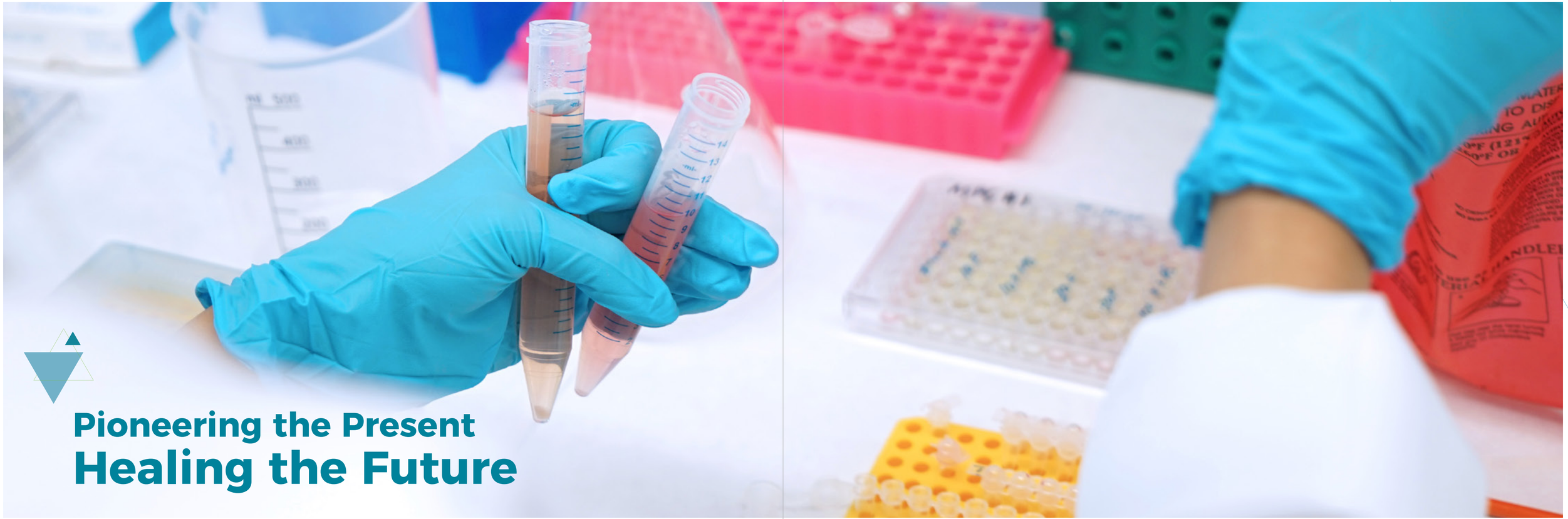
مؤسسة الجليلة
AL JALILA FOUNDATION

مركز محمد بن راشد للأبحاث الطبية
Mohammed Bin Rashid Medical Research Institute

Today's Investments
Tomorrow's Cures
Research Grants Portfolio 2020



Pioneering the Present
Healing the Future

We are building a new reality for our people, a new future for our children, and a new model of development.”

His Highness Sheikh Mohammed Bin Rashid Al Maktoum
Vice-President and Prime Minister of the UAE and Ruler of Dubai

Unlocking medical solutions, transforming lives

As the UAE looks toward the next 50 years we are inspired by the great strides we are taking in medical innovation and the advancement of science. It is hard to believe that less than a century ago, we did not have cures for diseases like tuberculosis and polio. It seemed impossible to imagine that entire continents could eradicate epidemics with a vaccine. Over the years medical discoveries have translated into improved treatment protocols and therapies. And, with each new breakthrough, a new sense of hope emerges. It is thanks to pioneering research that these medical wonders are made possible.

In 2020 medical research took centre stage as the world grappled with the coronavirus pandemic proving that there has never been a greater need for life-saving treatment and medical breakthroughs. Al Jalila Foundation remained steadfast in supporting the government's efforts to protect human life and in response to the global COVID-19 outbreak expanded its research portfolio to address the coronavirus disease.

