

ANNUAL REPORT

DASMAN DIABETES INSTITUTE

2021



معهد دسمان للسكري
Dasman Diabetes Institute



أحد مراكز
Center



**H.H Sheikh Nawaf Al-Ahmad Al-Jaber Al-Sabah
AMIR OF THE STATE OF KUWAIT**



**H.H Sheikh Mishal Al-Ahmad Al-Jaber Al-Sabah
CROWN PRINCE OF THE STATE OF KUWAIT**



**H.H Sheikh Sabah Al-Khalid Al-Hamad Al-Sabah
PRIME MINISTER OF THE STATE OF KUWAIT**



OPENING MESSAGE

DR. QAIS AL DUWAIRI

It is my pleasure to present the 2021 Dasman Diabetes Institute Annual Report. In the following pages, we highlight our major accomplishments in research and diabetes awareness initiatives of 2021.

The Dasman Diabetes Institute was established under the patronage of His Highness Sheikh Jaber Al-Ahmad Al-Sabah, the late Emir of the State of Kuwait, and the Kuwait Foundation for the Advancement of Sciences (KFAS) to address the increasing prevalence of

diabetes in Kuwait. Since its inauguration in 2006, the Institute has been striving to address the diabetes epidemic in Kuwait through advanced diabetes research, integrated prevention, training, and education.

Dasman Diabetes Institute, in collaboration with the George Institute for Global Health, developed the DasmanSwitch App that includes a Diabetes Switch (Filter). This application aims to emphasize the key components in foods that affect persons with diabetes and empower them make healthier choices by providing alternatives.

In recognition of Dasman Diabetes Institute's remarkable contributions to the management, treatment and prevention of diabetes and its related complications, the Institute was awarded the International Award 2021 by the UN Interagency Task Force on the prevention of non-communicable diseases (NCDs).

Dasman Diabetes Institute's Patent & Research Translation Office has been created to transfer the Institute's research to industry, organize multinational collaborative relationships to conduct research, while developing technologies of local, regional, and global value. In 2021, 3 patents were received: 2 granted in 2021 and 1 granted in 2020.

This year, the Medical Sector's clinical efforts witnessed notable improvements. The Sector monitored the educational impact on lowered HbA1c levels in people with T1DM. In 2021, 57% of patients with type 1 diabetes achieved HbA1c levels of < 8 mmol/L. The Dose Adjustment for Normal Eating (DAFNE) Program had 100% of patients with a reduction in diabetic ketoacidosis. In the Diabetes Remission Program, 50% of patients reduced their medications by 50%.

At Dasman Diabetes Institute, our efforts to support the government during this unprecedented public health crisis of COVID-19 and our dedication to address the diabetes pandemic in Kuwait remains.

Diabetes, a global epidemic, has been the driver for the Institute's collaborative efforts, nationally, regionally, and internationally. The Institute continues its collaborations to exchange scientific knowledge and to strengthen the country's scientific research community.

Our Sectors' research initiatives continue to benefit our society while maintaining their long-term objectives to improve health outcomes. In 2021, Dasman Diabetes Institute published 103 research publications, of which 57 are original research publications and 29 collaborative papers. Our original publications include 15 papers based on our COVID-19 research findings.

Despite the uncertainty and unpredictability, we continue to face in this pandemic, Dasman Diabetes Institute has proven to be resilient. COVID-19 has presented an opportunity for the Institute to adapt, innovate, evolve, and thrive in adversity. I would like to thank the Ministry of Health for their outstanding efforts during the COVID-19 pandemic.

In conclusion and on behalf of the staff at the Dasman Diabetes Institute, I can only express my heartfelt appreciation and gratitude to His Highness, the Emir of the State of Kuwait, Sheikh Nawaf Al-Ahmad Al-Jaber Al-Sabah, and to His Highness the Crown Prince, Sheikh Mishaal Al-Ahmad Al-Jaber Al-Sabah, and to His Highness the Prime Minister Sheikh Sabah Al-Khaled Al-Sabah - may God protect them - beseeching God Almighty to grant them success in moving our beloved country forward on the paths of progress and prosperity.

In the following pages, it is my pleasure to share a synopsis of our 2021 Achievements.

DR. QAIS AL DUWAIRI

Director-General

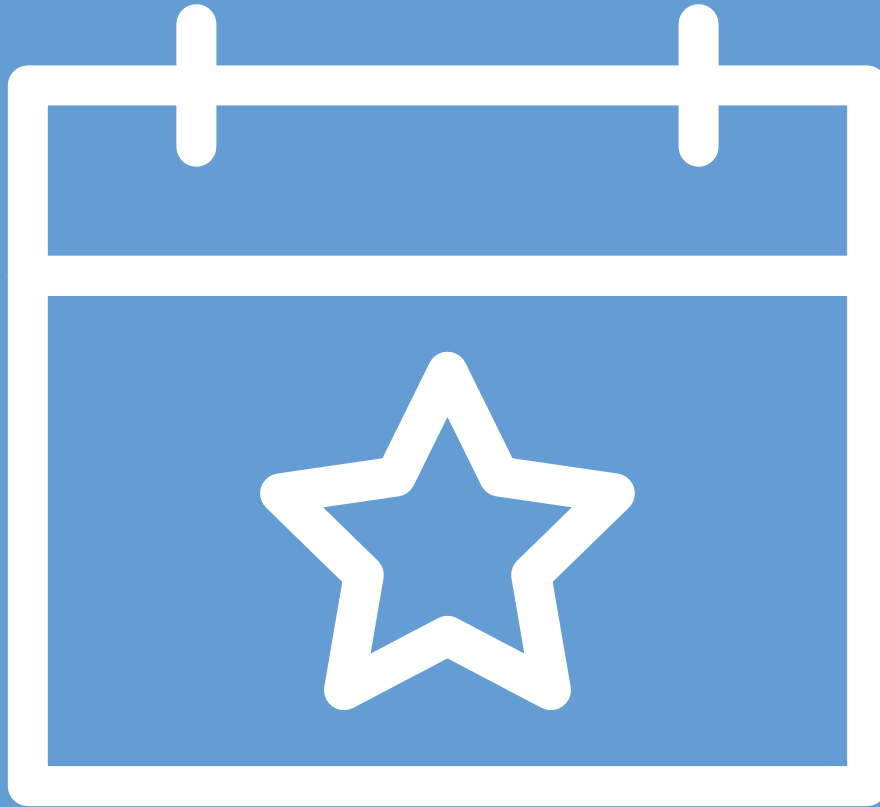
Dasman Diabetes Institute



**LIST OF
EVENTS & ACTIVITIES
2021**

| DATE | ACTIVITY |
|----------------|---|
| MARCH 2021 | The Education & Training Unit conducted a training program titled 'Patient Care' for Ministry of Health Primary Care nurses. |
| | Dr. Khaled Al-Fadhel, Director-General of the Kuwait Foundation for the Advancement of Sciences, visited DDI to discuss the Institute's progress and future plans. |
| | The Education & Training Unit organized a second training program titled 'Patient Care' for Ministry of Health Primary Care nurses. |
| MAY 2021 | H. E. Ambassador Cristian Tudor, head of the European Union Delegation, and his team attended a CPR and first aid course at the Clinical Skills Center in DDI. |
| JUNE 2021 | The Education & Training Unit held a training program for Royal Montessori Nursery titled "What Should School Workers Know." |
| | The Education & Training Unit held a training program for Ministry of Health nurses titled "Smart Objectives in Diabetes Education." |
| | DDI and Novo Nordisk celebrated the 100 Years of Insulin Anniversary with an educational conference that included roundtable discussions from several representatives including: H. E. Mr. Ole Moesby, the Ambassador of Denmark, Dr. Akin Aksekili, Novo Nordisk Vice-President, and Dr. Dalal Al Hajeri, representing Kuwait's primary healthcare sector. |
| | Dr. Qais Al Duwairi met with World Health Organization representatives Dr. Assad Hafeez and Dr. Amgad Elkholly |
| JULY 2021 | DDI's researchers attended KTV1's 'Layali AlKuwait' to discuss latest research. |
| AUGUST 2021 | Dr. Ebaa AlOzairi and Jumana AlKandari attend KTV1's 'Layali AlKuwait' to discuss latest medical achievements |
| | The Commercial Bank of Kuwait Employees attended CPR and First Aid courses at the Clinical Skills Center. |
| | The Education & Training Unit concluded a three-day course titled "Smart Objectives in Diabetes Education" for nurses from the Ministry of Health. |
| SEPTEMBER 2021 | The Pharmacy Unit held a training workshop titled 'Pharmacotherapy Management of Diabetes Complications.' |
| | The Pharmacy Unit held a training workshop titled 'Pharmacotherapy Management of Diabetes Complications' for the second group of attendees. |
| | The IT Department concluded the field training session for Kuwait University students from the Department of Computer Science. |
| | The Education & Training Unit organized a training workshop titled 'Young Pumpers' for children with diabetes. |
| | DDI celebrated the World Patient Safety Day 2021 to raise awareness on the importance of safe maternal and newborn care |
| | The Education & Training Unit held a 'Diabetes' training course for Ministry of Health nursing staff. |
| | DDI won the United Nations Interagency Task Force on prevention of Non-Communicable Diseases Award. |

