



جامعة الفيصل  
Alfaisal University

مكتب البحوث والابتكار  
Office of Research & Innovation



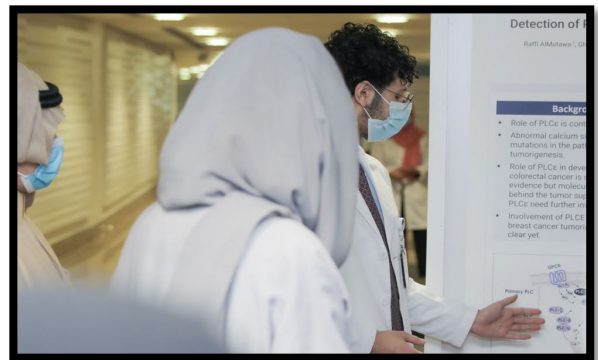
# STUDENT & FACULTY RESEARCH AWARDS

# 2022

Office of Research & Innovation

Version 27 September 2022/fs/bc/ss/mg

# Achievements by Students



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## ***Preface***

The success of the Annual Research Day Student Poster Competition would not have been possible without the assistance of the wider university community. Special thanks go out to Eng. Malek and staff of the Facility Department, to Mrs. Safia Dart and members of the Marketing and Public Relations Department, to Dr Abd-Elhamid Taha and staff of the Office of Research & Innovation, to Dr Rajaa Fakhoury and members of the Graduate School, to Dr Gada (Diana) Korayim and staff of the Alfaisal Center for Research & Consultancy Studies, to Mr. Syed Shah and the staff of IT Services, and to Mr. Musaad Al-Misfer and the Finance Department.

This event could not have been held without the help and dedication of all faculty from the Colleges of Business, Engineering, Law and International Relations, Medicine, Pharmacy, and Science & General Studies who served as Judges in this annual competition by contributing their valuable time. A special thanks go out to all students both undergraduate and graduate who took part in this exciting annual event.

Finally, we wish to acknowledge the senior university administration, Dr Mohammed Alhayaza, Dr Maha AlSaud, Dr Khaled Al-Kattan and Dr Yousef Alyousef as well the college deans for supporting the competition.

*Faizah AlShehri*

*Benrulph Corvera*

*Sawsan Sumeir*

*Mattheus Goosen*

*Alfaisal University*

*Riyadh, Saudi Arabia*

*2022*

# 1. Introduction

The “Research Day” is held annually to strengthen the vision that research is indeed one of the missions of Alfaisal University. Over the past decade the judging process has evolved from a few judges from diverse departments judging 20 or 30 undergraduate posters from different scientific areas as a group. There were initially 3 or 4 mixed judging groups each looking after 10-20 posters. By 2022 this had increased to 15 judging groups each looking after about 15 posters in specific areas: Business, Management & Law, Science & Humanities, Engineering & Technology, and Medicine, Pharmacy & Health Science. The submissions included both undergraduate and graduate posters.

In 2021 due to the COVID 19 Pandemic, the venue was modified. Rather than having the competition in one large room, it was moved to the 1<sup>st</sup> floor hallways with the posters separated by at least 15 feet. The posters were left up for one month to allow other students, faculty, and staff to view them.

## 2. Annual Research Day Student Poster Competition

### 2.1. Scope and Aims

One of Alfaisal University’s priorities is competence building by helping to develop a student’s intellectual abilities through involvement in focused research that address strategic problems of concern to the country and the region. The “Research Day” was held annually to strengthen the vision that research was indeed one of the missions of Alfaisal University. Students presented their summer research activities/ proposals/ future programs (<https://research.alfaisal.edu/poster-comp>). All posters had to be physically posted in the Venue.

Students could submit a research paper in one of the following categories:

- Business, Management & Law
- Engineering & Technology
- Medicine, Pharmacy & Health Science
- Science & Humanities

Any undergraduate or graduate student currently enrolled at a university was eligible to participate

### 2.2. Growth in Applications over Past Decade: Historical Perspective

The annual competition has been a great success in terms of numbers of posters participating. In 2010, the first year of the competition, there were 22 posters taking part. By 2022 this number had grown to 212 (Table 1).

**Table 1.** Increase in number of posters taking part in competition from 2008 to 2022

Competition #	Year	Number of Posters
1 <sup>st</sup>	2010	22
2 <sup>nd</sup>	2011	28
3 <sup>rd</sup>	2012	30
4 <sup>th</sup>	2013	42
5 <sup>th</sup>	2014	54
6 <sup>th</sup>	2015	81
7 <sup>th</sup>	2016	111
8 <sup>th</sup>	2017	140
9 <sup>th</sup>	2018	141
10 <sup>th</sup>	2019	157
11 <sup>th</sup>	2020	204
12 <sup>th</sup>	2021	178
13 <sup>th</sup>	2022	212

## 2.3. Judging Process & Effects of COVID 19

### 2.3.1. Faculty Judges & Evolution of Mini competitions

Over the past decade the judging process has evolved from a few judges from diverse departments judging 20 or 30 posters from different scientific areas as a group. For example, business, medicine, and engineering faculty would judge posters together even in they were not in their area of specialty. There were initially 3 or 4 mixed judging groups each looking after 10-20 posters. By 2022 this had increased to 15 judging groups each looking after about 15 posters in specific areas: Business, Management & Law, Science & Humanities, Engineering & Technology, and Medicine, Pharmacy & Health Science (Figure 1, Table 2). The judging process and tabulation of the results initially took place during the day of the competition. By 2022 this process had modified to allow for 1 week for judging and another week for tabulating the results.

The judging form was standardized and based on international practices as well as accreditation guidelines (e.g., NCAAA). The judges were coached to talk to students at each poster as an individual & then to come together afterwards to shortlist the 15 posters in their “mini competition. Afterwards they would come together to shortlist the top three posters on their 15-poster mini competition. Graduate and undergraduate posters were treated separately. Each judging group had its own group leader.



Figure 1. Judges and students at the poster competition 2022

**Table 2.** Judging Groups for 13th Annual Research Day Student Poster Competition to be held Thursday 3 March 2022 from 8:00 AM to 1 PM on 1st Floor Hallways at Alfaisal University (Version 2 March 2022)

**Poster Count 214 as of 2 March 2022: M 120, S 15, B 21, E 58.**

**Business, Management & Law (21)**

**JG1 (Posters B01-B10)**

- **Rami Bustami (Group Ldr)**
- Rahma Lahyani
- Welf Weiger
- Jan Smolarski

**JG2 (Posters B11-21)**

- **Robert Zacca (Grp Ldr)**
- Dmitry Khanin
- Nourah Alfayes
- Hesham Al Barrak

**Science & Humanities (15)**

**JG3 (Poster S01-S15)**

- **Mamoun Bader (Grp Ldr)**
- Souraya Goumri-Said
- Volodymyr Dvornyk
- Emily Wilson
- Rashid Mehmoud

**Engineering & Technol (58)**

**JG4 (Posters E01-E12)**

- **Sobhi Mejjaoui (Group Ldr)**
- Francisco Javier Cobo
- Fawaz Bin Sarra
- Faisal Alotaibi

**JG5 (Posters E13-E24)**

- **Tarek Mokhtar (Grp Ldr)**
- Jomalyn Ariola Pancho
- Safia Yasmeen
- Athiq Ahamed
- Sawsan Omer

**JG6 (Posters E25-E35)**

- **Basel Dudin (Grp Ldr)**
- Aram Monawar
- Hoda Elsayed
- Lotfi Tadj

**JG7 (Posters E36-E46)**

- **Aliaa Elabd (Grp Ldr)**
- Ahmed Alabbas Hamidalddin
- Asfa Javeed
- Ibrahim El Seoudi

**JG8 (Posters E47-E58)**

- **Sghaier Guizani (Grp Ldr)**
- Shaweta Khullar
- Zuruzi Sameh
- Ramazan Demirboga

**Medicine, Pharmacy & Health Science (120)**

**JG9 (Posters M1-M17)**

- **Dileep Rohra (Grp Ldr)**
- Moamad AlKodaymi
- Santos Kumar

**JG10 (Posters M18-M34)**

- **Shoukat Ali (Grp Ldr)**
- Jasmine Holail
- Qais Dirar
- Adeola Kola-Mustapha

**JG11 (Posters M35-M51)**

- **Rajaa Fakhoury (Grp Ldr)**
- Hanaa Hajeer
- Hassan Shaibah
- Omar Ameer

**JG12 (Posters M52-M68)**

- **Paul Ganguly (Grp Ldr)**
- Ghada Garaween
- Muhammad Ikram
- Khalid Said Mohammad

**JG13 (Posters M69-M85)**

- **Rimah Saleem (Grp Ldr)**
- Abdullah AlShawaf
- Ibrahim Salman
- Nora Alhomidan
- Fatheia Hamza

**JG14 (Posters M86-M102)**

- **Ahmed Aljada (Grp Ldr)**
- Shahid Akhund
- Dana Bou Matar
- Fareeda Mukhtar
- Abdul Ahad Shaikh

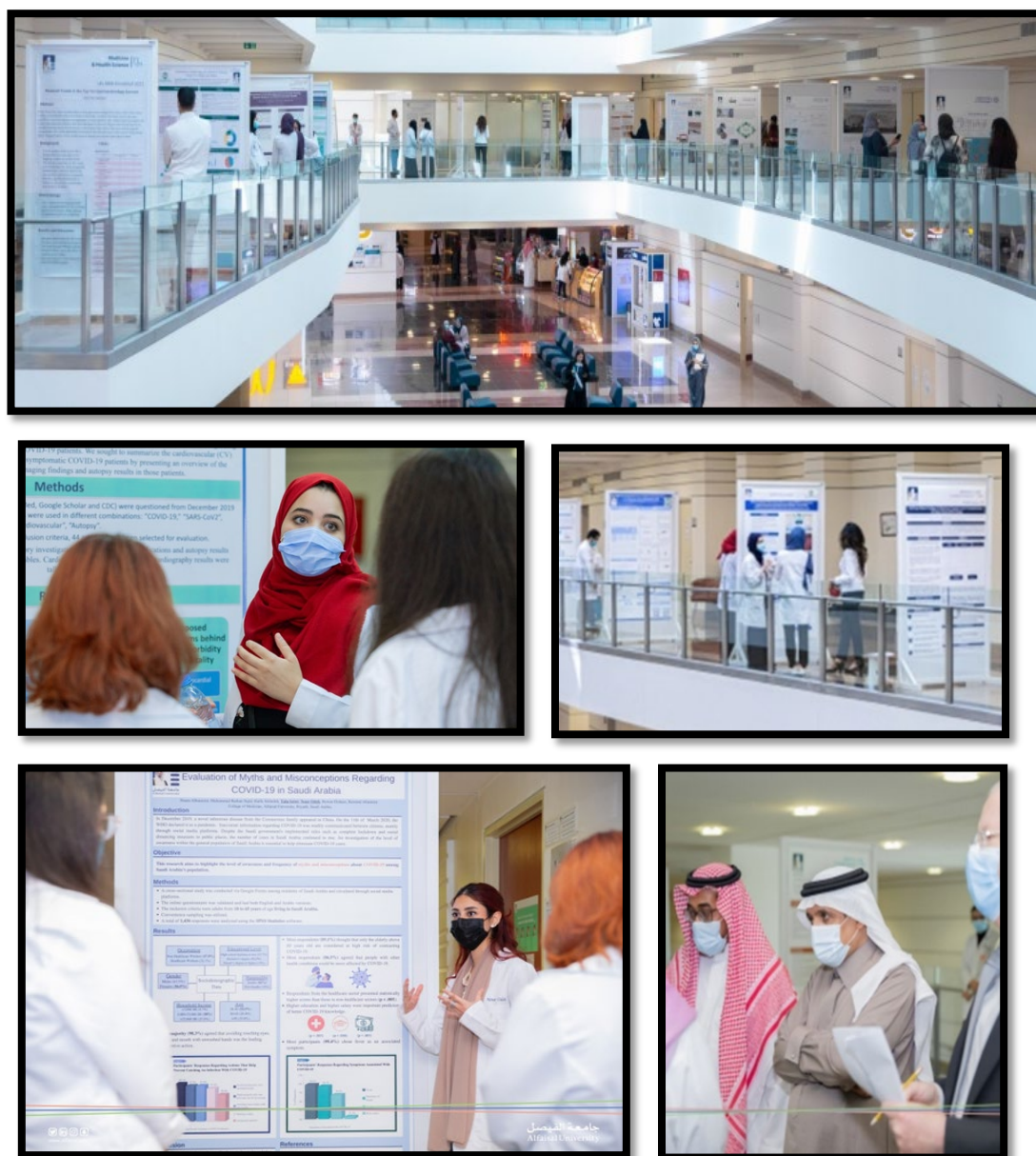
• **JG15 (Posters M103-M120)**

- **Atef Shibl (Grp Ldr)**
- Dana Bakheet
- Hatouf Sukkarieh
- Peter Kvietys



## 2.3.2. How COVID 19 Changed the Competition

In 2021 due to the COVID 19 Pandemic, the venue was modified. Rather than having the competition in one large room, it was moved to the 1<sup>st</sup> floor hallways with the posters separated by at least 15 feet. That year no visitors were allowed, only student participants & faculty judges. The posters were left up for one month to allow other students, faculty, and staff to view them (Figure 2).



**Figure 2.** Venue of 2021 Student Poster Competition moved to 1<sup>st</sup> Floor Hallways in Alfaisal University. Posters were separated by at least 15 feet. Only judges and students were allowed during the day of the competition.

### 3. Research Awards Ceremony 2022

A ceremony was held Sunday 29 May 2022 to recognize student winners of the poster competition as well as faculty receiving awards for research excellence and patents.



#### 3.1. Student Awards

Student winners of the poster competition received recognition and awards from senior university leadership (Figures 3 ).



**Figure 3.** Research Awards Ceremony. **Top:** Student winners in category “*Medicine, Pharmacy & Health Science*”. **Middle:** Students winners in category “*Engineering & Technology*”. **Bottom:** Student winners in categories “*Business, Management & Law*” and “*Science & Humanities*”.



### 3.2. Faculty Awards for Research Excellence

Faculty Awards for Research Excellence were established to recognize and reward those individuals whose creative endeavors were particularly successful and were so recognized locally, and nationally. For 2022 the winners were (Figure 4):

- **James C. Ryan**, Assoc Prof, Dept. Management, College of Business
- **Nidal Nasser**, Prof, Dept. Software Eng, College of Engineering
- **Ibrahim M. Salman**, Assist Prof, Dept. Pharmacy Practice, College of Pharm
- **Ahmad Aljada**, Prof, Dept. Chem & Molec Med, College of Med (shared)
- **Abderrahman Ouban**, Assoc Prof, Dept. Path, College of Medicine (shared)
- **Souraya-Goumri-Said**, Assoc Prof, Dept. Phys, Coll Sci & Gen Stud (shared)
- **Mateen A. Khan**, Assoc Prof, Dept. Life Sci, Coll of Sci & Gen Stud (shared)



**Figure 4.** Winners of Faculty Awards for Research Excellence 2022 receiving recognition from Senior University Administration

### 3.3. Patent Awards

Patent Awards were established to recognize faculty, staff & students who engaged in creation of intellectual property (IP) that could help in the economic development of the country. The recipients for 2021-2022 were (Figure 5):

- **Mohammed Zourob**, Professor of Chemistry
- **Shimaa Eissa**, Assoc Research Prof
- **Raja Chinnappan**, Lecturer of Chemistry
- **Edreese Alsharaeh**, Professor of Chemistry
- **Nidal Nasser**, Professor of Software Engineering
- **Farid Amalou**, Assistant Prof Physics
- **Tarek Mokhtar**, Assist Prof Architectural Eng



**Figure 5.** Winners of Patent Awards

# Alfaisal University – A Profile of Excellence

- **Founded 2002, Launched 2008**

- **Six Colleges**

- Medicine
- Engineering
- Business
- Science & General Studies
- Pharmacy
- Law & International Relations

- **Graduate School**

- 26 programs and tracks



- **201 -250** Globally (2022)
- **1<sup>st</sup>** in Saudi Arabia (Young Universities 2021)
- **1<sup>st</sup>** in Arab World (Young Universities 2021)
- **9<sup>th</sup>** in "The World's Best Small Universities" (2021)
- **176-200** in Clinical and Health
- **256** in Clinical Medicine
- **1<sup>st</sup>** in Clinical Medicine normalized citation Impact
- **12<sup>th</sup>** in Clinical Medicine percentage of highly cited papers that are among top 1% most cited



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## Industry & Research Institutes Collaborations



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## 4. Business, Management & Law Winning Posters2022



For Business, Management & Law there were 11 winning posters: 5 undergraduate and 6 graduate (Table 3).