In August 2020, we witnessed with great pride His Highness Sheikh Mohammed Bin Rashid Al Maktoum, Vice-President and Prime Minister of the United Arab Emirates and Ruler of Dubai, inaugurate the Mohammed Bin Rashid Medical Research Institute, a AED 300 million multi-disciplinary research centre established by Al Jalila Foundation to be a beacon of hope for the UAE and the Arab region. The UAE's first independent multi-disciplinary medical research institute aims to bring together leading local and international scientists to work together to discover solutions for the region's biggest health challenges: cancer, cardiovascular disease, diabetes, obesity, mental health and viral diseases.

Our priority at Al Jalila Foundation is to create opportunities to increase innovative and impactful research in the UAE to realise our vision to be at the forefront of global medical innovation. Since inception, we have invested AED 28 million to support 100 research projects and eight international fellowships at leading institutions around the world.

At a time when the world is racing to find solutions for eradicating the virus, well-funded research efforts are critical in combating the disease. These research awards are testament to our commitment to adapting to the changing needs of the medical landscape to ensure the health and safety of our people. By supporting talented scientists and investing in research, we are developing the next generation of innovators in health sciences and paving the way for medical breakthroughs.

We are proud to work with the nation's most brilliant scientists and it gives me immense pride to present our latest research grants portfolio with an overview of the projects we have funded to date. My team and I would like to thank our Board of Trustees, Board of Directors and Scientific Advisory Committee for their continued foresight; each one of our grant recipients and fellows for their dedication to biomedical research; and, we cannot forget, our donors that make it possible for us to continue to break the boundaries of science to transform patients' lives.

Dr Abdulkareem Sultan Al Olama
Chief Executive Officer
Member of the Board of Directors
Al Jalila Foundation

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Sheikh Mohammed inaugurates the Mohammed Bin Rashid Medical Research Institute, the UAE's first independent biomedical research centre

His Highness Sheikh Mohammed bin Rashid Al Maktoum toured the AED 300 million facility and met a group of scientists who presented their research projects.

Medical research is an integral part of prevention and medical security in the UAE. Supporting research helps ensure sustainable economic, social and human development to respond to the health challenges facing mankind. Scientific research is key to building a stable and prosperous future and the institute is an important addition to the global network of research institutions leading biomedical research in the world.

Ahmed bin Saeed recognises Al Jalila Foundation donors for significant contributions to medical research in the UAE

High Highness Sheikh Ahmed bin Saeed Al Maktoum, Chairperson of the Board of Trustees of Al Jalila Foundation, recognised the founding donors of Al Jalila Foundation in a VIP ceremony which unveiled their individual crystal of hope marking their significant contributions to the advancement of medical research in the UAE.

Al Jalila Foundation awards COVID-19 Research Grants to brilliant scientists in the UAE

His Highness Sheikh Mansoor bin Mohammed bin Rashid Al Maktoum, Chairman of Dubai's Supreme Committee of Crisis and Disaster Management, presented the research awards to UAE-based scientists studying the coronavirus in the areas of genetics, therapies and diagnosis to help enhance the UAE's capacity to address the pandemic and other viral diseases in the future.

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Overview of Research Grants
2014-2020

