



Hong Kong
Genome Institute
香港基因組中心



2025-30
Strategic Plan

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About Hong Kong Genome Institute

1 | The Institute

The Hong Kong Genome Institute (HKGI), established and wholly owned by the Hong Kong SAR Government, commenced full operations in 2021. With the vision “to avail genomic medicine to all for better health and well-being” and supported by the Health Bureau, HKGI works in close collaboration with the Department of Health (DH), Hospital Authority (HA), medical schools of local universities and other stakeholders to accelerate the development of genomic medicine in Hong Kong along four strategic foci: integrate genomics medicine into clinical care, advance research, nurture talents and enhance public genomic literacy and industry partnership.

The Government established the Steering Committee on Genomic Medicine in December 2017 to map out the strategies for developing genomic medicine in Hong Kong and subsequently set up HKGI upon the recommendation of the Steering Committee to promote the city’s long-term development of genomic medicine, with the Hong Kong Genome Project (HKGP) as HKGI’s first key initiative.

HKGP, being the first large-scale genome sequencing project in Hong Kong, serves as a catalyst to benefit patients and their families with more precise diagnosis and personalised treatment through whole genome

sequencing (WGS). It also aims to establish genome database of the local population, testing infrastructure and talent pool to address the healthcare needs of Hong Kong in the long run.

As the first step towards achieving its vision, HKGI launched HKGP in 2021 focusing on diseases and research cohorts that would benefit from WGS. They include undiagnosed diseases, hereditary cancer and cases related to genomics and precision health.

HKGI has set up Partnering Centres at the Hong Kong Children’s Hospital, Prince of Wales Hospital and Queen Mary Hospital, as well as referring networks including the Alice Ho Miu Ling Nethersole Hospital, Grantham Hospital, Pok Oi Hospital, The Duchess of Kent Children’s Hospital at Sandy Bay, Tin Shui Wai Hospital, Tuen Mun Hospital and Tung Wah Hospital to help recruit eligible participants with informed consent. The results of sequencing analysis will be fed back to respective clinical leads and patients once available to aid diagnoses and clinical services.

HKGI will continue expanding recruitment channels for HKGP and keeping relevant stakeholders closely engaged to bring the benefits of genomic medicine to the wider community.



2 | Vision, Mission and Core Values



Vision

To avail genomic medicine to all for better health and well-being.



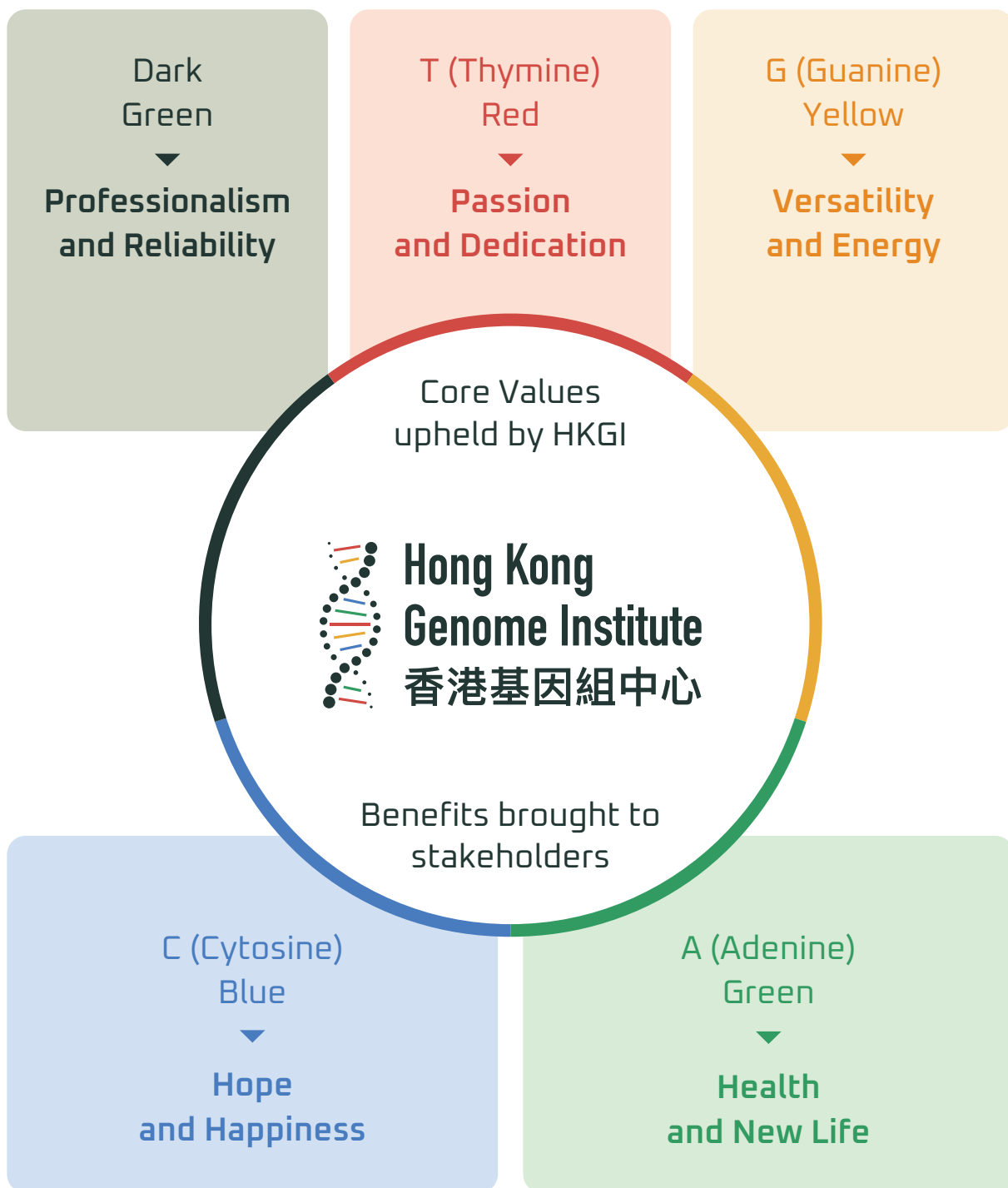
Mission

To accelerate the integration of genomics into medicine by driving clinical application, advancing research, nurturing talents and enhancing genomic literacy.



