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Name of student: \_\_\_\_\_ Regd. No. \_\_\_\_\_ Degree/discipline: \_\_\_\_\_

Title of thesis: \_\_\_\_\_

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1.	<b>Copy of Approved MPhil/PhD Synopsis</b> (signed by Postgraduate Office)	<input type="checkbox"/>	<input type="checkbox"/>		
2.	<b>Comprehensive Exam Pass Notification</b> (copy issued by controller office; only for PhD)	<input type="checkbox"/>	<input type="checkbox"/>		
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4.	<b>Supervisor's Approval Letter</b> (written confirmation for final thesis)	<input type="checkbox"/>	<input type="checkbox"/>		
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16.	<b>Thesis word count is within the prescribed range</b>	<input type="checkbox"/>	<input type="checkbox"/>		
17.	<b>(a) Word count</b> (excluding references & excluding Roman pages)	<table border="1"><tr><td style="width: 100px; height: 20px;"></td></tr><tr><td style="width: 100px; height: 20px;"></td></tr></table>			
	<b>(b) Word count</b> (including references & excluding Roman pages)				

I have written/prepared thesis according to the above guidelines/checklist. **Signature of student:** \_\_\_\_\_

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Muhammad Usman

MSc Physiology

2024

**Wheat (*Triticum aestivum* L.) Flour is the Source of  
Staple Food for Humans in this World**



**The  
University of  
Faisalabad**

**By**

**Muhammad Usman  
2022-MSPHY-004**

**Department of Physiology  
Faculty of Medicine & Allied Health Sciences  
The University of Faisalabad**

**Wheat (*Triticum aestivum* L.) Flour is the Source of Staple Food for Humans in this World** (18pt centered, title case, bold)

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16pt, centered



The  
University of  
Faisalabad

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space

By (16pt, centered, bold)

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space

**Muhammad Usman** (20pt centered, title case, bold)

**2022-MSPHY-004** (18pt centered, title case, bold)

Thesis Submitted in Partial Fulfilment of the  
Requirements for the Degree of (14pt centered, title case, bold)

space

**Master of Philosophy** (20pt centered, title case, bold)

in (16pt, bold)

**Physiology** (20pt centered, title case, bold)

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**Department of Physiology** (18pt centered, title case, bold)

**Faculty of Medicine & Allied Health Sciences** (18pt centered, title case, bold)

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\_\_\_\_\_. This thesis is submitted to the Department of  
\_\_\_\_\_ in partial fulfillment of the requirements for the degree  
of Doctor of Philosophy in the field of \_\_\_\_\_, Department of \_\_\_\_\_,  
University \_\_\_\_\_. (12pt justified, sentence case, normal font)

Student Name: \_\_\_\_\_

Signature: \_\_\_\_\_

**Examination Committee:** (14pt justified, justified, upper case, bold)

c) \_\_\_\_\_ (Supervisor name) Signature: \_\_\_\_\_

d) \_\_\_\_\_ Co-Supervisor name) Signature: \_\_\_\_\_

d) \_\_\_\_\_ (Member name) Signature: \_\_\_\_\_

e) \_\_\_\_\_ (Member name) Signature: \_\_\_\_\_

Head of Department/Chairman

Signature: \_\_\_\_\_

Dean, Faculty of \_\_\_\_\_

Signature: \_\_\_\_\_

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**Certificate of Ethical Approval** (16pt centered, title case, bold)

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(To be executed when the research is on animals or humans)

The certificate will be issued by the University Research Ethics Committee

(12pt justified, sentence case, bold)

**Dedication** (16pt centered, title case, bold)

Space (12pt)

**Acknowledgment** (16pt centered, title case, bold)

Space (12pt)

## Table of Contents (16pt centered, title case, bold)

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<b>Chapter</b>	<b>Title (14pt centered, title case, bold)</b>	<b>Page</b>
1	Introduction (12pt centered, title case, normal font)	1
2	Review of Literature	9
3	Materials and Methods	31
4	Results and Discussion	41
5	Summary	61
	Literature Cited	63
	Appendices (optional)	91

## List of Figures (16pt centered, title case, bold)

Space (12pt)

<b>Figure No.</b>	<b>Title</b> (14pt centered, title case, bold)	<b>Page</b>
2.6.2	Anatomy of human skin (12pt justified, sentence case, normal font)	1

