مؤسسة قطر
Qatar Foundation
لإطلاق قدرات الإنسان
Unlocking human potential

# Precision Health Fact Sheet

November 2024

# 01

## Overview

Across the fields of IT, education, environment and healthcare, Qatar Foundation's focus on innovative research is injecting new technologies into the global marketplace, while identifying new challenges and opportunities. The research environment that Qatar Foundation (QF) has created, and expanded, over the past decade-and-a-half, with the aim of supporting Qatar's vision for human, social, and economic development, is unique – it encompasses the entire value chain of education, research and development, innovation, commercialization, and entrepreneurship.

The application of Precision Health promises to revolutionize the management of healthcare, allowing a more rigorous and scientific approach to the needs of each patient based on their unique genetic fingerprint and lifestyle indicators. Qatar Precision Health Institute (QPHI), Qatar Science & Technology Park (QSTP), Sidra Medicine, the Industry Development and Knowledge Transfer (IDKT) office, and the research institutes within QF's universities are helping to shape the future of healthcare in Qatar through the implementation of precision health.

# 02

## Precision Health at QF

At Qatar Foundation, we are leading the charge to develop a precision health program that offers real benefits to the local population. Qatar has the unique opportunity to be at the forefront of precision health with its relatively homogeneous gene pool and common in-group health ailments.

Precision health holds a lot of promise to revolutionize the management of healthcare. Instead of a one-size-fits-all approach to health, it can help us cater to the needs of each patient based on their unique genetic fingerprint and lifestyle indicators.

These are some of the milestones we are hoping to reach in the near future:

- Reaching 100,000 unique genetic maps from the local population
- Genetic mapping of specific diseases: cardiovascular, diabetes, cancer, Multiple Sclerosis, autism.
- Implementing a lifestyle and wellness genomics program
- Establishing diagnostic protocols to identify patients disease areas
- Innovating pharmacogenetic treatment protocols in selected disease areas

The following are the entities leading our work in the field of precision health.

# 03

# Qatar Precision Health Institute

Launched in 2024, Qatar Precision Health Institute (QPHI) is an umbrella institute that brings together existing strengths in the field of health sciences and genomics within QF's Qatar Biobank (QBB) and Qatar Genome Programme (QGP), to help accelerate Qatar's adoption of personalized healthcare.

QPHI is building on a decade of groundbreaking work by QBB and QGP, uniting their precision health efforts with those of QF's research institutes and other key research entities across Qatar. This integration aims to consolidate and amplify the impact of research-based evidence on precision health, incorporating insights into how lifestyle, environment, and genetics influence the country's population.

By unifying these efforts under a single umbrella institute, QPHI seeks to advance the implementation of precision health strategies and provide comprehensive, data-driven insights that support the health and wellbeing of Qatar's people.

QPHI will support Qatar in delivering precision health by taking research findings in this field from laboratories into clinic – the 'bench-to-bedside' approach – so that this form of healthcare can directly benefit patients. This will be done by identifying key clinical focus areas that reflect the needs of Qatar, scaling up precision medicine so it can be employed in clinical practice, and establishing a policy program to provide guidance and clarity in the field of precision medicine and regulatory affairs.

QPHI's Research Access Office has so far enabled 508 research projects, with the participation of hundreds of researchers from 20 different institutions in Qatar's healthcare sector.

**The following entities are under the umbrella of QPHI:**

**Qatar Biobank**

Qatar Biobank (QBB), created in collaboration with Hamad Medical Corporation and the Ministry of Public Health, enables the research community to achieve the improvements in diagnostic and prognostic intelligence required to deliver personalized healthcare for the people of Qatar, the region, and worldwide, through establishing a research enterprise platform enabling access to high-quality biological samples, imaging data, and information on health and lifestyle from an underrepresented population.

Recent initiatives:

- Qatar Biobank population-based cohort study: 40,000 participants.
- Achieved College of American Pathologist (CAP) accreditation for general laboratory activities.
- In 2022, Qatar Biobank was nominated as an observer member of the Biobanking and BioMolecular Resources Research Infrastructure – European Research Infrastructure Consortium, making it the first non-European member and facilitating international collaboration on biobanking and research.
- Qatar Biobank introduced the Genetic Fragile Fracture Study and the Cystic Fibrosis Omics Study, expanding its research focus to these specific conditions.

