معهد قطر للرعاية الصحية الدقيقة
Qatar Precision Health Institute
عضو في مؤسسة قطر
Member of Qatar Foundation

Call for Proposals

2nd round of QGP consortium:
Qatar Precision Health Research Consortium (QPHRC)
November 2024

I. Introduction

Building on the success of QGP consortium's first round, this call for proposals invites researchers in Qatar to leverage QPHI's extensive genomic and health data for innovative studies that bridge basic research and practical applications. By facilitating impactful projects, the consortium aims to foster discoveries that can lead to tangible improvements in clinical practice and public health.

II. Objective

This research consortium is dedicated to advancing both basic and translational research, with a strong emphasis on implementing findings that directly benefit clinical and public health outcomes. By leveraging QPHI data, the goal is to address foundational questions and drive scientific discoveries that can swiftly transition into real-world applications.

III. Scope

A. Collaborative Approach

This consortium emphasizes a multi-institutional framework, ensuring broad collaboration across academic, clinical, and research institutions. Each research domain should have at least two principal investigators (PIs) from different institutions, fostering interdisciplinary collaboration and knowledge sharing. This approach will ensure that diverse expertise and perspectives are incorporated at every stage of the research process.

B. Project Timeline

Research projects are expected to be completed within a two-year timeline, starting from the moment access to genomic and phenotypic data is granted. This timeline allows for in-depth analysis and the generation of results while maintaining momentum for rapid publications.

C. Availability of Expertise

Proposals should demonstrate that the research team includes experts with the necessary skills and experience to address the specific research questions. Each submission will be evaluated to ensure it includes specialists across relevant domains to maximize the potential for meaningful outcomes.

D. Capacity Building

The consortium places a strong emphasis on the inclusion of capacity-building elements within proposed projects. Teams are encouraged to integrate early-career researchers, trainees and PhD students to foster a learning environment that strengthens local expertise in genomic research and precision health. This ensures building a sustainable foundation for ongoing research and expertise in the community.

IV. Research Domains

The consortium will focus on the following research priority domains:

A. Cancer Genomics

Investigating the genetic basis of various cancers to identify mutations, biomarkers, and therapeutic targets.

- Examples Include, but not limited to:
    - Identifying novel genetic mutations and polygenic risk factors contributing to cancer initiation and progression.
    - Conducting large-scale studies integrating clinical data and cancer gene mutation carriers to reveal new biomarkers for early cancer detection.
    - Advancing gene-targeted therapies tailored to specific cancer subtypes, guided by comprehensive tumor genomics.

- Potential Outcomes:
  - Uncovering novel biomarkers to enhance early detection and improve prognostic accuracy.
  - Enabling personalized prevention and therapeutic approaches that reflect individual genetic risk profiles.
  - Paving the way for more effective, targeted treatments aimed at enhancing patient outcomes and reducing recurrence.

B. Cardiovascular Disease (CVD) Genomics

Exploring the genetic underpinnings of cardiovascular diseases and related metabolic disorders to enhance prevention and treatment strategies.

- Examples Include, but not limited to:
  - Genome-wide association studies to identify genetic variants linked to CVD risk.
  - Research on how genetic factors influence cholesterol, blood pressure, and other CVD-related biomarkers.
  - Integration of genomic data into clinical tools for more personalized prevention and treatment.
- Potential Outcomes:
  - Improved risk prediction models for heart disease.
  - Development of gene-based interventions for the prevention and management of CVD and metabolic disorders.
  - Enhanced clinical decision-making with the use of genomic information.

C. Genomics and Artificial Intelligence

Advancing genomics research through the integration of artificial intelligence, with a focus on novel AI-driven approaches for interpreting complex genetic data and enhancing disease prediction capabilities.

- Examples Include, but not limited to:
  - Integrating AI with MRI imaging data to enhance the understanding of diseases, correlating genetic markers with structural brain changes for improved personalized treatment strategies.
  - Utilizing deep learning models to systematically curate and improve variant interpretation and patient outcomes.

  - Developing AI-powered tools for comprehensive detection of rare and ancestry-specific genetic variants.
- Potential Outcomes:
  - Development of scalable AI frameworks for efficient genetic variant interpretation, streamlining genomic data analysis for clinical applications.
  - Enhanced diagnostic capabilities and accuracy in detecting rare and complex genetic disorders.
  - Improved genetic testing through AI-driven screening tools that serve diverse populations.

