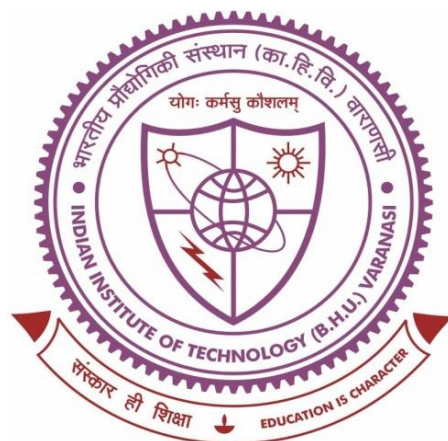


Development of Luffa Cylindrica-based Scaffolds for Biomedical and Environmental Applications



**Thesis submitted in partial fulfillment
for the Award of Degree**

Doctor of Philosophy

by

Shravanya Gundu

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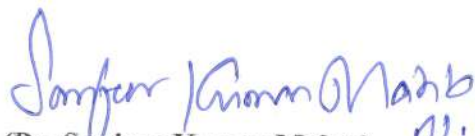
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Date: 01/11/23

Place: Varanasi


(Shravanya Gundu)

Dedicated To....
My Beloved
Parents and In-laws,
My Husband and Son,
My Loving Sister and Brother

TABLE OF CONTENTS

	Page No.
LIST OF FIGURES	xiii
LIST OF TABLES	xix
LIST OF ABBREVIATIONS AND SYMBOLS	xxi
PREFACE	xxv
 CHAPTER 1: INTRODUCTION	 1-71
1. Luffa cylindrica (LC)	02
1.1 Structure of luffa plant fiber	04
1.2 Chemical composition of luffa fibers	06
1.2.1 Cellulose	08
1.2.2 Hemicellulose	10
1.2.3 Lignin	11
1.3 Extraction and processing of luffa fibers	12
1.4 Bioactive compounds of LC	15
1.5 Properties of LC for scaffold fabrication	18
1.5.1 Physical, chemical, and mechanical properties of LC	19
1.6 Review of the existing literature	22
1.7 The significance of LC in biological and environmental applications	24
1.7.1 Biological	24
1.7.2 Environmental	27
1.8 Natural biomaterials and their potential in scaffold fabrication	28
1.8.1 Optimal Properties of Scaffolds	29
1.8.2 Scaffold Fabrication Techniques	30
1.8.2.1 Freeze thawing	32
1.8.2.2 Gas foaming	33
1.8.2.3 Freeze drying	34
1.8.2.4 Electrospinning	35
1.8.2.5 Three-Dimensional (3D) bioprinting	36
1.9 Foremost characterization methods	37

1.10 Research objectives	40
1.11 Thesis outline	42
1.12 Translational potential of the thesis	46
1.13 References	49

CHAPTER-2: FABRICATION AND IN VITRO CHARACTERIZATION OF LUFFA-BASED COMPOSITE SCAFFOLDS INCORPORATED WITH GELATIN, HYDROXYAPATITE AND PSYLLIUM HUSK FOR BONE TISSUE ENGINEERING **73-123**

2.1 Introduction	74
2.2 Materials and method	80
2.2.1 Materials	80
2.2.2 Methods	81
2.2.2.1 Chemical treatment of LC fibers	81
2.2.2.2 Fabrication of composite scaffolds	81
2.2.3 Characterization of the scaffolds	84
2.2.3.1 Scanning electron microscopy (SEM) Analysis	84
2.2.3.2 Determination of porosity of the scaffold	84
2.2.3.3 ATR-FTIR spectroscopic analysis	85
2.2.3.4 Scaffold stability and degradation	85
2.2.3.5 Water retention capacity	86
2.2.3.6 Differential scanning calorimetry (DSC)	87
2.2.3.7 Water contact angle measurement	87
2.2.3.8 Compressive strength testing	88
2.2.3.9 Cellular viability and compatibility study	88
2.2.3.9.1 Culturing of MG-63 human osteoblast-like cells within scaffolds	88
2.2.3.9.2 Actin and nuclear staining	88
2.2.3.10 MTT Assay	89
2.2.4 Statistical analysis	90
2.3 Results	91
2.3.1 SEM analysis of the fabricated composite scaffolds	91