**Table 3.** Winning Posters for Business, Management & Law.

Poster Code	Poster Title	Contact Person
<b>1<sup>st</sup> Prize Business, Management &amp; Law</b>		
<b>Undergraduate</b>		
UG-B02-Alabduljabbar-2022	Recycling as the Most Powerful Tool of Running a Business	Maha AlAbduljabbar
UG-B16-Alhanaky-Alshathri-2022	Composting Machine	Nouf Alhanaky & Norah Alshathri
<b>Graduate</b>		
G-B01-Alotibi-2022	Strategic Agenda for Online MBA Program: A Case Study of Alfasal University	Turkyh Saad Alotibi
G-B20-AlShugairan-2022	Why Do Employees Leave Their Jobs?	Nagoud AlShugairan
<b>2<sup>nd</sup> Prize Business, Management &amp; Law</b>		
<b>Undergraduate</b>		
UG-B06-Alyahya-2022	Entrepreneurship	Sara Alyahya
UG-B17-Alsubaihy-2022	The Impact, Recovery, & Future Direction of Supply Chain Management During COVID-19	Alanoud Alsubaihy
<b>Graduate</b>		
G-B10-Dudin-2022	Motivation, Empowerment and Job Involvement: The Special Case of SDAIA	Basil Dudin
G-B12-Alsharif-2022	What Factors Influence Growth in Market Share for Ride Hailing?	Reem Alsharif
<b>3<sup>rd</sup> Prize Business, Management &amp; Law</b>		
<b>Undergraduate</b>		
UG-B19-Alsaif-2022	Vision 2030 Triple Bottom Sustainable Projects for Better Economy, Society and Environment	Alwaleed Alsaif
<b>Graduate</b>		
G-B07-AlTammami-2022	The Impact of Human Capital Management on Organizational Performance	Haya AlTammami
G-B13-Alsharif-2022		Reem Alsharif

## ABSTRACTS

### 1<sup>st</sup> Prize

#### G-B01-Alotibi-2022

**PAPER TITLE:** Strategic Agenda for Online MBA Program: A Case Study of Alfaisal University.

**AUTHOR(S) & AFFILIATION(S): Students:** Turkyh Saad Alotibi, Afaf Saad Alshaibani.

**ABSTRACT:** The global demand for online MBA programs has surged recently. This study evaluates the factors that influence MBA enrolment and strategic recommendations of the prerequisites for developing a viable online MBA program and at Alfaisal University in the Kingdom of Saudi Arabia. It compares students' perspectives about online MBA with the face-to face on-site MBA program. The data from the survey questionnaire, distributed at the university's College of Business, reports that approximately 60% of MBA students prefer on-site in-person courses. Students enrolling in the online MBA primarily consider two factors, the university's ranking and the program timetable. However, preference for online courses from prestigious universities (international) was 34%, among the participants. Thus, Alfaisal University could build upon its outstanding ranking by offering online MBA programs that are designed and delivered through collaboration with other internationally reputed business schools.

#### UG-B02-Alabduljabbar-2022

**PAPER TITLE:** Recycling as the Most Powerful Tool of Running a Business

**AUTHOR(S) & AFFILIATION(S): Students:** Maha AlAbduljabbar & Rahaf Almady, **Faculty/Researchers:** Dr. Robert Zacca

**ABSTRACT:** Did you know that the top reason people say they do not recycle is a lack of convenient access? So, what if recycling becomes not only accessible but also profitable to bridge this gap? An app will be created that lets people order and set up recycling bins in their homes or businesses and schedule bin pickups as well. For every full bin that is collected, individuals get to save the planet, and get paid some money for doing so at the same time. The innovative app will have experts utilizing these recycled items to manufacture new materials and products that allow us to achieve our goal of sustaining the environment and building a better life for future generations. The app is virtually for anyone who needs a more convenient way to partake in recycling that fits their busy lifestyles; the app is a one-stop-shop for everyone's sustainable needs that is fast, easy to use, and offers cost-effective services. It is "recycling at the click of a button."

#### UG-B16-Alhanaky-Alshathri-2022

**PAPER TITLE:** Composting Machine

**AUTHOR(S) & AFFILIATION(S): Students:** Nouf Alhanaky, Norah Alshathri

**ABSTRACT:** Our poster topic discusses the benefits of a composting machine in general and specifically in aiding the environmental push for sustainable development which is a key aspect of the 2030 Vision. The amount of wasted food in KSA is one of the largest in the world, so utilizing this opportunity into generating new innovative eco-friendly energy could be a golden opportunity for the Kingdom. The composting machine works by converting food waste into soil nutrients through microbial actions in only a few hours by using it as a source of energy.

#### G-B20-AlShugairan-2022

**PAPER TITLE:** Why Do Employees Leave Their Jobs?

**AUTHOR(S) & AFFILIATION(S): Students:** Alanood Alyousef, Nagoud Al Shugairan, Noura Alsuhailani, Rahaf Almazroua, Wasaif Alakeel. **Faculty/Researchers:** Dr. Nourah Alfayez

**ABSTRACT:** Employee turnover is harmful and affects efficiency, productivity, profitability, and innovation in the workplace. The aim of our study was to investigate the factors that cause employees to leave their jobs. It identified the primary factors that lead to employee turnover and highlighted what can be done to avoid it in organizations. Our study introduces a general overview of the turnover rate with accurate data coming from people around us and could help them to recognize the turnover issue and could help the organization in realizing the importance of making the right hiring decisions and how to eliminate the reasons for high turnover rate.

## 2<sup>nd</sup> Prize

### UG-B06-Alyahya-2022

**PAPER TITLE:** Entrepreneurship

**AUTHOR(S) & AFFILIATION(S):** **Students:** Sarah BinDaham, Aljuharah Alhammad, Sara Alyahya

**Faculty/Researchers:** Dr. Robert Zacca

**ABSTRACT:** Entrepreneurship can be defined as a concept that explores the development and managing of a business venture with the main focus of gaining profit and taking risks in the business world. In the light of Saudi Vision 2030, the youth have found themselves to be more motivated due to the increasing access of resources to venture into opening their own small business and therefore also applying the concept of entrepreneurship. So, this report aims to answer the question 'how does entrepreneurship in the light of Vision 2030 encourage the youth to help thrive in the Saudi economy?' Through the conduction of a survey with 35 respondents, with the majority of them under the age of 35, it was able to be determined that a vast majority of the youth believe that Vision 2030 positively affects entrepreneurship. They both go hand in hand with further building the Saudi economy as not only is it easier to find employment now, due to the freedom of choosing your workplace, but it also creates an opportunity for the society to prosper and positively aid the government for caring to society's needs. Overall, entrepreneurship encourages open-mindedness and more opportunities for the youth to succeed. It will also significantly contribute to the national income and tremendously increase the standards of living.

### G-B10-Dudin-2022

**PAPER TITLE:** Motivation, Empowerment and Job Involvement: The Special Case of SDAIA

**AUTHOR(S) & AFFILIATION(S):** **Students:** Alaa Madani, Basil Dudin, Nahar Al Khodair, Kholoud Al Mashjari, Abdullah AlSuwat **Faculty/Researchers:** Dr Noura Alfayez

**ABSTRACT:** Motivation is defined as the process of ammunitioning the employees of an organization with what it takes to perform better at work. Being a topic of the field of organizational behavior, motivation exists in the form of content and process theories. It is widely believed that when an organization understands the needs of its employees and works on realizing these then it is working towards the realization of its long-term strategies. In this research, we have attempted to answer several questions, which are:

- The process of keeping employees engaged during stressful times.
- Understanding the importance of financial and non – financial rewards.
- The organizational perspective of what employee involvement is.
- The degree employees feel they are part of the decision-making process.

The Saudi Data and Artificial Intelligence Authority (SDAIA) has been chosen as the organization of interest.

### G-B12-Alsharif-2022

**PAPER TITLE:** What Factors Influence Growth in Market Share for Ride Hailing?

**AUTHOR(S) & AFFILIATION(S):** **Students:** Abdulaziz Algethami – Manar Alabdulwahed – Reem Alsharif – Abdulrhman Aldajaani

**ABSTRACT: Introduction:** ride hailing companies are plenty in the market Saudi Arabia. Different factors play major role in understanding customer choices and might be differ according to geographical area.

**Research question:** what the factors are to increase growth of BOLT Saudi Arabia.

**Method:** We reached out to CEO of BOLT Saudi Arabia and conducted interviews with drivers of different company as well we had survey for total of 181 users asking them about choices and possible determinant factors for choosing to ride hailing company over other.

**Finding:** currently market share for BOLT is low and estimated 3.3% according to our survey. Main difference for changing the taste for ride sharing customers are price, variety of payment options and least is promotions and loyalty. The main factor to choose different company was price followed by price difference more than 6 riyals among responder who do not look at price as first reason to change their choice.

**Conclusion:** market share is low, expansion in marketing with no profit margin will increase the chance of increase the market share and future revenue for bolt Saudi Arabia. As per the findings Bolt should seek to be the lowest price in the market to increase its market share. Respondents choosing price as the main factor of their app preference may indicate the apps operating in the market has low perceived product differentiation.

#### **UG-B17-Alsubaihy-2022**

**PAPER TITLE:** The Impact, Recovery, & Future Direction of Supply Chain Management During COVID-19

**AUTHOR(S) & AFFILIATION(S):** **Students:** Alanoud Alsubaihy, Loloh Alnemer, Raghad Balkhi, Haya Alnemer, Haya Aljomaih **Faculty/Researchers:** Dr. Sheraz Malik

**ABSTRACT:** The purpose of this study is to understand the deep impact the pandemic has had on the durability of organisations' supply chains. The study seeks to uncover the truth behind COVID-19's undeniable footprint on the business world through quantitative data collection from 25 randomly selected corporations of different entity sizes. This study collected data through a survey that covers questions revolving around the research's purpose. It included 19 questions of both an open and closed-ended nature. The closed-ended questions were analysed using the following tools, Microsoft Excel, Tableau Software, and IBM's SPSS, to be able to uncover deeper the levels of detail and understandable visuals for our target audience. The analyses that the study undertook consists of tables, including descriptive statistics and Spearman correlation. The study uncovered the deep impact COVID-19 had on many industries in the Middle East and Europe. COVID-19 disrupted the supply chains of many sectors including retail, distribution and transportation, and construction among other things. As such, COVID-19 damaged many parts of the supply chain, which includes the following areas: supply chain management, distribution, sourcing, procurement, and forecasting. Based on the data collected, all 100% of the participants were caught by surprise, with limited to no planning. The proposed recommendation alludes to better rigid supply chain planning, with room for alternative sourcing and distribution channels, improved supply chain unit synergy, and expanding to different target markets.

### **3<sup>rd</sup> Prize**

#### **G-B07-ALTammami-2022**

**PAPER TITLE:** The Impact of Human Capital Management on Organizational Performance

**AUTHOR(S) & AFFILIATION(S):** **Students:** Haya ALTammami

**ABSTRACT:** The world is rapidly changing with new technologies, systems, and innovations that are continuously incorporated in workplaces. However, the way employees are being managed, was never changing nor developing. The objective of this paper is to study the factors that have an actual impact on employees' productivity, and thus on organizational performance in general.

#### **G-B13-Alsharif-2022**

**AUTHOR(S) & AFFILIATION(S):** **Students:** Manar Alsafadi, Maha Alissa, Shahad Alfaleh, Naimah Alsalamah, Reem Alsharif, Raghad Al Okaili, Jude Al Tuwajri

**ABSTRACT:** The aim of our research is to explain how HR practices influence employees' Perceived Organizational Support (POS) and its impact on their outcome also in relation to the employees' satisfaction of XY Company (in Financial Sector) The analysis of mediation impact of POS among all HR practices is also the aim of this research. The HR managers, line managers and employees are the respondents of the research, and a survey was utilized for collection of data as an analysis tool. The findings explain that HR practices within XY Company have a positive influence on POS and job satisfaction. The results also show that POS positively mediates among the nexus of HR practices. These outcomes provided the guideline to the concerned authorities within XY Company that they should increase their focus on the HR practices that enhance the POS and job satisfaction of the employees which play a fundamental part in improving the organizational performance.

#### **UG-B19-Alsaif-2022**

**PAPER TITLE:** Vision 2030 Triple Bottom Sustainable Projects for Better Economy, Society and Environment.

**AUTHOR(S) & AFFILIATION(S):** **Students:** Alwaleed Alsaif, Tala Alshyea, Masour Bin Juma

**Faculty/Researchers:** Adnan Abo Alhaija

**ABSTRACT:** Since its inception, Vision 2030 has prioritized sustainability. Saudi Arabia has always been a major player in the international energy industry, contributing to global economic growth and development. It puts sustainability at the center of everything the country does, from policy development to investment to planning and infrastructure. The international community will be able to pursue sustainable growth and satisfy the needs of both energy and climate by reducing emissions and extending the use of carbon capture, utilization, and storage. Signature projects have been initiated to diversify energy resources and optimize the Kingdom's energy



mix, taking advantage of Saudi Arabia's tremendous natural potential for solar and wind power, as well as significant investments in sustainable technologies. Renewable energy projects are one of the most important movers toward sustainability, since they help to reduce emissions and the use of high-value fuels in electricity generation. Many unique habitats and wildlife areas may be found in Saudi Arabia. The National Center for Wildlife has already established 15 sanctuaries to conserve critically endangered species and boost biodiversity. Vision 2030 ensures that future generations will be able to enjoy the country's vast natural diversity by protecting distinctive wildlife and habitats.



## 5. Engineering & Technology Winning Posters 2022



For Engineering & Technology there were 22 winning posters: 17 undergraduate and 5 graduate (Table 4).

**Table 4.** Winning Posters for Engineering & Technology.

Poster Code	Poster Title	Contact Person
<b>1<sup>st</sup> Prize</b>		
<b>Engineering &amp; Technology</b>		
<b>Undergraduate</b>		
UG-E10-ElArwadi-2022	Development of an Ultra Fine Bubble Generator Based on Hydrodynamic Cavitation	Omar ElArwadi
UG-E17-Alothman-2022	The Investigation of 3D Printed Embedded Fluidic Channels on Agar Medium for Precision Agriculture	Lama Alothman
UG-E35-Khan-Badran-2022	Optimization of Mechanical Strength and Aerial Capacity of Lithium Sulfur Battery Cathodes	Abeer Khan & Zeina Badran
UG-E46-Zien-Elkordy-2022	Object Detection for Arabic Sign-Language	Bayan AlShikh Zain
UG-E49-AlArnous-2022	Delivery Work Optimization	AlAnoud AlArnous
<b>Graduate</b>		
G-E01-AlMarri-2022	Driving Industry 4.0 in Saudi Arabia: AI-Based Analysis for Digital Maturity models	Sadeem AlMarri
G-E44-Binobied-2022	Jukebox OpenAI: Generating Qanun Music	Nasser Binobied
G-E52-Alsahly-2022	COVID-19 Vaccine Sentiment Analysis for Arabic Tweets using Machine Learning Algorithms	Norah Alsahly

2 <sup>nd</sup> Prize Engineering & Technology		
<b>Undergraduate</b>		
UG-E02-Alghannam-2022	The Hive	Reema Alghannam
UG-E09-ElArwadi-2022	Towards Bulk Nano Aqueous Ozone Generation: Development of a Bulk Nano Aqueous Ozone Generator	Omar ElArwadi
UG-E14-Salamah-2022	Hayyakum (حيّاكم) – A Vaccine Digital Certificate	Hesham Salamah
UG-E30-Aldoaiji-Almugairin-2022	Recycling Trash Can that Holds up to 5x Capacity with Can Crushing Technology	Nora Aldoaiji & Dana Almugairin
UG-E39-Alrumaih-2022	Inventory Reduction	Abdullah Alrumaih
UG-E43-Aljandali-2022		Zain Aljandali
UG-E47-Dabbagh-2022	Folklore Dance Identification using AI Models	Yasmeen Dabbagh
<b>Graduate</b>		
G-E05-Alhamdani-2022	Cluster-Based Colormap of Nanoindentation Using Machine Learning	Sara Alhamdani
G-E37-AlJuraiyed-2022	Application of Lean Six Sigma to Improve Maintenance Requests Duration	Omar AlJuraiyed
3 <sup>rd</sup> Prize Engineering & Technology		
<b>Undergraduate</b>		
UG-E07-Hassan-Kachoum-2022	Ascend	Mohamed Hassan
UG-E20-Alsaleem-Aldabbagh-2022	Dakka: A 2050 Residential Project for Mitigating Negative Impacts of Hypothetical Dysfunctional Families	Alanoud Alsaleem & Alzahra Aldabbagh
UG-E25-Alwuayl-2022	Distributing Fast Ev Charging Stations in Saudi Highways	Omar Alwuayl
UG-E36-Alothman-2022	Implementation and Optimization of Hydrogen Fuel Cell for Shell Eco-marathon Student Vehicle	Lama Alothman
UG-E53-AlShaikh-2022	Managing Inventories	Mohammed AlShaikh

## ABSTRACTS

### 1<sup>st</sup> Prize

#### G-E01-AlMarri-2022

**PAPER TITLE:** Driving Industry 4.0 In Saudi Arabia: AI-Based Analysis for Digital Maturity Models

**AUTHOR(S) & AFFILIATION(S):**Students: Sadeem Rashed AlMarri **Faculty/Researchers:** Prof. Abdelghani Bouras

**ABSTRACT:** The fourth industrial revolution (industry 4.0) is a term used to describe the ongoing transformation of traditional business processes combined with the latest innovative technologies that are changing the way factories and businesses operate, leading to the faster, cheaper, and more effective delivery of products and services. Different companies and countries are preparing for this revolution by developing Industry 4.0 strategies. To assist the companies seeking to adopt Industry 4.0 in manageable phases, the maturity models (MMs) were created and used. However, in the context of Industry 4.0, literature reviews indicate that the number of available models has increased sharply in recent years, each with its dimensions and levels. Accordingly, companies face difficulty in determining the suitable maturity model that will be used to know where and how to start, therefore This challenge is preventing companies from incorporating Industry 4.0 into their businesses. In this work, we propose to solve this problem by analyze and compare the existing industry 4.0 maturity models and propose a framework to assist the industries seeking to adopt Industry 4.0 to set the ground for the transformation. In addition, this work will contribute to Kingdom of Saudi Arabia (KSA) transformation journey by proposing a maturity model for Industry 4.0 assessment for a sector that exists in KSA.