| | |
|---------------|---|
| OCTOBER 2021 | DDI's Chief Scientific Officer and Chief Medical Officer met the World Health Organization and Ministry of Health officials. |
| NOVEMBER 2021 | DDI participated in an outreach event at Munira Al-Ayyar Center in Kaifan honoring World Diabetes Day. |
| | In celebration of World Diabetes Day, DDI was lit in blue in honor of the theme: access to diabetes care. |
| | Al Hamra Tower was also lit in blue for World Diabetes Day as host of the year's event. |
| | DDI organized its Annual World Diabetes Day event at Al Hamra Tower accessible to the public for diabetes care, health awareness, and diabetes education. |
| | Dr. Ebaa AlOzairi joined KTV1's 'Layali AlKuwait' to discuss the Medical Sector's latest research findings. |
| | DDI participated in AIRawda Polyclinic World Diabetes Day celebration. |
| | The Education & Training Unit held KICK-OFF training course at DDI for children with diabetes. |
| | DDI participated in Al-Ikhlās Rehab School for an outreach campaign promoting diabetes awareness. |
| | DDI held a training course titled 'Prevention and Management of Diabetic Foot Complications.' |
| | DDI participated in an outreach event promoting diabetes awareness at the General Secretariat of the Council of Ministers |
| | DDI's Medical Team participated in Dahiyat Abdullah Al Salem Health Center's World Diabetes Day event |
| | Prof. Carel Le Roux presented a lecture at DDI titled, "Re-examining energy balance in patients with obesity" & "What is the evidence for the new obesity drugs?" |
| | DDI participated in an outreach campaign promoting diabetes awareness at AlAhli United Bank |
| | DDI lit the building in orange in support of #16DaysofActivism against Gender-Based Violence, which is recognized by the UN. |
| DECEMBER 2021 | Reem Almatrook joined the Kuwait Pulse 88.8FM program for a Radio interview. |
| | DDI participated in an outreach campaign promoting diabetes awareness at the Ministry of Higher Education. |
| | H.E. Mr. U.L. Mohammed Jauhar, Ambassador of Sri Lanka, visited DDI to discuss future means of collaboration. |
| | The Public Authority for Applied Education and Training (PAAET) nursing students visited DDI for a training course. |



NOTABLE EVENTS 2021

MARCH 2021



DR. KHALED AL-FADHEL, DIRECTOR-GENERAL OF THE KFAS, VISITS DDI

Dr. Khaled Al-Fadhel, Director-General of the Kuwait Foundation for the Advancement of Sciences (KFAS), visited DDI today and met with Dr. Hilal Al-Sayer, Chairman of the Board of Trustees, Dr. Qais Al Duwairi, Director-General of DDI, and Heads of DDI's Sectors to discuss the Institute's progress and future plans.

THE EDUCATION & TRAINING UNIT ORGANIZES A 'PATIENT CARE' TRAINING PROGRAM

The Education and Training Unit, in collaboration with Nutrition, Podiatry, and Medical Fitness Center at DDI, conducted a training program titled 'Patient Care' for Ministry of Health (MoH) primary care nurses and health educators.

MAY 2021



H. E. AMBASSADOR CRISTIAN TUDOR ATTENDS CLINICAL SKILLS COURSE AT DDI

The European Union Delegation headed by H. E. Ambassador Cristian Tudor attended the First Aid & CPR training course conducted by the Clinical Skills Center at DDI.

JUNE 2021



100 YEARS OF INSULIN, AN EDUCATION CONFERENCE HELD AT DDI

In celebration of the 100 years of Insulin Anniversary, DDI held a series of talks and facilitated roundtable discussions with MoH stakeholders across primary and secondary care, as well as the pharmaceutical sector

and patient advocates, supported by Novo Nordisk. This was the first time in Kuwait that prominent stakeholders in diabetes care met to discuss the possible options to improve diabetes management in Kuwait.

Dr. Qais Al Duwairi stated that 'At DDI, our teams work tirelessly to create effective programs of research, training, education, and health promotion that improve the quality of life of people with diabetes in Kuwait. In celebration of 100 years of insulin, we have created a platform to share a roadmap to improve diabetes care with our partners at MOH, patient's representative of Blue Circle, and all nonprofit organizations.

DR. QAIS AL DUWAIRI MEETS WITH WHO REPRESENTATIVES DR. ASSAD



HAFEEZ AND DR. AMGAD ELKHOLY

DDI held an introductory meeting with the WHO representative in Kuwait Dr. Assad Hafeez and Dr. Amgad Elkholy, the Medical Epidemiologist from WHO Regional Office for Eastern collaborations. This meeting was organized by the Director of International Health Relations in MoH, Dr. Rihab Al-Wotayan, and led by the Director General of DDI, Dr. Qais Al Duwairi, to discuss ongoing and future collaborations.

JULY 2021

DDI'S RESEARCHERS ATTEND KTV1'S 'LAYALI ALKUWAIT'

DDI's researchers were invited to the #1 show on KTV1 'Layali AlKuwait' to discuss the latest research achievements and findings. Dr. Faisal Al-Refaei, Chief Operating Officer, Dr. Dalal Al-Saeed, Clinical Operations Manager, and Dr. Hamad Muhammad, Assistant Professor at Kuwait University and Researcher at DDI, participated in the program.



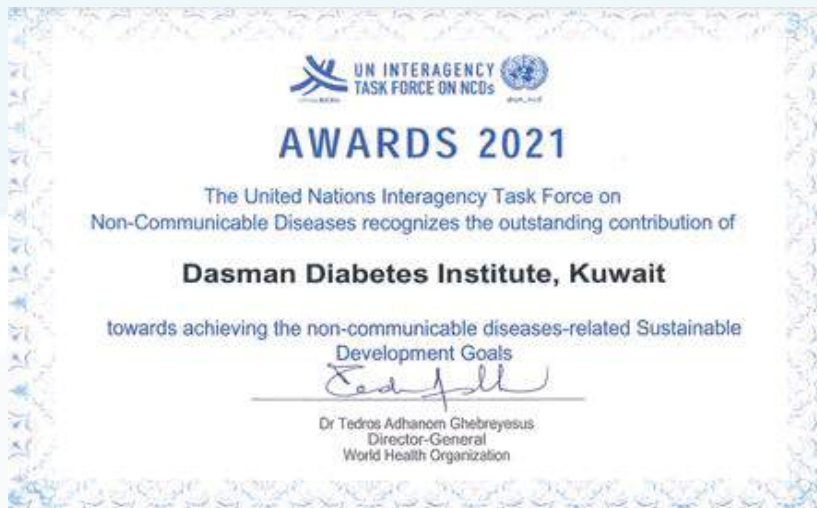
AUGUST 2021



OUR MEDICAL SECTOR ON KUWAIT'S PREMIER SHOW

Dr. Ebaa AlOzairi, Chief Medical Officer, and Jumana AlKandari, nutritionist and Head of DAFNE Program, joined Kuwait's premier nightly program 'Layali Al Kuwait.' The Medical Sector team was interviewed live to discuss the latest medical and research achievements of the Institute.

SEPTEMBER 2021



DDI WINS THE UN INTERAGENCY TASK FORCE ON PREVENTION OF NCD'S

This is a prestigious award given to DDI its efforts in addressing diabetes and its complications

After careful consideration by the UN Interagency Task Force on prevention of noncommunicable diseases (NCDs) and in recognition of continuous efforts of the Dasman Diabetes Institute, it has been selected to receive the prestigious international award of year 2021.



'PHARMACOTHERAPY MANAGEMENT OF DIABETES COMPLICATIONS' A TRAINING PROGRAM BY DDI'S PHARMACY UNIT

DDI's experienced team of pharmacists welcomed the first group of pharmacists for the training course titled 'Pharmacotherapy Management of Diabetes Complications.' This course was held at the Institute's headquarters, in cooperation with the Kuwait Association for Clinical Pharmacy and the Abdulmohsen Al-Abdul Razzaq Center for Medical Sciences, Kuwait Institute for Medical Specialties and Lilly Pharmaceutical Company.



WORLD PATIENT SAFETY DAY 2021 AT DDI

World Patient Safety Day 2021: This year's theme is 'safe maternal and newborn care.' World Patient Safety Day is celebrated and observed every year on September 17th across the globe; marked to raise awareness about patients' safety. To help

raise awareness and to stand in solidarity with this initiative, DDI lit up its building in orange.

OCTOBER 2021



DDI MEETS WHO AND MOH OFFICIALS

DDI welcomed several officials from the World Health Organization office in Kuwait and the Ministry of Health to discuss and enhance aspects of cooperation between the Institute, the Organization, and the Ministry in the fields of scientific research. These meetings were led by Prof. Fahd Al-Mulla, Chief Scientific Officer, and Dr. Ebaa AIOzairi, Chief Medical Officer.

NOVEMBER 2021



DDI LIT IN BLUE FOR WORLD DIABETES DAY

DDI is lit up in blue on the occasion of World Diabetes Day, which falls on the 14th of November. The Institute held its annual event in Al Hamra Tower today on this occasion.

AL HAMRA TOWER LIT IN BLUE FOR WORLD DIABETES DAY

Al Hamra Tower is lit up in blue on the occasion of World Diabetes Day, which falls on the 14th of November. DDI held its annual event in Al Hamra Tower today on this occasion.





DDI ORGANIZES ITS ANNUAL WORLD DIABETES DAY EVENT

DDI held its annual informative event to commemorate World Diabetes Day on November 14, 2021, at Al Hamra Tower and Shopping Center. The event allowed visitors to consult with diabetes specialists and dietitians, as well as gather medical information from booths that explained various facts of diabetes and promoted healthy lifestyle modification.



LECTURE AT DDI BY PROF. CAREL LE ROUX

DDI delivered a special obesity lecture series by world-renowned speaker Professor Carel Le Roux titled, “Re-examining energy balance in patients with obesity” & “What is the evidence for the new obesity drugs?”



