NANOMEDICINE: LEGAL AND REGULATORY CHALLENGES IN MALAYSIA

By:

Muhammad Syahlan Bin Shafie (2005365379) Suriani Binti Sulong (2005365434)

Submitted in partial fulfillment of the requirements for the Bachelor of Legal Studies (Hons)

Universiti Teknologi Mara Faculty of Law

April 2008

The authors confirmed that the work submitted is their own and that appropriate credit has been given where reference has been made to the work of others.

ACKNOWLEDGEMENTS

We would like to express our utmost gratitude and heartfelt appreciation to several people who were willing to lend us their hands to guide us in completing this project paper. They are as follows: much credit goes to Puan Siti Hajar Binti Mohd Yasin, our supervisor for her generous guidance and for her willingness to share with us her vast and depth knowledge concerning our area of research. We also wish to convey our gratitude to the staffs in Perpustakaan Abdul Razak 2, for facilitating the course of our research in the library and also to Encik Sufian Bin Harun, who had helped us around when we were doing our research in the National Library. Thanks to our beloved parents for their endless moral support to keep us going. Last but not least for friends and fellow group mate for making this research paper possible.

ABSTRACT

In the light of medical advancement, humanity advance rapidly in technology and every dream of a human is to live with a quality of life. Nanomedicine and nanotechnology is an advancement which not only has a potential in saving lives, but also preserves lives. In the face of that, this research is a study of legal and regulatory challenges in governing nanomedicine in Malaysia. This research looks into the issue of nanomedicine through an advantages and disadvantages of nanomedicine and nanotechnology to the human's health as well as to the environment, and the broadness of the applications of nanotechnology, along with laws governing nanomedicine in foreign countries. It is based on the qualitative methodology where in, referring to books, articles, journals as well as the Internet, to get a better insight into the topic.

As a final point, it is very important to emphasis that due to its nature and novelty, nanomedicine has a lot of unknown advantages and disadvantages towards human's health quality and the environment. Therefore, this research is to propose the relevant law in Malaysia, if necessary to best fit the requirements of all aspects related to nanomedicine in Malaysian context.

TABLE OF CONTENTS

Ackr	Acknowledgment		
Abstract			
Table	Table of contents		
CHA	APTER 1: PROPOSAL		
1.0	Introduction	1	
1.1	Problem Statement	4	
1.2	Objectives		
1.3	Literature Review		
1.4	Methodology		
1.5	Introduction Problem Statement Objectives Literature Review Methodology Limitation Significance of Study Provisional Plan of Research IAPTER 2: INTRODUCTION TO NANOMDICINE		
1.6	Significance of Study		
1.7	Provisional Plan of Research		
СНА	APTER 2: INTRODUCTION TO NANOMDICINE		
2.1	Introduction		
	2.1.1 Historical background of Nanotechnology	15	
	2.1.2 Broadness of Nanotechnology's Applications	19	
	2.1.3 The applications of Nanotechnology in Medical Treatment	22	

2.2	Advar	ntages and Disadvantages of Nanotechnologies and Nanomedicine	24
	2.2.1	The Advantages of Nanotechnology and Nanomedicine to Human's Health and the Environment	24
	2.2.3	The Disadvantages of Nanotechnology and Nanomedicine to Human's Health and the Environment	30
CHAI	PTER 3	8: APPLICATIONS OF NANOMEDICINE IN MEDICAL TREATME	NT
3.1	Applio	cation of Nanomedicine	35
	3.1.1	Medical Use of Nanomaterials in Drug Delivery System	37
	3.1.2	Cancer Treatment	39
	3.1.3	Medical Applications of Molecular Nanotechnology	
	3.1.4	Nanorobots	41
	3.1.5	Cell Repair Machines	42
	3.1.6	Nanonephrology	43
3.2	Recep	tion of Nanomedicine in Medical Practice	44
	3.2.1	Introduction	44
	3.2.2	The Challenges of Nanomedicine in Medical Practice	45