**List of Tables** (16pt centered, title case, bold)

Space (12pt)

<b>Table No.</b>	<b>Title</b> (14pt centered, title case, bold)	<b>Page</b>
2.1	Taxonomical classification of <i>Citrus chinensis</i> (12pt justified, sentence case, normal font)	1

## **List of Abbreviations** (16pt centered, title case, bold)

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<b>Abbreviations</b>	<b>Meaning</b> (14pt centered, title case, bold)
NPs	Nanoparticles
AgNPs	Silver Nanoparticles
UVA	Ultra violet A

## **Abstract** (16pt centered, title case, bold)

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0.5"tab The present-day study focuses on the development and characterization of polymeric nanoparticles encapsulating *Citrus lemon* extract, aimed at enhancing its stability, bioavailability, and therapeutic potential. *Citrus lemon* extract, opulent in biologically active substances for example flavonoids, vitamin C & phenolic, possesses significant antioxidant, anti-infective and anti-inflammatory action. However, its clinical application is limited by poor solubility and degradation under environmental conditions. To overcome these challenges, biocompatible and biodegradable polymers, such as chitosan was employed to formulate nanoparticles using the Nano precipitation technique. The resulting nanoparticles were categorized for size of particles, zeta potential, polydispersity index (PDI), encapsulation efficiency, and morphology using procedures such as scanning electron microscopy (SEM) and Fourier-transform infrared spectroscopy (FTIR). The nanoparticles exhibited a uniform size distribution (100–200 nm), electro positivity and high loading efficiency indicating successful incorporation of the *Citrus lemon* extract. The antioxidant and antimicrobial assays confirmed the retained bioactivity of the encapsulated extract. These findings suggest that polymeric nanoparticles are a promising delivery system for *Citrus lemon* extract, with potential applications in pharmaceuticals, cosmetics and nutraceuticals formulations. (12pt justified, sentence case, without keywords, past tense, 200-250 words).

## Chapter 1 (16pt, left aligned, title case, bold)

### (16pt right aligned, title case, bold) Introduction

space

0.5"tab The previous years have seen an augmented progression in the arena of nanotechnology, and several items incorporating nanoparticles are being used in a diversity of applications, comprising food science, face paint, and medicines. Atoms with a single aspect between 1 -100 nano meters are called nanoparticles (NPs). Dependent on their magnitude and exterior functions NPs show a multiplicity of features. Because of their tiny size and huge surface area NPs are widely used in a range of fields, containing electronics, maquillages and both investigative and calming remedial solicitations (Missaoui et al., 2018, Bartholomew and Sinclair, 2022).

0.5"tab The dimensions to representation nanomaterial retaining methods with microscopic perseverance competencies for example scanning electron microscopy has subsidized to the augmented escalation and emergent attentiveness in nanotechnology (Jin et al., 2010). Studies concentrating on the hazards connected with NPs and nanotechnology. However, despite our growing exposure to NPs, research on NP application is taking precedence over knowledge about nanoparticles safety (Missaoui et al., 2018).

(12pt justified, normal font, sentence case, without subheadings, each paragraph should be tab-indented, sources must be properly cited, present tense, started with page 1, multiple in-text citations must presented chronologically throughout the draft e.g., (Wang et al., 2019; Zhang et al., 2025).

## **Chapter 2** (16pt left aligned, title case, bold)

### (16pt right aligned, title case, bold) **Review of Literature**

**Space** (12pt)

**0.5" tab** Herbal remedies were typically utilized in both developed and developing nations since they were considered natural and had no deleterious effects. **each paragraph should be tab-indented, past tense, sources must be properly cited)**

#### **2.1 History** (14pt justified, title case, bold)

**0.5" tab** Herbal remedies were typically utilized in both developed and developing nations since they were considered natural and had no deleterious effects. **(12pt justified, sentence case, normal font)**

##### **2.1.1 Geographical Distribution** (12pt justified, title case, bold)

**0.5" tab** Although it originated in North India, it is now grown in the America, Argentine Republic, Persia, Brasil, Italia, Espana, Mexico, Turkey and China. Around the world, *Citrus lemons* are utilized for both culinary and non-culinary uses. *Citrus lemons* are largely utilized for their juice which is extracted from the pulp (Figueira et al., 2020). **(12pt justified, sentence case, normal font)**