Core Values

The core values of HKGI are embedded in its logo of a five-colour double helix structure with dark green as the primary logo colour signifying the fundamental HKGI spirit of **professionalism and reliability**, as well as the lines in green, red, blue, and yellow, which apart from being the colour codes representing ATCG (A – Adenine, T – Thymine, C – Cytosine, and G – Guanine), the four different bases of DNA nucleotides, also symbolise the HKGI values of “**health and new life**”, “**passion and dedication**”, “**hope and happiness**”, and “**versatility and energy**” respectively.





Professionalism and Reliability

To provide WGS, laboratory, genetic counselling, genetic education, bioinformatics, research facilitation and related services with professionalism and reliability, observing relevant professional guidelines, ethical codes, standardised protocols as well as principles of data privacy and security.



Passion and Dedication

To achieve HKGI's vision and mission with passion and dedication, working wholeheartedly, thinking positively and taking the initiative to go the extra mile to serve patients and the wider community in a better way.



Versatility and Energy

To adopt a multidisciplinary approach for engaging professionals from various disciplines to promote the development of genomic medicine with vibrant means, energetic efforts and teamwork, embracing the spirit of openness, mutual respect, and acceptance of different ideas.



Hope and Happiness

To bring hope and happiness to patients and their families by fostering the integration of genomic medicine into clinical care to improve genomic diagnosis, personalised treatment and prevention of diseases.



Health and New Life

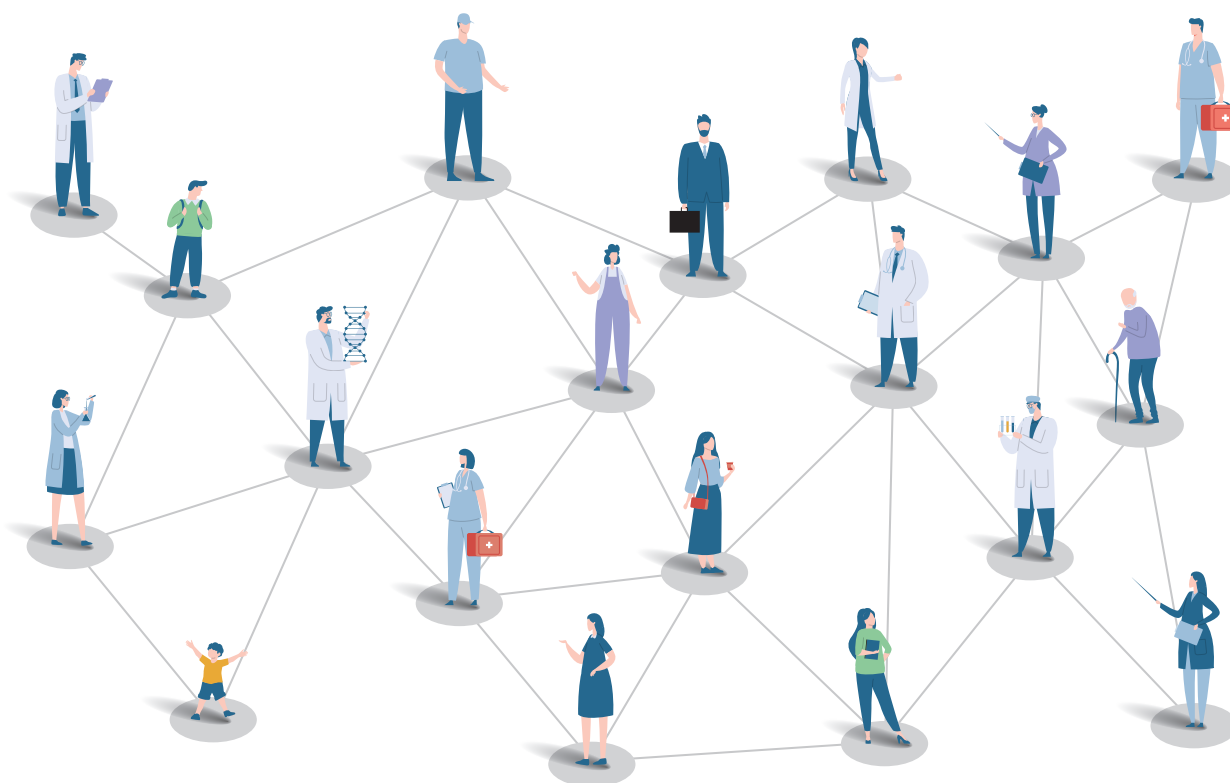
To promote health and better quality of life among patients and the people of Hong Kong by facilitating the advancement of knowledge and technology in genomic medicine through vigorous research as well as the translation of research breakthroughs into clinical practice.

