

UNIVERSITI TEKNOLOGI MARA

**DIFFERENTIAL PROTEIN PROFILE
IN BONE REMODELLING INDUCED
BY DENTURE WEAR**

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MSc

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AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the results of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduate, Universiti Teknologi MARA, regulating the conduct of my study and research.

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ABSTRACT

Removable partial and complete dentures are routinely used to replace missing teeth in partially and completely edentulous patients respectively. However, as these dentures obtain their primary support from the mucosa and the underlying bone to function effectively, denture wearing has been associated with an increased rate of residual ridge resorption (RRR). The continuous and intermittent mechanical pressure exerted by these dentures on the underlying soft tissue mucosa has been shown to induce inflammation and led to the phenomena of alveolar bone resorption and triggered the secretion of various proteins and enzymes into the saliva. This study aimed to identify the differential protein profile associated with bone remodelling induced by denture wear. These differentially expressed proteins could potentially serve as biomarkers for bone remodelling in denture wearing patients. This research was based on the data obtained from the saliva samples of 6 Removable Partial Denture and 14 Complete Denture patients. Unstimulated whole saliva was collected twice, once before the issuance of denture (T0) and another after 30 days of denture insertion (T1). Salivary proteins were resolved using two-dimensional gel electrophoresis (2DE) over a pH range of 3-10, and the resulting proteome profiles were compared using Image J software. The differentially expressed proteins with significant p-value ≤ 0.05 were further identified by LC/MS Q-TOF. Based on the functional annotation analysis, 8 of the identified proteins were found to have functions that are potentially associated with the mechanism of inflammation and bone remodelling process. The proteins were Serine/threonine-protein kinase 38 (p=0.003), G-protein coupled receptor (p=0.003), Interleukin-31 receptor subunit alpha (p=0.012), PTB-containing, cubilin and LRP1-interacting protein (p=0.005), Fibroblast growth factor 11 (p=0.003), BMP and activin membrane-bound inhibitor homolog (p=0.002) and Granzyme B splice variant 2 (p=0.001). In conclusion, differential protein profile associated with bone remodelling induced by denture wear have been identified and these proteins could potentially serve as biomarkers for bone remodelling in denture wearing patients.

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TABLE OF CONTENT

	Page
CONFIRMATION BY PANEL OF EXAMINERS	ii
AUTHOR'S DECLARATION	iii
ABSTRACT	iv
ACKNOWLEDGEMENT	v
TABLE OF CONTENT	vi
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF PLATES	xiii
LIST OF SYMBOLS	xiv
LIST OF ABBREVIATIONS	xvi
CHAPTER ONE INTRODUCTION	1
1.1 Research Background	1
1.2 Problem Statement	3
1.3 Objectives	4
1.4 Significance of the Study	4
CHAPTER TWO LITERATURE REVIEW	5
2.1 Outline of the Chapter	5
2.2 Tooth Loss	6
2.2.1 Prevalence of Tooth Loss	6
2.2.2 Effect of Tooth Loss	7
2.2.3 Contributing Factors to Tooth Loss	8
2.2.4 Prosthetic Replacement of Tooth Loss	8
2.3 Residual Alveolar Ridge and Residual Ridge Resorption	12
2.3.1 Effect of Tooth Loss on Alveolar Ridge	13
2.3.2 Effect of Denture on Alveolar Bone/Ridge	14
2.3.3 The Process of Bone Remodelling	16
2.3.4 Cells that are Involved in Bone Remodelling and their Functions	19
2.4 Bone Mechanotransduction	20
2.4.1 Occlusal Forces and Residual Ridge Resorption	22