#### UG-E10-ElArwadi-2022

**PAPER TITLE:** Development of an Ultra Fine Bubble Generator based on Hydrodynamic Cavitation

**AUTHOR(S) & AFFILIATION(S):**Students: Omar El Arwadi, Ziad Ibrahim **Faculty/Researchers:** Dr. Zuruzi Abu Samah

**ABSTRACT:** Ultra-fine bubbles are gaining much interest due to potential applications ranging from wastewater treatment to drug delivery. This paper describes the development of a prototype device to generate bulk Ultra-fine bubbles in the water. The device works by inducing hydrodynamic cavitation in which macro bubbles formed implode into bulk Ultra-fine bubbles by local pressure changes in the device. As the water circulates in the device, the local pressure drops below the saturated vapour pressure of the liquid causing cavitation. Preliminary ambient testing of the prototype was carried out. The prototype was fabricated using a photopolymer by 3-D printing.

#### **UG-E17-Alothman-2022**

**PAPER TITLE:** The Investigation of 3D Printed Embedded Fluidic Channels on Agar Medium for Precision Agriculture

**AUTHOR(S) & AFFILIATION(S):**Students: Lama Alothman **Faculty/Researchers:** Dr. Zuruzi Abu Samah

**ABSTRACT:** In agricultural industry, Agar is used as a neutral carrier for nutrients and growth substances. Therefore, it is an ideal medium to root development and growth and nutrient absorption. In previous research experiments, the use of channels to distribute nutrients to stems has been investigated with the use of lateral cylindrical channels that extend straight through the container of which the seeds are germinated. In this research project, the embedded channels will be 3D printed using biodegradable PolyVinyl Alcohol (PVA), synthetic polymer filament formed by polymerizing vinyl acetate, which is then hydrolyzed to create PVA filament for 3D printing. PVA filament has a translucent appearance, which is ideal to observe nutrient flow and root development. It is resistant to oil as well as grease and solvents and has excellent adhesive properties. The advantage of 3D Printing channels, as opposed to using conventional lateral channels, is the ease of incorporating complex geometry to conduct a comparative analysis of various channel designs in accordance with nutrient flow and root development.

#### **UG-E35-Khan-Badran-2022**

**PAPER TITLE:** Optimization of Mechanical Strength and Aerial Capacity of Lithium Sulfur Battery Cathodes

**AUTHOR(S) & AFFILIATION(S):**Students: Abeer Khan, Zeina Badran **Faculty/Researchers:** Dr. Edreese Alsharaeh  
**Coordinator:** Dr. Yousef M. Alyousef

**ABSTRACT:** The demand for batteries with high energy and power density has been rapidly increasing as technology advances. Lithium Sulfur batteries stand out from other candidates due to their ultra-high energy density, low cost, and material availability making them an ideal and economical choice to revolutionise the rechargeable battery market. However, lithium sulfur batteries come with limitations that restrict their use. Sulfur's low conductivity and reaction with the anode results in poor material utilisation, low cyclic performance, as well as irreversible loss of active material. Furthermore, the shuttle effect of lithium polysulfides and volume expansion of sulfur cause low coulombic efficiency and degradation of the cathode respectively. The objective of this project is to prevent the degradation of the cathode by achieving high mechanical cathode strength to resist the volume expansion of Sulfur. Composites mixed with varying sulfur percentages were used to fabricate the cathodes. In addition, the cathode's thickness, weight, and composition were optimised. Characterisation was done to study the prepared cathode materials' properties and most importantly, Nano-indentation was used to test the cathode's mechanical properties. Finally, the electrochemical studies on the assembled batteries will be presented.

#### **G-E44-Binobied-2022**

**PAPER TITLE:** Jukebox OpenAI: Generating Qanun Music

**AUTHOR(S) & AFFILIATION(S):** Students: Nasser Binobied, College of Engineering **Faculty/Researchers:** Dr. Areej Al-Wabil

**ABSTRACT:** The history of music is not just about creation; it is also about technological advancements. The making of music is a complicated process but with the help of AI, one can explore new areas. Recent technological development has laid the way to create music like never before. In this paper, we explore generating a traditional Qanun music using an AI model named Jukebox developed and released to the public by Open AI organization. The Jukebox model generates music with singing in the raw audio domain. We tackle the long context of raw audio using a multi-scale VQ-VAE to compress it to discrete codes, and modelling those using autoregressive Transformers. The combined model at scale was capable of generating high-fidelity and diverse songs with coherence up to multiple minutes. Windows training require some significant changes in the code to adapt to the different environment that was intended for jukebox to run on. It required various and long debugging steps since this project is on Archive status, meaning there are no official support from the makers. It took for this project to fully sample Qanun music a month, with various time for each step and including the debugging time.

#### **UG-E46-Zien-Elkordy-2022**



**PAPER TITLE:** Object Detection for Arabic Sign-Language

**AUTHOR(S) & AFFILIATION(S):** Students: Bayan Al Shikh Zien, Layali Elkordy, College of Engineering **Faculty/Researchers:** Dr. Areej Al-Wabil

**ABSTRACT:** Today, the deaf and mute individuals usually face difficulties communicating with others via sign language, as our community lacks this knowledge. Although 360 million of the world's population are deaf/mute, which is more than 5% of the global population. Sign language is not a universal language, and each language has its own gestures for the letters. As technology is evolving, different solutions have been designed to help conquer this problem in many languages, yet there are still no similar technologies for Arabic language. The proposed solution is creating a model that can recognize hand gestures which represent different Arabic letters through a camera lens. The model will connect the captured letters to form a sentence or a word. The main purpose of this project is to help people who lack the knowledge of sign language to understand and be able to communicate with deaf and mute people.

#### **UG-E49-AIArnous-2022**

**PAPER TITLE:** Delivery Work Optimization.

**AUTHOR(S) & AFFILIATION(S):** Students: AlAnoud AlArnous, Muneera AlMutairi, AlHanouf AlHagbani, Sara AlDuhaishi **Faculty/Researchers:** Dr. Sobhi Mejjaoui

**ABSTRACT:** A F&B company in the MENAP region that operates multiple brands. We will be focusing on one brand that serve quality food at a competitive price. This restaurant is currently facing an issue with the average delivery time (ADT) which is causing a reduction in sales and demand. Due to that, we're aiming to increase the productivity of the operations and the workers efficiency, in order to maximize the profit and have outstanding outcomes.

#### **G-E52-Alsahly-2022**

**PAPER TITLE:** COVID-19 Vaccine Sentiment Analysis for Arabic Tweets using Machine Learning Algorithms

**AUTHOR(S) & AFFILIATION(S):** Students: Norah Alsahly **Faculty/Researchers:** Dr. Areej Al-Wabil

**ABSTRACT:** This research aims to build a labeled COVID-19 vaccination-related Arabic dataset that is comprised of Arabic tweets, with regards to specified keywords and a timeframe. Additionally, build machine learning sentiment analysis algorithms that will analyze Arabic tweets on a sentence-level to determine its polarity; negative or positive, to recognize the public opinions towards the topic of COVID-19 vaccination.

## **2<sup>nd</sup> Prize**

#### **UG-E02-Alghannam-2022**

**PAPER TITLE:** THE HIVE

**AUTHOR(S) & AFFILIATION(S):** Students: Reema Alghannam, Nora Bin Hassan, Dana Alhowar

**Faculty/Researchers:** Dr. Tarek Mokhtar

**ABSTRACT:** In this post-vaccine age, and with the rapid rate at which our population is growing, we as architects need to adapt and be prepared for any crisis that we might face in the future. The Hive project will focus on finding new and adaptive ways to solve the problem of resources shortages due to population growth and turn it into an architectural solution. It will explore the idea of turning the home into a factory that produces its own food and water for its residents and is, to a certain extent self-sufficient to accommodate for any crisis that may occur in the unforeseen future.

#### **G-E05-Alhamdani-2022**

**PAPER TITLE:** Cluster-Based Colormap of Nanoindentation Using Machine Learning

**AUTHOR(S) & AFFILIATION(S):** Students: Sara Ghaleb Alhamdani **Faculty/Researchers:** Dr. Abdallah Alrshdan

**ABSTRACT:** Nanoindentations is an advanced method of measuring the mechanical properties of small volumes of materials using an instrumented indentation technique. Properties such as elastic modulus and hardness can be measured and explored by Nanoindentation. To support the material designers and specialists, this research is aiming to segment the captured data into regions with homogenous physical properties that can be used to optimize the process of mixing composite materials. During the Nanoindentation tests, and depending on the grid size, the resulting image/map of mechanical properties from the tested material's layer has a large dimensionality variety of values. Image processing technique and Machine Learning algorithms were utilized to cluster the physical property map and reduce its dimensionality. The sample data for this study is data of SLA 3D printed Nanocomposite of acrylic polymer (boron nitride), which is used as a case study to apply denoising and clustering techniques.

**UG-E09-ElArwadi-2022**

**PAPER TITLE:** Towards Bulk Nano Aqueous Ozone Generation: Development of a Bulk Nano Aqueous Ozone Generator

**AUTHOR(S) & AFFILIATION(S):**Students: Omar El Arwadi, Ziad Ibrahim **Faculty/Researchers:** Dr. Zuruzi Abu Samah

**ABSTRACT:** With the onset of COVID-19, there is a universal need for innovative solutions in the sanitization of public and private places. This project introduces a Nano-aqueous ozone cleaner. The technology infuses cold water with ozone gas to create aqueous ozone, a natural and robust cleaning solution. Ozone-laden air is dissolved into water, and it regularly decomposes back into diatomic oxygen O<sub>2</sub>. The released mono-atomic oxygen ion is very reactive and either kills or reactivates all microbes in the vicinity. One of the main target markets is healthcare, as the device can be used in many applications, including hospital room quick sanitation decreasing acquired infection by 90%, emergency patient rapid wash-stations, emergency bacterial and virus exposure wash stations, and bio hazmat emergency sanitation. There are many benefits including no need for FDA approval, does not create a carbon footprint, cleans and sanitizing in one application while penetrating deeply into the surfaces being cleaned. The product eliminates the need for using harsh and often very expensive chemicals

**UG-E14-Salamah-2022**

**PAPER TITLE:** Hayyakum (حيّاكم) – A Vaccine Digital Certificate

**AUTHOR(S) & AFFILIATION(S):**Students: Hesham Salamah, Meshal Alsaleh, Osama Elghazaly, Muhammed Herwis, Omar Felimban **Faculty/Researchers:** Nidal Nasser

**ABSTRACT:** The Vaccine Digital Certificates are profitable and modern value due to the coronavirus pandemic. Almost all countries require that people take at least one vaccination dose before travelling. Nevertheless, there is no program or system to record all the people's vaccination records in one place. Some countries have their own databases; however, it takes a long time to confirm from other countries about the vaccinations of their travelers. The Vaccine Digital Certificate solution will serve as the system countries should rely on and use when accessing vaccination records. Blockchain will serve as an easy, reliable, and secure source for countries to access these records.

**UG-E30-Aldoaiji-Almugairin-2022**

**PAPER TITLE:** Recycling Trash Can that Holds up to 5x Capacity with Can Crushing Technology

**AUTHOR(S) & AFFILIATION(S):**Students: Nora Aldoaiji and Dana Almugairin

**ABSTRACT:** In Saudi Arabia landfill waste takes up 8 million square meters and has been an ongoing issue, there haven't been enough solutions out there to solve the problem. Therefore, we decided to design and implement a can crusher into a trash can, which will cut down on the recycling process, and encourage more people to recycle. The motivation for our project stems from the need to create a more sustainable future for recycling and getting rid of waste. We want to create an easier way to get rid of and recycle waste to promote recycling as the only way to get rid of waste. By recreating a trash can that takes up to 5x as much trash than a regular trash can, also with an installed can crusher that eliminates one of the many steps of recycling.

**G-E37-AlJuraiyed-2022**

**PAPER TITLE:** Application of Lean Six Sigma to Improve Maintenance requests Duration

**AUTHOR(S) & AFFILIATION(S):** Students: Omar Al Juraiyed, Ali AlZaeri **Faculty/Researchers:** Dr. Subhi Mejjaouli

**ABSTRACT:** Application of lean six sigma methodology, define, measure, analyze, improve and control (DMAIC) to reduce the duration of maintenance requests in real estate projects. First, we will collect real data from deferent residential properties that is under operation and create a distribution curve (Number of tickets vs Duration) in order to assess current situation by calculating mean, median, variance, range and sigma level, then we will use Ishikawa analysis to discover root cause of effects. Also, we will use process map analysis to find out any chance of process improvements, finally, we will use control chart to monitor new results after applying recommended improvements.

**UG-E39-Alrumaih-2022**

**PAPER TITLE:** Inventory Reduction

**AUTHOR(S) & AFFILIATION(S):** Students: Faisal Binmugayel, Nawaf Alhomod, Abdullah Alrumaih **Faculty/Researchers:** Dr. Tariq Alhawari, Industrial Engineering

**ABSTRACT:** Jazeera Paints Company was a small institution with high aspirations and ambitions. In a short period of time, the company became a pioneer in manufacturing and developing innovative, high quality and environmentally responsible paints, designed to meet the requirements and needs of a wide range of clients

including industrial, commercial and individuals. The company has several warehouses for storing. The problem is that a lot of money is lost in the materials stored in the warehouses and there is a clear opportunity to reduce the amount of inventory stored in the warehouses. Our objective is to decrease the inventory level by 10% based on monetary terms which equates approximately to a 23 MSAR reduction in the inventory. After screening the warehouses, we found out that packed materials, raw materials, packed materials, and spare parts takes up above 90% of the total inventory and is related which would ease up the reduction process so we made these categories a main priority.

#### **UG-E43-Aljandali-2022**

**AUTHOR(S) & AFFILIATION(S):** Students: Zain Aljandali, Fahad Alowaidh, Khalid Ali Hali. **Faculty/Researchers:** Dr. Areej Al-Wabil

**ABSTRACT:** Mirror therapy is a type of physical rehabilitation used for upper-limbs and lower-limbs. The way it works is that there is a mirror in which the patient places in the middle of both upper limbs (in our case) in which the paralyzed limb is placed on the hidden side and the non-affected limb is placed visibly to the patient. In that case, when the unaffected limb moves, the brain is tricked into believing that both limbs are moving but in reality, only one is. Consequently, the ability to move the paralyzed limb is gradually restored. It is well-established that the plasticity of the brain can help in restoring the memory of how to move an affected limb through physical rehabilitation. The developed product will help in tracking the progress of patients with stroke using different types of sensors. one that will detect how much the upper limb is levitated from the device's base. and another that will detect the angle in which the upper limb is twisted. Creating an application that can capture the data from the sensors and display the progress of the patient. The application would be connected to the clinician for monitoring progress remotely.