AED 28M
invested in local research

519
grant applications received

152
reviewers from 19 countries

100
grants awarded

25
nationalities

16
institutions

4
Emirates

321
publications in international journals

298
presentations at international conferences

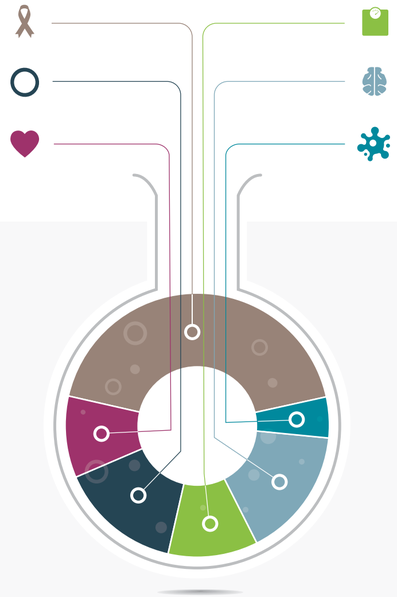
420
research training completed

61
PhD/Master's Thesis

103
Principal Investigators

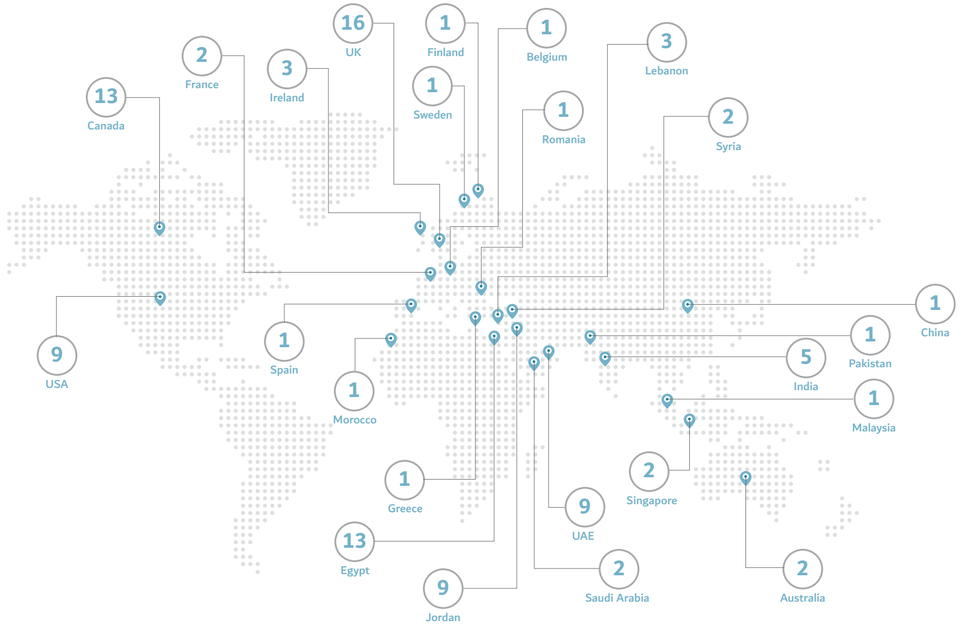
285
Co-investigators

Research Grants Funded by Theme 2014-2020

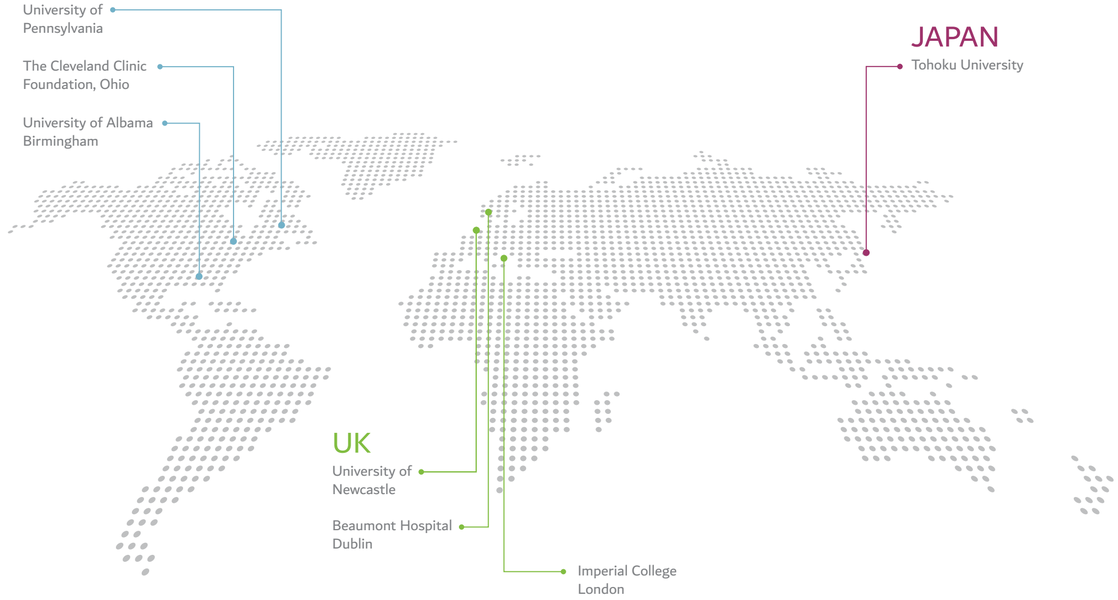


	Number	AED (M)
Cancer	43	11.80
Cardiovascular Disease	10	2.80
Diabetes	15	4.05
Obesity	11	3.10
Mental Health	16	3.31
COVID-19	5	2.50
TOTAL	100	27.56

Research Grants Recipients by Nationality 2014-2020



Research Fellowships
2014-2020



Institutions Funded
2014-2020

1. Abu Dhabi University
2. Al Jalila Children's Speciality Hospital
3. Al Ain University
4. American University of Sharjah
5. Dubai Health Authority
6. Dubai Hospital
7. Gulf Medical University
8. Khalifa University of Science, Technology and Research
9. Latifa Hospital
10. Mediclinic City Hospital
11. Mohamed Bin Rashid University of Medicine and Health Sciences
12. New York University Abu Dhabi
13. University of Sharjah
14. United Arab Emirates University
15. Zayed University

Overview of COVID-19
Research Grants

Dr Farah Mustafa

BS (Hon.), PhD
Associate Professor of Biochemistry
College of Medicine and Health Sciences
United Arab Emirates University

Research Theme

COVID-19 (Diagnosis)

Project Title

COVID-19 Biomarkers: Characterization of microRNAs induced during different stages of clinical disease for better prognosis and development of novel RNA-based therapies against COVID-19.