Executive Summary

The HKGI Strategic Plan 2025-30 is an overarching document for guiding all aspects of the Institute's development and planning in the coming five years. It provides the basis on which HKGI executives develop the annual plan programme initiatives through a longer-term planning approach. This plan is formulated after a comprehensive evaluation of HKGI's work progress and achievements in the first three years of its operations, as well as an in-depth analysis of the environmental changes and challenges that lie ahead. By establishing clear objectives and actionable strategies, the plan empowers HKGI to navigate the evolving landscape of genomic medicine, drive clinical applications, strengthen partnerships, and enhance research capabilities. Through this strategic approach, HKGI aims to accelerate the advancement of genomic medicine in Hong Kong for the well-being of the community and contribute significantly to its overall development into an International Health and Medical Innovation Hub.

1 | Planning Process

Building on HKGI's achievements and milestones accomplished by implementing its first Strategic Plan 2022-25, the planning process of the 2025-30 Strategic Plan was led by the HKGI Board of Directors and its six functional committees. The Plan has been developed through a process of realistic analysis of HKGI's internal and external environment and consultation with key stakeholders. From the process, four main strategic foci on the development of genomic medicine in Hong Kong have been consolidated along with a number of strategies, which map out the corporate priorities for HKGI to work towards addressing the key issues and challenges it faces in the next five years.



2 | Strategic Foci



Integrate Genomic Medicine into Clinical Care

HKGI aims to drive the integration of genomic medicine into mainstream clinical service in Hong Kong by expediting the adoption of genomic research evidence into clinical practice. This is done by building a pool of genomic champions/genomic advocates who can effectively translate genomic findings into actionable clinical protocols, collaborating closely with key stakeholders including HA to facilitate the seamless integration of evidence-based genomic insights into everyday medical care, and amplifying the clinical utility of HKGI's knowledgebase to enhance patient care. In collaboration with HA, HKGI will contribute to formulating a directory for inherited and rare diseases by leveraging its genomic data, thereby facilitating early diagnosis and treatment by clinical teams for those suffering from rare genetic conditions, while supporting relevant research and clinical trials to promote genomic medicine. On the disease prediction and prevention front, HKGI will develop local polygenic risk scores (PRS) models for common diseases and apply them to patients to improve personalised prediction and prevention of disease risks. Furthermore, HKGI will enhance the interoperability of its genomic and clinical data systems for better clinical decision-making. Overall, this strategic focus is designed to transform Hong Kong's healthcare landscape, making it more responsive and effective in addressing the needs of patients.



Advance Research in Genomic Science

In its quest to position Hong Kong as a leader in health and medical innovation, HKGI is focused on advancing research in genomic science through strategic collaborations with research institutions and industry leaders in the Guangdong-Hong Kong-Macao Greater Bay Area (GBA) and beyond. By harnessing its genomic and clinical databases, HKGI plans to improve the design, conduct, and outcomes of clinical trials, which will contribute significantly to the International Health and Medical Innovation Hub development. Strengthening collaborative genomic research across GBA and beyond will solidify Hong Kong's status as a pivotal player in the global research landscape. Additionally, HKGI is committed to promoting scientific discoveries through effective data sharing and innovative intellectual property (IP) policy. By increasing support for collaborative data efforts and establishing a creative IP framework, HKGI seeks to spur innovation and accelerate the translation of scientific discoveries into practical applications that benefit society.



Nurture Talents in Genomic Medicine

To cultivate a vibrant ecosystem in genomic medicine, HKGI places significant emphasis on establishing a dynamic genomic talent pool through continuous learning and education. By fostering a culture of lifelong learning, HKGI seeks to ensure that local genomics professionals are equipped to leverage on emerging technologies and methodologies in genomic research and clinical practice. Through deepening its partnership with educational institutions, HKGI also aims to encourage more students to pursue degrees in relevant fields, thereby expanding the genomic talent pool. To develop an ecosystem conducive to attracting and retaining genomics professionals, HKGI will establish clear career progression pathways with flexible mobility for its workforce and provide them with easy access to cutting-edge technology and infrastructure support. This strategic focus is developed to ensure that Hong Kong is well-equipped with skilled professionals ready to drive the future of genomic research and applications.



Enhance Public Genomic Literacy and Industry Partnership

HKGI recognises that enhancing public genomic literacy and fostering industry partnerships are crucial for the successful advancement of genomic medicine. To deepen public understanding and appreciation of genomic medicine, HKGI will enhance its outreach efforts aimed at informing the general public and targeted stakeholders about the benefits and implications of genomic technologies. This includes creating relatable educational content and expanding the channels through which information is disseminated. Concurrently, HKGI seeks to drive genomics-related innovations through strategic collaborations with scientific institutions and industries to promote the development and market readiness of genomic-related technologies and products. By strengthening collaborative networks with academics and industry partners, HKGI aims to advance the development of innovative genomic solutions while ensuring that they are effectively integrated into clinical practice. Together, these initiatives will create a knowledgeable public and a robust industry network that supports the ongoing evolution of genomic medicine in Hong Kong.

3 | Strategic Goals

Expediting Adoption of Genomic Research Evidence into Clinical Practice

- Build a pool of genomic champions/genomic advocates by actively sourcing in relevant genomic specialties; fostering a community of practice to provide platforms for genomic champions/genomic advocates to navigate their journeys of growth and achievement; and implementing recognition schemes as well as sharing success stories to attract aspiring genomic champions/genomic advocates.
- Form clinical alliance with key stakeholders, including HA, to put evidence-based genomic medicine into practice by participating in professional expert committees to establish best practices based on genomic research evidence; offering WGS as part of routine clinical care to deliver timely diagnosis for cases with clinical needs; and developing personalised pharmacogenomic profiles to effectively tailor individual treatment plans; and Amplify clinical utility of HKGI's knowledgebase by enhancing its capacity and capability to better serve the local population and contribute to formulating a directory for inherited and rare diseases in collaboration with HA; providing support in genome curation and WGS diagnostics to local clinical laboratories; and consolidating population-specific pharmacogenomic findings to inform and optimise drug usage.