DDI HOLDS A PREVENTION AND MANAGEMENT OF DIABETIC FOOT COMPLICATIONS MODULE

DDI held its specialized three-day course on the Prevention and Management of Diabetic Foot Complications. This program was held at the Institute and attended by healthcare professionals.

DDI VISITS THE GENERAL SECRETARIAT OF THE COUNCIL OF MINISTERS

DDI's team of healthcare professionals and nursing team visited the General Secretariat of the Council of Ministers to participate in the diabetes open day held for the secretariat employees. The Institute's team provided blood glucose testing, medical consultations, and physical fitness consultations. It also provided brochures and brochures about diabetes and its complications for the attendees.





DDI AWARENESS CAMPAIGN AT AUB

DDI held a diabetes awareness campaign at AIAhli United Bank head office. The medical teams performed blood glucose testing, blood pressure testing, HbA1c rapid testing and allowed for medical consultations to answer any questions. Afterwards, the Education and Training department gave a diabetes lecture for the employees of AIAhli United Bank.

DECEMBER 2021

DDI PARTICIPATES IN HEALTH AWARENESS CAMPAIGN FOR MOHE

DDI participated in a health awareness campaign held at the Ministry of Higher Education (MoHE), Sanabel Tower. DDI's team of healthcare professionals conducted blood sugar tests, HbA1c, vital signs, and provided nutritional counseling, medical education and more. DDI's Public Relations and Media Services team organized the participation and recorded attendance data.

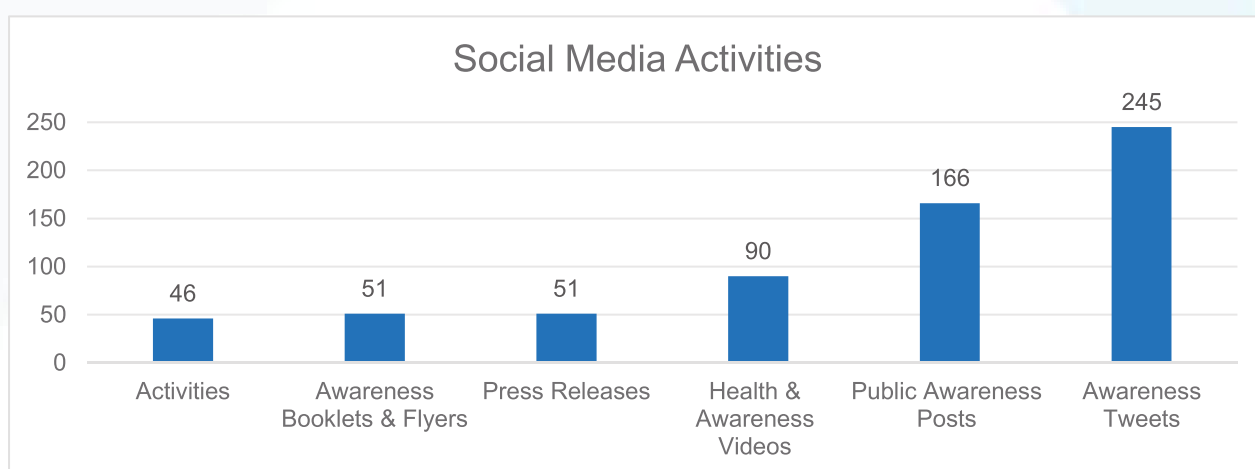




PUBLIC AWARENESS ACTIVITIES

Working closely with DDI's Sectors, the Public Relations (PR) and Media Services team aims to expand the public's awareness of Diabetes through educational outreaches, campaigns, events, seminars, lectures, and workshops by ensuring public engagement and participation. As a result of the impact of the pandemic, physical activities/events decreased in 2020-2021 when compared to 2019. However, as restrictions were lifted, activities increased from 36 in 2020 to 46 in 2021.

Nevertheless, the PR and Media Services department utilized the Institute's social platforms and other online communication technologies to ensure awareness is maintained at a community and population-level. A breakdown of these activities is illustrated below:



DDI VIDEOS

DDI continued to provide diabetes and health awareness messages through its' YouTube channel and Instagram (@dasmaninstitute). Diabetes research videos were shared on the website's media page: (<https://www.dasmaninstitute.org/media/>). These videos also include educational interviews, scientific updates, and newsworthy highlights on DDI activities. A total of 90 health awareness videos and 7 research videos were conducted in 2021.

DDI RESEARCH NEWSLETTERS

DDI's Research Newsletters focus on different aspects of scientific research. Each issue highlights research topics related to diabetes and its associated complications. The Newsletter

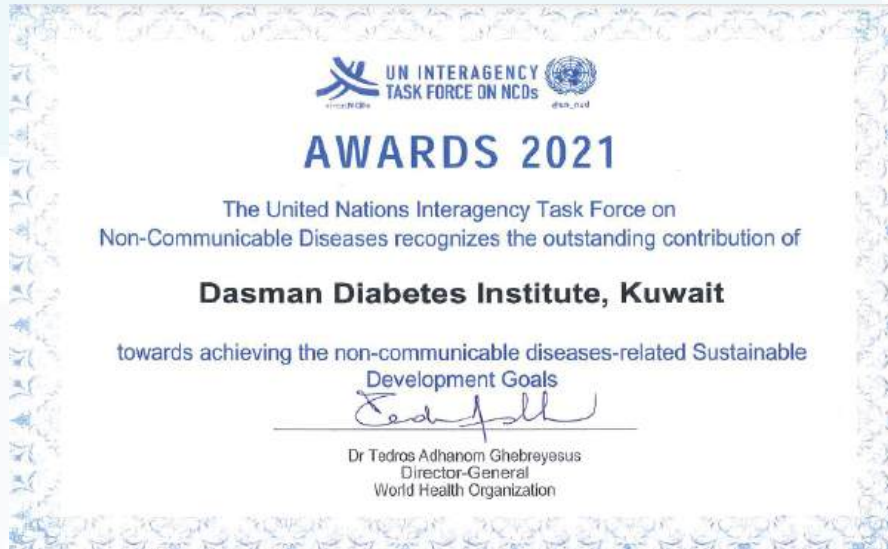
aims to strengthen the public's understanding of the disorder and demonstrate how the research at DDI is helping to improve patients' lives. The Newsletter is issued quarterly.





KEY ACHIEVEMENTS

UNITED NATIONS AWARD 2021



In September 2021, DDI was awarded the International Award 2021 by the UN Interagency Task Force on the prevention of non-communicable diseases (NCDs) for the Institute's remarkable contributions to the management, treatment, and prevention of diabetes and its related complications. This award is the result of months of tireless work with the Ministry of Health to develop a national diabetes registry and the Institute's remarkable contributions to the prevention and treatment of diabetes and its related complications, including obesity.

L'ORÉAL-UNESCO PRIZE FOR WOMEN IN SCIENCE 2021

Dr. Hend AlQaderi won the international award for the 2021 L'Oréal-UNESCO Prize for Women in Science, recognizing female scientists from the Middle East and North Africa (MENA) region for their groundbreaking research. Dr. AlQaderi's project: the use of oral fluids as a non-invasive diagnostic tool that allows early diagnosis and treatment of COVID-19 and other inflammatory diseases.



PATENTS AND INNOVATION

The Patent & Research Translation Office (PRTO) supports the development and protects the rights of DDI's research. It also aims to transfer this research to industry, organize multinational collaborative relationships to conduct research, while developing technologies of local, regional, and global value. In 2021, a total of 2 new patents were filed, 2 patents were approved and granted, and 1 patent was approved and granted but backdated for 2020. DDI now has a cumulative total of 4 approved and granted patents till date.





ONGOING ACCREDITATIONS

COLLEGE OF AMERICAN PATHOLOGISTS



DDI is certified with the College of American Pathologists (CAP) since 2018, which is valid until January 2024.



ACCREDITATION CANADA

DDI has maintained the Accreditation Canada (AC) Unconditional Diamond Level Certification from its third AC cycle in the QMENTUM Accreditation program in 2018/2019. The level shows DDI's drive to continuously meet international standards to deliver safe and high-quality care.



HIPAA COMPLIANCE

DDI has maintained the Health Insurance Portability and Accountability Act (HIPAA) verified approval to earn the HIPAA Seal of Compliance since 2019 and passed the HIPAA audit in 2021. The current Seal of Compliance certification is valid until August 18, 2022.





RESEARCH OUTPUT

TRANSLATIONAL RESEARCH

DDI's research aims to translate fundamental/novel research findings into clinical practice and community-based health outcomes to improve the overall quality of life. DDI applies an integrative research approach that brings together different disciplines to better understand diabetes. These projects have translational and clinical components to drive bench to bedside and bedside to community-based research flow to ultimately improve health and community outcomes.

Bench to Bedside, Bedside to Community and back



KEY TERMS

Original research is defined as a paper where all or some of the actual research was done within DDI and/or paid by DDI at least in part. This includes data sharing and contribution.

The **impact factor (IF)** or **journal impact factor (JIF)** of an academic journal is a scientometric index that reflects the yearly average number of citations that recent articles published in a given journal received.