2.3.2 ATR-FTIR spectroscopic analysis of composite scaffolds	94
2.3.3 Stability and degradation of fabricated scaffolds	95
2.3.4 Water retention capacity of scaffolds	98
2.3.5 Thermally stability of the fabricated scaffolds using DSC	99
2.3.6 Contact angle measurement	100
2.3.7 Compression testing	101
2.3.8 Cytocompatibility of the fabricated scaffolds	102
2.3.9 MTT assay	104
2.4 Discussion	105
2.5 Conclusion	113
2.6 References	114

CHAPTER-3: IN VIVO CHARACTERIZATION OF LUFFA-BASED COMPOSITE

SCAFFOLDS UPON SUBCUTANEOUS IMPLANTATION IN RATS	125-151
3.1 Introduction	126
3.2 Materials and method	128
3.2.1 Materials	128
3.2.2 Fabrication of composite scaffold	129
3.2.3 Ethical approval	129
3.2.4 Animals grouping for scaffold implantation	130
3.2.5 Histopathological studies	131
3.2.6 Biochemical analysis of serum	131
3.2.6.1 CK-MB	132
3.2.6.2 Serum creatinine	132
3.2.6.3 Assessment of liver function (AST/ALP/AST and bilirubin levels)	132
3.2.7 Antibacterial sustained drug from fabricated scaffolds	132
3.3 Statistical analysis	134
3.4 Results and Discussion	134
3.4.1 Histopathological analysis of scaffold implanted	134
3.4.2 Histopathological analysis of organs of rats implanted with scaffolds	135
3.4.2.1 Heart (CK-MB)	135

3.4.2.2 Kidney (Serum creatinine)	136
3.4.2.3 Liver	138
3.4.3 Biochemical analysis	138
3.4.3.1 CK-MB	138
3.4.3.2 Serum creatinine	138
3.4.3.3 AST/ALP/ALT and bilirubin levels	141
3.4.4 Antibacterial drug release on fabricated scaffolds	145
3.5 Conclusion	147
3.6 References	148

CHAPTER-4: CELLULOSE-BASED LUFFA CYLINDRICA (MAT, FLAKES, AND POWDER) REINFORCED POLYDIMETHYLSILOXANE COMPOSITES FOR OIL AND ORGANIC SOLVENT ABSORPTION

153-209

4.1 Introduction	154
4.2. Materials and method	158
4.2.1 Materials	158
4.2.2 Methods	158
4.2.2.1 Modification of LC Fibers through chemical treatment	158
4.2.2.2 Fabrication of Luffa-PDMS scaffolds	159
4.2.3 Characterization of fabricated scaffolds	161
4.2.3.1 Morphological and surface roughness analysis using SEM	161
4.2.3.2 Surface roughness using atomic force microscopy (AFM)	161
4.2.3.3 Effective porosity of the scaffolds	161
4.2.3.4 Thermogravimetric analysis (TGA)	162
4.2.3.5 Surface wettability measurement	162
4.2.3.6 Absorption of oil, PBS, and organic solvents by the prepared scaffolds	163
4.2.3.7 Oil- water sorption study	163
4.2.3.8 Reusability of fabricated scaffold	164
4.2.3.9 Mechanical characterization of scaffold	164
4.2.3.10 Cytotoxicity	164

4.2.3.11 Biodegradation of scaffold	165
4.2.4 Statistical analysis	166
4.3 Results	166
4.3.1 Characterization of the scaffolds	166
4.3.1.1 Morphological characterization and surface roughness analysis of the fabricated scaffolds	166
4.3.1.2 Surface roughness analysis (AFM)	170
4.3.1.3 Determination of effective porosity of the scaffold	171
4.3.1.4 Thermogravimetric analysis (TGA)	172
4.3.1.5 Surface wettability measurement	173
4.3.1.6 Efficiency of the scaffolds to absorb oil, PBS and organic solvents	176
4.3.1.7 Oil-water sorption study	179
4.3.1.8 Reusability of fabricated scaffolds	181
4.3.1.9 Assessment of mechanical stability	181
4.3.1.10 Cell cytotoxicity study	184
4.3.1.11 Biodegradation of the scaffold	185
4.4 Discussion	187
4.5 Conclusion	199
4.6 References	200
CHAPTER-5: CONCLUSION AND FUTURE SCOPE OF WORK	211-217
Permission from Central Animal Ethical Committee	219
List of Publications	220