#### **UG-E47-Dabbagh-2022**

**PAPER TITLE:** Folklore Dance Identification using AI Models

**AUTHOR(S) & AFFILIATION(S):** Students: Yasmeen Dabbagh, Leena AlZahrani, Rema AlMutairi; College of Engineering **Faculty/Researchers:** Dr. Areej Al-Wabil

**ABSTRACT:** Many of the traditional dances in Saudi Arabia are undocumented and unknown to other regions within the country. Over time, these dances will vanish due to their low popularity. In efforts to preserve the culture and keep the various folklore dances alive, we propose creating an AI machine that can identify the type of dance based on the dancers' movements. Our focus was to create an AI model that can categorize the two dances depending on the input video. This can be accomplished by teaching a model – i.e., machine learning – to distinguish between the two dances using teaching sets for each dance. To create the model, we will be using an online tool, Teachable Machine, to simplify the process of creating a good algorithm by feeding the machine many instances of various poses for each dance at different angles and lighting conditions. The results and design implications will be discussed in the poster.

## **3<sup>rd</sup> Prize**

#### **UG-E07-Hassan-Kachoum-2022**

**PAPER TITLE:** Ascend

**AUTHOR(S) & AFFILIATION(S):** Students: Mohamed Hassan, Abdulelah Kachoum

**ABSTRACT:** Ascend, by definition, is the act of rising or mounting upwards. It is the name we picked for our project which comprises of two medium rise buildings that offer multiple types of residential spaces and hotel spaces.

#### **UG-E20-Alsaleem-Aldabbagh-2022**

**PAPER TITLE:** Dakka: A 2050 Residential Project for Mitigating the Negative Impacts of Hypothetical Dysfunctional Families

**AUTHOR(S) & AFFILIATION(S):** Students: Alanoud Alsaleem & Alzahra Aldabbagh **Faculty/Researchers:** Dr. Tarek Mokhtar

**ABSTRACT:** Dakka: A 2050 Residential Project for Mitigating the Negative Impacts of Hypothetical Dysfunctional Families. The project aims to provide an adaptable and proper housing design that will mitigate several social problems. Focusing on lowering and preventing dysfunctional families due to weak communities and poor communication -verbal and physical- caused by COVID-19 led by population growth. Our design will utilize the technologies and innovative design techniques found in the modern days to produce a mixed-use development that blends residential and commercial uses, promoting a balanced intact community. Dakka will offer a wide range of

spaces that serve day to day needs, enabling people to seamlessly integrate their work, home, and social lives to improve the mental and physical healths. This balance would lead to healthier lifestyles for families and individuals; offer services and experiences that will help the residences on a bigger and deeper level to prevent dysfunction within.

#### **UG-E25-Alwuayl-2022**

**PAPER TITLE:** Distributing Fast Ev Charging Stations in Saudi Highways

**AUTHOR(S) & AFFILIATION(S): Students:** Omar Khalid Alwuayl, Tareq Elsaka, ALWALID IDRIS, ABDULAZIZ ALSHAIKH.

**Faculty/Researchers:** Dr. SOBHI MEJJAOULI

**ABSTRACT:** With the leaps and strides Saudi Arabia has been making in recent years, and it's clear interest in making Saudi Arabia more dependent on Electric Vehicles taking form in the green initiative of the Saudi 2030 Vision. In this paper, a model that locates and distributes fast charging EV stations (FCS) among the highways connecting the major cities in Saudi Arabia and plan the most ideal distribution of stations is created using methods from Industrial Engineering. The first problem is determining the charging station's locations on a certain highway. The second problem is deciding how many charging stations will be placed in every specific location considering the parameters of each. For this study, the model is applied on the Jeddah-Riyadh-Dammam highway crossing the most important cities of Saudi Arabia. For the methodology, 15 locations are located along this route. For each location, the Criteria Priority Weight system (CPWS), a system used to calculate the composite weight of each location, is applied. Finally, we will apply our mathematical model with the set parameters to find the maximum user utility score, which corresponds to the optimal distribution of EV chargers upon the locations. The results yield a certain distribution of charging stations in those locations under budget, cost, and capacity constraints.

#### **UG-E36-Alothman-2022**

**PAPER TITLE:** Implementation and Optimization of Hydrogen Fuel Cell for Shell Eco-marathon Student Vehicle

**AUTHOR(S) & AFFILIATION(S): Students:** Haifa Alshathry, Modhy Alrasheed, Dana Almugairin, Mohanad Shamsan, Abeer Khan, Zeina Badran, Lulwa Alsudiri, Abdelkarim De Vol, Afraa Aldawsari, Jeeshan Sayed, Thukra Alrejaee, Lama Alothman **Faculty/Researchers:** Dr. Abdel Naser Daoud

**ABSTRACT:** The Shell Eco-marathon is a global competition that focuses on energy optimization and is one of the world's leading student engineering competitions. In our team, we prioritize energy efficiency and sustainable sources of fuel in our vehicles. We decided to use Hydrogen Fuel Cell (HFC) as our energy source since it uses abundant hydrogen gas. In a conventional HFC, hydrogen gas ( $H_2$ ) from the tank reacts with oxygen ( $O_2$ ) from the surrounding air to generate electricity with water and heat as the only byproducts of the whole process. Hence making it the critical reason we are implementing it in our automobile. In this research, we investigate the optimizations of HFCs in vehicles for an increased energy-efficiency.

#### **UG-E53-AlShaikh-2022**

**PAPER TITLE:** Managing inventories

**AUTHOR(S) & AFFILIATION(S): Students:** Mohammed AlShaikh, Sultan Alkhalidi **Faculty/Researchers:** Industrial Engineering

**ABSTRACT:** This project objective is to design storage and ware housing system by maximizing space utilization, equipment utilization, labor utilization, material accessibility, and material protection. To meet these requirements we will maximize resource utilization while satisfying customer requirements and to maximize customer satisfaction subject to a resource constraint, planning for maximum equipment utilization requires the selection of the correct equipment, maximizing labor involves providing the needed offices and other services for personnel, maximum accessibility of all material is a layout issue, maximum protection of items follows directly from having well trained personnel store goods in adequate space with proper equipment in a properly planned layout. We expect to reach our goal at the end of this project which is providing the most economical storage in relation to cost of equipment, use of space, damage to material, handling labor, and operational safety and most important to make the warehouse a model of good housekeeping.





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## 6. Medicine, Health Science & Pharmacy Winning Posters 2022



For Medicine, Health Science & Pharmacy there were 36 winning posters: 22 undergraduate and 14 graduate (**Table 5**).

**Table 5.** Winning Posters for Medicine, Health Science & Pharmacy.

Poster Code	Poster Title	Contact Person
<b>1<sup>st</sup> Prize</b>		
<b>Medicine, Health Sciences &amp; Pharmacy</b>		
<b>Undergraduate</b>		
UG-M04-Batha-2022	Differential Gene Expression Signatures and Cellular Signalling Pathways of Lamin A/C Transcript Variants in MCF7 Cell Line by RNA Sequencing	Lin Batha
UG-M21-Farhan-2022	Attitude and Knowledge of KSA population towards Premarital Mental Health Screening	Hania Farhan
UG-M49-Abouelkhair-2022	An Unexpectedly High Prevalence of The Chromophobe Histopathology Subtype in Renal Carcinoma Specimens Among Nephrectomy Patients in King Faisal Specialist Hospital and Research Centre Between 2005-2020	Ahmed Abouelkhair
UG-M52-Alabsi-2022	Multimic Analysis of The Arabian Camel (Camelus Dromedarius) Kidney Reveals a Role for Cholesterol in Water Conservation	Ammar Alabsi
UG-M78-Alaklabi-2022	Polycythemia Secondary to Multiple Paragangliomas- A Case Report	Abdulaziz Alaklabi
UG-M94-Siddique-2022	Treatment of Bronchial Anastomosis Fistula using Autologous Platelet-rich Plasma Post-Lung Transplantation - A Case Report	Aisha Siddique
UG-M118-Albashari-2022	A Strange Occurrence of Hematohidrosis: A Case Report from Saudi Arabia	Muna Albashari
<b>Graduate</b>		
G-M08-Ansori-2022	SARS-CoV-2 Spike Glycoprotein of Omicron Variant in Indonesia: <i>In Silico</i> Cloning	Arif Ansori

G-M18-Rajab-2022	Creating Chimeric Mouse Expressing Red Fluorescence Protein Using C57BL/6J And FVB Blastocysts	Mohamed Rajab
G-M35-Shamma-2022	Role of CTLA4-Ig Mediated Immunosuppression in Airway Allograft Repair	Talal Shamma
G-M59-Aleidi-2022	Targeting phospho-p70S6K1, a potential biomarker of invasive breast cancer progression in type 2 diabetic patients	Hamad Aleidi
G-M81-Alrashed-2022	There is a Difference in Clinical Outcomes between Three Different Thromboprophylaxis Doses? A Retrospective Cohort Study among COVID-19-Infected Critically Ill Patients	Ahmed Alrashed
G-M105-Almaiman-2022	The Public Health Perspectives in Nephrology for Continuous Renal Replacement Therapy among Infants and New-Born in Saudi Arabia	Weiam Almaiman

## 2<sup>nd</sup> Prize Medicine, Health Sciences & Pharmacy

### Undergraduate

UG-M09-Albalkhi-2022	Endoscopic Third Ventriculostomy and Choroid Plexus Cauterization in the Pediatric Populations	Ibrahim Albalkhi
UG-M29-Adam-2022	Comparative Kinetic Release Modeling Between Generic Amlodipine Besylate Tablets and Capsules with Innovator Brands	Doaa Adam
UG-M47-AbouChaer-2022	The Association of Genitourinary Cancer Among Patients with Gastrointestinal Stromal Tumor: a KFSH&RC 2003-2020 Cohort	Kenan AbouChaer
UG-M62-Deeba-2022	Improved Survival in Adolescents and Young Adults (AYA) Patients Aged 14–55 Years with Acute Lymphoblastic Leukemia Using Pediatric-Inspired Protocol – A Retrospective Analysis of a Real-World Experience In 79 Of Patients Treated at A National Tertiary Care Referral Centre	Farah Deeba
UG-M76-Haque-2022	Assessing the Scope of Non-Resuscitative First Aid Knowledge amongst Public School Educators in Riyadh, Saudi Arabia	Sarah Haque
UG-M86-Hamad-2022	Successful Use of Twice-Daily Letemovir in Treatment of Resistant Cytomegalovirus in A Small Bowel Transplant Recipient	Alaa Hamad
UG-M116- Alanazi-2022	Urogenital Tuberculosis Presenting as Bilateral Pyelonephritis in HIV Negative Diabetic Female. A Case Report	Rakan Alanazi

### Graduate

G-M11-Alsinan-2022	A Case Report of Breast Reconstruction in Twins with Xeroderma Pigmentosum	Tuqa Alsinan
G-M30-Zhra-2022	Establishment of Portable and Point of Care SARS-CoV-2 Rapid Multiplex rRT-PCR Test without RNA Isolation	Mahmoud Zhra
G-M44-Abuhaimed-2022	Impact of COVID19 Pandemic on Preparedness of Saudi Pediatricians and Pediatric Trainees to Face Growing Vaccine Hesitancy in Saudi Arabia	Jawahir Abuhaimed
G-M82-Alwadi-2022	Comparative Analysis of Commercially Available Paracetamol Tablets in Saudi Arabia	Aiman Alwadi
G-M104-Fatani-2022	Experts' Opinion on Linking Cancer Local Registries with National Death Registries in Saudi Arabia	Doha Fatani

## 3<sup>rd</sup> Prize Medicine, Health Sciences & Pharmacy

### Undergraduate

UG-M16-Binsulaiman-2022	Diagnosis Of Glomus Tumor of The Elbow: A Case Report	Najd Binsulaiman
UG-M19-Arai-2022	CYP24A1 And Breast Cancer	Momo Arai
UG-M24-Garaween-2022	Study Of Synergistic Effect of Natural and Synthetic Preservatives Using the Challenge Test	Noureldeen Garaween
UG-E36-Alothman-2022	Implementation and Optimization of Hydrogen Fuel Cell for Shell Eco-marathon Student Vehicle	Lama Alothman
UG-M64-Elshaer-2022	Endoscopic Retrieval of Air Gun Pellet Retained in Frontal Sinus: A Case Report	Rawan Elshaer
UG-M80-ALDoumani-2022	Bone Mineral Density Recovery in Patients with Nephrotic Syndrome after treatment with Rituximab	Mhd AlDoumani
UG-M98-Kafaji-Abdalla-2022	The First Case of a Patient with Graft-versus-Host Disease and Retinitis Pigmentosa in the Literature: True Association, or Circumstantial?	Mustafa Kafaji
UG-M112-Alhowaish-2022	Predictors and Clinical Outcomes of Permanent Pacemaker Insertion Following Transcatheter Aortic Valve Implantation	Thamer Alhowaish

### Graduate

G-M32-Alrifai-2022	In-house Real-Time Q-PCR NAT assay for multiplexed detection of HCV and HBV	Majeda Alrifai
G-M50-AlAbdullah-2022	The Association Between Social Media Use and Quality of Life Among the Saudi Population	Amal AlAbdullah
G-M107-Abduljawad-2022	Thoracolumbar Kyphoscoliotic Deformity with Neurological Impairment Secondary to A Butterfly Vertebra in An Adult. A Case Report	Salim Abduljawad

## ABSTRACTS

### 1<sup>st</sup> Prize

#### UG-M04-Batha-2022

**PAPER TITLE:** Differential Gene Expression Signatures and Cellular Signalling Pathways of Lamin A/C Transcript Variants in MCF7 Cell Line by RNA Sequencing

**AUTHOR(S) & AFFILIATION(S):** Undergraduate Student: Lin Batha Graduate Student: Mahmoud Zahra Faculty: Ahmad Aljada, Rajaa Fakhoury, Jasmine Holail Researcher: Mohammad Azhar Aziz

**ABSTRACT:** **Background:** Lamins are the major component of nuclear lamina. Alternative splicing of the 12 exons comprising *lamin A/C* gene creates five known transcript variants, lamin A, lamin C, lamin AΔ10, lamin AΔ50, and lamin C2. **Objectives:** Examine the association of critical pathways, networks, molecular and cellular functions with differentially expressed genes following upregulation of lamin A/C transcript variants in MCF7 cell line. **Methodology:** Ion AmpliSeq Transcriptome Human Gene Expression analysis for the measurement of the expression levels of over 20,000 human RefSeq genes was performed on MCF7 cells stably transfected with lamin A/C transcript variants. **Results:** Lamin A or lamin AΔ50 upregulation were associated with a predicted activation of increased cell death and inactivation of carcinogenesis while both lamin C or lamin AΔ10 upregulation were associated with activation of increased carcinogenesis and inactivation of cell death. **Conclusion:** Data suggest anti-apoptotic and anti-senescence effects of lamin C and lamin AΔ10. However, lamin AΔ10 upregulation is associated with a more carcinogenic and aggressive tumor phenotype. Lamin A or lamin AΔ50 upregulation is associated with the activation of increased cell death and inactivation of carcinogenesis. Thus, the large number of laminopathies could be explained by the diverse signaling pathways of lamin A/C transcript variants.

#### G-M08-Ansori-2022

**PAPER TITLE:** SARS-CoV-2 Spike Glycoprotein of Omicron Variant in Indonesia: *In Silico* Cloning

**AUTHOR(S) & AFFILIATION(S):** Students: Arif Nur Muhammad Ansori

**ABSTRACT:** Omicron variant of SARS-CoV-2 is rapidly spreading all over the world. The development of a vaccine against SARS-CoV-2 Omicron variant is a must in order to stop the virus from spreading and causing more deaths. Thus, a vaccine candidate for the SARS-CoV-2 Omicron variant had been developed in this work using an *in-silico* technique. Furthermore, *in silico* tools and servers had been employed to assess the efficacy and safety of the proposed epitopic vaccination candidate. Essentially, the vaccine candidate demonstrated no allergenicity or toxicity in this investigation. The *in-silico* cloning model has exhibited an efficacy of the constructed vaccine along with the identified epitopes against SARS-CoV-2 Omicron variant. In conclusion, this study suggested *in silico* vaccine candidate demonstrates powerful efficacy against COVID-19 infection (Omicron variant) and further study might confirm its efficacy in *in vivo* and *in vitro* settings.