This project envisions to characterize microRNA (miRNA)-based biomarkers for COVID-19. Biomarkers can help physicians predict which patients will develop more severe form of the disease from those that will recover after a mild episode. Although ~85% of infected people experience asymptomatic to moderate disease, ~15% experience acute respiratory distress, potentially leading to death. The elderly, people with comorbidities such as diabetes and cardiovascular diseases, and those with compromised immunity are more likely to contract the severe disease.

However, with the evolving pandemic, the profile of people at risk of severe disease has become murkier, with younger and healthier people without any comorbidities also succumbing to severe disease and death. Currently, biomarkers for COVID-19 do not exist, making it difficult to determine who are the vulnerable people in the population. This study aims to characterize miRNAs expressed in patients during disease progression to allow clinicians to develop disease prognosis and patient management protocols. Such biomarkers can lead to the development of new anti-miRNA-based therapeutic agents against COVID-19, making this study of dual importance to both the medical and scientific communities.

Professor Rabih Halwani

BS, MS, PhD
Professor
College of Medicine
University of Sharjah

Research Theme

COVID-19 (Genetics)

Project Title

Determining inborn errors of immunity associated with life-threatening SARS-CoV-2 infections in previously healthy young individuals.

There is stunning inter-individual variability among individuals infected with COVID-19, ranging from asymptomatic infection to severe lethal disease. Although patients with severe disease were mostly elderly or patients with comorbidities, a good proportion of otherwise healthy, young people developed severe symptoms. The reason behind that is not known. In this context, we hypothesize that life-threatening COVID-19 in young previously healthy individuals can be caused by monogenic inborn errors of immunity (IEIs).