LIST OF FIGURES

Figure No.	Figure description	Page No.
Figure 1.1	A representation of the geographical distribution of LC and various kinds of LC that are attainable.	02
Figure 1.2	Luffa cylindrica: A) plant, B) LC flower, C) LC seeds, D) LC raw fruit E) LC partially removed outer skin, and F) LC dried fruit.	04
Figure 1.3	Structure of plant fiber illustrating the primary and secondary walls as well as the interior components of the fiber.	05
Figure 1.4	Illustrates the layers of dried luffa fruit and internal components inside the fiber. (Image was captured in the Tissue Engineering and Biomicrofluidics Laboratory, School of Biomedical Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi and generated in powerpoint).	07
Figure 1.5	Represents cellulose chemical structure comprised of a series of β -D-glucopyranose units covalently connected by (1–4) glycosidic bonding.	09
Figure 1.6	The chemical structure of hemicellulose	11
Figure 1.7	The three main components of the lignin structure.	12
Figure 1.8	Represents the types of natural polymers and the properties of luffa cylindrica.	18
Figure 1.9	A graphical illustration of the various applications using luffa-based materials.	23
Figure 1.10	Characteristics of ideal scaffolds for tissue regeneration.	30
Figure 1.11	Various approaches for fabricating a wide range of 3D scaffolds.	31
Figure 1.12	Porous scaffold and scanning electron microscopic (SEM) image of the fabricated scaffolds using freeze-drying process.	34
Figure 1.13	Diagrammatic representation of electrospinning unit setup, Taylor cone formation and nanofibrous mat. Images of the instruments have been obtained from the Tissue Engineering and Biomicrofluidics Laboratory, School of Biomedical Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi.	36

Figure No.	Figure description	Page No.
Figure 1.14	A graphical representation of chapter 2 (fabrication and invitro characterization of luffa-based composite scaffolds incorporated with gelatin, hydroxyapatite, and psyllium husk).	43
Figure 1.15	A graphical representation of chapter 3 (In Vivo Characterization of Luffa-based Composite Scaffolds upon Subcutaneous Implantation in Rats.	44
Figure 1.16	A graphical representation of chapter 4 (cellulose-based luffa cylindrica (mat, flakes, and powder) reinforced polydimethylsiloxane composites for oil and organic solvent absorption).	45
Figure 2.1	Chemical structure of gelatin.	77
Figure 2.2	Chemical structure of psyllium husk consists of xylose and arabinose units.	78
Figure 2.3	Schematic representation of fabrication of scaffolds by lyophilization technique using glutaraldehyde (GTA) as a crosslinking agent and porous structure of the scaffolds visualized by SEM images.	83
Figure 2.4	(a) Represents the digital images, (b) SEM images represent the pore structure, and (c) pore distribution of the scaffolds	92
Figure 2.5	Represents the apparent porosity (calculated using ImageJ) and effective porosity (calculated using liquid replacement method) percentage of the fabricated scaffolds. Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	93
Figure 2.6	ATR-FTIR spectra of luffa powder, control (blend of hydroxyapatite (HA), psyllium husk (PH) and gelatin (G)), 3% LC (Luffa cylindrica powder (LC) + hydroxyapatite (HA), psyllium husk (PH) and gelatin (G)) and 5% LC scaffolds (Luffa cylindrica powder (LC) + hydroxyapatite (HA), psyllium husk (PH) and gelatin (G)).	95
Figure 2.7	Represents digital images of composite scaffolds incubated in lysozyme solution and scaffolds were held with forceps after 50 days of immersion in lysozyme solution.	96
Figure 2.8	Represents SEM images of (a) 3% LC, (b) 5% LC, (C) control (C), and (d) weight loss percentage of 3% LC, 5% LC and control (C) scaffolds.	97