Enhancing Personalised Prediction and Prevention of Disease Risk

- Develop and improve PRS for common diseases in the local population by evaluating the performance of PRS from international studies using HKGP data; developing local PRS models for common diseases in Hong Kong; and applying the PRS models to local patients in collaboration with key stakeholders.

Improving Interoperability of Genomic and Clinical Data Systems for Better Clinical Decision-making

- Adopt widely accepted standards to standardise genomic and clinical data formats and exchange protocols by engaging with global expert committees on setting standards and best practices in clinical genomics; implementing standardised data formats and data exchange protocols in partnership with key stakeholders; and deploying robust technological solutions to enable genomic and clinical data integration and promote seamless data sharing across systems.

Contributing to the Overall Development of International Health and Medical Innovation Hub

- Harness HKGI's genomic and clinical databases to improve the design, conduct, and outcomes of clinical trials by expanding diversity of the HKGI biobank to enhance the robustness and effectiveness of clinical trials; applying innovative genomic technologies to establish genomic and multi-omics profiles of the local population for clinical trials; and collaborating with regulatory agencies to promote appropriate use of genomic data in clinical trials according to national and international standards.
- Strengthen collaborative genomic research in GBA and beyond to position Hong Kong as a leader in health and medical innovation by establishing research partnership with emphasis on functional and therapeutic genomics to foster local and international collaborations; and collaborating with key research institutions and industry partners to innovate and co-develop health and medical products.

Instituting Effective Data Sharing and Innovative IP Policy to boost Scientific Discoveries

- Increase support for collaborative data sharing and synthesis efforts by strengthening capabilities and capacity of HKGI's Synergistic Research Environment (SRE) as a collaborative platform for scientific research; deploying advanced technologies and innovative methods to improve data sharing and synthesis; and fostering interdisciplinary collaboration for data-driven scientific discoveries.
- Establish a creative IP framework to help spur innovation, creativity, and entrepreneurship by developing HKGI's IP policy, incorporating incentive and novelty elements, in consultation with key experts and stakeholders.

Establishing a Dynamic Genomic Talent Pool through Continuous Learning and Education

- Deepen partnership with educational institutions by strategically allocating resources for scholarships and grants to support students with interests in genomics; and engaging genomic experts to provide students with mentorship, internship, and hands-on research opportunities.
- Foster a culture of lifelong learning among genomics professionals by strengthening global and local collaborations to provide a diverse range of continuous learning resources.

Developing an Ecosystem Conducive to Attracting and Retaining Genomics Professionals

- Establish clear career ladders for genomics professionals by designing an integrated career progression pathway with flexible mobility.
- Provide easy access to cutting-edge technology and infrastructure support by collaborating with leading institutions and industry partners to offer genomics professionals access to advanced technologies and knowledge sharing.

Deepening Public Understanding and Appreciation of Genomic Medicine

- Enhance publicity outreach to the general public and targeted stakeholders by creating relatable contents for different stakeholders to improve understanding of genomic medicine; and broaden and update publicity channels to strengthen public awareness.

Driving Genomics-related Innovations through Strategic Collaborations with Scientific Institutions and Industries

- Strengthen collaborative networks to promote the development and market readiness of genomics-related technologies and products by developing best practices and operational models to advance collaborative partnership.

4 | Functional and Economic Benefits of Implementing the Strategic Plan

The advancement of genomic medicine in Hong Kong holds significant promise for transforming healthcare delivery and enhancing medical innovation. By implementing the above-mentioned strategies, HKGI strives to yield the following functional and economic benefits.



Functional Benefits

Patients

■ Developing and improving PRS for common diseases will allow for more accurate predictions of disease risk, enabling preventive measures tailored to individual patients. This personalised approach can lead to earlier diagnoses, smarter interventions and more timely predictions, reducing the incidence of severe health conditions and improving the overall health of the population.



Healthcare System

■ Building a pool of genomic champions/genomic advocates will facilitate the translation of genomic research into practical applications in healthcare settings, thereby improving patient outcomes through personalised treatment plans and better disease management. Collaborations with HA and other stakeholders will ensure that evidence-based genomic practices are effectively implemented across clinical settings, enhancing the overall quality of care. Amplifying the clinical utility of HKGI's knowledgebase will provide healthcare providers with accessible, up-to-date information and tools necessary for informed decision-making. Setting up a comprehensive directory of inherited and rare diseases will enable clinicians to make precise diagnoses, facilitating personalised treatment and preventive options.

■ By adopting widely accepted standards for genomic and clinical data formats, HKGI aims to enhance data sharing and accessibility between healthcare providers. Improved interoperability will facilitate better clinical decision-making, allowing for coordinated care that leverages comprehensive genomic data, ultimately leading to more effective treatment options.

Economic Benefits

Research and Industry

- By harnessing HKGI's genomic and clinical databases, the design and conduct of clinical trials will be improved, leading to more efficient and effective research outcomes. Strengthening collaborative genomic research within GBA and beyond positions Hong Kong as a leader in health and medical innovation, attracting investments and fostering economic growth in the biomedical science sector.
- Enhancing support for collaborative data sharing can drive scientific discoveries, leading to innovations that have the potential for commercialisation. Establishing a creative and well-defined IP framework will provide researchers with the assurance that their innovations are protected, encouraging further investment in genomic research and development (R&D).

Workforce and Public Level

- By deepening partnership with educational institutions, fostering a culture of lifelong learning, establishing clear career ladders for genomics professionals, and providing them with easy access to cutting-edge technology and infrastructure, HKGI will cultivate a highly skilled workforce equipped to meet the demands of the evolving genomic medicine landscape. Investment in talent and education will yield long-term economic benefits by creating a competitive workforce that can support the growth of the genomics industry and enhance productivity.