Whole exome sequences of young patients with severe COVID-19 will be analysed for candidate disease-causing variants using a cutting-edge strategy. We will then perform in-depth functional studies to decipher the molecular, cellular, and immunological mechanisms by which they actually predispose to severe disease. This is specifically important in countries with high consanguinity, like the gulf area including UAE, where the rate of inborn errors of immunity are expected to be higher. This information will guide the genetic diagnosis and counselling, while paving the way to design preventive and therapeutic strategies including anti-viral drugs and vaccines.

Dr Ahmad Abou Tayoun

PhD, DABMGG
Director
Al Jalila Genomics Center
Al Jalila Children's Specialty Hospital
Associate Professor of Genetics
Mohammed Bin Rashid University of Medicine
and Health Sciences

Research Theme

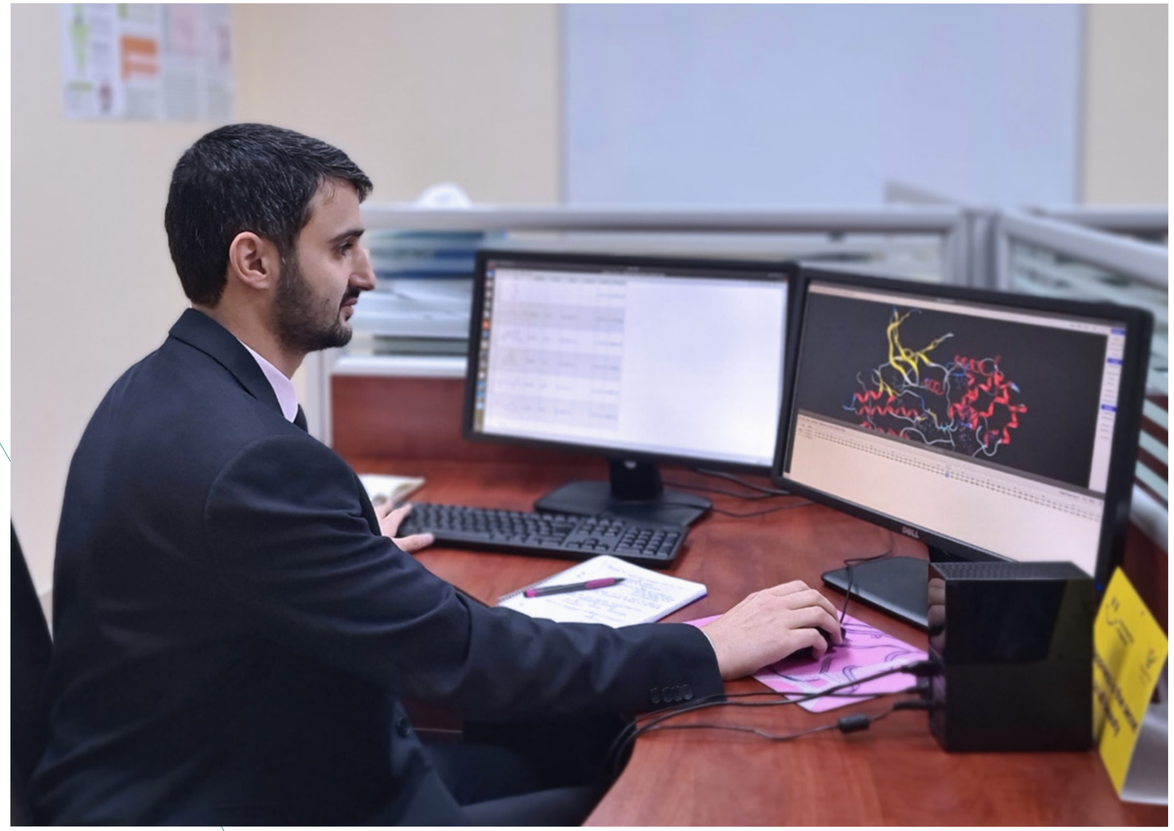
COVID-19 (Genetics)

Project Title

Genetics of COVID-19 in children and young adults in the UAE.