NUMBER OF PUBLICATIONS

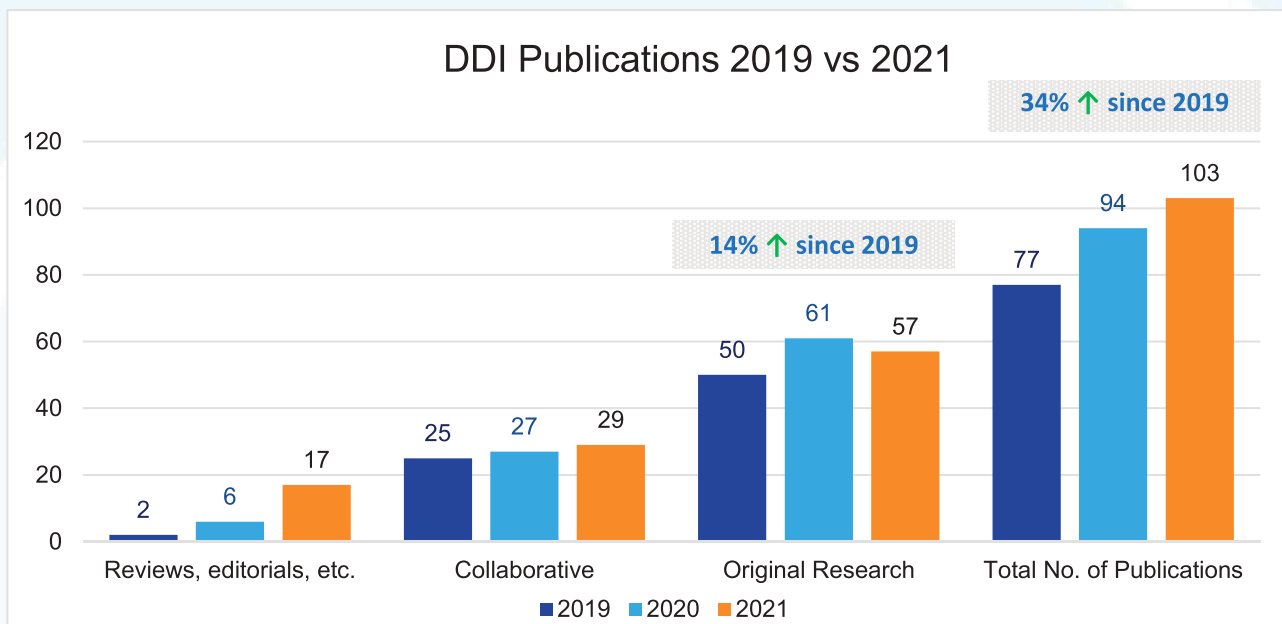
The total number of publication output for 2021 was 103, a **34%** increase from 77 in 2019, and around a **10%** increase from 2020. DDI also witnessed an increased output in original research from 50 in 2019 to 57 in 2021 (**14%**).

Per the recommendations of the International Scientific Advisory Board (ISAB), DDI researchers have focused on producing more original research-based publications. Overall, **55%** of DDI's 2021 total publication output was **original research**.

An overview of the publication output is provided in the subsequent figures/graphs.

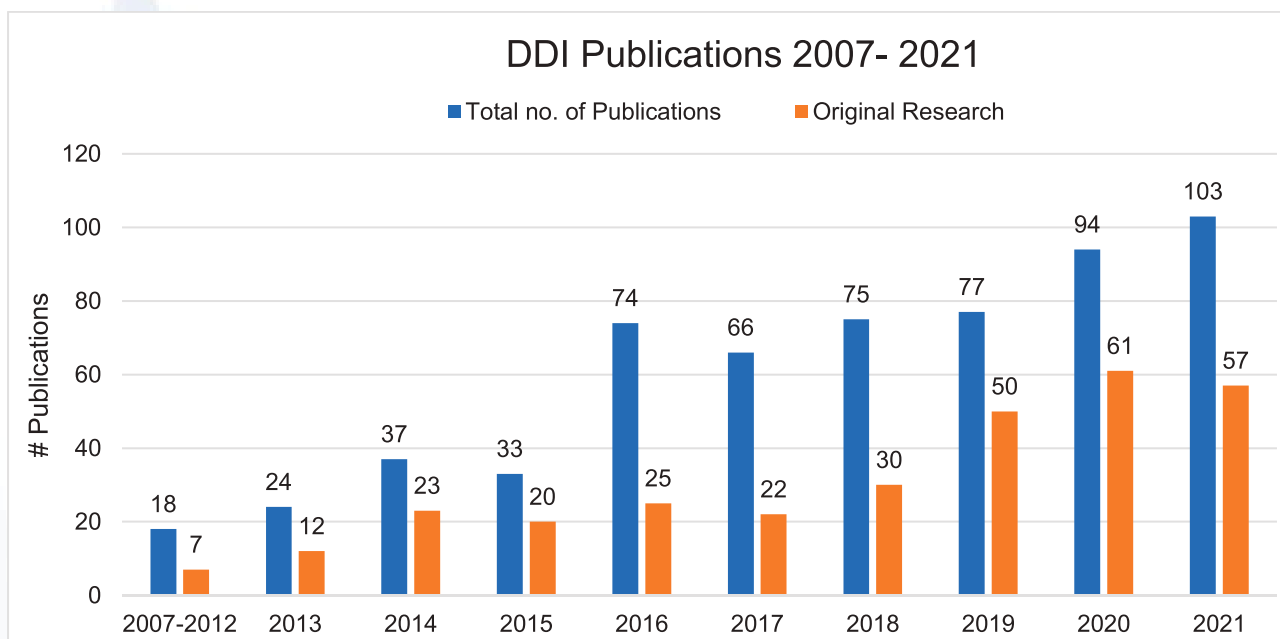
PUBLICATION BREAKDOWN

A history of DDI's publications, categorized by type, from 2019 till date is illustrated below:



PUBLICATION HISTORY

An overview of the total DDI publications and original research history from 2007 till date is illustrated below:

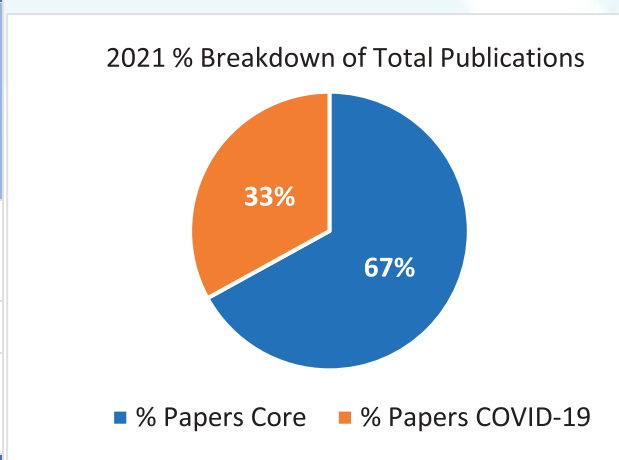


There were **103** total publications in 2021, a 10% increase from 2020. Original Research publications were maintained above 50% of the total publications.

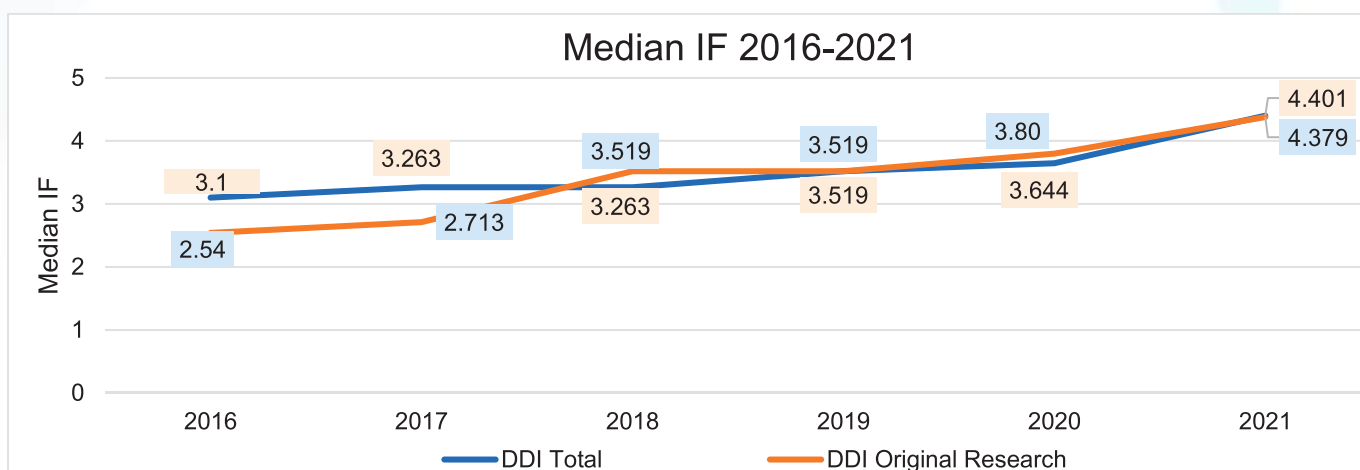
COVID-19 PUBLICATIONS

An overview of the DDI publications including core (i.e., non-COVID-19) and COVID-19 papers.

| TYPES | Number of Papers | | |
|---------------------------|------------------|-------------------|---|
| | TOTAL | DDI Core Activity | COVID-19 & COVID-19 diabetes related papers |
| Original Research | 57 | 42 | 15 |
| Collaborative | 29 | 17 | 12 |
| Reviews, Editorials etc.. | 17 | 10 | 7 |
| Total | 103 | 69 | 34 |



