Penyelidikan USM Jangka Pendek	✓	
2.	Borang Laporan Hasil Penyelidikan, PPSP	✓	
3.	i) Salinan Menuskrip	✓	
	ii) Salinan surat/email bukti penghantaran kepada mana-mana journal	✓	
4.	Penyata Perbelanjaan (Financial Statement) (Sila dapatkan daripada Jabatan Bendahari)	✓	
5.	Laporan Komprehensif (termasuk kertas persidangan atau seminar dan penerbitan saintifik hasil daripada projek ini)		
6.	Surat pemakluman penghantaran Laporan Akhir ke Bhg. Penyelidikan	✓	

Nota:

* Sila buat 3 salinan buku laporan Akhir
* No. 1-5 - Perlu dimasukkan dalam Buku Laporan Akhir
* No.6 - Hantar terus Kepada Pn. Che Merah Ismail (RCMO) hanya salinan kepada Bhg. R&D, PPSP

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UNIVERSITI SAINS MALAYSIA

LAPORAN AKHIR PROJEK PENYELIDIKAN JANGKA *PENDEK*

FINAL REPORT OF SHORT TERM RESEARCH PROJECT

Sila kemukakan laporan akhir ini melalui Jawatankuasa Penyelidikan di Pusat Pengajian dan Dekan/Pengarah/Ketua Jabatan kepada Pejabat Pelantar Penyelidikan

1. **Nama Ketua Penyelidik:**
Name of Research Leader: DR. ARAVAZHI ANANDA DORAI

☐ Profesor Madya/*Assoc. Prof.* ☑ Dr/*Dr.* ☐ Encik/Puan/Cik/*Mr/Mrs/Ms*

2. **Pusat Tanggungjawab (PTJ):**
School/Department FPSP / UNIT SAINS REKONSTRUKTIF

3. **Nama Penyelidik Bersama:**
Name of Co-Researcher: PROF. DR. AHMAD SUKARI HALIM
MR. LAU HUI YEE

4. **Tajuk Projek:**
Title of Project GROWTH CHARACTERISTICS OF HUMAN KERATINOCYTES IN VITRO AND ITS COMPARISON USING HUMAN AMNION MEMBRANE ANDFIBRIN GLUE AS A SCAFFOLD.

5. **Ringkasan Penilaian/***Summary of Assessment:*	Tidak Mencukupi *Inadequate* 1	2	Boleh Diterima *Acceptable* 3	Sangat Baik *Very Good* 4	5
i) **Pencapaian objektif projek:** *Achievement of project objectives*	☐	☐	☐	☑	☐
ii) **Kualiti output:** *Quality of outputs*	☐	☐	☐	☑	☐
iii) **Kualiti impak:** *Quality of impacts*	☐	☐	☐	☑	☐
iv) **Pemindahan teknologi/potensi pengkomersialan:** *Technology transfer/commercialization potential*	☐	☐	☑	☐	☐
v) **Kualiti dan usahasama :** *Quality and intensity of collaboration*	☐	☐	☑	☐	☐
vi) **Penilaian kepentingan secara keseluruhan:** *Overall assessment of benefits*	☐	☐	☐	☑	☐

6. **Abstrak Penyelidikan**
(Perlu disediakan di antara 100 - 200 perkataan di dalam **Bahasa Malaysia dan juga Bahasa Inggeris**. Abstrak ini akan dimuatkan dalam Laporan Tahunan Bahagian Penyelidikan & Inovasi sebagai satu cara untuk menyampaikan dapatan projek tuan/puan kepada pihak Universiti & masyarakat luar).

Abstract of Research
(An abstract of between 100 and 200 words must be prepared in Bahasa Malaysia and in English).
This abstract will be included in the Annual Report of the Research and Innovation Section at a later date as a means of presenting the project findings of the researcher/s to the University and the community at large)

SILA LIHAT LAMPIRAN

7. **Sila sediakan laporan teknikal lengkap yang menerangkan keseluruhan projek ini.**
[Sila gunakan kertas berasingan]
Applicant are required to prepare a Comprehensive Technical Report explaning the project.
(This report must be appended separately)

Senaraikan kata kunci yang mencerminkan penyelidikan anda:
List the key words that reflects your research:

Bahasa Malaysia	*Bahasa Inggeris*
Selaput Amnion, pelekat fibrin,	Amnion membrane, fibrin glue,
pengganti kulit biologi,	Biological skin substitutes,
kejuruteraan tisu, keratinosit.	Tissue engineering, keratinocytes.

8. **Output dan Faedah Projek**
Output and Benefits of Project

(a) **Penerbitan Jurnal**
Publication of Journals
(Sila nyatakan jenis, tajuk, pengarang/editor, tahun terbitan dan di mana telah diterbit/diserahkan)
(State type, title, author/editor, publication year and where it has been published/submited)

SUBMITTED TO WOUND AND REPAIR JOURNAL

(b) **Faedah-faedah lain seperti perkembangan produk, pengkomersialan produk/pendaftaran paten atau impak kepada dasar dan masyarakat.**
State other benefits such as product development, product commercialisation/patent registration or impact on source and society.