# 04

## Qatar Genome Programme

Qatar Genome Program (QGP) is a national population-based research project that aims to study the genetic makeup of the Qatari as well as other Arab populations and generate large scale genomic databases for researchers with the ultimate aim of introducing precision medicine and personalized healthcare to the national health care system.

This large-scale genome project combines whole genome sequencing with other omics data thus offering an unprecedented opportunity to researchers and health care providers to have a very comprehensive and deep understanding of the population at the molecular level. Such understanding will facilitate the translation of research outcomes into clinical precision medicine practices.

QGP's operation was launched in 2015 with a comprehensive strategy based on the seven building blocks shown below. This strategy which is aligned with Qatar's National Vision 2030 extends, beyond generating data, into areas related to policies and regulation, human capacity building and clinical integration.

To date, QGP has sequenced approximately 40,000 genomes, with the goal of achieving 100,000 genome sequences by 2025.

Newest developments:

- Cutting-edge genomic research with global consortia
- The QChip Qatar specific SNP Microarray
- Science curricula enforcement with content about genomics.
- 180 students in the "Genomics and Precision Medicine Track" for building local capacity in healthcare through Qatar University and the Ministry of Education and Higher Education.

- Genome Heroes comic series, creating edutainment content and resources in Arabic, to spread knowledge and awareness on genomics and precision health.
- The pan-Arab whole-genome genotyping array and imputation reference panel
- Returning genomic data to healthcare providers, for individuals carrying actionable BRACA mutations.
- Wellness and lifestyle genomic reports through genetic counselling
- Masters and PhD programs at HBKU and Qatar University on genetic counseling and precision medicine.
- Launch of a genomics education game, available in Arabic and English for students globally.
- Path towards Precision Medicine awards with Qatar National Research Fund, focusing on innovative projects aiming at translating basic research into clinical implementation.

**The following QF entities are also centrally engaged in efforts to advance precision health:**

# 05

## Sidra Medicine

Sidra Medicine provides children, women, and young people with outstanding tertiary healthcare services in an innovative and ultramodern facility specially designed to promote healing. It is a unique academic medical center serving patients from Qatar and abroad.

The healthcare organization's patient driven research, advanced diagnostics and personalized therapy is what sets it apart from other institutes in the local, regional, and international context. Its biomedical and clinical research have both national relevance and global impact, with programs focused on genetic disorders and genomics, diabetes and metabolic disorders, cancer as well as maternal and child health.

The past few years have marked a significant step in realizing Sidra Medicine's research mission to deliver hospital-wide precision medicine, with research technologies and innovation continuing to play a prominent role in every patient's journey. By 2022, the impact of research on patient care was seen at multiple levels, from diagnosis onwards, and as much as 57 percent of its research studies featuring a clinical lead.

Sidra Medicine's experience with Middle Eastern genotypes and phenotypes as well as with novel diseases, has become a game changer in the precision medicine field. Its commitment to establish a strong, clinically oriented biomedical research program and to develop a national resource of genomic information that improves health in Qatar and the region, is increasingly becoming a precision medicine benchmark for many institutes around the world.

Thanks to a strong culture of innovation and recognition of Sidra Medicine's intellectual property and technical know-how, it is on track with its mission to deliver a hospital wide Precision Medicine Program. This is built upon the philosophy that research technologies and innovation should play a prominent role in every Sidra Medicine patient's journey.

Recent initiatives:

- In 2022, more than 250 papers were published by scientists and clinicians with close to 50 percent of Research Branch publications appearing in the top 15 percent of international journals such as The Lancet Oncology, Nanoscale and Advanced Materials. The Research Branch papers published in the last 12 months had a mean impact factor of 9.6.
- Publication of several cancer research studies, such as an in-depth paper analyzing the relationship between tumor cells and immune cells and the impact of anti-tumor immune responses related to the survival of young cancer patients; a study that indicates fasting as a possible immunotherapy for treating cancer; and a large-scale genomic study helped unveil cancer susceptibility among Arab and Middle Eastern populations.
- The discovery and diagnoses of a gastroenterological disease, a new form of inflammatory bowel disease by researchers at Sidra Medicine helped save the lives of two young patients, through an innovative precision care program.
- Sidra Medicine is in the midst of its first birth cohort Omouma study which aims to investigate factors affecting pregnancy outcomes, the early life determinants, and their impact on the infant, child's, and adolescent's health in the population
- of Qatar.
- In 2022, it received two major international grants from the Juvenile Diabetes
- Research Foundation (JDRF), to fund two research projects that will help advance predictions of type 1 diabetes among susceptible children. In the same year, it also received 15 grants totaling almost QR 11 million from Qatar National Research Fund and external funds.
- It was selected as a center of excellence to become the regional hub for the provision of lifesaving therapies for children with Spinal Muscular Atrophy. The program was successfully launched in 2022, with the treatment of the first two patients in the GCC region at Sidra Medicine.
- Sidra Medicine's annual Precision Medicine and Functional Genomics Symposium continues its goal of making Qatar a leading hub for research and innovation in precision and genomic medicine. It hosted the 7th edition of the symposium in 2022, and showcased several milestones and achievements of making precision medicine a reality for patients in Qatar.