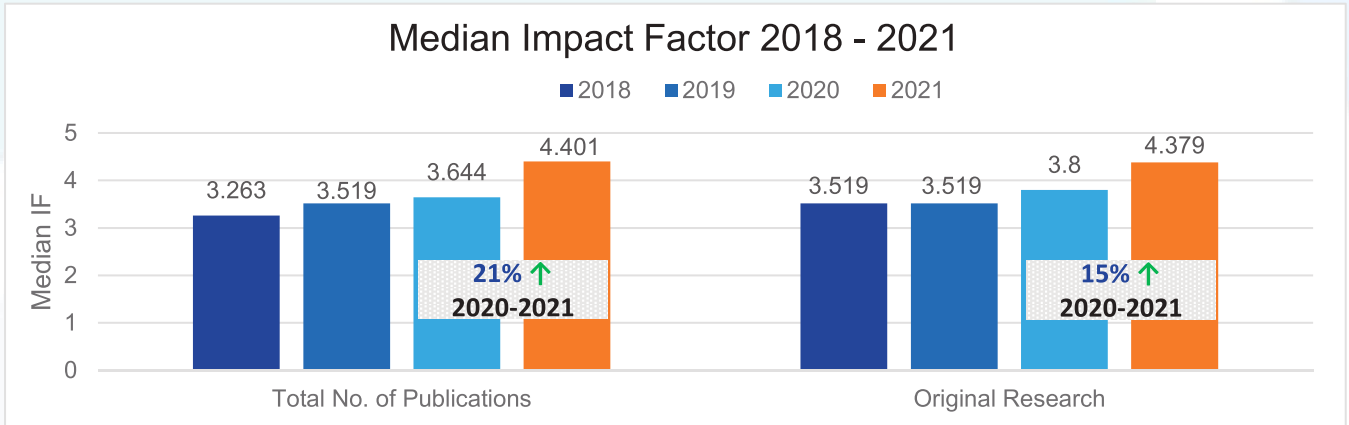
QUALITY OF PUBLICATIONS: IMPACT FACTOR (IF)



Since 2016 to date, the total DDI publications Median IF increased by **42%** from 3.1 to 4.4 with the original research Median IF increasing by **72%** from 2.54 to 4.38. In 2021, the Median IF for all publications increased by **21%** vs. original research Median IF increase of **15%** when compared to 2020.

Furthermore, in 2021, the percentage (%) of papers published in journals with an IF of greater than or equal to 5 was **37%** compared to 16% in 2020. Publications in journals with an IF 10 was **9%** compared to **4%** in 2019, and consistent with that of 2020. These results convey DDI's focus to strive to increase and maintain publications in higher IF journals

| | 2019 | 2020 | 2021 |
|----------------------------------|------|------|------|
| % Publications with IF \geq 5 | 19% | 16% | 37% |
| % Publications with IF \geq 10 | 4% | 9% | 9% |



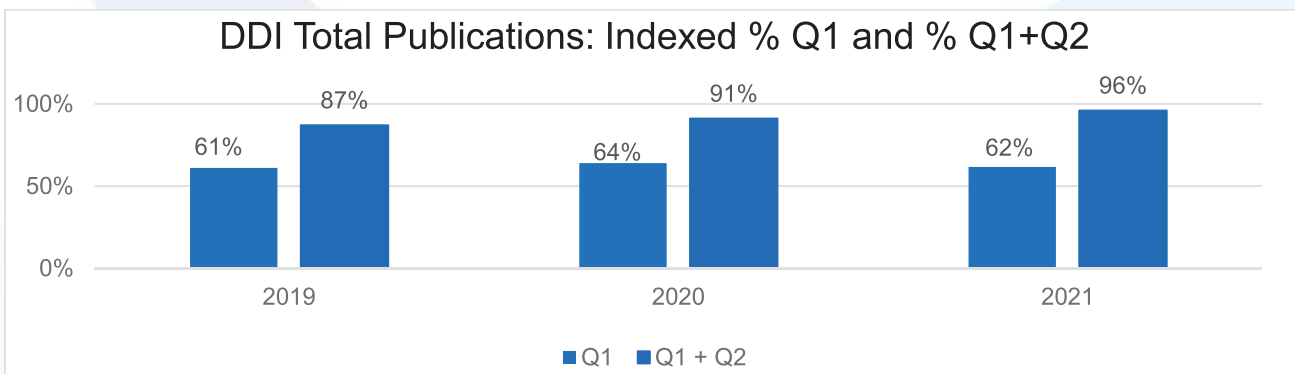
QUALITY OF PUBLICATIONS: QUARTILE JOURNAL RANKING

Quartile rankings are derived for each journal in each of its subject categories according to which quartile of the Impact Factor (IF) distribution the journal occupies for that subject category:

| | |
|------------------------|--|
| Quartile 1 (Q1) | Q1 denotes the top 25% of the IF distribution |
| Quartile 2 (Q2) | Q2 for middle-high position (between top 50% and top 25%) |
| Quartile 3 (Q3) | Q3 middle-low position (top 75% to top 50%) |
| Quartile 4 (Q4) | Q4 the lowest position (bottom 25% of the IF distribution) |

DDI is continuously looking to improve its research quality output and uses the metric “% indexed publications in Quartile 1 and 2 Journals” which is commonly used in Kuwait.

DDI continuously achieves a % greater than 60% in Quartile 1 Journals since 2019 with a 62% achievement in 2021, and an increase in % papers in Q1 & Q2 Journals from 87% in 2019, 91% in 2020 to 96% in 2021.



% of Indexed Q1 and Q2 total publications should be > 85%

INTERNATIONAL CONFERENCES

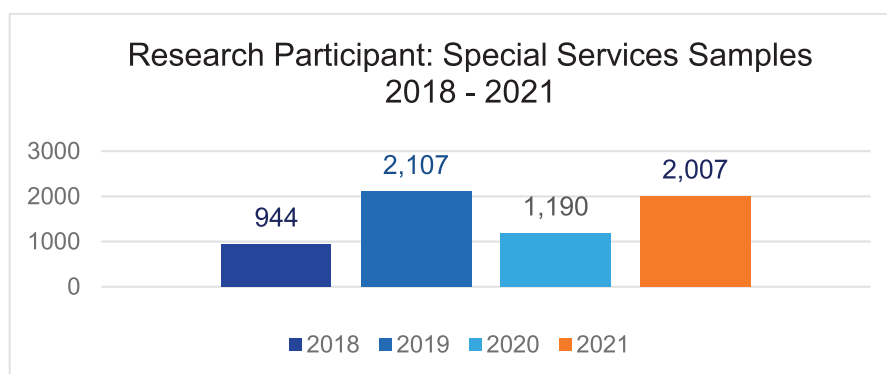
DDI engaged in over **40 conferences** in 2021 via face-to-face and online platforms, as available.

LECTURES AND PRESENTATIONS

DDI conducted **38 internal lectures** including 26 journal clubs and 12 research presentations and hosted **8 guest lectures** in 2021. These knowledge transfer activities explore the sharing of thought processes, cognitive structures, broader contextual methods and provides a platform for scientific exchange and mentorship.

RESEARCH PARTICIPANTS

The COVID-19 pandemic has had an impact on research participation and enrollment since 2020, due to enhanced protective and safety measures. In 2021 DDI nearly doubled its sample intake with **2,007** samples collected in 2021 compared to **1,190** samples in 2020, achieving as much as was collected in 2019.



However, patient participation and engagement in research continued with **1,439** patients enrolled in 2021 (compared to 504 in 2020). In 2020, DDI managed to engage a total of **32%** of patients to participate in Research.

NATIONAL DASMAN DIABETES BIOBANK

The National Dasman Diabetes Biobank (NDDB) is the first and only Biobank (biosample repository) in Kuwait. The NDDB offers DDI and collaborators repository services to conduct short and long-term research projects related to diabetes and its complications. The NDDB's wide range of services include sample processing and fractionation, storage, testing, and nucleic acid isolation, among others. The NDDB is a member of the European, Middle Eastern and African Society for Biopreservation and Biobanking. It is a Biosafety Level 2 laboratory which specializes in the processing of blood and other body fluids, tissue samples (for histology and immunohistochemistry purposes) and cell culture. The NDDB facilities include secure sample storage rooms with -80°C freezers and liquid nitrogen tanks. Cumulatively, NDDB houses

over **39,449 research participants' samples** and tracks more than **343,447 biological specimens** for freezer inventory using a sample management system.