NIL

* Sila berikan salinan/*Kindly provide copies*

(c) **Latihan Sumber Manusia**
Training in Human Resources

i) Pelajar Sarjana: NIL
Graduates Students
(Perincikan nama, ijazah dan status)
(Provide names, degrees and status)

ii) Lain-lain: NIL
Others

9. **Peralatan yang Telah Dibeli:**
Equipment that has been purchased

NIL

10-12=2008
Tarikh
Date

BORANG LAPORAN HASIL PENYELIDIKAN

PPSP

Tajuk geran: GROWTH CHARACTERISTICS OF HUMAN keratinocytes in vitro and its comparison using Human Amnion and Fibrin Glue as a Scaffold.

Penyelidik: DR. ARAVAZHI ANANDA DORAI

Jenis geran: USM Jangka Pendek

Tempoh geran: 2 Tahun (1 NOV 2005 – 31 OKT 2007)

Jenis laporan: Laporan Kemajuan ☐ Alatan di beli ☐ Ya:nyatakan.....

Laporan Akhir*: ☑ ☐ Tidak

OBJEKTIF SPESIFIK KAJIAN (sama spt dalam proposal asal)	SECARA RINGKAS TERANGKAN PENCAPAIAN/HASIL	OBJEKTIF TERCAPAI ATAU TIDAK
1. To establish an invitro human keratinocyte culture system	Using the established method of extraction of Human keratinocytes	Achieved
2. To test the viability of human keratinocytes using the Amnion membrane as a feeder layer	Using the MTT Assay, the viability of the human keratinocytes growing on the Amnion membrane is tested	Achieved
3. To test the growth of human keratinocytes using Amnion membrane as a	Using 3 separate culture flasks to compare the growth characteristics at 24, 48 and 72 hours	Achieved
4. To compare the growth patterns and cell viability using fibrin glue and amnion membrane as a scaffold.	By seeding the cells on the amnion membrane and fibrin glue scaffolds.	Achieved

- *Laporan Akhir perlu disertakan salinan manuskrip dan surat yang dihantar kepada mana-mana jurnal untuk penerbitan.*

Nama Penyelidik Utama (PI): Dr. ARAVAZHI ANANDA DORAI I.L.:

Tarikh: 7.1.2009.

WOUND REPAIR AND REGENERATION
THE INTERNATIONAL JOURNAL OF TISSUE REPAIR AND REGENERATION

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Manuscript submitted - WRR-09-04-01((08-Apr-2009)

Submitted Manuscripts

Manuscript ID	Manuscript Title	Date Created	Date Submitted	Status
WRR-09-04-0102	A COMPARATIVE IN VITRO STUDY EXAMINING THE VIABILITY OF HUMAN KERATINOCYTES GROWN ON IRRADIATED HUMAN AMNIOTIC MEMBRANE OR FIBRIN GLUE SCAFFOLDS. [View Submission]	03-Apr-2009	08-Apr-2009	ADM: Ferns Under revi

A COMPARATIVE IN VITRO STUDY EXAMINING THE VIABILITY OF HUMAN KERATINOCYTES GROWN ON IRRADIATED HUMAN AMNIOTIC MEMBRANE OR FIBRIN GLUE SCAFFOLDS.

Ananda A Dorai M.S, Ahmad Sukari Halim FCCP, Lim Chin Keong B.Sc.

Reconstructive Sciences Department, School of Medical Sciences Universiti Sains Malaysia, 16150-Kubang Kerian, Malaysia.

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Dr Ahmad Sukari Halim

Senior Consultant Plastic and Reconstructive Surgeon,

Universiti Sains Malaysia,

16150- Kubang Kerian, Kelantan, Malaysia.

Key words: Amniotic membrane, Fibrin glue, biological skin substitutes, tissue engineering, keratinocytes.

A Comparative study of human keratinocytes grown on biological scaffolds

ABSTRACT

The amniotic membrane is a natural biological scaffold that is widely used to promote and speed wound healing. An ideal scaffold should be bio-compatible and be able to support and maintain the activity of cells involved in wound healing. Furthermore, it should allow angiogenesis in order to support the viability and activity of cells, in addition to the anchorage and migration of keratinocytes to achieve wound closure. In this study, normal human epidermal keratinocytes were seeded on an amniotic membrane or the fibrin glue TISSEEL (Baxter). The proliferation and growth of viable keratinocytes was documented over three days. The percentage of viable keratinocytes proliferating on the amniotic membrane scaffold was 23.33%, 26.15% and 31.82% after 24, 48 and 72 hours, respectively. The percentage of viable keratinocytes proliferating on the fibrin scaffold was 72.36%, 75.05% and 78.82% after 24, 48 and 72 hours, respectively. The percentage of viable keratinocytes was significantly higher on the fibrin scaffold ($p < 0.005$). Immune rejection due to the cellular components of the amniotic membrane prevents the proliferation of keratinocytes in vitro. The human amniotic membrane needs to be de-epithelialized in order to support the growth of various cell lines. Fibrin glue, however, supports the growth of keratinocytes in vitro and has the potential to become an ideal scaffold for a skin substitute.