- Deepening public understanding of genomic medicine through enhanced outreach will increase community engagement and acceptance of genomic technologies, leading to wider utilisation of these advancements. Collaborating with scientific institutions and industries to expedite the market readiness of genomic technologies will help spur economic activity through the development of new products and services, contributing to the overall economic health of the region.

In conclusion, the strategies formulated by HKGI to promote the advancement of genomic medicine in Hong Kong are poised to deliver significant functional and economic benefits. By emphasising the integration of genomic research into clinical practice, advancing research collaboration, nurturing talent, and enhancing public understanding and industry partnership, HKGI will not only improve healthcare outcomes but also bolster the regional economy. This holistic approach will establish Hong Kong as a pioneering hub in genomic medicine, ultimately benefiting both the healthcare sector and the broader community.



5 | Implementation and Monitoring

Strategies and key actions of the HKGI Strategic Plan 2025-30 will be implemented through the annual planning process. The five Annual Plans covering the period 2025-26 to 2029-30 will be the specific action plans for implementing this Strategic Plan.

Monitoring of the implementation of the Strategic Plan will be led and overseen by the HKGI Board of Directors and its six functional committees, and regularly reported to the Health Bureau of the HKSAR Government. Progress on the implementation will be disclosed in the Annual Report of HKGI for public review.



Foreword by the Chairperson




As we embark on the next chapter of our journey at the Hong Kong Genome Institute, I am both proud and excited to present our Strategic Plan for 2025-30. This plan builds upon the solid foundation laid by the successful implementation of our inaugural strategic plan in the past four years and reflects our unwavering commitment to advancing genomic medicine for the benefit of the people of Hong Kong.

Between 2021 and 2025, we achieved significant milestones that have positioned us as a leader in the field of genomics. Our efforts in establishing a robust genomic database have not only enhanced our understanding of genetic factors affecting health but have also paved the way for personalised medicine in our healthcare system. Collaborating with diverse stakeholders, we successfully integrated genomic knowledge into clinical care, thereby improving patient outcomes and healthcare practices across the region.

We have also focused on nurturing talents within the genomics field. Our partnerships with local educational institutions have empowered a new generation of genomics professionals, including clinicians, geneticists, genome curators, bioinformaticians, genetic counsellors and genomic science researchers, ensuring a sustainable future for genomic research and applications in Hong Kong.

Looking forward, our Strategic Plan for 2025-30 is developed to build on these achievements while addressing the evolving challenges and opportunities in genomic medicine. We will continue to prioritise collaboration, innovation, and research excellence. Our goals include expanding our genomic database, enhancing access to and sharing of genomic data, and fostering a culture of research that encourages groundbreaking scientific discoveries.



“ This Strategic Plan for 2025-30 is developed to build on our achievements while addressing the evolving challenges and opportunities in genomic medicine. We will continue to prioritise collaboration, innovation, and research excellence. ”

As we move ahead, we are also dedicated to contributing to the development of Hong Kong into an International Health and Medical Innovation Hub. Our initiatives align with the national goals of advancing China's life sciences sector and enhancing healthcare quality across the country. By fostering collaboration and innovation, we aim to create a vibrant ecosystem that supports cutting-edge genomic research and drives improvements in healthcare delivery for all.

I would like to take this opportunity to express my heartfelt gratitude to the Health Bureau, our fellow Board and Committee members, HKGI executives, the dedicated staff of our partnering institutions, and patient representatives whose invaluable insights and contributions have shaped the formulation of this Strategic Plan. Your commitment to our mission has been instrumental in guiding our vision for the future.

Together with all stakeholders, I am confident that we will achieve remarkable advancements in genomic medicine that will improve the health of our population, promote ethical standards in research, and contribute to the global genomic community. I invite all of you to engage with us in this exciting journey as we work towards a healthier future for Hong Kong and our country at large.



Philip TSAI Wing-chung, BBS, JP
Chairperson

Introduction by the Chief Executive Officer

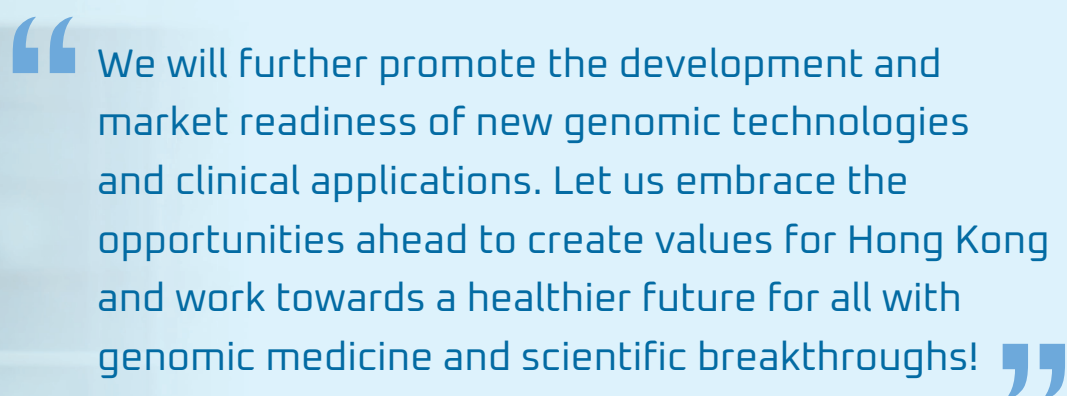


As we commence the next phase of our mission to accelerate the development of genomic medicine in Hong Kong through our Strategic Plan 2025-30, it is essential to reflect on the significant achievements and milestones attained during the previous plan.