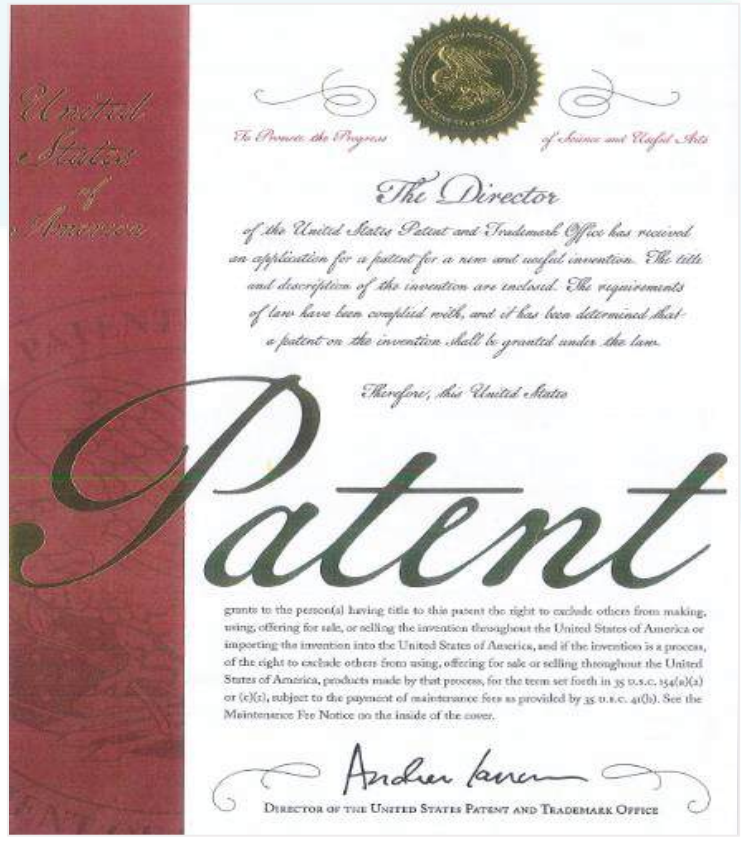
PATENTS

The Patent & Research Translation Office (PRTO) supports the development and protects the rights of DDI's research to transfer to industry, organize multinational collaborative relationships to conduct research while developing technologies of local, regional, and global value. In 2021, 3 patents were received: 2 granted in 2021 and 1 granted in 2020 (backdated). Ten patents are in various stages, per below.

| Patent Status/Stages | Value |
|---|-----------|
| New Patents Filed in 2021 | 2 |
| Ongoing Patent applications/filings from 2019/2020 | 4 |
| Approved/Granted Patents in 2021 | 2 |
| Approved/Granted Patents in 2020 (Notified in 2021) | 1 |
| 2021 Total | 9 |
| Previous Granted Patents 2020 | 1 |
| Total till date | 10 |

Details of Approved Patents at the United States Patent and Trademark Office:

| Docket No. | Year | Title of Invention(s) | Inventors | Co-Inventor(s) |
|-----------------|------|---|----------------------|---|
| 33024.00 | 2020 | Method for preventing progression to metabolic syndrome | Prof. Fahd Al Mulla | Raseeba Nizam, Dr. Ashraf Madhoun |
| 33024.01 | 2020 | Use of MicroRNA-103 as Inhibitor for dyslipidemia by repressing ANGPTL8 gene (2020) | Dr. Mohamed Abufarha | Dr. Jehad Abubaker Prof. Fahd Al Mulla Preethi Cherian Irina Alkhairi |
| 33024.02 | 2021 | Use of MicroRNA-181d as Inhibitor for dyslipidemia by repressing ANGPTL3 gene (2021) | Dr. Jehad Abubaker | Dr. Mohamed Abufarha, Prof. Fahd Al Mulla Irina Alkhairi Preethi Cherian |
| 33024.10 | 2021 | Targeting Signaling Crosstalk Between IL-6 and TNF- α for Preventing MMP-9 Induced tumor growth (2021) | Dr. Rasheed Ahmad | Prof. Fahd Al Mulla |



US011098095B1

(12) **United States Patent**
Ahmad et al. (10) **Patent No.: US 11,098,095 B1**
(45) **Date of Patent: Aug. 24, 2021**

(54) **METHODS OF INHIBITING MMP-9**

(71) Applicant: **DASMAN DIABETES INSTITUTE,**
Dasman (KW)
(72) Inventors: **Rashed Ahmad, Dasman (KW); Fahd Al Mulla, Dasman (KW)**
(73) Assignee: **DASMAN DIABETES INSTITUTE,**
Dasman (KW)
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(51) **Int. Cl.**
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C07K 14/47 (2006.01)
C07D 239/00 (2006.01)
A61K 38/00 (2006.01)
A61K 31/498 (2006.01)

(52) **U.S. Cl.**
CPC **C07K 14/4703** (2013.01); **C07D 239/00** (2013.01); **A61K 31/497** (2013.01); **A61K 31/498** (2013.01); **A61K 38/00** (2013.01)
(58) **Field of Classification Search**
CPC .. **A61K 31/497; A61K 31/498; A61K 31/277; C07D 403/12; C07D 487/14**
See application file for complete search history.

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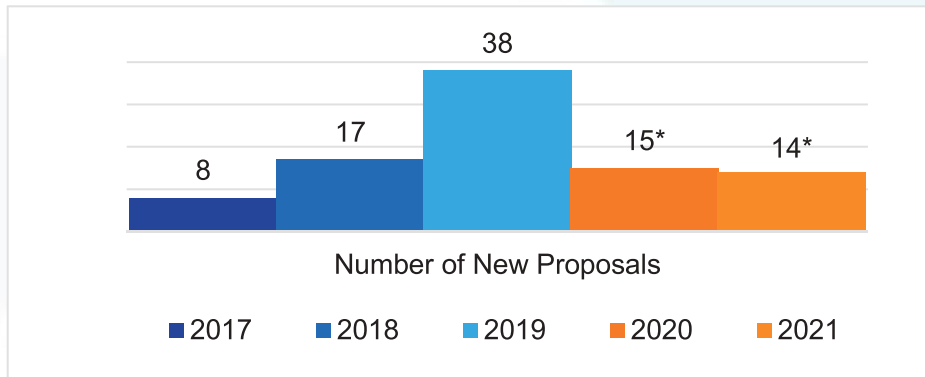
(57) **ABSTRACT**
Methods of inhibiting MMP-9 are provided. The methods of inhibiting MMP-9 include methods of inhibiting IL-6/TNF- α crosstalk mediated expression and/or secretion of MMP-9. The inhibition of the IL-6/TNF- α crosstalk pathway may be accomplished using an IL-6 signaling inhibitor, such as AG490 or SC-144. The methods may also include the treatment of diseases through the inhibition of IL-6/TNF- α crosstalk mediated production of MMP-9. In an embodiment the methods may include preventing the progression of cancer or cardiovascular disease through the inhibition of the IL-6/TNF- α crosstalk pathway.



RESEARCH PROJECTS AND PROPOSALS

RESEARCH PROJECT PROPOSALS

All research proposals follow a standardized ISAB approved project governance process. As per the ISAB recommendations to maintain a focused approach in research, DDI continues to see a decrease in the number research proposals per year, with a total of 14 new submitted proposals in 2021 and 8 project extension requests.

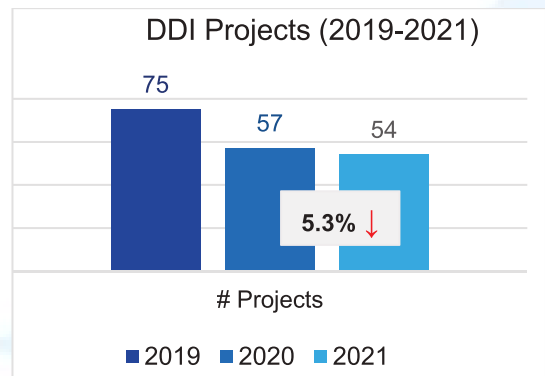
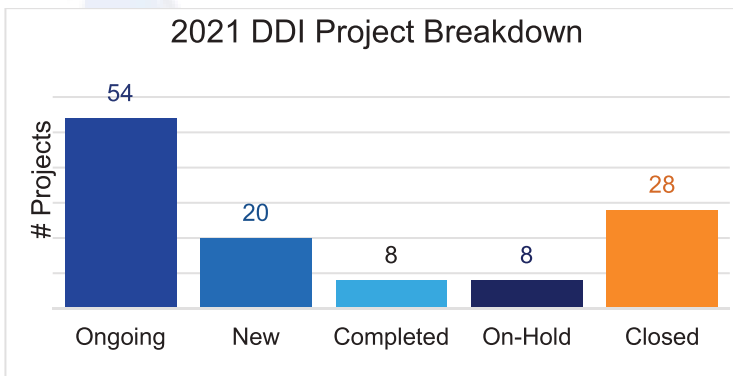


*Decrease in number of proposals are per ISAB recommendations as part of a continued focused research approach.

PROJECTS

There were **54 ongoing projects** at the end of 2021. Project approvals follow a standardized process for approval, per above, with all new projects aligned and directly contributing to the approved DDI Strategic Plan, i.e., DDI Initiatives 1-3 and the Research Strategy.

| | Research Sector | Medical Sector | DG Directorate | Operations Sector |
|---------------------------------------|-----------------|----------------|----------------|-------------------|
| 2021 Ongoing Projects Overview | 37 | 14 | 1 | 2 |



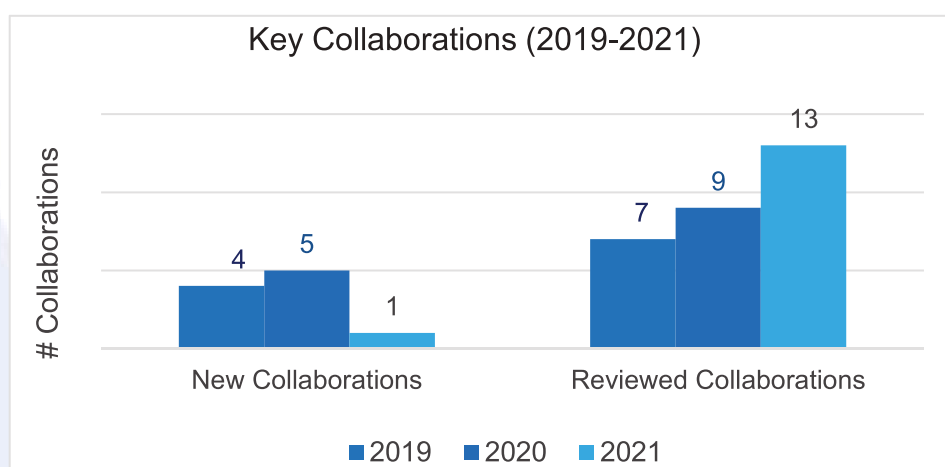


COLLABORATIONS

KEY COLLABORATIONS

In 2021, DDI continued to expand its national, regional, and international network via enhancement of its national and international collaborations. **Thirteen** of the major existing collaborations were reviewed and re-assessed with **1 new collaboration** concluded.