D. Reproductive Genomics

Exploring gene functions and interactions to better understand biological mechanisms behind genetic variation, with a focus on reproductive health.

- Examples Include, but not limited to:
  - Research studies to determine the role of the genetics of reproductive disorders.
  - Research on gene-environment interactions that influence reproductive health outcomes.
  - Studies on gene regulation during development and its impact on fertility.
- Potential Outcomes:
  - Identification of key genes involved in reproductive disorders and their functions.
  - Improved understanding of gene regulatory networks related to reproductive biology.
  - Provide insights that could lead to development of new therapeutic targets to improve fertility and reproductive health.

E. Mental Health Genomics

Examining the genetic factors that contribute to mental health disorders, with an emphasis on risk prediction and fundamental research into underlying mechanisms.

- Examples Include, but not limited to:
  - Genome-wide association studies (GWAS) to identify genetic variants linked to psychiatric disorders and neurodegenerative conditions.

  - Investigating the interaction between genetic predispositions, environmental factors, and aging in mental health disorders and cognitive decline.
  - Development of genetic markers for the early diagnosis and personalized treatment of aging-related mental health and neurodegenerative conditions.
- Potential Outcomes:
  - Identification of key genetic variants contributing to the onset and progression of mental health disorders and neurodegenerative diseases.
  - Enhanced risk prediction models that incorporate genetic and environmental factors for early detection and intervention.
  - Development of personalized therapeutic strategies that target specific genetic pathways involved in mental health disorders.

Each of the above research domains should align with the goal of moving research from discovery to implementation, with clear pathways for clinical or public health integration.

V. Expected Deliverables

- Peer-reviewed publications in high-impact journals.
- Insights to inform public health or clinical implementation strategies based on research findings.
- Development of new tools, methodologies, or technologies for genomic research.
- Contribution to training and capacity-building efforts within participating institutions.

VI. Budget and Resources

Consortium projects will benefit from waived access fees to QPHI data, with additional funding support available specifically for publication costs. Limited funding may also be allocated for validation studies, evaluated on a case-by-case basis; depending on priority, relevance and budget availability.

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VII. Monitoring and Reporting

Progress will be reviewed every **six months** through recorded one-to-one meetings to ensure smooth project advancement and provide support in overcoming potential obstacles. In addition, a progress report is to be submitted by each LPI after the completion of the **first year**, and a final report is expected after completing the **second year**. These reports will track milestones, challenges, and key findings to ensure alignment with the overall goals of the consortium.

VIII. Proposal Submission Process

- **Submission Platform**: Proposals shall be submitted through the QPHI research portal (https://researchportal.qphi.org.qa/).
- **Application Steps**: This shall be as follows:
    - Login to your account → Go to "My Applications" → then "QPH Research Consortium" → then "New Proposal" → then fill-in the required details.
- **Required Documents**: During the submission process, the following documents will be required:
    - Lead PI CV
    - Lead PI and Co-PIs relevant CITI certificates
    - Lead PI Institutional approval letter
- **Submission Deadline**: Submissions will be accepted until **January 31, 2025**.
- **Review Process**: Proposals will be assessed based on the scope of the consortium. The assessment process will be conducted by the QPHI evaluation committee.
- **Notification Timeline**: Selected proposals will be announced in **February 2025**.
- **Access Procedure**: Once the proposal is selected as part of the QPHRC, the QPHI research access office will contact the researcher to facilitate IRB approval, complete agreement signing and grant access to the data.

IX. Publications

Prior to publication, please consult with QPHI research directorate. Please also refer to the authorship guidelines below:

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A. Authorship Guidelines

- The Lead Principal Investigator (LPI) is responsible for managing the authorships, including position, order, and designation of the corresponding author, based on merit and contribution.
- Each consortium project must include the consortium banner in the authorship list. A list of the working groups will be provided prior to submission. Please refer to examples from the consortium's first round.
- We expect adherence to ICMJE guidelines for authorship.
- QPHI offers guidance and assistance with journal selection for submission, as well as reviewer suggestions.
- Researchers are encouraged to submit their manuscripts to pre-prints (e.g. medRxiv, bioRxiv).

B. Acknowledgements

Please include the following paragraph in the acknowledgement section:
"We thank all the participants who contributed samples and data to Qatar Biobank and Qatar Genome Program under the Qatar Precision Health Institute. This study is supported by Qatar Foundation for Education, Science, and Community Development".