#### G-M18-Rajab-2022

**PAPER TITLE:** Creating Chimeric Mouse Expressing Red Fluorescence Protein Using C57bl/6j And Fvb Blastocysts

**AUTHOR(S) & AFFILIATION(S):** Students: Mohamed Rajab, College of Medicine, Alfaisal University  
**Faculty/Researchers:** Bhavesh Mistry\*, Maha Alanazi\*, Abdullah Assiri\*, \*Comparative Functional Genomics, Department of Comparative Medicine, King Faisal Specialist Hospital & Research Centre, Riyadh, Saudi Arabia

**ABSTRACT:** To unravel gene functions and dissect the molecular basis of diseases, mouse embryonic stem cells (mESC) have been used extensively in gene targeting experiments to produce gene knockout (KO), knock-in (KI), and point mutations. International repositories such as the knockout mouse project (KOMP) and others that provide genetically engineered mESC. We have established gene targeting capability infrastructure and performed proof of concept experiments to produce mice with a gene-targeted mutation at the KFSHRC. We have obtained and propagated transgenic mESC that express red fluorescence protein (RFP). The undifferentiated state of the stem cells was examined by their expression of stem cell markers Oct4, Nanog, and SOX2. To produce chimeras, RFP expressing mESC were injected into blastocysts and transferred to pseudopregnant mice. We achieved 74% injection survival (385/520 embryos) and transferred 369 embryos to pseudopregnant mice. We have identified several chimeras by coat-color and In Vivo Imaging System (IVIS). Chimeric RFP positive founder will be crossed with wild type to assess germline transmission and fertility. In-house chimeras' production will increase our animal modeling efficiency and will be a cost-effective research tool.



#### UG-M21-Farhan-2022

**PAPER TITLE:** Attitude and Knowledge of KSA population towards Premarital Mental Health Screening

**AUTHOR(S) & AFFILIATION(S):** **Students:** Hania Farhan, Laiba Yaseen, Sara Abid, Syeda Sobiah Imad. **Faculty/Researchers:** Dr. Noara AlHusseini

**ABSTRACT:** The purpose of this study is to assess the attitude and knowledge of the KSA population towards premarital screening for mental health and psychiatric disorders. Mental Health Premarital screening tests individuals for mental health disorders and other psychiatric medical conditions. Premarital screening and counselling are essential in a population since it informs the couple about any psychiatric disorders their potential spouse possesses. A cross-sectional study was carried out by conducting a survey which was sent through social media. Convenience sampling along with the Chi-square test was used to determine the results. After comparing the results, it was found out that Saudi respondents have a more positive attitude than non- Saudi's respondents with mothers' education being high school or less had a lower level of acceptance compared with a graduate degree, similarly, respondents with fathers' level of education being graduate degree had a higher level of beneficial attitude than with an undergraduate degree. Overall, a significant predictor for respondents' attitude is the level of parent's education.

#### G-M35-Shamma-2022

**PAPER TITLE:** Role of CTLA4-Ig mediated immunosuppression in airway allograft repair.

**AUTHOR(S) & AFFILIATION(S):** **Students:** Talal Amer Shamma **Faculty/Researchers:** Dr. Mohammad Afzal Khan, Abdullah Altuhami, Dr. Abdullah Mohammed Assiri, Dr. Dieter Clemens Broering. **Affiliations:** Transplantation Research and Innovation Department, Organ Transplant Centre of Excellence, King Faisal Specialist Hospital and Research Centre.

**ABSTRACT:** The long-term survival of a transplanted organ is limited due to the inevitable onset of chronic rejection in HLA mismatched patients. Studies have showed that reducing the intensity of the acute rejection phase can delay the occurrence of chronic rejection, which results in long term survival. Therefore, drugs that targets the acute rejection phase are being developed as a potential therapeutic intervention in the field of transplantation. CTLA4-Ig (Abatacept) is a potent costimulatory inhibitor that plays an important role in preventing early T cell activation and function during inflammation. Administration of CTLA4-Ig have shown produce better renal functions in clinical kidney transplants and many preclinical transplant studies, but its effects on the Treg and T effector balance and microvascular associated grafts injuries are poorly understood. Therefore, we investigated the impact of CTLA4-Ig mediated costimulatory blockade as an immunotherapy during acute and chronic allograft rejection in a mouse model of tracheal transplantation. Our results showed that CTLA4-Ig mediated immunosuppression significantly leads to the late increase in FOXP3+ Tregs, which favors reestablishment of graft microvascular blood flow and restores transplant integrity. Furthermore, healthy epithelium was found at day 90 post-transplant with no subepithelial fibrosis indicating no chronic rejection. In summary, CTLA4-Ig showed effective early immunosuppression and preservation of graft microvasculature and tissue repair that leads to long term organ transplant survival.

#### UG-M49-Abouelkhair-2022

**PAPER TITLE:** An unexpectedly high prevalence of the chromophobe histopathology subtype in renal carcinoma specimens among nephrectomy patients in King Faisal Specialist Hospital and Research Center between 2005-2020.

**AUTHOR(S) & AFFILIATION(S):** **Students:** Ahmed Abouelkhair<sup>1\*</sup>, Kenan Abou Chaer<sup>1\*</sup>, Amal Albalawi<sup>1\*</sup>, Hadeel Alarfaj<sup>1\*</sup>, Loulwah Almainan<sup>1\*</sup>, Omar Zeitouni<sup>1\*</sup> **Faculty/Researchers:** Raouf Seyam<sup>2</sup>, Othman Alzahrani<sup>2</sup>, Razan A. Alhamidi<sup>3\*</sup>, Zaid Ali Alzahrani<sup>2</sup>, Ali Suliman E Al-Gonaim<sup>2,4</sup>, Turki Al-Hussain<sup>5</sup>, Hassan M. Alzahrani<sup>2</sup>, Mohamed F. Alotaibi<sup>2</sup>, Sultan Alkhateeb<sup>2</sup>, and Waleed Altaweel.<sup>2</sup> **Affiliations:** <sup>1</sup>Alfaisal University, Riyadh, <sup>\*</sup>Student, <sup>2</sup>Department of Urology, KFSH&RC, Riyadh, <sup>3</sup>King Saud Bin Abdul-Aziz University for Health Sciences, Riyadh, <sup>\*</sup>Student, <sup>4</sup>Prince Sattam bin Abdulaziz University, Riyadh, <sup>5</sup>Department of Pathology and Laboratory Medicine, KFSH&RC, Riyadh.

**ABSTRACT: Aim:** We set out to identify the histopathology of renal cancer tumors treated by surgical excision in KFSHRC and determine whether the pattern is comparable to the international data. **Methods:** Retrospectively, the files of all patients with histological diagnosis of RCC were evaluated. Descriptive statistics are reported.

**Results:** From 2005-2022, 632 patients (61% males, 39% females) had surgical excision of 666 renal carcinomas with average age 53.0 years (SD 15.2). The mean tumor size was 6.8 cm (SD 4). Histological types were clear cell RCC (n=416, 62.5%), Chromophobe RCC (n=142, 21.3%), papillary RCC (n=63, 9.5%), unclassified RCC (n=13, 2%) and other types of RCC (n=32, 4.8%). Tumor stage was T1 (n=326, 49%), T2

(n=100, 15%), T3 (n=225, 34%), and T4 (n=13, 2%). The mean Fuhrman grade was 2.5 (SD 0.8). **Discussion:** The prevalence of chromophobe RCC internationally is 4-6% among patients with renal cancer. However, in our current study, the prevalence is 21.3%. The underlying risk factors that led to this difference are not known. **Conclusion:** Chromophobe RCC is prevalent in our patients with renal cancer in a proportion that is quadruple what is reported worldwide. The discrepancy in this prevalence needs further study of the underlying factors.

#### UG-M52-Alabsi-2022

**PAPER TITLE:** Multiomic Analysis of The Arabian Camel (Camelus Dromedarius) Kidney Reveals a Role for Cholesterol in Water Conservation

**AUTHOR(S) & AFFILIATION(S):** Students: Ammar H. Alabsi<sup>3</sup>, College of Medicine, Alfaisal University, Riyadh, Saudi Arabia **Faculty/Researchers:** Fernando Alvira-Iraizoz<sup>1,7</sup>, Benjamin T. Gillard<sup>1,7</sup>, Panjiao Lin<sup>1</sup>, Alex Paterson<sup>1</sup>, Audrys G. Pauža<sup>1</sup>, Mahmoud A. Ali<sup>2</sup>, Ammar H. Alabsi<sup>3</sup>, Pamela A. Burger<sup>4</sup>, Naserddine Hamadi<sup>5</sup>, Abdu Adem<sup>2,6,8</sup>, David Murphy<sup>1,8</sup>, & Michael P. Greenwood<sup>1,8</sup> **Affiliations:** 1 Molecular Neuroendocrinology Research Group, Bristol Medical School: Translational Health Sciences, University of Bristol, Bristol, UK. 2Department of Pharmacology and Therapeutics, College of Medicine and Health Sciences, United Arab Emirates University, AL Ain, United Arab Emirates. 3College of Medicine, Alfaisal University, Riyadh, Saudi Arabia. 4Department of Interdisciplinary Life Sciences, Research Institute of Wildlife Ecology, Vetmeduni Vienna, Vienna, Austria. 5Department of Life and Environmental Sciences, College of Natural and Health Sciences, Zayed University, Abu Dhabi, United Arab Emirates. 6Department of Pharmacology and Therapeutics, College of Medicine and Health Sciences, Khalifa University, Abu Dhabi, United Arab Emirates. 7These authors contributed equally: Fernando Alvira-Iraizoz, Benjamin T. Gillard. 8These authors jointly supervised this work: Abdu Adem, David Murphy, Michael P. Greenwood. email: f.alvirairaizoz@gmail.com; [abdu.adem@ku.ac.ae](mailto:abdu.adem@ku.ac.ae)

**ABSTRACT:** The Arabian camel (*Camelus dromedarius*) is the most important livestock animal in arid and semi-arid regions and provides basic necessities to millions of people. In the current context of climate change, there is renewed interest in the mechanisms that enable camelids to survive in arid conditions. Recent investigations described genomic signatures revealing evolutionary adaptations to desert environments. We now present a comprehensive catalogue of the transcriptomes and proteomes of the dromedary kidney and describe how gene expression is modulated because of chronic dehydration and acute rehydration. Our analyses suggested an enrichment of the cholesterol biosynthetic process and an overrepresentation of categories related to ion transport. Thus, we further validated differentially expressed genes with known roles in water conservation which are affected by changes in cholesterol levels. Our datasets suggest that suppression of cholesterol biosynthesis may facilitate water retention in the kidney by indirectly facilitating the AQP2-mediated water reabsorption.

Link to the research paper: <https://www.nature.com/articles/s42003-021-02327-3>

#### G-M59-ALEidi-2022

**PAPER TITLE:** Targeting phospho-p70S6K1, a potential biomarker of invasive breast cancer progression in type 2 diabetic patients

**AUTHOR(S) & AFFILIATION(S):** Students: Hamad Aleidi, College of Medicine, Alfaisal University.

**Faculty/Researchers:** Hamad Al-Eidi 1, Abdullatif Khan 2,8, Abdulrahman Alasiri 1, Nafisa Abdelhafiz 3,8, Nessar Ahmed 4, Amina Munye 2, Duaa Nouh 5, Altaf Husain Khan 6, Hanaa Sharaf 7, Slava Al Baghli 2, and Sabine Matou-Nasri 1,8\* **Affiliations:** 1Cell and Gene Therapy Group, Medical Genomics Research Department, King Abdullah International Medical Research Center (KAIMRC), Ministry of National Guard Health Affairs (MNGHA), Riyadh, Saudi Arabia. 2Department of Pathology and Laboratory Medicine, National Guard Health Affairs, Riyadh, Saudi Arabia. 3Oncology Department, KAMC, MNGHA, Riyadh, Saudi Arabia. 4Department of Life Sciences, Manchester Metropolitan University, Manchester M1 5GD, United Kingdom. 5Research Office Department, KAIMRC, MNGHA, Riyadh, Saudi Arabia. 6Department of Biostatistics and Bioinformatics, King Abdullah International Medical Research Center, King Abdulaziz Medical City, Ministry of National Guard Health Affairs, Riyadh, Saudi Arabia. 7Pathology and clinical laboratory Medicine, King Saud Medical City, Riyadh, Saudi Arabia. 8King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia

**ABSTRACT: Background:** Type 2 diabetes (T2D) increased the risk of developing invasive breast cancer (BC) in patients compared to non-diabetic counterparts. Discovery of novel biomarkers is required for early diagnosis of invasive T2D BC patients and development of targeted therapeutic strategies. Phospho-p70S6K1 was reported to be highly expressed in invasive BC cell line MDA-MB-231 exposed to advanced glycation endproducts (AGEs). Therefore, we aimed to verify whether phospho-p70S6K1 could be a potential biomarker and investigate its role in

AGEs-promoted BC progression. **Methods:** Immunohistochemistry was used for the detection of p70S6K1 in patients' invasive ductal carcinoma tissues. Role of p70S6K1 was investigated in AGEs-stimulated MDA-MB-231 cells, and cancer-related protein expression was detected by Western blotting. p70S6K1 downregulation and blockade were performed using siRNA technology and a pharmacological inhibitor PF-4708671. **Results:** Here, we confirmed p70S6K1 overexpression in invasive BC cells in T2D patients compared to non-diabetic counterpart tissues. Both knockdown and blockade of p70S6K1 expression and activity resulted in the suppression of AGEs-promoted MDA-MB-231 cell migration, invasion, and ERK1/2 phosphorylation; the main cell events that promote tumor progression. **Conclusion:** The detection of phospho-p70S6K1 in invasive ductal carcinomas could be a promising biomarker and a potential therapeutic target against BC progression in T2D patients.

#### UG-M78-Alaklabi-2022

**PAPER TITLE:** Polycythemia Secondary to Multiple Paragangliomas- A Case Report

**AUTHOR(S) & AFFILIATION(S):** Students: Abdulaziz Alaklabi, Tarek Arabi **Faculty/Researchers:** Dr. Ghazi Alotaibi

**ABSTRACT:** Polycythemia can occur as a primary disease or secondary to tumors, such as hepatocellular carcinoma and renal cell carcinoma. Paragangliomas are rare tumors characterized by increased release of catecholamines with symptoms such as sweating and palpitations. Pheochromocytoma secondary to paragangliomas is rarely reported in the literature. We present a case of a 14-year-old female who presented with polycythemia as a result of multiple underlying paragangliomas.

#### G-M81-Alrashed-2022

**PAPER TITLE:** There a Difference in Clinical Outcomes between Three Different Thromboprophylaxis Doses? A Retrospective Cohort Study among COVID-19-Infected Critically Ill Patients

**AUTHOR(S) & AFFILIATION(S):** Students: Ahmed Alrashed, College of medicine **Faculty/Researchers:** Dr. Peter M.B. Cahusac

**ABSTRACT: Introduction:** Thrombotic complications of COVID-19 have received considerable attention. Although numerous conflicting findings have compared escalated thromboprophylaxis doses with a standard dose to prevent thrombosis, there are no reports which compare three different anticoagulation dosing regimens simultaneously. Thus, we investigated the effectiveness and safety profiles of standard, intermediate, and therapeutic-dosing strategies in critically ill patients. **Methodology:** This retrospective multicenter cohort study of intensive care unit (ICU) patients from the period of April 2020 to August 2021. Inclusion criteria were age  $\geq 18$  years, diagnosis of severe or critical SARS-CoV-2 infection, receiving prophylactic anticoagulant dose within 24-48hrs of ICU admission. The primary endpoint was a composite of thrombotic events, with mortality rate and minor or major bleeding serving as a secondary endpoint. We applied survival analyses with inverse propensity score treatment weighting (IPTW) and propensity score matching (PSM). Confounding factors were adjusted in multivariable models. **Results:** A total of 811 patient records were reviewed, with 551 (standard-dose=192, intermediate-dose=180, and therapeutic-dose= 179) included in the analysis. After using IPTW modeling to balance the dataset, we found that standard-dose group was associated with similar hazard of the composite of thrombotic events to intermediate-dose group (19.8% vs 25%; adjusted hazard ratio (aHR), 1.46, [95% confidence of interval (CI), 0.94 to 2.26];  $P=0.246$ ) or therapeutic-dose group (19.8% vs 24%; aHR, 1.22 [95% CI, 0.88 to 1.72];  $P=0.246$ ). Also, no statistically significant differences were observed between standard, intermediate, or therapeutic-dosing groups with respect to overall in-hospital mortality (51.6% vs 53.7% vs 61.1%, respectively;  $P=0.769$ ). Moreover, the risk of major bleeding was comparable in all three groups (standard: 4.8% vs intermediate: 2.8% vs therapeutic: 9%;  $P=0.115$ ). However, a higher percentage of patients experienced minor bleeding in the intermediate-dose and therapeutic-dose groups when compared to the standard-dose group (12.6% vs 17.5% vs 5%;  $P=0.001$ ). **Conclusion:** Among COVID-19 patients admitted to the ICU, neither of the three dosing regimens differed for the composite of thrombotic events and mortality. Compared with standard-dose regime, intermediate and therapeutic-dosing thromboprophylaxis were associated with a higher risk of minor but not major bleeding.