| International Research Collaborations | |
|--|---------------------------|
| Montreal Diabetes Research Centre | Ulster University |
| McGill University | University of Canberra |
| University of Glasgow | BIDMC-Harvard |
| Sunnybrook Research Institute | World Health Organization |
| Onze Lieve Vrede Hospital | Emory University |
| Public Authority for Food and Nutrition & George Institute for Global Health | |
| University of Texas Health Science Center, San Antonio | |
| New Research Collaborations | |
| Yale University | |
| Local Collaborations | |
| Bayt Abdullah Children's Hospice (BACCH) | |



COLLABORATIVE CONSORTIUMS

Consortiums provide multiorganizational groups the opportunity to coordinate, network and pull resources together for common well-defined scientific goals. To enhance joint alliances, DDI participated in 9 consortiums during 2021.

| Collaborative Consortiums | |
|---------------------------|--|
| 1 | Genetic Investigation of Anthropometric Traits (GIANT) |
| 2 | Global Lipids Genetics (GLGC) at Broad Institute (USA) |
| 3 | Weill-Cornell Medicine (Qatar and New York) on genome data sharing & integration |

| | |
|---|---|
| 4 | COVIDiaB Registry |
| 5 | COVID-19 Host Genetics Initiative |
| 6 | Personalized Medicine Coalition |
| 7 | NCD Risk Factor Collaboration (NCD-RisC) |
| 8 | COVID Human Genetic Efforts (CHGE) – Rockefeller University |
| 9 | International SWEET Network |

In addition to the above, DDI researchers are associated and work on multiple research projects with over 11 international institutions worldwide on a project level basis over and above the ones listed earlier.

DASMANSWITCH

GIS- University of Canberra (UC) / George Institute / Public Authority for Food and Nutrition

As part of DDI’s initiative to develop a Switch tailored for diabetics, in collaboration with the George Institute for Global Health, DDI developed a **Diabetes Switch** (Filter), the first of its kind in the world. The Diabetes Switch considers components in its logic that are integral to diabetic patients, such as carbohydrates and Fiber – in addition to the existing nutrients such as Energy Density, Saturated Fat and Salt/Sodium. The DDI and George Institute team developed a new logic specific to the DiabetesSwitch to emphasize the components that affect people with diabetes and propose healthier choices. As a result, FoodSwitch Kuwait has been rebranded as the DasmanSwitch.

DDI piloted the DasmanSwitch in 2021 with an official launch scheduled for February 2022.

REGIONAL COLLABORATIONS

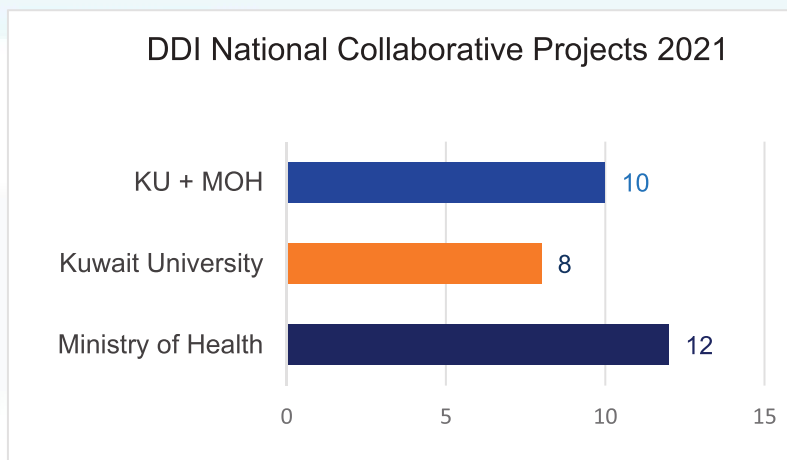
DDI continued with 5 **major** regional collaborators in 2021 on multiple research projects:

| Regional Institutions | |
|-----------------------|---|
| 1 | Weill Cornell University, Qatar |
| 2 | The UAE Genetic Disease Association |
| 3 | Sidra Medical Center – Qatar (<i>STEPS Project</i>) |
| 4 | Hamad Medical Corporation – Qatar |
| 5 | King Abdullah University of Science and Technology |

NATIONAL COLLABORATIONS

DDI continues to collaborate nationally to exchange knowledge to strengthen and contribute to the country’s scientific research community to enhance knowledge transfer and scientific capacity building with national institutes and ministries.

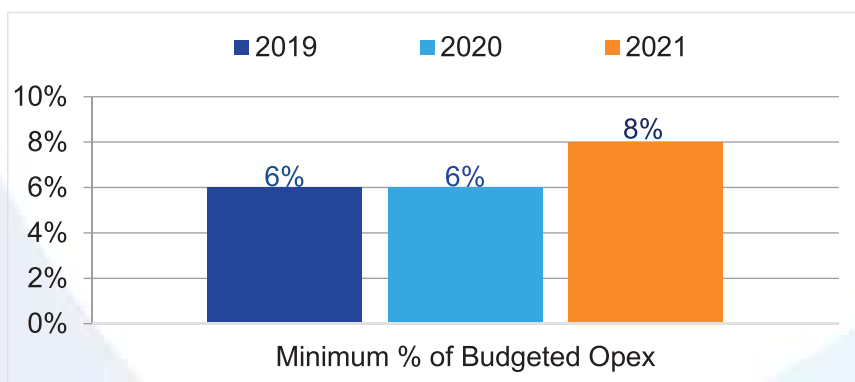
In 2021, DDI continued to collaborate with the MoH and Kuwait University (KU) on multiple projects covering various scientific disciplines. A breakdown of the number of projects is illustrated below with a total number of national projects with KU and MoH reaching 30 collaborations for 2021.



The above does not include the collaborations with Public Authority for Food and Nutrition (PAFN) collaborations and is purely KU and MoH projects.

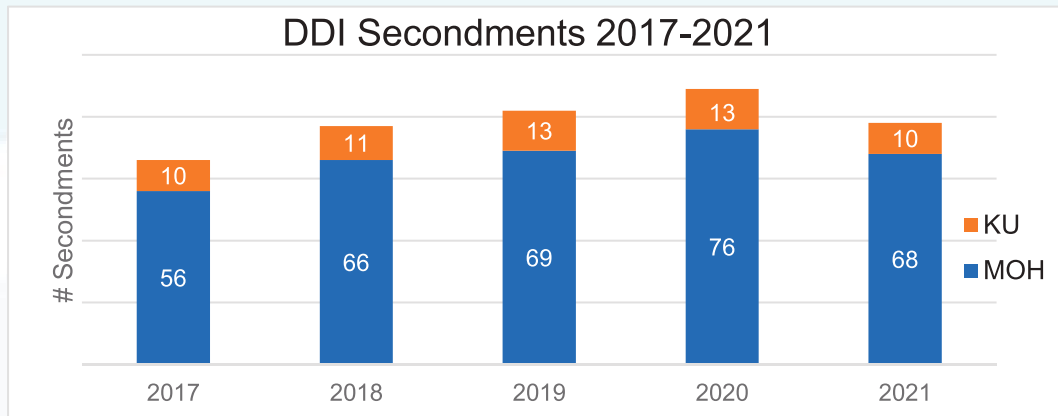
OPEX % EXPENDITURES ON NATIONAL PROJECT COLLABORATIONS

As a leading Diabetes research institute, DDI dedicates a minimum goal of 5% of its annual OPEX budget to active national collaborative projects. In 2021, this figure was approximately 8% (as of Nov 2021).



NATIONAL COLLABORATIONS: SECONDMENTS

DDI continues to enhance and strengthen its national ties with KU and MoH through secondment enrollment within DDI.



| Year | DG Directorate | Medical | Operations | Research | Total |
|-------------|----------------|---------|------------|----------|-----------|
| 2021 | 1 | 63 | 1 | 13 | 78 |
| 2020 | 1 | 70 | 1 | 17 | 89 |
| 2019 | 1 | 65 | 1 | 15 | 82 |
| 2018 | 2 | 61 | 1 | 13 | 77 |
| 2017 | 2 | 51 | 1 | 12 | 66 |



**CLINICAL RESEARCH,
EDUCATION, AND SKILL
DEVELOPMENT
PROGRAMS**

CLINICAL RESEARCH PROJECTS & PROGRAMS

DDI continued driving clinical projects and programs which aim to improve the quality of healthcare delivery services, patient well-being and diabetes outcomes through behavioral interventions and therapeutics. Some key results are illustrated below:

The **Diabetes Remission** program
(1st T2DM remission clinic in the region)

- **50%** of patients reduced their medications by 50% through the program in 2021