C. References and Citations

- For the full methodology description of the data collection, generation and QC, please cite the flagship paper of the second round (doi to be shared once available). Alternatively, the researcher may request for documentation from QPHI-research team by sending email to qphi-research@qf.org.qa.
- We also encourage citing the previous two flagship publications of the first round of the consortium; the QGP flagship paper (PMID 35112413), and the QBB flagship paper (PMID 30927351).
- We also recommend citing the previous QGP Research Consortium publications.

X. Useful links

- QPHI Data catalog: https://www.qphi.org.qa/DataCatalog
- Description of the 25K genomic data release: https://www.qphi.org.qa/genomicdata

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XI. Publications of the 1st round of QGP Consortium

	Title	Journal	Date	Link
1	Whole genome sequencing in the Middle Eastern Qatari population identifies genetic associations with 45 clinically relevant traits	Nature communications	Feb-2021	https://www.nature.com/articles/s41467-021-21381-3
2	Actionable genomic variants in 6045 participants from the Qatar Genome Program	Human Mutation	Aug-2021	https://onlinelibrary.wiley.com/doi/10.1002/humu.24278
3	Thousands of Qatari genomes inform human migration history and improve imputation of Arab haplotypes	Nature communications	Oct-2021	https://www.nature.com/articles/s41467-021-25287-y
4	Qatar Genome: Insights on Genomics from the Middle East	Human Mutation	Feb-2022	https://onlinelibrary.wiley.com/doi/10.1002/humu.24336
5	Genetic predisposition to cancer across people of different ancestries in Qatar: a population-based, cohort study	Lancet Oncology	Feb-2022	https://www.thelancet.com/journals/lanonc/article/PIIS1470-2045(21)00752-X/fulltext
6	A population study of clinically actionable genetic variation affecting drug response from the Middle East	Npj Genomic Medicine	Feb-2022	https://www.nature.com/articles/s41525-022-00281-5
7	Functional Characterization of the MYO6 variant p.E60Q in non-syndromic hearing loss patients	International Journal of Molecular Sciences	Mar-2022	https://www.mdpi.com/1422-0067/23/6/3369
8	Analysis of Incidental Findings in Qatar Genome Participants Reveals Novel Functional Variants in LMNA and DSP	Human Molecular Genetics	Mar-2022	https://academic.oup.com/hmg/advance-article/doi/10.1093/hmg/ddac023/6554582?login=true
9	Ratios of acetaminophen metabolites identify new loci of pharmacogenetic relevance in a genome-wide association study	Metabolites	May-2022	https://www.mdpi.com/2218-1989/12/6/496
10	Differences and commonalities in the genetic architecture of protein quantitative trait loci in European and Arab populations	Human Molecular Genetics	Sep-2022	https://academic.oup.com/hmg/advance-article/doi/10.1093/hmg/ddac243/6724969
11	Identification of PCSK9-like human gene knockouts using metabolomics, proteomics, and whole-genome sequencing in a consanguineous population	Cell Genomics	Nov-2022	https://www.cell.com/cell-genomics/fulltext/S2666-979X(22)00171-9
12	Assessing the genetic burden of familial hypercholesterolemia in a large Middle Eastern Biobank	Journal of Translational Medicine	Nov-2022	https://translational-medicine.biomedcentral.com/articles/10.1186/s12967-022-03697-w
13	Multi-ancestry genome-wide association analyses improve resolution of genes and pathways influencing lung function and chronic obstructive pulmonary disease risk	Nature Genetics	Mar-2023	https://www.nature.com/articles/s41588-023-01314-0
14	Clinically actionable pharmacogenomic landscape of antidepressants and antipsychotics in Qatar: A population-based cohort study	MedRxiv	Sep-2023	https://www.medrxiv.org/content/10.1101/2022.09.27.23298620v1
15	Burden of Mendelian disorders in a large Middle Eastern biobank	Genome Medicine	Apr-2024	https://pubmed.ncbi.nlm.nih.gov/38584274/
16	Analysis of 14,392 whole genomes reveals 3.5% of Qataris carry medically actionable variants	Eur J Hum Genet	Jul-2024	https://www.nature.com/articles/s41431-024-01656-1
17	Mapping the genetic landscape of treatable inherited metabolic disorders in a large Middle Eastern biobank	Genetics in Medicine	Sep-2024	https://www.gimjournal.org/article/S1098-3600(24)00202-8/pdf