#### UG-M94-Siddique-2022

**PAPER TITLE:** Treatment of Bronchial Anastomosis Fistula using Autologous Platelet-rich Plasma Post-Lung Transplantation - A Case Report

**AUTHOR(S) & AFFILIATION(S):** Students: Aisha Siddique, Belal Nedat Sabbah, Tarek Arabi **Faculty/Researchers:** Ismail Mohammed Shakir, MD; Rayid Abdulqawi, MD, PhD; Khaled AlKattan, MD; Mohamed Hussein Ahmed, MD

**ABSTRACT:** Airway anastomosis dehiscence and fistula are well-described complications after lung transplantation and are associated with significant morbidity and mortality. We describe a case of bronchial anastomosis fistula one month after double lung transplantation for non-cystic fibrosis bronchiectasis. The fistula was treated successfully

with applications of autologous platelet-rich plasma (PRP) using fiberoptic bronchoscopy. Furthermore, the article discusses the causes of post lung transplantation airway anastomosis dehiscence/fistula and the previously described treatment options. Although PRP has been previously reported in the treatment of tracheobronchial, bronchopleural, perianal and vesicovaginal fistulas, to our knowledge, there are no reports of PRP in the treatment of bronchial anastomosis fistula post-lung transplant. Our experience here indicates that treating post lung transplantation bronchial anastomosis fistula with PRP is safe and effective.

#### **G-M105-Almaiman-2022**

**PAPER TITLE:** The Public Health Perspectives in Nephrology for Continuous Renal Replacement Therapy among Infants and Newborns in Saudi Arabia

**AUTHOR(S) & AFFILIATION(S):** **Students:** Weiam Almaiman **Faculty/Researchers:** Dr.Noara AlHusseini

**ABSTRACT:** **Background:** Kidney diseases are major public health concerns and an economic burden globally. Continuous Renal Replacement Therapy (CRRT) is one of the most utilized modalities in the management of acute kidney injury (AKI) secondary to renal or non-renal causes. In infants and newborns, it is a challenging and expensive procedure. The literature about the outcome of CRRT in this age until present is still limited. **Objective:** To determine the outcome and mortality rate of CRRT among infants and newborns. **Design:** A retrospective study by reviewing charts & Virtual Performance System VPS. In Pediatric intensive care unit in a tertiary care center in the Kingdom of Saudi Arabia. **Patients and methods:** The study included 40 patients whose age ranges from 0 to 1 year who underwent CRRT from September 2009 to December 2019; and excluding those who had CRRT for less than 24 hours and patients whom the primary diagnosis was cardiac in origin. We reported demographics, nature of diseases, presence of multiorgan failure, CRRT prescriptions. Statistical analyses were used to identify the correlation between the outcome and the mentioned data. **Results:** There was slight male predominance (22 out of 40), the age at ICU admission was (range 0-12) median 5 months, the weight was (range 2.20-9.70) median 5.45 kg. Additionally, the most common category was bone marrow transplantation (42.5%) followed by metabolic (20%). The most common CRRT modality was used CVVHD 21 (56.8%). The CRRT blood flow rate was (range 20-100) median 50 ml/min, and dialysate flow rate (range 100-800) median 400 ml/hr. The duration of stay in PICU was ranging between (0.80-139.01) median 16.97 days. 12 patients (30%) survived, while 28 (70%) died. The duration of CRRT was ranging between (0.03-286.80) median 38.95 hours. 37 patients (92.5%) developed complications related to CRRT, mostly with hypothermia (62.5%). Non-survived group had higher weight (6 vs 4.3 Kg, P-value 0.01), and were older at ICU admission (6 vs 3.33 months, p-value 0.02). Primary diagnostic category, reason to initiate CRRT and the presence of multiorgan failure were all correlated significantly with the outcome (p value 0.01). Significant correlation between serum creatinine after 3 months of CRRT and age at ICU admission (correlation coefficient 0.47, P-value 0.05). 50% of the patients had an overall survival time, from initiating CRRT until the PICU patients' physical discharge of 13 days (95% CI: 9 - 26) **Conclusion:** The overall the mortality rate was 70%. The survival rate for the metabolic newborn and infants who underwent CRRT was 88%, with an increase of mortality rate among other categories, post bone marrow transplant, immunodeficiency, and oncology patients. In addition, the weight, age at ICU admission, coagulopathies, and presence of multiorgan failure showed significant correlation with the outcome.

#### **UG-M118-Albashari-2022**

**PAPER TITLE:** A Strange Occurrence of Hematohidrosis: A Case Report from Saudi Arabia

**AUTHOR(S) & AFFILIATION(S):** **Students:** Sara Alasfoor, Muna Albashari **Faculty/Researchers:** Aya Alsermani, Mohamad Bakir, Maamoun Alsermani, Sami Almustanyir

**ABSTRACT:** Hematohidrosis is a rare disorder of blood excretion from the eccrine sweat gland not associated with an injury or trauma. Although several hypotheses exist to explain such a condition, the etiology of hematohidrosis remains unknown. Psychological stress is strongly linked to the condition, yet patients may present completely healthy with no identifiable etiology. The diagnosis of hematohidrosis can be difficult and requires the exclusion of bleeding disorders, vasculitis, and other disorders. Here, we present a case of hematohidrosis in a 20-year-old female who had almost weekly bloody tears, as well as gum bleeding, ear bleeding, and epistaxis for the past four months. During hospitalization, the patient was thoroughly investigated for an etiology, but no identifiable cause was found. The patient was diagnosed with hematohidrosis and treated with propranolol. Her condition had improved significantly on follow-up.



## 2<sup>nd</sup> Prize

### UG-M09-Albalkhi-2022

**PAPER TITLE:** Endoscopic Third Ventriculostomy and Choroid Plexus Cauterization in the Pediatric Populations

**AUTHOR(S) & AFFILIATION(S):** **Students:** Ibrahim Albalkhi, Sarah Garatli, Baraa Helal **Faculty/Researchers:** Dr. Abdullah H. AlRamadan, MD

**ABSTRACT:** Endoscopic Third Ventriculostomy (ETV) has become the procedure of choice for the treatment of hydrocephalus where it carries the advantage of emancipation from a shunt. A database search was then analysed to note the success rate of Endoscopic Third Ventriculostomy based on age and etiologies like tumours, Aqueductal Stenosis (AS), myelomeningocele, post-hemorrhagic hydrocephalus (PHH), and post-infection hydrocephalus (PIH). The average success rate for infants younger and older than 6 months at the time of surgery is 46% and 59% respectively. The highest average success rate was in hydrocephalus due to tumours, AS, and myelomeningocele (77%, 64%, 58%) and the lowest was in PHH and PIH (38%, 49%). Higher success rates have been found in patients with bowing of the third ventricle. The addition of Choroid Plexus Cauterization has raised the success rate in infants by 16%. Pontine scarring and interthalamic adhesions are considered markers of failure. Low birth weight premature infants had a higher failure rate (3 out of 5 infants 60%) compared to full term infants with normal birth weight (12.3%). The use of ETV as first line treatment for hydrocephalus in infants has shown a good success rate with fewer complications as compared to shunts.

### G-M11-Alsinan-2022

**PAPER TITLE:** A Case Report of Breast Reconstruction in Twins with Xeroderma Pigmentosum

**AUTHOR(S) & AFFILIATION(S):** **Students:** Tuqa A Alsinan **Faculty/Researchers:** Luay Alsalmi, Ovais Habib

**ABSTRACT:** Xeroderma Pigmentosum (XP) is a rare inherited autosomal recessive disorder with inability to repair DNA damage caused by the sunlight. Patients with XP are extremely sensitive to the sunlight resulting in sunburns and pigmentations in affected areas, and a greatly elevated incidence of cancers such as skin and breast. Many studies were conducting in understanding the genetic causes of breast cancer in familial diseases in order to overcome the negative results, for which the satisfactory outcomes increased with Bilateral Prophylactic Mastectomy (BPM) in such patients. Here we report a case revolves around Saudi female twins aged 21-year-old who are known case Xeroderma Pigmentosum type 2 since birth, which make them at higher risk of developing breast cancer in the future. Both patients were counselled to undergo a bilateral prophylactic mastectomy as a protective measurement. After thorough investigations and workups, the management plan was to be taken at our institute by performing a reconstructive surgery. Despite the limited life expectancy in this subset of patients owing to development of multiple malignancies with poor prognosis, it is feasible to give these patients the optimal reconstructive options in order to have the best quality of life till the end.

### UG-M29-Adam-2022

**PAPER TITLE:** Comparative Kinetic Release Modeling Between Generic Amlodipine Besylate Tablets and Capsules with Innovator Brands.

**AUTHOR(S) & AFFILIATION(S):** **Students:** Doaa Rashed Adam, Nuran Ahmad Faisal AL-rayes, Raghad Mohammed Fatoum **Faculty/Researchers:** Dr. Adeola Kola-Mustapha

**ABSTRACT:** Quality assessments are the most important issue in the pharmaceutical field to ensure the efficacy and safety of the brands compared to their innovators. The objective of the study is to conduct comparative in-vitro dissolution studies of three amlodipine besylate generic tablets with the innovator Norvasc® and two capsule brands with the innovator Amlor® available in Riyadh, Saudi Arabia pharmacies. Dissolution studies have been performed according to United States Pharmacopoeia 38, Apparatus II (hydrochloric acid 0.01 N). The comparison between the dissolution profiles was carried out by model-dependent (MD) and model-independent (MID) methods. Various mathematical models were utilized in (MD), like zero order, first order, Higuchi, and Hixson-Crowell to elucidate the kinetic behavior of the drug release from the generic and innovator brands. In terms of (MID), included fit factors and ratio test. All the tested brands followed the Higuchi model of release. Regarding (MID), using fit factors, it was found that all products have a similarity factor >50%. For Ratio tests all tablet and capsule brands had no significant difference in mean dissolution time.

### G-M30-Zhra-2022

**PAPER TITLE:** Establishment of Portable and Point of Care SARS-CoV-2 Rapid Multiplex rRT-PCR Test without RNA Isolation

**AUTHOR(S) & AFFILIATION(S):** **Students:** Mahmoud Zhra **Faculty/Researchers:** Hanaa Hajeer, Rajaa Fakhoury and Ahmad Aljada

**ABSTRACT:** One of the crucial measures to combat COVID 19 is the early identification and isolation of infected individuals. To this end, the WHO and the CDC have established a COVID-19 monoplex gene specific RT-PCR test. This monoplex COVID-19 RT PCR method requires a molecular diagnostic laboratory with highly trained and skilled personnel. Another constraint is the cost and the difficulties in ordering the kits and supplies during times of curfew and high global demands. Another major limitation for the wide use of the assay is the length of time required between sample collection and obtaining the results, which is usually not less than 10-12 hours. Hence, the development of a portable COVID-19 rapid multiplex RT- PCR test will help minimize and eliminate the spread of the disease and overcome the test limitations. The portability and bypassing the RNA isolation step will also facilitate the completion of the test in about 30 minutes. The in-house preparation of the amplification enzyme, Taq Polymerase and reverse transcriptase, and buffers will overcome the cost and supplies availability limitation.

#### **G-M44-Abuhaimed-2022**

**PAPER TITLE:** Impact of COVID19 Pandemic on Preparedness of Saudi Pediatricians and Pediatric Trainees to Face Growing Vaccine Hesitancy in Saudi Arabia

**AUTHOR(S) & AFFILIATION(S):** **Students:** Jawahir M. Abuhaimed, Alfaisal university, college of medicine **Faculty/Researchers:** Yossef Alnasser <sup>1</sup>, Mahdi A Alnamakani <sup>1</sup>, Jawahir M Abuhaimed <sup>2</sup>, Lulwah Z Alshiha <sup>3</sup>, Nouf M Alhamid <sup>1</sup>, Ghada A Alalshaikh <sup>1</sup> **Affiliations:** <sup>1</sup>Pediatric Department, King Saud University Medical City, King Saud University, Riyadh, Saudi Arabia. <sup>2</sup>Clinical Trails Unit, King Saud University Medical City, King Saud University, Riyadh, Saudi Arabia. <sup>3</sup>King Saud Medical School, King Saud University, Riyadh, Saudi Arabia.

**ABSTRACT: Introduction:** There have been major concerns among parents regarding vaccines' safety within the last decade globally. Recent study has documented vaccine hesitancy to be common among Saudi parents (20%). This study aims to explore preparedness and readiness of current and future Pediatricians to face this growing public health problem which might intensify post pandemic. **Methods:** This study adopted non-interventional cross-sectional online questionnaire specifically designed to encompass general vaccine hesitancy related questions including Covid-19's vaccines. It was disseminated through main tertiary centers within the capital city, Riyadh. **Results:** The ongoing study has shown familiarity with the term "Vaccine Hesitancy" among 81.7% of the participants. Despite 80% of participants encountered vaccine hesitant parents in their practice, only 55% consider it a common public health issue. Majority (91%) believes Saudi parents have concerns about vaccine safety. But only one third (29%) of participants envision altering vaccine schedule to be a future Saudi parental demand. At the same time, Saudi pediatric trainees and practitioners hold a strong stand against vaccine-hesitancy. They consider it a form of child neglect (95%). Furthermore, the unanimous consensus among 90% of participants is in favor of mandating vaccinations by law. Unfortunately, only 26% of all participants received any training to address vaccine hesitancy. In regard to COVID19's vaccine, 30% of study participants are reluctant to get the vaccine themselves. Also, male physicians disclosed negative attitude toward addressing vaccine hesitancy. **Conclusion:** Pediatric workforce in Saudi Arabia commonly encounters vaccine hesitancy. The strong stand against vaccine hesitant parents might affect rapport with families and decrease quality of care. Lack of training, unenthusiastic attitude and the pandemic might negatively impact efforts to tackle this growing public health issue in Saudi Arabia.

#### **UG-M47-AbouChaer-2022**

**PAPER TITLE:** The Association of Genitourinary Cancer Among Patients with Gastrointestinal Stromal Tumor: a KFSH&RC 2003-2020 Cohort.

**AUTHOR(S) & AFFILIATION(S):** **Students:** Kenan Abou Chaer<sup>1\*</sup>, Ahmed Abouelkhair<sup>1\*</sup>, Arwa Almouh<sup>1\*</sup>, Mohammad Alghafees<sup>3\*</sup>, Razan A. Alhamidi<sup>3\*</sup> **Faculty/Researchers:** Raouf Seyam<sup>2</sup>, Othman Alzahrani<sup>2</sup>, Ali Suliman E Al-Gonaim<sup>2,4</sup>, Turki Al-Hussain<sup>5</sup>, Tarek Mahmoud Amin<sup>6</sup>, Waleed Altaweel.<sup>2</sup> **Affiliations:** <sup>1</sup>Alfaisal University, Riyadh, \*Student, <sup>2</sup>Department of Urology, KFSH&RC, Riyadh, <sup>3</sup>King Saud Bin Abdul-Aziz University for Health Sciences, Riyadh, \*Student, <sup>4</sup>Prince Sattam bin Abdulaziz University, Riyadh, <sup>5</sup>Department of Pathology and Laboratory Medicine, KFSH&RC, Riyadh, <sup>6</sup>Surgical Oncology Department, Oncology Center, KFSH&RC, Riyadh.