Several risk factors, including age, sex and underlying health conditions, have already been shown to modify clinical outcomes in COVID-19 patients. However, additional, yet-to-be discovered, risk factors are also very likely to contribute to COVID-19 clinical outcomes. There is evolving body of knowledge suggesting that host variables, mainly genetic factors, controlling the immune system and host-virus interactions could contribute to COVID-19 etiology.

We hypothesize that severe presentations in young, healthy patients are more likely to be due to highly penetrant genetic factors. Our study is therefore designed to characterize those genetic factors predisposing to severe COVID-19 outcomes in this young patient population. We will perform whole exome on blood samples from young patients to identify strong genetic risk factors associated with severe COVID-19 outcomes. We will then perform whole transcriptome sequencing to functionally characterize the molecular pathway(s) possibly associated with the faulty genetic errors in those patients. Additionally, we will conduct targeted functional analysis of novel genes and/or variants using CRISPR-CAS gene editing technology.



Dr Mohammad Ghattas

Bpharm, PhD
Associate Professor
College of Pharmacy
Al Ain University

Research Theme

COVID-19 (Therapies)

Project Title

Targeting the SARS-CoV-2 main protease enzyme (Mpro) via druglike inhibitors as potential treatment of COVID-19.

COVID-19 is a disease that is caused by sever acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and it has been declared as a pandemic by the World Health Organization (WHO) in March 2020. It is widely believed that vaccination would not be enough to fully control the situation and hence finding new therapies seems to be a priority worldwide. Thus, the aim of this study is to target the main protease (Mpro) enzyme of the SARS-CoV-2 virus that plays an essential role in the infectious process. Structure-based drug design approaches will be utilized in this project as the crystal structure of the target enzyme has been already revealed in March 2019.

Consequently, millions of ligands will be virtually screened against the target enzyme via using advanced computational methods such as docking, pharmacophore modelling and MD simulations. Consequently, compounds showing favorable binding energies and binding patterns to the protease enzyme will be tested experimentally for their inhibition activity. These potential inhibitors can act as a starting point for further studies to pave way for the discovery of new antiviral drugs for SARS-CoV-2..

Professor Taleb H Al-Tel

BSc, MSc, PhD
Professor and Director
Sharjah Institute for Medical Research
College of Pharmacy
University of Sharjah

Research Theme

COVID-19 (Therapies)

Project Title

Development of Novel Therapeutics for the Treatment of COVID-19: Targeting the SARS-CoV-2 Protease, Spike RBD protein and RNAdependent RNA polymerase Enzyme.

The genome of SARS-CoV-2 translates non-structural proteins [SARS-CoV-2 Mpro (main protease), RNA-dependent RNA polymerase (RdRp)], structural proteins (spike glycoprotein), and other accessory proteins. The non-structural proteins play a key role during the virus's life cycle, and spike glycoprotein is necessary for the interactions of the virus with the host cell receptors during viral entry. These were recognized as promising targets for the development of broad-spectrum antiviral therapeutic agents.

Thus, drugs targeting these proteins are usually capable of preventing the replication and proliferation of the virus and display broad-spectrum antiviral activity. In addition, dual drug targeting of these enzymes, represents a novel approach that can reduce the risk of mutation-mediated drug resistance in current and future emerging deadly strains. Thus, in collaboration with our colleagues at Harvard University and MIT, we have screened our compound libraries using in silico molecular modeling against SARS-CoV-2 drug targets and identified several lead compounds with unique chemical structures that bind and inhibit two key enzymes required for viral replication, namely the Proteases and RNA dependent RNA polymerase. Therefore, our research aims at translating these findings to develop novel molecules to combat COVID-19.

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Unravelling Medical Mysteries
Transforming Lives