Figure No.	Figure description	Page No.
Figure 2.9	Variation in the pH of lysozyme solution (up to 7 days) used for degradation study of 3% LC, 5% LC, and control (C).	97
Figure 2.10	Represents the (A) digital images of scaffolds before and after immersion in PBS solution and (B) weight gain percentage of the fabricated scaffolds in phosphate-buffered saline (PBS), pH 7.4 for a period of 72 h. Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	98
Figure 2.11	Illustrates the DSC analysis of fabricated composite scaffolds.	100
Figure 2.12	Represents the surface wettability of 3% LC, 5% LC and control (C) microporous scaffolds. Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	101
Figure 2.13	Graphical illustration of the compression stress-strain curve for luffa-based composite scaffolds.	102
Figure 2.14	The above panel of images represents the (A) bright-field, DAPI, and merged images of MG-63 osteoblast-like cells cultured on 3% LC, 5% LC, and control scaffolds. (B) Represents the DAPI, actin, merged images of MG-63 osteoblast-like cells and scanning electron microscopy (SEM) micrographs cultured on 3% LC, 5% LC, and control scaffolds (day 6). Scale bar: 100 μ m. Scale bar for digital images: 10 mm.	103-104
Figure 2.15	Cytotoxicity of the Scaffolds: The figure illustrates the percentage cellular proliferation of MG-63 osteoblast-like cells for 2 and 4 days and the compatibility of the scaffolds determined by MTT assay. In this experiment, absorbance for 4 th -day culture of positive control (+ve control i.e. cells cultured without scaffolds on tissue culture Petri plate) was used as a point of reference OD for all the samples. Data were analyzed using One-way ANOVA Tukey's Post hoc Test. Values are expressed as mean $\pm$ SD (n=3) and the level of significance as *p<0.05, **p<0.01, and ***p<0.001, respectively.	105
Figure 3.1	Histological images of luffa-based scaffolds A) 3% LC, B) 5% LC, C) Control scaffold (without LC), and D) Sham (positive control) harvested after 3 weeks of implantation in Wistar rat model, subcutaneously. The figure illustrates the scaffold morphology and presence of pores in vivo. Scale bar: 100 μ m.	135

Figure No.	Figure description	Page No.
Figure 3.2	H&E staining of pathological sections of heart tissues after 3 weeks implantation of scaffold: A) 3% LC, B) 5% LC, C) control (without LC), and D) Sham (positive control). The figure depicts clear evidence of the excellent biocompatibility of the scaffolds. Scale bar: 100 μ m.	136
Figure 3.3	Histological examination of kidney tissues demonstrated that the implanted scaffolds had no adverse impact on the kidney tissues for the implanted scaffolds (i.e., 3% LC, 5% LC, and control compared to the control group (Sham)). Scale bar: 100 μ m.	137
Figure 3.4	Histological examination of liver tissues demonstrated that the implanted scaffolds had no adverse impact on the liver tissues for the implanted scaffolds (i.e. 3% LC, 5% LC, and control compared to the control group (Sham)).	138
Figure 3.5	The plot illustrates the biochemical values of creatinine phosphokinase-MB (CK-MB) of the experimental group in comparison to the control group. Figure A depicts the values after 24 hours post-implantation, while Figure B displays the values after three weeks of implantation.	140
Figure 3.6	The figure depicts the serum creatinine's biochemical values. Graph A shows the values 24 hours after implantation, and Graph B exhibits the values after three weeks of implantation.	141
Figure 3.7	The figure depicts the values of A) ALP, B) ALT, C) AST, and D) bilirubin of various experimental groups compared to the control group (Sham) after 24 h of scaffold implantation in rats.	142
Figure 3.8	The figure depicts the values of A) ALP, B) ALT, C) AST, and D) bilirubin of various experimental groups compared to the control group (Sham) after 3 weeks of scaffold implantation in rats.	144
Figure 3.9	Depicts the antibacterial drug release test (I) represents the control Petri plate with E. coli bacterial colony spread, (II) Placement of antibacterial drug-loaded scaffolds and (III) percent retention of the zone of clearance after 24h.	146
Figure 4.1	Schematic representation of scaffold fabrication of (A) P-L mat, (B) P-L flakes, (C) P-L powder, and (D) PDMS (P) scaffolds using a hand lay-up technique.	160
Figure 4.2	Morphological analysis through scanning electron microscopy	167