**ABSTRACT: Background:** The most commonly occurring primary mesenchymal tumor in the GI tract is the gastrointestinal stromal tumor (GIST). Few cases worldwide were reported associated with renal cell carcinoma (RCC). **Aim:** Identify the association of genitourinary tumors in patients with GIST in KFSHRC. **Methods:** Retrospectively, patient files were examined for the presence of RCC, adrenal tumor, or other genitourinary cancer. **Results:** From 2003-2022, 178 patients had a histopathologic diagnosis of GIST, 106 men and 72 women, age 63 (±15.6) years. GIST only tumors 171 (gastric 99, small bowel 39, mesenteric,

omentum, peritoneum, and abdomen 16, and other 10). Seven patients had associated GU cancer. Three patients had RCC (two clear cell RCC and one radiologic diagnosis only), three had adrenal tumors (one adrenal carcinoma, one an isolated adrenal GIST and one pheochromocytoma) and one had a tumor invading the urinary bladder. Although the cohort included 57 men aged 60 years old or above (60-94), none demonstrated clinical prostatic carcinoma. **Conclusion:** We report the rare association with GIST tumors and primary genitourinary cancer, mainly RCC. Adrenal tumors and secondary invasion of the bladder were also found. Surprisingly none of the older male patients had clinical prostate cancer expected in this age group.

#### UG-M62-Deeba-2022

**PAPER TITLE:** Improved Survival in Adolescents and Young Adults (AYA) Patients Aged 14–55 Years with Acute Lymphoblastic Leukemia Using Pediatric-Inspired Protocol – A Retrospective Analysis of A Real-World Experience In 79 Of Patients Treated At A National Tertiary Care Referral Center

**AUTHOR(S) & AFFILIATION(S):** **Students:** Maryam Asif, Farah Deeba **Faculty/Researchers:** Amr Hanbali, Adult Oncology, KFSH; Dr Ahmed Kotb, Adult Hematology, KFSH

**ABSTRACT: Background:** Treating adolescents and young adults with [acute lymphoblastic leukemia](#) using pediatric-inspired protocols have shown improvement in outcomes. This report aims to provide a real-world experience from using a pediatric-inspired protocol in ALL-AYA population in larger number of patients treated at tertiary care referral center. **Methods:** Newly diagnosed Philadelphia negative ALL-AYA patients ages between 14 and 55 years of age were treated on an institutional protocol (AYA-15 protocol) adopted from a modified version of Children's Cancer Group 1900 protocol. Event-free survival (FFS), disease-free survival (DFS), and overall survival (OS) were analyzed using cumulative incidence and Kaplan-Meier methods. **Results:** The median age at diagnosis was 18 years (14–51 years) with 63% male patients. Complete remission (CR) at day 28 of induction was achieved in 88.6% of which 73.4% were minimal residual disease (MRD) negative. At a median follow up of 5 years, EFS, DFS and OS were 57.5%, 69.2% and 75.8% respectively. Toxicities were within the expected range with infections and transaminitis being the most common adverse events.

**Conclusion:** Our single-center experience real-world data in treating AYA-ALL patients with pediatric-inspired protocol demonstrates encouraging results of high survival rate for patients aged 18–55 years.

#### UG-M76-Haque-2022

**PAPER TITLE:** Assessing the Scope of Non-Resuscitative First Aid Knowledge amongst Public School Educators in Riyadh, Saudi Arabia

**AUTHOR(S) & AFFILIATION(S):** **Students:** Sarah Haque, Mohammed Rami Shaath, Sana Taimur Butt **Faculty/Researchers:** Sonia Butt (KFSHRC)

**ABSTRACT:** Teachers are often the first to perform the assistance measures when accidents, inevitably, occur in school settings. Given this reality, the role of an educator, particularly for those that work alongside vulnerable and young children, has expanded to contributing to not only students' education but their physical, mental and social health. Equipping teachers and other school staff with first aid skills and knowledge is vital to prevent conditions from worsening. First aid acts as a temporary treatment until further medical intervention can be sought. **Method:** The empirical material was collected from a semi-structured interviews and an online survey targeting teachers and administrative staff of public primary schools in Riyadh, Saudi Arabia. Questions asked included queries about one or more of the following non-resuscitative first aid categories: bleeding fracture epilepsy bite burning nose bleeding choking injury fainting poison breathing difficulty and others. **Results:** Teachers alone cannot meet their student's health needs. The majority (>58%) of the 188 surveyed teachers answered basic first aid questions incorrectly. It was evident that teachers have a perception that is very close to first aid concepts; however, it is still very restricted due to the lack of formalized training, the limited focus on health promotion, and a lack of appropriate materials. **Discussion:** The need to explore strategies in schools aimed to promote specific knowledge regarding first aid actions for the teachers is revealed, alongside the need for the presence of professional medical specialists, such as school nurses, on campus.

#### G-M82-Alwadi-2022

**PAPER TITLE:** Comparative Analysis of Commercially Available Paracetamol Tablets in Saudi Arabia.

**AUTHOR(S) & AFFILIATION(S):** **Students:** Aiman Y. Alwadi **Faculty/Researchers:** Ghosoun M Arafah, Omar Z. Ameer, Ibrahim M. Salman.

**ABSTRACT:** Acetaminophen is a widely used oral analgesic and antipyretic medication. The aim of the present study was to evaluate and compare critical quality attributes, including in-vitro dissolution characteristics, of five acetaminophen tablet brands (A-E) from the Saudi market and determine their pharmaceutical equivalence. All brands were tested for conformity with the United States Pharmacopoeia (USP) standards, through the evaluation of weight variation, hardness, friability, disintegration, and dissolution. Dissolution profiles were compared using model-dependent and independent approaches relative to the innovator. All brands have passed the weight variation and friability tests, except brand C showing relatively higher friability. Tested brands displayed variable disintegration times; however, all have complied with USP. All brands released >80% of the drug within 30 min, however, brands B and C exhibited lower drug release rates, area under the curve (AUC), and dissolution efficiency (DE) compared with the innovator. Alternatively, brand E exhibited higher drug release rate, AUC, DE, and mean dissolution time (MDT) and was not pharmaceutically equivalent with the innovator. Dissolution data were best fitted with the Korsmeyer-Peppas model of drug-release kinetics. In conclusion, all tested brands have passed USP specifications warranting their interchangeability, however, variations in their dissolution characteristics could reflect manufacturing-inherent compounding differences.

#### UG-M86-Hamad-2022

**PAPER TITLE:** Successful Use of Twice Daily Letemovir in Treatment of Resistant Cytomegalovirus in A Small Bowel Transplant Recipient

**AUTHOR(S) & AFFILIATION(S):** **Students:** Fatima Sheikh Alaidaros, Hamzah Faher Koujan, Alaa Hamad  
**Faculty/Researchers:** Dr. Hala Joharji

**ABSTRACT: Introduction:** This is a case report that presents a unique and successful incident of utilization of letemovir in a small bowel transplant patient as treatment of resistant CMV infection. The patient is a 29-year-old gentleman, failed to achieve clinical response due to ganciclovir resistance and intolerance to foscarnet. Letemovir was used as the last treatment option and showed positive outcome. **Objectives:** Describe the definition, risk factors, complications, and therapeutic options for cytomegalovirus (CMV) infection post solid organ transplantation, review the pertaining literature on the use of letemovir for CMV infection post solid organ transplantation, and report the first case on the use of letemovir in the treatment of CMV viremia in a small bowel transplant patient at KFSH&RC in Riyadh. **Methodology:** Patients' information was retrieved from the electronic health record at King Faisal Specialist Hospital and Research Centre in Riyadh, Saudi Arabia from March 2018 until Oct 2021. **Main results:** The patient responded to the initiation of letemovir and his viral load levels went down to ~ 50 (IU/ml). **Conclusion:** Letemovir utilization as salvage therapy in small bowel transplant patients with tissue invasive CMV disease was associated with stabilization of the CMV viral load.

#### G-M104-Fatani-2022

**PAPER TITLE:** Experts' Opinion on Linking Cancer Local Registries with National Death Registries in Saudi Arabia

**AUTHOR(S) & AFFILIATION(S):** **Students:** Doha Fatani **Faculty/Researchers:** Dr. Noara AlHusseini

**ABSTRACT: Background:** Complete and accurate cancer registry patient survival data is crucial to ensure accurate survival estimate. There are multiple ways to update patient survival data ranging from direct contact of cancer patients, their families, or physicians to indirect confirmation through computerized linkage with governmental databases. In Saudi Arabia (SA), cancer registries are not linked to any governmental database, and patients' survival data update is done through direct contact (manually), and not through a computerized linkage, causing inaccurate survival data, and inefficient resource utilization. **Objective:** To shed light on the importance of having a computerized linkage between the cancer registries with the national death registry in Saudi Arabia. **Methods:** Critical review of the literature review, current available system compared with international systems to identify the gaps, recommendations based on the identified gaps, and proposed recommendations will be evaluated through interviewing domain experts in SA using a pre-defined questionnaire. **Keywords:** Cancer registry; Saudi Arabia; record linkage; survival status, national death data, guidelines.

#### UG-M116- Alanazi-2022

**PAPER TITLE:** Urogenital Tuberculosis Presenting as Bilateral Pyelonephritis in HIV Negative Diabetic Female. A Case Report

**AUTHOR(S) & AFFILIATION(S):** **Students:** Moustafa S Alhamadh<sup>1,2</sup>, Rakan Alanazi<sup>1,2</sup>, Rajkumar Rajendram<sup>1,2,3</sup>, Naveed Mahmood<sup>1,2,3</sup> **Faculty/Researchers:** Dr. Naveed Mahmood **Affiliations:** 1 College of Medicine at King Saud bin Abdulaziz University for Health Sciences (KSAU-HS), Ministry of the National Guard Health Affairs, Riyadh, Kingdom of Saudi Arabia. 2 King Abdullah International Medical Research Centre, Ministry of the National Guard Health Affairs, Riyadh, Kingdom of Saudi Arabia. 3 Department of Medicine, King Abdulaziz Medical City, Riyadh,



Saudi Arabia. **ABSTRACT:** Tuberculosis (TB) remains a global public health burden, with an annual mortality of 1.7 million making it the leading infectious cause of death worldwide. Although it is mainly a pulmonary infection, up to 24% occurs in extrapulmonary sites. Extrapulmonary TB commonly involves the lymph nodes, pleura, bone and joints, urogenital tract, and meninges but can afflict virtually any organ. Urogenital TB (UGTB) is the second most frequent form of extrapulmonary TB, accounting for 30-40% of all extrapulmonary TB cases. UGTB is easily mis- or under-diagnosed until complications, such as obstructive nephropathy, renal parenchymal destruction, or end-stage kidney disease, develop. Herein, we report a case of UGTB in a 67-year-old diabetic lady with positive family history of active pulmonary TB and past history of flank pain and recurrent pyelonephritis for one year presenting as bilateral pyelonephritis, complicated by right sacroiliitis, and diagnosed, after a very extensive work-up, with urine TB PCR.

## 3<sup>rd</sup> Prize

### UG-M16-Binsulaiman-2022

**PAPER TITLE:** Diagnosis of glomus tumor of the elbow: A case report

**AUTHOR(S) & AFFILIATION(S): Students:** Najd Binsulaiman **ABSTRACT: Introduction:** Glomus tumors are rare and often benign vascular lesions that present classically in the subungual region of the hand. Nonetheless, presentations in atypical sites have been reported over the years. However, the classic symptoms of typical glomus tumors are often absent in tumors of atypical sites.

**Case presentation:** We present a case of an extradigital glomus tumor with a 3-year history of pain in the lateral aspect of the elbow. **Discussion:** The case we present took three years and multiple visits to different clinics and specialties to reach the final diagnosis and management. It often takes longer to diagnose glomus tumors of atypical sites and presentations. The causes could be related to the rare incidence, the atypical presentation in site and symptoms, or the diagnostic methods. **Conclusion:** This case report discusses the possible causes behind the diagnostic delay in extradigital glomus tumors, aiming to raise clinical awareness among primary health care physicians.

### UG-M19-Arai-2022

**PAPER TITLE:** CYP24A1 And Breast Cancer

**AUTHOR(S) & AFFILIATION(S): Students:** Yazan Almasry, Momo Arai, Nadeen Garaween, Tariq Makhzoum, Maeen AlDamouni, Biam Saydo, Raziqa Hazari **Faculty/Researchers:** Dr. Santosh Kumar: Pharmacology Department, College of Medicine

**ABSTRACT: Background:** Vitamin D, a nutrient needed in small amounts, supports the immune system. Its signalling pathway has also been shown to have anti-tumorigenic effects on certain types of cancer. CYP24A1, a member of the cytochrome P450 family, is known to neutralize the active 1,25-hydroxycholecalciferol. Inhibiting CYP24A1 activity is associated with increased systemic calcitriol, which may enhance its antitumor effects. **Method:** Constructs containing RNAi of CYP24A1 will be transfected using lipofection into MCF10A breast cells and MCF7, its tumorigenic form. The downstream effects of inhibiting CYP24A1 on proliferation, migration, and tumorigenesis, as well as the minimum level required to achieve these effects *in vitro* will be investigated alongside a negative control. **Expected Results:** We predict that downregulation of CYP24A1 will inhibit angiogenesis and propagation of breast tumour cells. **Conclusion:** Despite the heavy research done regarding vitamin D signalling and receptors, much is yet to be understood about how CYP24A1 affects cancer progression and its changes in incidence observed in the literature. This study thus aims to investigate the possible ways that CYP24A1 gene expression may affect the progression of breast cancer, providing a possible means for genetic screening, and opening a therapeutic possibility of targeting the 24-hydroxylase enzyme in further research.

### UG-M24-Garaween-2022

**PAPER TITLE:** Study of Synergistic Effect of Natural and Synthetic Preservatives Using the Challenge Test

**AUTHOR(S) & AFFILIATION(S): Students:** Noureldeen Garaween, Amal El-Hamwi, Areeg Abumostafa **Faculty/Researchers:** Dr. Hana Abdalla, Dr. Sarra Zaraa

**ABSTRACT:** Many pharmaceutical, food, and cosmetic products must contain at least one preservative agent. A preservative is added to the products to provide an antimicrobial effect and inhibit any contamination, thus prolonging the product's shelf-life. Companies and industries choose preservatives based on the product type, pH, thermal stability, formulation compatibility, and the microbiological protection spectrum. During this study, the effectiveness of the initial preservative used in a base cream will be tested using the challenge test, referred to as

United States Pharmacopeia protocol 51 (USP<51>), then compared to a new formulation where a natural preservative will be added. The test will be performed at different time points over three months. Statistical analysis will be performed at the end of the study using the t-test. This study aims to prove the initial preservative effectiveness and evaluate the synergistic effect of the preservatives after the addition of the natural one. The results might be a first step towards decreasing the synthetic preservative concentration and developing a new formulation.

#### **G-M32-Alrifai-2022**

**PAPER TITLE:** In-house Real-Time Q-PCR NAT assay for multiplexed detection of HCV and HBV

**AUTHOR(S) & AFFILIATION(S):** **Students:** Majeda Alrifai **Faculty/Researchers:** Dr. Ahmad Aljadaa, Mahmoud Zahra, Farah Alrass, Dana abu Obaid

**ABSTRACT:** Testing for hepatitis C virus (HCV) and hepatitis B virus (HBV) is mandatory for each blood transfusion. Multiplexed real time PCR allows for the detection of several genes in the same reaction. Commercial real time PCR kits are usually used for detecting viral genes, and they are costly. The main objective for this project is to establish an in-house procedure for a multiplexed detection of HBV and HCV Real Time-PCR nucleic acid testing assay. Primers were designed to be specific for HBV and for HCV using different primer design software and choosing a preserved gene in the viruses' genomes. Degenerate primers were added to include all the strains. Furthermore, primers for a housekeeping gene were added as an internal control for nucleic acid extraction. This assay provides an affordable in-house test for HBV and HCV that could be an alternative option for rural areas and poor countries who lack the funds for the expensive kits.

#### **UG-M36-Khokhar-2022**

**PAPER TITLE:** Carbamazepine-Induced Adverse Reactions: A Study to Evaluate the Need for Proactive Carbamazepine Pharmacogenetics Screening in Saudi /Arab Patients.