Over the past four years, we have successfully integrated genomic medicine into various clinical practices, resulting in improved patient outcomes and personalised treatment plans. Our research initiatives have led to some groundbreaking discoveries and collaborations with leading institutions, establishing Hong Kong as a hub for genomic science. Notably, we implemented HKGP, establishing a comprehensive genomic and clinical database for the local population. This achievement has not only improved our research capabilities but also facilitated personalised medicine initiatives.

Moreover, we have improved public understanding of genomic technologies through educational outreach programmes and have fostered collaboration among healthcare professionals, researchers, and industry partners, thereby elevating the standard of genomic healthcare in our community.

The Strategic Plan for 2025-30 builds upon these successes and outlines our vision for the future. This plan proposes a Strategic Framework centred around four strategic foci. The first strategic focus aims to integrate genomic medicine into clinical care. This involves expediting the adoption of genomic research evidence into clinical practices, enhancing personalised prediction and prevention of disease risk, and improving interoperability of genomic and clinical data systems for better clinical decision-making.



“ We will further promote the development and market readiness of new genomic technologies and clinical applications. Let us embrace the opportunities ahead to create values for Hong Kong and work towards a healthier future for all with genomic medicine and scientific breakthroughs! ”

Our second strategic focus emphasises the importance of advancing cutting-edge genomic research to drive innovation in genomic science. To coincide with the HKSAR Government’s policy direction of developing Hong Kong into an International Health and Medical Innovation Hub and the national goals of enhancing the life sciences sector in GBA and beyond, we aim to contribute significantly to these planned developments. We will also strive to deepen collaborations with research institutions and industry leaders in GBA and beyond to promote scientific discoveries through effective data sharing and innovative IP policy.

Recognising that our success hinges on skilled professionals, our third strategic focus is dedicated to nurturing talents for this burgeoning field.

This entails the establishment of a dynamic genomic talent pool through continuous learning and education, as well as developing an ecosystem conducive to attracting and retaining genomics professionals.

Our fourth strategic focus seeks to enhance genomic literacy among healthcare professionals and the public while fostering partnerships with industry stakeholders. In this regard, we aim to deepen the understanding and appreciation of genomic medicine among the public and stakeholders, while driving genomics-related innovations through strategic collaborations with scientific institutions and industries to promote the development and market readiness of innovative genomic technologies.

In alignment with these strategic foci, we have identified specific directions and strategies for each area:

Integrate Genomic Medicine into Clinical Care

Central to our mission is the rapid adoption of genomic research evidence into clinical practice. To achieve this, we will cultivate a network of genomic champions/genomic advocates and forge alliances with key stakeholders including HA, ensuring that our vast knowledgebase is translated directly into tangible clinical outcomes. By offering WGS as part of routine clinical care, developing personalised pharmacogenomic profiles to tailor individual treatment plans, and amplifying the utility of genomic insights, we strive to enhance patient care and improve health outcomes across the local population.

To improve personalised prediction and disease risk prevention, we will evaluate the performance of PRS from international studies using HKGP data, develop local PRS models for prevalent diseases in Hong Kong, and apply these models to local patients in collaboration with key stakeholders. To improve the interoperability of genomic and clinical data systems for better clinical decision-making, HKGI will adopt widely accepted standards to unify genomic and clinical data formats and exchange protocols.

Efforts will also be made to deploy robust technological solutions to enable data integration and seamless data sharing across systems.

Advance Research in Genomic Science

In parallel with our clinical initiatives, HKGI commits to the advancement of research in genomic science. Our objective is to significantly contribute to the overall development of Hong Kong into an International Health and Medical Innovation Hub. This is done by expanding the diversity of our biobank, applying innovative genomic technologies to establish genomic and multi-omics profiles of the local population, and collaborating with regulatory agencies to promote the adoption of national and international standards. Together, these strategies will empower HKGI's collaborators in both academia and industry to leverage our genomic and clinical databases to improve the design, execution, and outcomes of clinical trials.

To strengthen our collaborative genomic research in GBA and beyond, HKGI will establish partnerships with researchers and industry leaders in the region to foster local and international collaborations on functional and therapeutic genomics, as well as to innovate and co-develop health and medical products. In addition, we will promote scientific discoveries through a





robust data-sharing framework and innovative IP policy, thereby accelerating the pace of research and innovation in the genomic domain.

Nurture Talents in Genomic Medicine

Recognising the importance of human capital, HKGI is dedicated to nurturing a dynamic talent pool within genomic medicine. We will deepen our partnership with educational institutions and foster a culture of lifelong learning for genomics professionals to enhance their education and continuing professional development (CPD). To maintain our status as a sought-after destination for genomic talent, we will establish clear career ladders for genomics professionals and provide them with easy access to cutting-edge technology and infrastructure support with a view to developing an ecosystem conducive to attracting and retaining them.

Enhance Public Genomic Literacy and Foster Industry Partnership

Lastly, enhancing public genomic literacy and fostering industry partnerships are essential components of our strategic goals. We aim to deepen public understanding and appreciation for genomic medicine through intensified outreach efforts targeting various stakeholders. Concurrently, by driving genomics-related innovations through strategic collaborations

with scientific institutions and industries, HKGI will promote the development and market readiness of new genomic technologies and products, positioning ourselves as a catalyst for innovation. Through these efforts, we will elevate genomic services in Hong Kong and contribute to a healthier society through informed choices and evidence-based decisions.

I would like to extend my heartfelt gratitude to the Health Bureau, our dedicated Board and committee members, and all HKGI colleagues for their unwavering support and commitment. Furthermore, our partnerships with HA, DH, universities, and patient groups have been instrumental in our success, and I look forward to continuing our collaborative efforts in the years to come.

