

**Interaction Network Design for the Target Assessment
of Clinically Significant Drugs Repurposed Against the
COVID-19 Disease**



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2021

**Interaction Network Design for the Target Assessment of
Clinically Significant Drugs Repurposed Against the COVID-19
Disease**

A thesis submitted in partial fulfilment of the requirement for the degree of

Master of Science

In

Industrial Biotechnology

By

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THESIS ACCEPTANCE CERTIFICATE

Certified that the contents and form of MS/MPhil thesis entitled “**Interaction Network Design for the Target Assessment of Clinically Significant Drugs Repurposed Against the COVID-19 Disease**” written by Ms. Iqra Noor, Registration No. 00000317874, of Atta-ur-Rahman School of Applied Biosciences has been vetted by the undersigned, found complete in all respects as per NUST statutes/ regulations, is free of plagiarism, errors and mistakes and is accepted as partial fulfillment for award of MS/MPhil Degree. It is further certified that necessary amendments as pointed out by GEC members of the scholar have also been incorporated in the said thesis, have been found satisfactory for the requirement of the degree.

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Dedicated to

*All the kind souls that restore my faith in
humanity*

ACKNOWLEDGEMENTS

In the name of **Allah**, the most beneficent and the most merciful. All praises to Almighty Allah for giving me opportunity, determination, and strength to do my research and thesis.

I would like to express my deepest gratitude to my supervisor, **Dr. Saadia Andleeb**, whose sincerity and encouragement I will never forget. Dr. Saadia has been an inspiration as I hurdled through the path of this Master's degree. She is the true definition of a leader and the ultimate role model. This thesis would not have been possible without Dr. Saadia, whose guidance from the initial step in research enabled me to develop an understanding of the subject. I am thankful for the extraordinary experiences she arranged for me and for providing opportunities for me to grow professionally. It has been an honor to learn from Dr. Saadia Andleeb.

Thank you to my GEC members, **Dr. Abdur Rahman**, **Dr. Najam us Sahar Sadaf Zaidi**, and external examiner **Dr. Bashir Ahmad**. Their encouraging words and thoughtful, detailed feedback have been very important to me. I am also thankful to **Dr. Hussnain Ahmed Janjua**, Principal ASAB NUST for his valuable guidelines and facilitation.

For every achievement in life, I always must share the credit with one person and that is my **Mother**, she is my comfort place. Also, I am grateful for my parents, **Dilshad Zaheer** and **Sardar Zaheer Mohabbat (Late)**, whose constant love and support keep me motivated and confident. My accomplishments and success are because they believed in me. You have always stood behind me, and this was no exception. Thank you to my siblings, **Hifza Noor**, **Isbah Noor**, and **Mohammad Arslan Zaheer** for your endless support.

Deepest thanks to my best friends, **Ayesha Rafique** and **Hayeqa Shahwar Awan** who keep me grounded, remind me of what is important in life, and are always supportive of my adventures. I have been blessed to have come across some amazing people in my life. I would like to thank my senior **Sidra Irum** who has been such a moral support and gave me a sense of motivation to keep going every time I would fall short of it. Life would not have been fun without the wittiness of my friends, **Aeraj Amjad**, **Ayesha Gul**, and **Hafsa Raja**. They lightened up my mood after every encounter of stress. Thank you to my friends, **Shabana Gul**, **Saba Talib**, **Shaheer Shafiq**, **Afraz Saeed**, and **Mohammad Nauman Sharif**. My gratitude to my special friend **Tehreem Nadeem** for being such a sweet friend. I cannot forget to thank my amazing friend **Andleeb Khizar** who has grown really close to my heart in such a limited time.

My sincerest thanks to my lab fellows **Aeraj Amjad**, **Mariam Mumtaz**, **Maryam Shahid**, **Andleeb Khizar**, **Bakhtawar Nawaz**, **Sadia Masood**, **Saba Jahan**, and **Nauman Khaliq** for being supportive and cooperative throughout my research. Thank you to each and every one of my friends for remaining true to me.

Iqra Noor

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List of Abbreviations

PECAM1 - Platelet Endothelial Cell Adhesion Molecule

GAB1 - GRB2 Associated Binding Protein1

TIE2 - Angiopoietin-1 Receptor

NICD - Notch1 Intracellular Domain

TAT - Trans-Activator of Transcription

AMPK - AMP-Activated Protein Kinase

TLR4 - Toll-Like Receptor 4

AP1 - Activating Protein 1

CD28 - Cluster of Differentiation 28

VAV1 - Vav Guanine Nucleotide Exchange Factor 1

SOS - Son of Sevenless - Guanine Nucleotide Exchange Factor

PI3K - Phosphoinositide 3-Kinases

AKT - Protein Kinase B

FGFR - Fibroblast Growth Factor Receptor

CCT TRIC - Chaperonin containing Tailless Complex Polypeptide 1 or Tailless Complex Polypeptide 1 Ring Complex

NUMA - Protein of the Nucleus and Mitotic Apparatus

MTOC - Microtubule Organizing Center

JAKs - Janus Kinases

STATs - Signal Transducer and Activator of Transcription Proteins

ERK1/2 - Extracellular Signal-Regulated Kinases

CCR - CC-Chemokine Receptor-1

GTPases - GTP-Binding Proteins

HIV - Human Immunodeficiency Virus

ZAP70 - Zeta-Associated Protein 70

G ALPHA I - Gi Protein Alpha Subunit

CTLA4 - Cytotoxic T-Lymphocyte-Associated Protein 4

BH3 only proteins - Bcl2 Homology 3 (pro-apoptotic member of the Bcl-2 protein family)

SUMO - Small Ubiquitin-Related Modifier

UDP - Uridine 5'-Diphospho Glucuronosyltransferase (UGT)

NSAID - Nonsteroidal Anti-inflammatory Drug

COX - Cyclooxygenase

TOR - Target of Rapamycin

G1/S phase - G1 (GAP 1 - Cell Growth), S (Synthesis of DNA)

MTORC1 - MTOR Complex 1

MTOR - Mammalian Target of Rapamycin

ERBB - The Epidermal Growth Factor Receptor Family (EGFR) of Receptor Tyrosine Kinases (RTKs)

Fc Receptor - Fragment Crystallizable

Ras - Rat Sarcoma

Rho - Ras Homologous (Ras superfamily of small GTPases)

PD1 - Programmed Cell Death Protein 1

SYK - Spleen Tyrosine Kinase

NS5A - Nonstructural Protein 5A

HIF-1 - Hypoxia-inducible Factor 1