# 06

## Qatar Biomedical Research Institute (QBRI)

QBRI aims to improve and transform healthcare through discoveries in prevention, diagnosis, and treatment of diseases affecting the Qatari population and the region. QBRI is home to three research centers: Neurological Disorders Research Center, Diabetes Research Center and Translational Cancer and Immunity Center.
Through its Interdisciplinary Research Program, QBRI aims to encourage researchers to tackle common scientific challenges across two or more of QBRI's research centers while working together and stimulating biomedical research across different disciplines. The approach is expected to generate innovative, problem-solving strategies that transcend individual disciplines while integrating a diverse range of skill sets and expertise.

Programs include:

- Autism Interdisciplinary Research Program
- Diabetes Interdisciplinary Research Program
- Breast Cancer Interdisciplinary Research Program

Among its partners and collaborators are Hamad Medical Corporation, the Shafallah Center, Sidra Medicine, Qatar University, Weill Cornell Medicine - Qatar, Anti-Doping Lab Qatar, the King Hussein Cancer Center, the Harvard Stem Cell Institute, Cleveland Clinic, AFFiRis, Olink, Lundbeck and Sengenics.

Recent initiatives:

- 2023: Investigators at QBRI, in collaboration with HBKU Core Labs, have published a highly impactful research article in the scientific journal "Advanced Science." The article reports that a reduction in cholesterol levels in the neurons due to aging is associated with decreased synaptic activity, and a deficiency in cholesterol-mediated synaptic transmission may lead to neurodegeneration.
- 2022: Researchers at QBRI published a paper in the high ranking "Proceedings of the National Academy of Sciences" (PNAS) scientific journal which reported novel findings related to the molecular mechanism of neurodegenerative diseases including Parkinson's, dementia with Lewy bodies, and Alzheimer's diseases.
- 2021: QBRI signed a collaboration agreement with Scripps Research, which is ranked as the most influential institution in the world for its impact on innovation. Under the agreement, QBRI and Scripps Research will combine their respective scientific expertise and world-class facilities to accelerate biomarker and drug discovery for unmet medical needs.
- October 2020: QBRI signed technology transfer agreements with two leading companies in the field of Proteomics, namely: Singapore-based Sengenics and Sweden's Olink Proteomics. Both these certified proteomics core technology platforms have been established at its research facilities.
- July 2020: A novel diagnostic technology for Parkinson's disease developed by a trio of experts from QBRI was used in a series of promising clinical trials conducted by Austrian clinical-stage biopharmaceutical company, AFFiRiS AG, based in Vienna, Austria.

## 07 About Qatar Foundation

Qatar Foundation (QF) is a non-profit organization made up of more than 50 entities focused on education, research, and community development.

QF's unique ecosystem – supported by partnerships with leading international institutions – is built on initiatives that address our most pressing challenges, create global opportunities, and empower people to shape our present and future.

## 08 About Education City

Education City, QF's flagship initiative, is a campus that spans more than 12 square kilometers and hosts branch campuses of some of the world's leading educational institutes, a homegrown university, research and innovation hubs, and community facilities. Together, this makes Education City a unique environment of knowledge – pioneering a new approach to multidisciplinary, global education and enabling breakthroughs that benefit Qatar and the rest of the world.

## 09 QF Media Center

Qatar Foundation hosts a range of experts able to comment on several health topics including, breast cancer, microbiology and immunology, diabetes, neuroscience, and more.
You can view our wide range of experts,www.qf.org.qa/media-center

**For more information and for media enquiries, please contact the QF Press Office at pressoffice@qf.org.qa**

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