

Genotoxic Evaluation of Locally Produced Dental porcelain by using
Comet Assay

Principal Investigator

Dr. T.P.Kannan



Co-investigators

Dr. Adam Husein

Assoc. Prof. Dr. Abdul Rashid Ismail

Cik Haswati Abdullah

USM Short Term Grant

304/PPSG/6131609

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: Dr. T.P. Kannan <i>Name of Research Leader</i> <input type="checkbox"/> Profesor Madya/ <i>Assoc. Prof.</i> <input checked="" type="checkbox"/> Dr./ <i>Dr.</i> <input type="checkbox"/> Encik/Puan/Cik <i>Mr/Mrs/Ms</i>						
2. Pusat Tanggungjawab (PTJ): <i>School/Department</i> School of Dental Sciences						
3. Nama Penyelidik Bersama: Dr. Adam Husein, Assoc. Prof. Dr. Abdul Rashid Ismail, Cik Haswati Abdullah <i>Name of Co-Researchers</i>						
4. Tajuk Projek: Genotoxic Evaluation of Locally Produced Dental porcelain by using Comet Assay <i>Title of Project</i>						
5. Ringkasan Penilaian/Summary of Assessment:						
	Tidak Mencukupi <i>Inadequate</i>		Boleh Diterima <i>Acceptable</i>		Sangat Baik <i>Very Good</i>	
	1	2	3	4	5	
i) Pencapaian objektif projek: <i>Achievement of project objectives</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
ii) Kualiti output: <i>Quality of outputs</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
iii) Kualiti impak: <i>Quality of impacts</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
iv) Pemindahan teknologi/potensi pengkomersialan: <i>Technology transfer/commercialization potential</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
v) Kualiti dan usahasama : <i>Quality and intensity of collaboration</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
vi) Penilaian kepentingan secara keseluruhan: <i>Overall assessment of benefits</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

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)

Attached Separately

7. **Sila sediakan laporan teknikal lengkap yang menerangkan keseluruhan projek ini.**

[Sila gunakan kertas berasingan]

Applicant are required to prepare a Comprehensive Technical Report explaining the project.

(This report must be appended separately)

Comprehensive Technical Report appended separately

Senaraikan kata kunci yang mencerminkan penyelidikan anda:

List the key words that reflects your research:

Bahasa Malaysia

Bahasa Inggeris

Esei Komét

Comet assay

Porselin

Porcelain

Agén mutasi

Mutagenicity

Kerosakan DNA

DNA damage

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/submitted)

Type **Original Article**

Title **Genotoxicity evaluation of locally produced dental porcelain – An in vitro study using the Ames and Comet assays**

Author **Mohammed Noushad, Thiromulu Ponnurai Kannan, Adam Husein, Haswati Abdullah, Abdul Rashid Ismail**

Year **2009**

Journal **Toxicology in Vitro 23:1145-1150 (Impact factor = 2.473) – Got Hadiah Sarjungan**

Presentations

1. M Noushad, TP Kannan and A Husein. Genotoxicity evaluation of locally produced dental porcelain using Ames test – A preliminary study. 2nd USM – Penang International Postgraduate Convention 2008. 18th to 20th June 2008. USM, Penang, Malaysia

2. M Noushad, TP Kannan and A Husein. Genotoxicity evaluation of a locally produced dental porcelain. An in vitro study using the Ames and Comet assays. 14th National Conference on Medical and Health Sciences. 21 – 22 May 2009. USM, Kubang Keran, Kelantan

Genotoxic Evaluation of Locally Produced Dental porcelain by using Comet Assay

ABSTRACT

The aim of this study was to determine the genotoxicity of a locally produced dental porcelain (Universiti Sains Malaysia, Malaysia) using the Comet assay. The protocol for the Comet assay was followed as per the guidelines proposed by Tice et al. (2000). L929 (CCL-1 ATCC, USA) mouse fibroblast cells were treated with the dental porcelain at three different concentrations (50, 100 and 200mg/ml) along with concurrent negative (Eagle's Minimal Essential Medium) and positive (Zinc sulfate) controls. DNA strand breaks were evaluated based on the mean tail moment for 150 comets/sample. There was no significant difference in the tail moment between the negative control and the different concentrations of the dental porcelain tested, suggesting that the locally produced dental porcelain did not induce any DNA damage. Also, there was no dose-dependent relationship on the tail moment. Zinc sulfate, which was used as a positive control induced significant DNA damage. The results indicate that the locally produced dental porcelain is non-genotoxic under the present test conditions.

Penentuan Genotoksik Porselin Gigi Yang Dihasilkan Secara Tempatan Menggunakan

Assay Komet

ABSTRAK

Penyelidikan ini dijalankan bertujuan untuk menentukan kegenotoksikan porselin gigi yang dihasilkan secara tempatan (Universiti Sains Malaysia, Malaysia) menggunakan assay komet. Protokol untuk assay komet adalah mengikut garis panduan yang dicadangkan oleh Tice et al. (2000). Sel fibroblast tikus, L929 (CCL-1 ATCC, USA) telah dirawat oleh porselin gigi pada tiga kepekatan berbeza (50, 100 dan 200mg/ml) bersama kawalan negatif (Eagle's Minimal Essential Medium) dan kawalan positif (Zink Sulfat). Bebenang DNA yang terpisah ditentukan berdasarkan min momen ekor untuk 150 komet/sampel. Tiada perbezaan yang signifikan pada momen ekor berbanding control negatif dan perbezaan kepekatan porselin, yang mana menunjukkan bahawa, porselin gigi yang dihasilkan secara tempatan tidak menggalakkan sebarang kerosakan DNA. Keputusan juga menunjukkan tiada hubungan dos-bersandar pada momen ekor. Zink Sulfat yang mana telah digunakan sebagai kawalan positif telah menggalakkan kerosakan DNA yang signifikan. Keputusan menunjukkan porselin gigi yang dihasilkan secara tempatan adalah tidak genotoksik pada keadaan yang telah diuji didalam kajian ini.