**0.5" tab** Although it originated in North India, it is now grown in the America, Argentine Republic, Persia, Brasil, Italia, Espana, Mexico, Turkey and China. Around the world, *Citrus lemons* are utilized for both culinary and non-culinary uses. *Citrus lemons* are largely utilized for their juice which is extracted from the pulp (Figueira et al., 2020). **(12pt justified, sentence case, normal font)**

##### **2.1.1.1 Geographical distribution** (12pt justified, Sentence case, bold)

**0.5" tab** Although it originated in North India, it is now grown in the America, Argentine Republic, Persia, Brasil, Italia, Espana, Mexico, Turkey and China. Around the world, *Citrus lemons* are utilized for both culinary and non-culinary uses. *Citrus lemons* are largely utilized for their juice which is extracted from the pulp (Figueira et al., 2020). **(12pt justified, title case, bold)**

## Chapter 3

(16pt right aligned, title case, bold) **Materials and Methods**

Space (12pt)

### **3.1 Materials (14pt, Title Case)**

#### **3.1.1 Soil and Chemical Analysis (12pt, Title Case)**

### **3.2. DPPH Method for Antioxidant Activity**

#### **3.2.1 Growth and Morphology (12pt, Title Case)**

##### **3.2.1.1 Root and shoot (12pt, Sentence Case)**

For format details see chapter 2, each paragraph should be tab-indented, past tense, each method must be properly cited)

## Chapter 4

(16pt right aligned, title case, bold) **Results and Discussion**

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For format details see chapter 2, each paragraph should be tab-indented, past tense

## Chapter 5

(16pt right aligned, title case, bold) **Summary**

Space (12pt)

For format details see chapter 2, each paragraph should be tab-indented,

## Literature Cited

(16pt centered, title case, bold, tab-indented)

space (12pt)

Gasek NS, Kuchel GA and Kirkland JL (2021) Strategies for targeting senescent cells in human disease. *Nature Aging* 1: 870–879. . (use en dash (–) hyphen)

Gavahian M and Yang YH (2022) Power ultrasound for valorization of *Citrus limon* (cv. Eureka) waste: Effects of maturity stage and drying method on bioactive compounds, antioxidant, and anti-diabetic activity. *Innovative Food Science & Emerging Technologies* 79: 103052. Scientific names italicized

For journal reference (12pt, justified):

Author name: without dots; et al. if authors exceed three,

Year: in parenthesis

Paper title: normal case

Journal name: full, title case and italicized

Crouch C, Le Gales P and Trigilia C (2001) *Local Production Systems in Europe: Rise or Demise?*, 1st edn. Oxford: Oxford University Press.

For journal reference writing (12pt, justified, normal font):

Author name: without dots; et al. if authors exceed three

Year: in parenthesis

Book title: title case, italicized. City of publisher: Publisher name.