Figure No.	Figure description	Page No.
	(SEM) photomicrograph of (A) P-L mat, (B) P-L flakes, (C) P-L powder, and (D) PDMS (P) scaffolds along with their respective surface roughness and grey value peak intensity to justify their surface roughness.	
Figure 4.3	Represents the digital images of scaffolds (A) P-L mat, (B) P-L flakes, (C) P-L powder, and (D) PDMS (P) in top and side view and SEM images of the respective fabricated scaffolds with various magnification. Scale bar: 10 mm	169
Figure 4.4	Represents the (A) digital image of P-L mat, and surface roughness analysis measured by atomic force microscopy (AFM) in 3D and 2D of (B) P-L flakes, (C) P-L powder, and (D) PDMS (P) scaffolds to justify their surface roughness.	170
Figure 4.5	Graph depicts the effective porosities of P-L mat, P-L flakes, P-L powder, and PDMS (P) scaffolds. The effective porosities were calculated using the ethanol replacement method.	172
Figure 4.6	Thermogravimetric analysis (TGA) graph for P-L mat, P-L flakes, P-L powder and PDMS (P) scaffolds.	173
Figure 4.7	Time-dependent contact angle of various forms of luffa-PDMS-based scaffolds at 0, 30, 60, and 90 min time intervals.	175
Figure 4.8	Digital images depict (A) oil absorption study with respective weight gain plots, (B) PBS absorption with respective plots; P-L mat, (B) P-L flakes, (C) P-L powder, (D) PDMS (P) and (E) L-mat scaffolds.	176
Figure 4.9	Graphical representation of changes in weight gain percentages over time in organic solvents (A) n-hexane, (B) diethyl ether, (C) toluene, and (D) cyclohexane.	178
Figure 4.10	Graphical representation of the weight gain percentages of various scaffolds.	179
Figure 4.11	Digital images depict the oil sorption study of P-L mat, P-L flakes, P-L powder, PDMS (P), and L-mat scaffolds.	180
Figure 4.12 (A)	Graph shows compressive stability of various scaffolds.	182
Figure 4.12 (B)	Graph shows tensile stress-strain curve until break point of various scaffolds.	183
Figure 4.13	Graph represents the percentage cellular viability of MG-63 (Human osteoblast) cells. The 4 th -day control was considered a positive control and its OD was considered reference OD for all	185

Figure No.	Figure description	Page No.
	the samples. Data were analyzed using One-way ANOVA Tukey's Post hoc Test. Values are expressed as mean $\pm$ SD ($n=6$) and the level of significance as $*p<0.05$, $**p<0.01$, and $***p<0.001$, respectively.	
Figure 4.14	Graph represents the in vitro degradation of P-L mat, P-L flakes, P-L powder, and PDMS (P) scaffolds after 20 days in a lysozyme-containing solution at 40°C. One-way ANOVA Tukey's Post hoc Test was performed, and the values are expressed as mean $\pm$ SD ($n=3$).	186
Figure 4.15	Illustrates the (A) digital image of luffa flakes (L flakes), (B) SEM micrographs at 100 x magnification, and (C) 1000 x magnification showing microcapillaries of luffa flakes.	191

LIST OF TABLES

Table No.	Table description	Page No.
Table 1.1	Chemical composition of luffa fiber.	08
Table 1.2	Different chemical treatments utilized to modify luffa fibers.	14
Table 1.3	Various studies on the mineral content of luffa leaf extract, fruit, and seed kernel.	17
Table 1.4	Various findings on the nutritional value of luffa leaf extract, fruit, and seed kernel.	18
Table 1.5	Physical properties of treated and untreated luffa fibers.	19
Table 1.6	Mass loss percentage for untreated and chemically altered luffa and mechanical properties of luffa fibers.	22
Table 1.7	Represents luffa-based samples utilized in various applications with advantages and disadvantages.	28
Table 2.1	Represents the various combinations of composite scaffolds.	83
Table 2.2	Represents the comparative porosity calculated using the ImageJ technique and liquid replacement method. Absolute ethanol has been utilized for the calculation of effective porosity. Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	93
Table 2.3	Represents Young's modulus and compressive strength of 3% LC, 5% LC, and control scaffolds. High luffa content resulted in higher compressive strength of 5% LC scaffold. Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	100
Table 3.1	Depicts the biochemical parameters of the heart, kidney, and liver of rats implanted with various scaffolds.	145
Table 4.1	Represents the composition of various forms of luffa-PDMS- based scaffolds, i.e., types of scaffolds and their composition.	160
Table 4.2	Surface roughness parameters (A) P-L mat (B) P-L flakes (C) P-L powder and (D) PDMS (P) scaffolds quantified using Surf CharJ 1q plugin of ImageJ. Units= arbitrary units (au). Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	168
Table 4.3	Represents surface roughness parameters of scaffold P-L flakes, P-L powder, and PDMS (P) in 3D measured using Atomic force microscopy (AFM). Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	171

