

# Muhammad Raza

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Lahore, Punjab, Pakistan.

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## EDUCATION

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**Biochemistry, Master of Philosophy (MPhil)** CGPA: 3.76/4.00

February 2016- November 2018

University of Lahore (UOL), Lahore, Pakistan. ([www.uol.edu.pk](http://www.uol.edu.pk))

**Biochemistry, Bachelor of Science BS (Hons)** CGPA: 3.44/4.00

February 2011- July 2015

University of Lahore (UOL), Lahore, Pakistan. ([www.uol.edu.pk](http://www.uol.edu.pk))

**FSc Pre Medical** Marks: 632/1100

May 2007-July 2010

Board of Intermediate and secondary education (BISE) Lahore, Pakistan.

**Secondary School Certificate (Matric)** Marks: 620/850

April 2005-August 2007

Government central model school, Rattigan Road Lahore, Pakistan.

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## RESEARCH PROJECTS & PUBLICATION

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### MS Research Project

**Title:** Cloning and recombinant expression of thermostable laccase enzyme in *Escherichia coli*.

**Problem Statement:** Cloning and recombinant expression and optimization of thermostable laccase enzyme in *Escherichia coli* in short period of time.

### Abstract:

Laccase is an enzyme that had the ability to accelerate a chemical reaction. It relates to that specific class of enzymes that have naturally produced reactive radical enzymes that are beneficial not only for biological reactions as well as used for commercial purposes in various chemical and biotechnological industries. Laccases are not only present in bacteria but also found in different species of fungi and plants. They had various industrial uses including detoxification of industrial effluents, cosmetic industries, pulp or paper industry as well as medical applications as a diagnostic tool in various laboratories, anti-cancer drugs as well as in water purification mechanisms. The purpose of this present study is the determination of recombinant formation in *E-coli* and optimization of the laccase parameters in order to check the expression of the laccase enzyme in a maximum possible shorter period of time. The production of recombinant laccase enzyme initially on lab scale level and expression analysis of the recombinant enzyme. *Clostridium thermocellum* will be considered a source of the laccase gene. The *Escherichia coli* and BL21 will be used for cloning and vector propagation and expression of recombinant laccase enzyme will be observed in *Escherichia coli*. Primers will be designed by retrieving the gene sequence from NCBI databases and will be designed through the software of Primer-3 input (v. 0.4.0) by cds region. Restriction enzymes will be selected by using the NEB cutter (V2.0) tool. DNA will be isolated by the DNA kit method and will be confirmed via 1% agarose gel electrophoresis. DNA isolation will be followed by PCR amplification and its confirmation on 1% agarose gel. Purified laccase genes F1 and F2 will be cloned in expression vector pET22b (+). The double digestion restriction (F1) was done by *NdeI* and *XhoI* and (F2) restriction digestion was done by *NcoI* and *XhoI*.

Shake flask fermentation will be done by inducing the cells with lactose and IPTG as inducers in LB media and their expression will be analyzed with 12% SDS-PAGE. During the present study, the effects of influential parameters on the kinetics of the laccase enzyme were also studied. The optimization and the reaction kinetics were done by using different substrates like as the IPTG, lactose induction, and autoinduction.

### **BS Research Project**

**Title:** Correlation between estimated serums ALK-P in newly diagnosed hyperthyroid patients, Mayo Hospital, Lahore, Pakistan.

**Link of Paper:** (<https://identifier.visnav.in/1.0001/iacbs-21j-21005/>).

**Problem Statement:** Correlation between estimated serums ALK-P in newly diagnosed hyperthyroid patients, Mayo Hospital, Lahore, Pakistan.

**Abstract:** Thyroid hormones significantly affect the proper growth, development and functioning of liver. It has been seen that the drugs indicated for thyroid abnormalities also cause troubles in liver function. Aim of this study was to check the effect of thyroid abnormality on liver function. Patients were recruited from Center of Nuclear Medicine and examined for their thyroid status and also their liver function was checked. The results appeared with statistical analysis show that there is a strong correlation between disturbed function of thyroid gland and liver function. A variation in thyroid function brings change in liver functioning. While treating thyroid patients, combination therapy must be recommended to effectively treat the associated disorder and increasing the social and psychological status of the patient. Furthermore, patients coming with thyroid dysfunction must also be examined for liver abnormalities so that culprit cause of this thyroid abnormality could be treated from the root if present.

### **Review Paper Publication**

**Title:** A systematic review and meta-analysis on SARS-COVID-2, its molecular virology, transmission and sero-prevalence worldwide.

**Link of Paper:** (<https://identifier.visnav.in/1.0001/iacbs-21j-19004/>).

**Problem Statement:** A systematic review and meta-analysis on SARS-COVID-2, its molecular virology, transmission and sero-prevalence worldwide.