Collaboratively, let's embrace the opportunities ahead to create values for Hong Kong and work towards a healthier future for all with genomic medicine and scientific breakthroughs!

Dr LO Su-vui
Chief Executive Officer

Major Achievements and Milestones in 2022-25

In alignment with the recommendations of the Steering Committee on Genomic Medicine presented to the HKSAR Government in December 2019, HKGI was established as a wholly government-owned entity in May 2020 to advance the development of genomic medicine in Hong Kong and to execute HKGP. With the vision to make genomic medicine accessible for all, HKGI collaborates closely with healthcare institutions, universities, and stakeholders to integrate genomics into medical practices, promote research, nurture talents, and enhance genomic literacy.

To guide its strategies for achieving these strategic foci, HKGI developed its first three-year Strategic Plan in 2021, outlining objectives to address challenges, seize opportunities, and progress towards its vision. This plan builds upon the groundwork laid by the Steering Committee, leveraging the momentum from previous policy announcements and establishing HKGP as a cornerstone project in genomic medicine development.

The overarching policy objectives of HKGP include establishing a comprehensive genome database, cultivating a skilled workforce, and setting standards for genetic and genomic testing protocols. By creating a large-scale health-related database, standardising data collection and analysis, and prioritising data security and privacy, HKGP aims to mainstream genomic medicine in Hong Kong's healthcare system and serve as a model for regional data practices.

Over the past three years, HKGI has made significant strides in implementing its strategic goals of the Strategic Plan 2022-25, focusing on improving genomic diagnosis and personalised treatment,

enhancing personalised prediction and prevention of disease risk, and establishing infrastructure for genomic medicine. In 2021, HKGI established Partnering Centres in collaboration with key public hospitals to recruit participants for WGS. As HKGP progresses, HKGI has expanded its referral network to additional hospitals, aiming to include more patients in its initiatives to advance genomic medicine.

In 2023-24, the HKSAR Government commissioned the Public Health Genomics Foundation of the University of Cambridge (PHG) and the School of Public Health of the University of Hong Kong (HKU) to conduct an independent study on Evaluation of HKGP, which concluded that the project has already achieved much in the past three years and put in place a solid foundation for world-leading genomic research and the development of genomic medicine in Hong Kong.

This Chapter encapsulates the key achievements and milestones of HKGI and HKGP during this period, while also incorporating insights from the independent evaluation study conducted by PHG and HKU.

Enhancements in Genomic Medicine

One of the primary achievements of HKGI has been the development of innovative genomic technologies and their application in healthcare. In collaboration with HA and medical schools of local universities, HKGI has successfully improved diagnostic capabilities for various genetic conditions, translating complex genomic data into actionable medical insights. The independent study highlighted that HKGI's initiatives have positively impacted patient care, particularly in personalised medicine, where treatments can be tailored to individual genetic profiles.

Recruitment for Whole Genome Sequencing

A significant milestone in HKGP has been its ambitious goal of recruiting 20,000 cases and collecting 40,000 to 50,000 bio-samples for WGS in the first three years of its full operations. By March 2025, HKGI has not only met this target but exceeded it, gathering a diverse cohort that reflects the genetic diversity of the Hong Kong population. This recruitment effort has been recognised as a crucial step in building a comprehensive genomic database, which is essential for population health research and the development of targeted therapies.

Building Local Genome Database

With the aim to enhance clinical applications of genomic medicine and inspire research with scientists and industry partners like big pharmaceutical

companies locally and worldwide, HKGI is building a genome database of the local population through HKGP. The data collected can be used to study genetic variations, understand disease mechanisms, facilitate precise diagnoses and develop personalised therapies. Such database not only helps address the healthcare needs of Hong Kong, but also improves the under-representation of the Asian/Chinese genomes in the global scientific community. This database will be invaluable to novel gene discoveries, medical innovations such as invention of new diagnostic tests or new treatment therapies, as well as collaborative research with the pharma industry such as new drug trials or pharmacogenomic research. The usefulness of this clinical and genomic database in enabling local and international genomic research collaborations was well recognised by the independent evaluation study conducted by PHG and HKU.



Established State-of-the-Art Infrastructure

HKGI has developed a well-established infrastructure that supports a wide range of genomic research applications. It has made significant investments in cutting-edge laboratory equipment, high-performance computing systems and bioinformatics infrastructure. The HKGI laboratory, which is established according to international standards, is the first laboratory in Hong Kong offering end-to-end WGS services and facilitating multi-omics studies. HKGI is also the first in Greater China region to equip its laboratory with the market-leading sequencer NovaSeq X Plus System. Moreover, with the addition of the Nanopore sequencers, HKGI has deployed long-read sequencing, the cutting-edge technology that was named the “Method of the Year 2022” by the renowned international journal Nature Methods, to further strengthen its sequencing capabilities. The independent evaluation study also acknowledged effectiveness of HKGI’s bioinformatics and genome curation platform set up for analysing and interpreting HKGP WGS data and accepted that its standards are comparable to similar international genome projects.

Talent Development and Capacity Building

HKGI has placed a strong emphasis on nurturing talent in the field of genomics. Through various training programmes, workshops, and collaborations with educational institutions, HKGI has successfully built a robust pipeline of skilled professionals in genomic research and clinical applications, including an exemplary multi-disciplinary team of scientists,

clinicians, bioinformaticians, genetic counsellors, genome curators, laboratory professionals, researchers and seasoned administrative veterans. The independent evaluation conducted by PHG and HKU noted that these initiatives have not only enhanced the expertise within the institute but have also contributed to the broader scientific community in Hong Kong.

