

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# **Chemical and Biological Evaluation of Type (I) Collagen Extracted by Two Techniques from Fish Scales for Dental Use.**

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## **Dedication**

**To My Dearly Beloved *Father, Mother* and *Sister*.**

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## **Acronyms**

$\Delta H$	Enthalpy of denaturation
3D	Three-dimensional
ACS	Acidic collagen solutions
Ala	Alanine
As	Arsenic
ASC	Acid-solubilized collagen
ATP	Adenosine Triphosphate
BHK-21	Baby Hamster kidney
BSE	Bovine spongiform encephalopathy
CC	Calf skin
Cd	Cadmium
CII	Type II collagen
Col-HA	Collagen- hydroxyapatite
Cr	Chromium
Cys	Cystine
ddH <sub>2</sub> O	Double-distilled water
DHT	Dehydrothermal
DIL	Dilatometry
DMA	Dynamic mechanical analysis
DPPA	Diphenylphosphoryl- azide
DSC	Differential scanning calorimetry
DTA	Differential thermal analysis

ECM	Extracellular matrix
EDC	1-Ethyl-3-(3-dimethylaminopropyl)carbodiimid
EDTA	Ethylenediaminetetraacetic acid
ELISA	Enzyme-linked immunosorbent assay
FAO	Food and Agriculture Organization of the United Nations
FBS	Fetal bovine serum
FMD	Foot-and-mouth disease
FT/IR	Fourier transform infrared spectroscopy
GA	Glutaraldehyde
GBR	Guided bone regeneration
GC/MS	Gas chromatography mass spectrometry
Gly	Glycine
GTR	Guided tissue regeneration
HAp	Hydroxyapptite
HBSS	Hank's Balanced Salt Solution
HCl	Hydrochloric acid
Hg	Mercury
Hyp	Hydroxy- proline
IARC	International Agency for Research into Cancer
ICP-MS	Inductive Coupled Plasma-Mass Spectrometry
IgE	Immunoglobulin E
IgG	Immunoglobulin G
ISO	International Organization for Standardization

KDa	Kilodalton
$K_{\alpha}$	Monochromatic characteristic emissions
LVP	Large Volume Parenteral
M	Molarity
MMPs	Matrix metalloproteases
NaCl	Sodium chloride
Ni	Nickel
Pb	Lead
PBS	Phosphate buffered saline
Pd/Au	Palladium/Gold
PDL	Periodontal ligament
Pro	Proline
PSC	Pepsin-solubilized collagen
RA	Rheumatoid arthritis
RGD	Arg-Gly-Asp
SDS-PAGE	Sodium dodecyl sulfate polyacrylamide gel
SEM	Scanning Electron Microscopy
$T_d$	Denaturation temperature
TE	Tissue engineering
TGA	Thermogravimetric analysis
TIMPs	Tissue inhibitors of metalloproteases
$T_m$	Melting temperature
TMA	Thermomechanical analysis
$T_{max}$	Maximum transition temperature