**Abstract:** In Wuhan, China (2019), an immediate flare-up of corona virus occurred in the human body to introduce a mortal corona virus which not only affects the human health system, but also affect the global economic approach of the world. The virus is the single-chain of positive sensation of RNA that has structural and non-structural proteins. The ACE2 receptor is bound by SARS-CoV-2 in human cells and has its polymerase RNA. While we have seen a big leap in our understanding of corona viruses after two precedents, there are still a few successful methods of treatment and epidemiological surveillance are both important. The corona virus is spreading on a fearful revealing the world that covered the 200 countries in the universe. Current epidemiological and clinical evidences from early Wuhan studies was updated to highlight a range of SARS-CoV-2 features, which differentiate greater fluctuation between the SARS-CoV and the MERS virus of the Middle East (MERS) have been named by the World Health Organization (WHO). The latest clinical trial of the Covid-19 pandemic is systematized. Although studies are currently being performed on different vaccines for the genome of SARS-CoV-2 and therapeutic antibodies, this is a more long-term approach, because it requires a comprehensive safety check.

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## **CONFERENCES**

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1. Health awareness conference, Society of emerging sciences, University of Lahore, (2018).
2. Internship and complete research project in “Center of research in Nuclear medicine” (CENUM) under the supervision of Dr. Shan Elahi (2014).
3. Internship in Punjab Institute of Cardiology (PIC) learns the basic techniques of biochemistry and perform biochemical test related to CVD (2013).
4. Learn short course of driving under the Motorway driving police school, babusabu interchange, Lahore.

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## **PROFESSIONAL EXPERIENCE**

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1. Lecturer Biochemistry Afro Asian Institute affiliated with Government College University, Faisalabad (GCUF). **(May 2021 to Present)**
2. Tutorship Allama Iqbal Open University (AIU). **(Nov 2019 to Present)**
3. Excellence science and commerce academy. **(Mar 2016 to Present)**
4. City District Government boys high school. **(Jan2014 to March 2018)**

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## **SCIENTIFIC TECHNIQUES**

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Use the followed instruments and techniques in university laboratory.

1. DNA/RNA extraction.
2. Primer designing using different bioinformatics tools.
3. Molecular cloning.
4. Polymerase Chain reaction (PCR).
5. SDS-PAGE (polyacrylamide gel electrophoresis).
6. Gel-Electrophoresis.
7. Microbiology techniques (media preparation, Inoculating agar plate, colony count, gram staining).
8. Estimation of FT4, FT3 and TSH by radioimmunoassay (RIA).
9. TSH estimation by IRMA techniques.
10. Estimation of serum TPO-Ab titer using ELISA (Enzyme linked immunosorbent assay).

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## **COMPUTING SKILLS**

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1. Competent with most Microsoft Office programs (especially in MS-Word, MS-Excel, MS-PowerPoint) of all versions (97-2003, 2007 and 2022).
2. Scientific bioinformatics tools like BLAST, FASTA.

3. Competent with most Statistical Analysis tools like as Means, Standard Deviations (SD), Standard Error of Means (SEMs) and P-values of study parameters, ANOVA.

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## EXTRA CO-CURRICULAR ACTIVITIES AND ONLINE COURSES

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1. Online certifications of COVID-19: Tackling the novel corona virus. Instructors, Dr. Anna Seale (Associate Professor), Wellcome Trust Career Development Fellow and Deputy Director for Research for the UK Public Health Rapid Support Team, **London School of Hygiene and Tropical Medicine**.
2. Online certifications of bacterial genomes: Antimicrobial resistance in bacterial pathogens by Future Learn. Instructors, Dr. Rebecca Twells (Head of Wellcome Genome Campus Advanced Courses and Scientific Conferences) and Beth Blane (Research Assistant), **University of Cambridge**.
3. Online certifications of COVID-19 Training for healthcare workers by Coursera, Instructors Professor, S.V.Mahadevan and Matthew Strehlow (Associate Professor) **Stanford University**
4. Online certifications of Introduction to the Biology of Cancer by Coursera Instructors, Kenneth J. Pienta, M.D. (The Donald S. Coffey Professor of Urology) **Johns Hopkins University**,.
5. Online certifications of Stanford Introduction to Food and Health by Coursera Instructors, Maya Adam, MD. **Stanford University**,
6. Online certifications of Free Lancing by DigiSkills **Virtual University**.
7. Online certifications of Creative writing by DigiSkills **Virtual University**.

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## AMAL CAREER-PREP FELLOWSHIP

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A three month (**July 2020-Oct 2020**) fellowship focusing on career and professional development affiliated with (**Stanford University**) worked as a Team Leader.

1. Team work.
2. Self-improvement.
3. Time management.

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## LANGUAGE SKILLS

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1. Native language: Urdu.
2. Other languages: English, Punjabi.
3. Language of instruction is English for the whole period of studies.