Table No.	Table description	Page No.
Table 4.4	Surface water contact angle values (°) of various forms of luffa-PDMS-based scaffolds measured at 0, 30, 60, and 90 minutes time intervals. Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	174
Table 4.5	The absorption efficacy (%) of the fabricated scaffold when placed in PBS and oil. Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	177
Table 4.6	The absorption efficacy (%) of the fabricated scaffolds when placed in organic solvents. Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	176
Table 4.7	Weight gain of the scaffold from oil-water mixture. Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	179
Table 4.8	Mechanical properties showing Young's modulus and strength of scaffolds. Data were analyzed using One-way ANOVA Tukey's Post hoc Test.	184
Table 4.9	Comparison of materials, fabrication methods, oils, and the absorption and adsorption capacities of various materials for oil-water separation	195

LIST OF ABBREVIATIONS AND SYMBOLS

%	Percentage
°	Angle
°C	Degree Celsius
µg	Microgram
µL	Microlitre
µM	Micro molar
µm	Micrometre
2D	Two-dimensional
3D	Three-dimensional
AFM	Atomic force microscopy
ALP	Alkaline phosphatase
ALT	Alanine aminotransferase
ANOVA	Analysis of variance
As	Sampling area
AST	Aspartate aminotransferase
ASTM	American Society for Testing and Material
ATR	Attenuated total reflection
au	Arbitrary units
BOD	Biological oxygen demand
BSA	Bovine serum albumin
CaCO ₃	Calcium carbonate
CAD	Computer-aided design
CK-MB	Creatine kinase-MB
CO ₂	Carbon dioxide
COD	Chemical oxygen demand
DAPI	(4,6-diamidino-2-phenylindole)
DIV	Days in vitro
DMEM	Dulbecco's modified Eagle's medium

DMSO	Dimethyl Sulfoxide
DNA	Deoxyribonucleic acid
DSC	Differential scanning calorimetry
ECM	Extracellular matrix
EDC	1-Ethyl-3-(3-dimethylaminopropyl)-1-carbodiimide hydrochloride
FBS	Fetal Bovine Serum
FTIR	Fourier transform infrared
G	Gelatin
GA	Gelatin-alginate
GAA	Glacial Acetic Acid
GelMA	Gelatin Methacryloyl
GO	Graphene oxide
GTA	Glutaraldehyde
H&E	Hematoxylin and eosin
H ₂ O ₂	Hydrogen peroxide
HA	Hydroxyapatite
Hz	Hertz
IFCC	International Federation of Clinical Chemistry
IU/L or U/L	International Units per litre
KPa	Kilo Pascal
LC	Luffa cylindrica
L-flakes	Luffa flakes
LiBr	Lithium bromide
L-mat	Luffa mat
L-powder	Luffa powder
mg/dL	Milligrams per decilitre
MG-63	Osteoblast cell-lines
mL/h	Millilitre per hour
MPa	Mega Pascal

MSC	Mesenchymal cells
MTT	(3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide)
MWCO	Molecular weight cut-off
NaOH	Sodium hydroxide
NCCS	National Centre for Cell Science
NHS	N-Hydroxysuccinimide
nm	Nanometre
OD	Optical density
PBS	Phosphate buffer saline
PCL	polycaprolactone
PDMS	Polydimethylsiloxane
P _E	Effective porosity
PEG	Polyethylene glycol
PGA	Poly(glycolic acid)
PH	Psyllium husk
P-L flakes	PDMS-Luffa flakes
P-L mat	PDMS-Luffa mat
P-L powder	PDMS-Luffa powder
PLA	Poly(lactic acid)
PLGA	Poly (lactic acid-co-glycolic acid)
PVA	polyvinyl alcohol
PVDF	polyvinylidene fluoride
Ra	Arithmetical mean deviation
RGD	Arginine-Glycine-Aspartate
R _p	Highest peak
rpm	Rotations per minute
R _q	Root means square roughness
RT	Room temperature
R _t	Total height of the profile

Rv	Lowest valley
SA	Surface area
Sa	Average roughness
SD	Standard deviation
SEM	Scanning electron microscopy
SFF	Solid Freeform Fabrication
Sp	Highest peak height
Sq	Root mean square roughness
SRL	Sisco Research Laboratories
St	Area peak to valley height
Sv	Maximum area valley depth
t	Time
TCP	Tissue culture polystyrene
TEBM	Tissue Engineering and Biomicrofluidics
TEOS	tetraethyl orthosilicate
Tg	Glass transition temperature
TGA	Thermogravimetric analysis
Tm	Melting temperature
TSS	Total suspended solids
UTM	Universal testing machine
V	Apparent volume
W_d	Dry weight
W_f	Final weights
W_i	Initial weight
W_w	Wet weight