**All in-text citations must be crossmatched with the reference list**

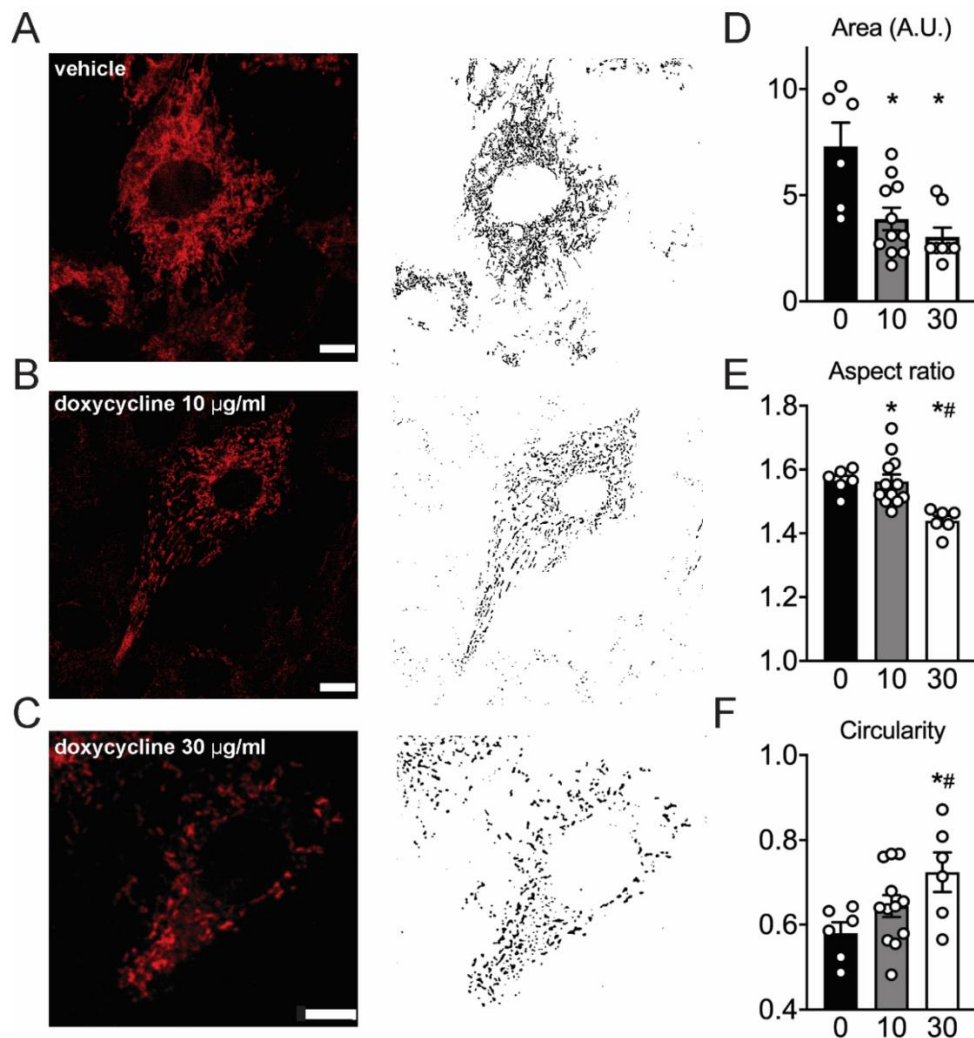


Figure Centered, Times New Romans

Figure 1: Mitochondria appear more fragmented in doxycycline-treated H9C2 cells. (A–C), representative H9C2 cells loaded with TMRM with corresponding masks for quantification. (D–F), Mitochondria in doxycycline-treated H9C2 cells appeared more fragmented, were smaller, had lower aspect ratios and higher circularity compared to vehicle. Values are median (area and aspect ratio) or 25% percentile values (circularity) because of non-normal distribution.  $n = 5–12$  independent samples per group on four different days. Error bars are SEM. Scale bar: 10  $\mu\text{M}$ . \*:  $p < 0.05$  vs. vehicle; #:  $p < 0.05$  vs. 10  $\mu\text{g/mL}$  doxycycline, one-way ANOVA followed by Tukey’s post-hoc test for multiple comparisons. (Caption 12pt justified, Sentence case. Properly cited intext. All figures and their captions must be clear and self-explanatory, properly cited, insert figures in relevant sections, cite source if figure is not self-drawn)

**Annexure-8**

Table 1: Antimicrobial groups based on their mode of action obtained from rat treated with treated water in laboratory experiments (12pt justified, sentence case. Properly cited in text. Insert in relevant sections, all tables and their captions must be clear and self-explanatory, Cite source if table is not self-drawn.)

No.	Mode of Action	Antimicrobial Groups
1.	Cell wall synthesis inhibitor	$\beta\beta$ -lactams: Penicillin, Cephalosporins, monobactams, carbapenems Glycopeptides: Vancomycin
2.	Depolarization of cell membrane	Lipopeptide
3.	Protein synthesis inhibitors	Bind to 30 s ribosomal subunit: <ul style="list-style-type: none"><li>• Aminoglycosides</li><li>• Tetracyclines</li></ul> Bind to 50 s ribosomal subunit: <ul style="list-style-type: none"><li>• Macrolides</li><li>• Chloramphenicol</li><li>• Lincosamides</li></ul>
4.	Nucleic acid synthesis inhibitor	Quinolones, Fluoroquinolones
5.	Inhibitors of metabolic pathways	Sulfonamides, Trimethoprim

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