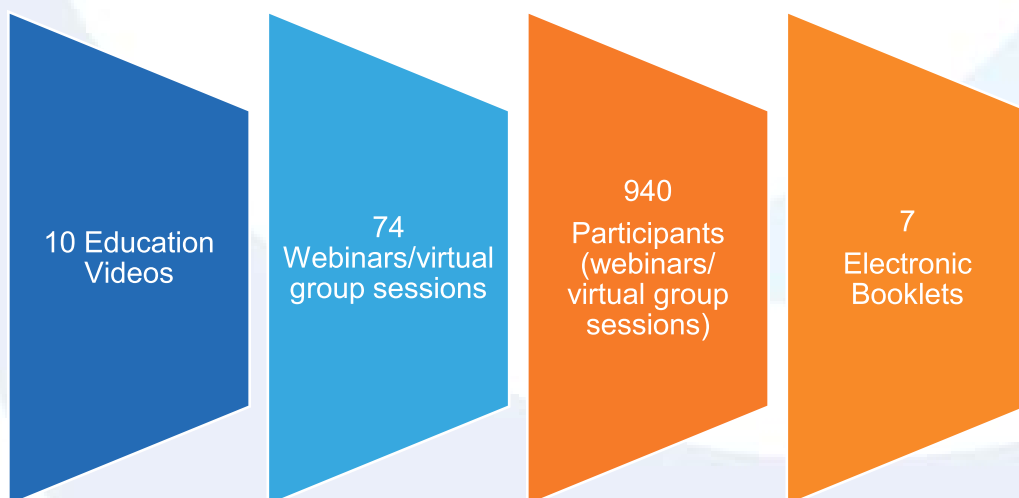
Cognitive Testing project for people with Type 1 and Type 2 Diabetes

- Increased to **422 participants** in 2021

MEDICAL EDUCATION AND SKILL DEVELOPMENT PROGRAMS

Multiple skills development programs were designed for professionals, patients, partnering organizations, and the general population of Kuwait. These research, educational, and awareness initiatives focused on learning and development for the treatment of diabetes and its corresponding burden. DDI provided accredited training and development opportunities for **2,158 professionals** in 2021.

As a result of the impact of the COVID-19 pandemic, online platforms were utilized and optimized to deliver initiatives for schools and the public for diabetes awareness.



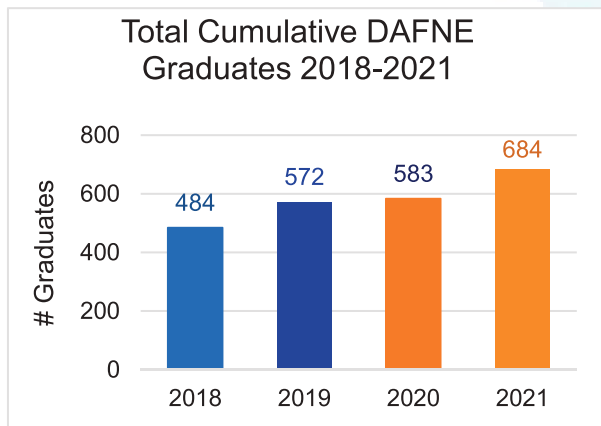
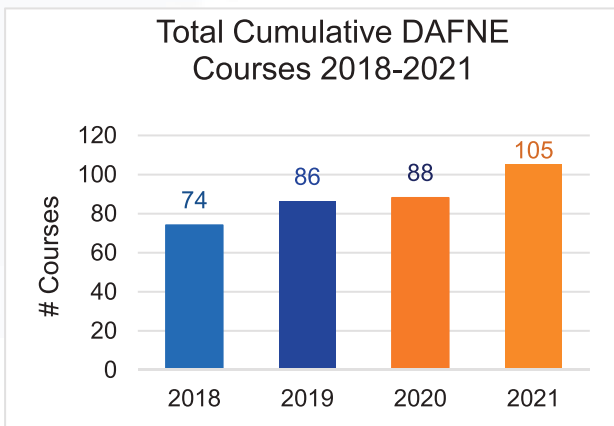
DOSE ADJUSTMENT FOR NORMAL EATING (DAFNE)

In Kuwait, DDI continues to be the only training center for the Middle East for DAFNE.

DAFNE was piloted in Kuwait with cultural adaptation as a clinical service, with 684 graduates (cumulative) completed in 2021.

Collaboration has been extended for clinical training, expansion to DAFNE pump program, health economist training and qualitative training.

| | 2018 | 2019 | 2020 | 2021 |
|-----------------------------------|------|------|------|------|
| Total cumulative no. of courses | 74 | 86 | 88 | 105 |
| Total cumulative no. of graduates | 484 | 572 | 583 | 684 |



CLINICAL IMPROVEMENTS



Monitored educational impact on lowered HbA1c levels in people with T1DM in 2021 with 57% with T1DM achieving HbA1c levels of < 8



In 2021 a total of 3,535 patients were seen for one-to-one diabetes education



Provided 3,766 Investigations in the DDI Diagnostic Imaging Centre (x-ray, ultrasound, MRI, etc.)



The DAFNE Program had 100% of patients with a reduction in DKA in 2021



Around 4,476 patients were seen across DDI clinics with 47,194 appointments



The Clinical Skills Center participation increased in 2021 with 443 courses held and 1,935 participants



ORGANIZATIONAL DEVELOPMENT

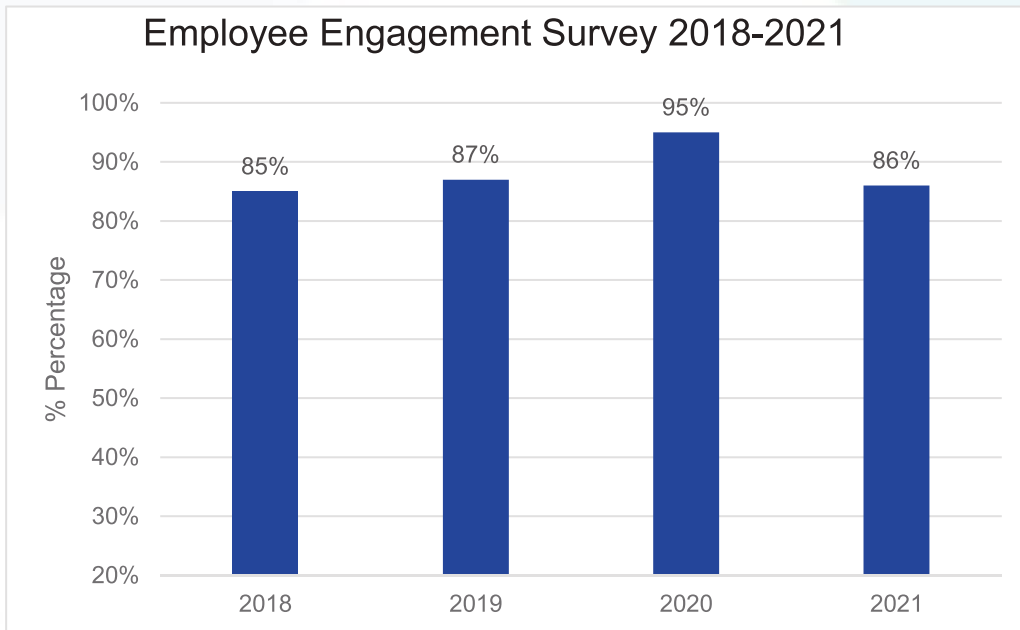
ORGANIZATIONAL AND PERFORMANCE UPDATES

EMPLOYEE ENGAGEMENT

The annual employee engagement survey conducted in 2021 showed a decrease in the employee satisfaction score, with an **86% in 2021**, which is above the norm of > 80 - 85%.

The major points and concerns raised from employees internally are summarized below:

- Compensation & Benefits
- Rewards & Recognition



ORGANIZATIONAL DEVELOPMENTS

DDI internal committees established to support internal governance continued their activities in 2021. Two of these committees, i.e., the Enterprise Risk Management (ERM) Committee and the Quality and Safety Management (Q&SM) Committee, continued to identify potential events that may affect DDI while managing risks within its risk appetite to provide reasonable assurance regarding DDI's organizational sustainability and deliverables towards its strategy and objectives. This included the development of risk mitigation strategies and the creation of an integrated Quality platform within DDI.

SCIENTIFIC GOVERNANCE

Since 2017, DDI has continued to achieve research milestones and planned steps in alignment with ISAB.



The ISAB meetings with internationally recognized experts were conducted twice yearly since 2017, and due to the COVID-19 pandemic, once only in 2020. However, in 2021, ISAB was back on schedule with 1 meeting and 1 mid-term research strategy review meeting.

The ISAB continues to support DDI in strengthening its internal research strategy by providing advice and input on the overall DDI research agenda, long-term research strategy and guidance on selected research projects, as needed.

DDI MID-TERM STRATEGY REVIEW

The 2018-2023 DDI strategic plan is divided into five strategic initiatives across the Institute. Underlying each of these initiatives is a series of programs providing a focused approach to delivering DDI's vision, mission, and key objectives.

The DDI Strategy Management Office (SMO) in collaboration with the Research Operations & Project Management (ROPM) Department conducted a mid-term strategy review to assess the continued relevance of the DDI Strategic Plan 2018-2023's strategic initiatives, workstreams and objectives while ensuring alignment of all related activities towards achieving these goals. This activity was kicked off in May 2021 and was concluded in Nov/Dec 2021. During this time SMO internally reviewed initiatives 4 & 5 against their goals.

Furthermore, in October 2021 a mid-term research strategy review was conducted with the consultative support and input of selected ISAB members covering DDI's first 3 strategic initiatives in its current strategic plan. The reviewers received a comprehensive report on the research progress to date along with presentations on planned research strategic objectives, status of overall progress, challenges and issues, and future directions.

The ISAB commended and praised the work and research focus which DDI has concluded since 2018 and affirmed that the current and revised strategic objectives were realistic, and the current work is aligned with the overall research direction to help attain the strategic objectives.

Overall, DDI is on track with its strategic plan and all related initiatives and strategic programs of work were on target with only minor recommendations and adjustments.