**AUTHOR(S) & AFFILIATION(S):** **Students:** Ayesha Abdul Ghafoor Khokhar **Faculty/Researchers:** Hatouf H. Sukkarieh, Gulsan Karbani, Fatimah AlTurki

**ABSTRACT: Introduction:** Carbamazepine (CBZ) is a widely used drug approved as the first line for the treatment of epilepsy, also used in the treatment of bipolar disorder and neuropathic pain. Many studies have shown that carbamazepine (CBZ)-induced hypersensitivity reactions are associated with mutations in human leukocyte antigen (HLA) genes. These associations are ethnicity-specific and have a strong phenotype. **Objectives:** This study aims to assess, and document CBZ-induced adverse reactions among prescribed Saudi/Arab patients. **Methods:** A retrospective study has been done through reviewing Electronic medical records for patients who were prescribed CBZ for the past 5 years. These records were linked to the number of patients who also experienced CBZ induced adverse reactions.

**Results:** Results are in the process of being analyzed. **Conclusions:** The outcome of this study is expected to prompt in the near future the need for proactive pharmacogenetic testing and its implication for improvement of treatment outcomes, reducing adverse events, and decreasing the burden of unnecessary costs for healthcare system.

#### **G-M50-AlAbdullah-2022**

**PAPER TITLE:** The Association Between Social Media Use and Quality of Life Among the Saudi Population

**AUTHOR(S) & AFFILIATION(S):** **Student:** Amal Al-Abdullah

**ABSTRACT: Introduction:** social media plays a critical role in rapidly transforming societies. While the number of individuals participating in internet-based social networks increases globally, it is unclear how they might influence life quality. **Objective:** The study aims to evaluate the association between social media use and two domains of the quality of life (physical and psychological health) among the Saudi population. **Methods:** This was a cross-sectional online survey-based study adapted from WHO. Including adults aged above 18 years old. Participants were asked to complete an online survey examining social network use and quality of life. We used chi-square tests ( $\chi^2$ ). **Result:** A total of 1550 respondents were included in our study, with 70.06 reported spending 3 hours or more on social media. A large proportion of respondents were between females aged 18 and 25 (25.97%), married (56.26%), holding a bachelor's degree (51.38%), employed (50.74%), with no monthly income (45.12%), Saudis (89.23%), reside in the central region (73.48%), with a healthy weight (27.26%), and reported using 3 or more platforms (77.9%). **Conclusions:** Participants who reported less than one hour on social media had reported better physical health. In contrast, there was no significant difference in the mean score of psychological health perception.

#### **UG-M64-Elshaer-2022**

**PAPER TITLE:** Endoscopic Retrieval of Air Gun Pellet Retained in Frontal Sinus: A Case Report

**AUTHOR(S) & AFFILIATION(S):** **Students:** Hassan Shah, Rawan Elshaer, Tarek Arabi **Faculty/Researchers:**

**ABSTRACT:** Foreign bodies in paranasal sinuses are rarely encountered, and most commonly present in the maxillary sinus. Guidelines for the management of paranasal sinus object removal are limited due to its rarity. However, there are three major management options: open surgery, an endoscopic approach, and observation. FESS is commonly used for improving sinus drainage and ventilation in recurrent chronic and acute infective sinusitis. We report a rare case of an 18-year-old boy who underwent FESS for the retrieval of a retained air gun pellet in the frontal sinus.

#### **UG-M80-AIDoumani-2022**

**PAPER TITLE:** Bone Mineral Density Recovery in Patients with Nephrotic Syndrome after treatment with Rituximab

**AUTHOR(S) & AFFILIATION(S):** **Students:** Mhd Adnan Al Doumani, Ola Al Doumani **Faculty/Researchers:** Majed Hussein

**ABSTRACT:** Steroid-dependent nephrotic syndrome (SDNS) carries a high risk of toxicity from steroids or steroid-sparing agents. This study analyzed whether the initiation of treatment with rituximab (RTX), after the discontinuation of other treatments, can lead to bone mineral density recovery and weight and height improvements in SDNS. We studied patients aged 19-43 years who had developed SDNS and were now receiving rituximab injections at varying intervals as monotherapy. We questioned participants over the phone to obtain additional information regarding fractures, infections, and hospitalization.

#### **UG-M98-Kafaji-Abdalla-2022**

**PAPER TITLE:** The First Case of a Patient with Graft-versus-Host Disease and Retinitis Pigmentosa in the Literature: True Association, or Circumstantial?

**AUTHOR(S) & AFFILIATION(S):** **Students:** Mustafa Kafaji & Hesham Abdalla

**ABSTRACT:** We present a case of a 36-year-old female status post-allogeneic bone marrow transplant treated for acute lymphocytic leukemia. Following her continued treatment for her ALL the patient developed severe graft vs host disease and was referred to a GVHD clinic for her chronic sclerodermatous lesions on her four limbs. Her chronic GVHD NIH score was 3 for skin, 1 for eyes, and 0 for liver, lung, musculoskeletal system, and gastrointestinal tract. After, she was referred to ophthalmology due to recent visual disturbances in her left eye (OS). With her best-corrected visual acuity being 20/40 and 20/200 for the right and left eyes, respectively. Slit lamp examination showed bilateral pseudophakia (previous bilateral cataracts due to chronic steroid use) and posterior subcapsular opacification OS and a follow-up Yag capsulotomy was done. Two weeks later, visual acuity didn't improve, and the dilated fundusoscopic exam showed macular retinal pigment epithelial mottling with attenuated retinal arteries OS raising the suspicion of retinitis pigmentosa (RP). This prompted an Electroretinography which indeed confirmed the diagnosis of RP. This is the first reported case of RP as a manifestation of chronic ocular GVHD. This case report will try to analyze a possible association between the RP and GVHD.

#### **G-M107-Abduljawad-2022**

**PAPER TITLE:** Thoracolumbar Kyphoscoliotic Deformity with Neurological Impairment Secondary to A Butterfly Vertebra in An Adult. A Case Reports.

**AUTHOR(S) & AFFILIATION(S):** **Students:** Salim Mustafa Abduljawad, College of Medicine, Alfaisal University. **Faculty/ Researchers:** Anouar borghli, Department of Orthopedics, Kingdom Hospital.

**ABSTRACT:** Study design: Case report Objective: To describe a rare case of thoracolumbar kyphoscoliosis secondary to a butterfly vertebra in an adult, and its surgical correction technique. **Background:** Kyphoscoliosis secondary to an isolated butterfly vertebra is rare and its management can be very challenging. **Methods:** We report the case of a 39-years old male, complaining of chronic middle and low back pain with unsteady gait and altered sensation of lower extremities. Full spine anteroposterior and lateral X-rays revealed a thoracolumbar kyphosis with an angulation of 60° between T10 and T12, with a short thoracolumbar scoliosis of 32 degrees. CT scan confirmed the presence of a butterfly vertebra at the level of T11 with posterior arch fusion between T10 and T12. **Results:** The patient underwent a posterior resection of the T11 butterfly vertebra with instrumentation from T8 to L2, and use of a one-sided domino on the convex side and a mesh cage on the concave side for asymmetrical correction and vertebral height preservation. He could walk on day 2 with a satisfactory clinical and radiological result at 2 years. **Conclusion:** Literature is sparse on the management of thoracolumbar kyphoscoliosis secondary to butterfly vertebra in the context of neurological impairment. The current case described a surgical treatment strategy in order to correct both deformity planes simultaneously by a vertebral resection performed through a posterior only approach.

#### UG-M112-Alhowaish-2022

**PAPER TITLE:** Predictors and Clinical Outcomes of Permanent Pacemaker Insertion Following Transcatheter Aortic Valve Implantation

**AUTHOR(S) & AFFILIATION(S):** **Students:** Thamer Alhowaish, Shaya Aldosari – Student, College of Medicine, KSAU-HS. **Faculty/Researchers:** Fares Rajah – Resident, Department of Medicine, King Abdulaziz Medical City-Riyadh, Abdulkhaliq Alaamiri – Resident, Department of Medicine, KAMC-RD, Mohammed Mahmoodurrahman – Resident, Brooklyn Hospital Center, Shaya Aldosari – Student, College of Medicine, KSAU-HS, Abdulwahab Hussain – Asst. Consultant, Cardiac Center, KAMC-RD, Emad Masuadi – Asst. Professor, College of Public Health, KSAU-HS, Haitham Alanazi – Head, Department of Electrophysiology, Cardiac Center, KAMC-RD

**ABSTRACT:** **Background:** Transcatheter aortic valve implantation (TAVI) is a procedure done for symptomatic severe aortic stenosis. Permanent pacemaker (PM) insertion is a known complication of TAVI. The aim of this study was to identify incidence and predictors of this complication, and to assess clinical outcomes of patients requiring PM after TAVI. **Methods:** We conducted a retrospective chart review of 174 patients who underwent TAVI in our hospital from 2010 to 2018. 74 variables were collected. We compared clinical outcomes including complications and survival. **Results:** 28% patients required PM within 30 days of TAVI. The median time from TAVI to PM insertion was 2 days. Positive predictors of PM insertion were prior right bundle branch block ( $p < 0.001$ ), development of left bundle branch block ( $p 0.027$ ), and PR interval prolongation after TAVI ( $p < 0.001$ ). Diabetes was a negative predictor of PM insertion ( $p 0.039$ ). PM implantation was associated with longer hospital stay ( $p 0.015$ ). There was no statistically significant difference in survival or complications in both groups. **Conclusion:** One-third of patients require PM after TAVI. Rhythm on serial ECGs before and after TAVI may identify future PM requirement. PM insertion is associated with longer hospital stay but does not affect other outcomes.





## 7. Science & Humanities Winning Posters 2022



For Science & Humanities there were 5 winning undergraduate posters (Table 6).

**Table 6.** Winning Posters for Science & Humanities.

Poster Code	Poster Title	Contact Person
<b>1<sup>st</sup> Prize</b>		
<b>Science &amp; Humanities</b>		
<b>Undergraduate</b>		
UG-S10-Alnamlah-2022	Development of 3D-culture system using decellularized materials for liver repair	Alaroob Alnamlah
<b>2<sup>nd</sup> Prize</b>		
<b>Science &amp; Humanities</b>		
<b>Undergraduate</b>		
UG-S02-AIHakbani-2022	Cellulose Nanocrystals for Passive and Targeted Drug Delivery Systems	Deema AIHakbani
<b>3<sup>rd</sup> Prize</b>		
<b>Science &amp; Humanities</b>		
<b>Undergraduate</b>		
UG-S04-BuHulayqah-2022	Synthesis of Nanocellulose-Based Hydrogels and Aerogels	Fatimah Bu Hulayqah
UG-S06-Alshalan-2022	Mutation in SLC25A4 gene In Mitochondrial DNA depletion syndrome 12B (cardiomyopathic type) : case from Saudi Arabia	Noura Alshalan
UG-S12-Fataftah-2022		Shahid Fataftah

## ABSTRACTS

### 1<sup>st</sup> Prize

#### UG-S10-Alnamlah-2022

**PAPER TITLE:** Development of 3D-culture system using decellularized materials for liver repair

**AUTHOR(S) & AFFILIATION(S):** **Students:** Alaroob Alnamlah **Faculty/Researchers:** Dr.kazmi, Dr.Mir

**ABSTRACT:** Liver disease is a major global healthcare and economic concern, affecting millions of people globally. To date, the ultimate treatment option for the patients with end-stage chronic hepatic diseases is organ transplantation. However, the limited availability of suitable donor organs has been a major obstacle in this context. Every day, thousands of men, women, and children are added to the transplant waiting list worldwide. Even when the patient receives an organ transplant often the immune system recognizes it as foreign body therefore attacks the new organ which eventually leads to transplants being rejected. Although it has been demonstrated that cell transplantation can replenish hepatocytes and restore liver function, it is still very difficult to design optimal three-dimensional scaffolds to generate mature liver tissue substitutes or whole organs. The goal of this study is to employ decellularization and recellularization technologies to construct liver-specific 3D environments that support hepatocyte proliferation, differentiation, and polarity, or to fabricate functional bioengineered whole liver from patient own cells.

### 2<sup>nd</sup> Prize

#### UG-S02-AlHakbani-2022

**PAPER TITLE:** Cellulose Nanocrystals for Passive and Targeted Drug Delivery Systems

**AUTHOR(S) & AFFILIATION(S):** **Student:** Deema Saad Al Hakbani **Faculty/Researchers:** Dr. Saddam Muthana (thesis supervisor)

**ABSTRACT:** Cellulose nanocrystal (CNC) is a rod-like nanostructure obtained from natural sources, including plants, algae, and bacteria. It has a potential for drug delivery applications due to its biocompatibility, biodegradability, low cost, and high surface-area-to-volume ratio providing a high loading and binding capacity for active pharmaceutical ingredients. This work aims to evaluate the potential use of CNC as a drug delivery excipient and to study the toxicity of CNC-drug conjugates using in vitro cytotoxicity assay. CNC was extracted from date palm by acid hydrolysis. CNC-drug conjugates will be prepared and evaluated as passive and targeted drug delivery systems following CNC extraction.

### 3<sup>rd</sup> Prize

#### UG-S04-BuHulayqah-2022

**PAPER TITLE:** Synthesis of Nanocellulose-Based Hydrogels and Aerogels

**AUTHOR(S) & AFFILIATION(S):** **Students:** Fatimah Bu Hulayqah **Faculty/Researchers:** Dr. Saddam Muthana

**ABSTRACT:** Hydrogels are soft and porous materials with three-dimensional network of crosslinked polymer chains. They can be used in different technological, industrial, biological, and medical applications. Removal of water from hydrogels can yield aerogels, which are the lightest solids known. Aerogels can be widely used in many applications including thermal insulation, energy conversion, energy storage, and oil absorption. Hydrogels can be obtained from synthetic or natural polymers. The use of renewable and biodegradable natural polymers such as cellulose have gained more attention in recent years. Due to their natural abundant, low toxicity, biocompatibility, and biodegradability, cellulose is a promising material for hydrogels and aerogels synthesis. The aim of this work is to synthesize nanocellulose-based hydrogels and aerogels. Cellulose nanocrystals (CNCs) were extracted from date palm and functionalized to be crosslinked to produce tolerant hydrogels and Aerogels.

#### UG-S06-Alshalan-2022

**PAPER TITLE:** Mutation in SLC25A4 gene In Mitochondrial DNA depletion syndrome 12B (cardiomyopathic type) : case from Saudi Arabia.

**AUTHOR(S) & AFFILIATION(S):** **Students:** Noura Saud Alshalan **Faculty/Researchers:** Dr. Kaya Namik (King Faisal Specialist Hospital & Research Centre)

**ABSTRACT:** The mitochondria is an essential organelle in the cell due to its different cellular processes, one of its most essential processes in the production of ATP, which is the energy that is required for different processes. The mitochondria contain DNA as well (mtDNA) that is inherited maternally. Mitochondrial DNA depletion syndrome or MDDS is an autosomal recessive disorder; this rare disorder is characterized by a significant quantifiable decrease in total mtDNA. A gene related to the manifestation of this syndrome is the SLC25A4 gene. To Further understand this disease diagnosis, we will report a case with The SLC25A4 mutation investigated at NM\_001151.4: c.112-1G>C and its association with MDDS. We are looking at the functional changes when analyzing patients with the disease as appose to healthy patients by extracting RNA and reverse transcribing it to get cDNA. Sequencing is then done to observe any change in sequences. We will further analyze the mtDNA quantity using a DNA depletion essay done by qPCR (real-time PCR) to monitor the decrease in mtDNA in affected patients compared to healthy patients. Analyzing this will help us understand the functional effect of this specific variant on the patient, thus reporting the mutation with MDDS.

#### UG-S12-Fataftah-2022

**AUTHOR(S) & AFFILIATION(S):** Students: Shahid Amjad Fataftah **Faculty/Researchers:** Dr. Mohammed Zourob

**ABSTRACT:** A parasite is a pathogenic plant or animal that lives in or on a host, which supports a parasite and helps it gain nutrients at the expense of the host. The relationship between a parasite and its host is when two individuals of different species get to live in close association together leads to something called symbiosis. The focus of my research is to study a specific type of parasite, helminth parasite, which are multicellular organisms that can be seen within the naked eye, and I plan to develop a specific aptameric assay for the rapid diagnosis of helminth parasite infection using BmR1 antigen. Aptamers are oligonucleotides that can bind to a target at high levels. Aptamer-based biosensors are significantly superior to natural receptors such as antibodies and enzymes in a variety of applications. Aptamers are usually selected according to the SELEX approach (systematic evolution of ligand by exponential enrichment) which is an in vitro selection tool to discover new kinds of nucleic amino acids. SELEX is a technique for screening target oligonucleotide probes from a large oligonucleotide library (RNA or single-stranded DNA) through iterative in vitro selection processes and amplification by polymerase chain reaction (PCR) of selected sequences.







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Version 27 September 2022/fs/bc/ss/mg