Commitment to Best Practices and International Standards

To ensure patient recruitment is carried out according to the highest standards of medical ethics around the globe, HKGI produced a comprehensive Informed Consent Package detailing the consent processes for adult, youth and child participants. HKGP is implemented according to a set of unified and internationally acclaimed protocols on clinical workflow, consent, patient data use and research to instil public confidence, generate stakeholders’ support and build credibility in the outcomes of HKGP. On the data privacy and cybersecurity front, HKGI has put in place stringent policies and guidelines to ensure the best practices in compliance with global standards. HKGI is honoured to be a winner of the Gold Award of Privacy-Friendly Awards 2023 from the Office of the Privacy Commissioner for Personal Data, Hong Kong. The PHG and HKU study validated that HKGP has incorporated best practices and learnings from international genome initiatives, facilitating a more informed approach to genomic research and ensuring alignment with global standards.

Fostering Public Engagement

Public engagement has been a cornerstone of HKGI's strategy. HKGP has actively sought to involve the community through outreach programmes, educational initiatives, and public forums aimed at raising awareness about genomic medicine. The independent study emphasised that these efforts have resulted in greater public understanding and acceptance of genomic technologies, fostering a supportive environment for future research.

Strong Local Stakeholder Support

The PHG and HKU study observed that the HKGP initiative has garnered strong support from local stakeholders, including academic institutions, government bodies and community organisations. This collaboration has fostered an environment conducive to research and innovation.

Robust Governance

The governance structure of HKGP was recognised by the independent evaluation study as robust, ensuring that the project adheres to high standards of management and oversight. This framework promotes accountability and transparency in the project's operations.

In conclusion, the milestones of HKGI have been achieved with desirable outcomes in the past three years. In particular, the implementation of HKGP is in remarkable progress with meaningful results in a relatively short period of time.

Major Achievements



Gathered leading minds to advance genomic medicine and deliver clinical benefits



Established state-of-the-art infrastructure, including the bioinformatics platform and internationally recognised laboratory facilities



Developed a sizable local clinical and genome database



Assembled and nurtured talents in genomic medicine



Committed to best practices and international standards



Fostered public and stakeholder engagement



Implemented robust corporate governance

Planning Context and Process

1 | Policy Direction for Development of Genomic Medicine

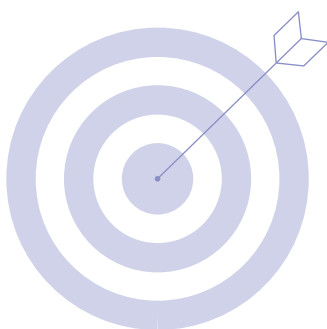
Pursuant to the Chief Executive's 2017 Policy Address to harness the potential of new technology for better public health policies and clinical outcomes, the Steering Committee on Genomic Medicine was established in December 2017 to map out strategies for developing genomic medicine in Hong Kong. The Steering Committee submitted its report to the Government in December 2019, leading to the acceptance of its eight recommendations including launching the HKGP which has been accorded top priority.

On 14 May 2020, the HKSAR Government announced its policy direction for the development of genomic medicine in Hong Kong to harness its huge potential in precise diagnoses, personalised treatment, and

surveillance of diseases. HKGI was established as a wholly government-owned entity to take forward the implementation of HKGP, which is a large-scale genome sequencing project aimed to recruit 20,000 cases and collect 40,000-50,000 bio-samples for WGS in the first three years of its full operations.

With the implementation of its first Strategic Plan from 2022 to 2025, HKGI has been actively promoting the integration of genomic medicine into clinical practice, achieving the milestones as detailed in the last Chapter and enabling patients to receive personalised diagnostics and tailored treatment plans based on their genetic profiles. Stepping into its fourth year of operations, the overarching objectives of HKGI are the following.

HKGI's Key Objectives



- Implement broader genome sequencing in healthcare to improve diagnostics and equity in care for the community
- Establish a unique Southern Chinese genome platform and knowledge database
- Promote greater use of genomic and health data in research, development and innovation
- Provide wider access to genetic and genomic analysis for improved diagnostics and more personalised care, treatment, and prevention via SRE
- Achieve increased participation in clinical studies
- Focus more on primary prevention and early diagnosis of common diseases

The overarching objectives of HKGI, particularly its long-term investment in genomic medicine, resonate with the Government's recent policy directives of developing Hong Kong into an International Health and Medical Innovation Hub. These policy directives and initiatives, as announced in the Chief Executive's Policy Address for 2023 and 2024, include:

Regional Collaboration

- Full support and close collaboration with Shenzhen to take forward the development of the Hetao Shenzhen-Hong Kong Science and Technology Innovation Co-operation Zone, leveraging the comparative advantages of the two places to promote cross-boundary flow of innovation elements such as talent and high-quality research;
- Increased investments in infrastructure development to support health and medical research, including enhancing facilities for clinical trials such as setting up the GBA International Clinical Trial Institute; and
- Aligning with the national goals of developing China's life sciences sector and enhancing healthcare quality across the country.



Infrastructure and Policy Support

- Establishment of a Drug Approval Authority based on a "Primary Evaluation" system to expedite and streamline the approval process for new medicines;
- Introduction of a \$10 billion New Industrialisation Acceleration Scheme to promote downstream development in the biomedical sector, including support for startups and established companies in the health sector; and
- Setting up the Hong Kong Centre for Medical Products Regulation by 2026-27 to facilitate a robust regulatory environment conducive to medical product innovation.

Talent and Research Development

- Attracting and nurturing talents in life sciences and healthcare, including partnerships with local universities and international institutions to foster innovation and research;
- Enhancing collaboration and partnerships between academia, industry, and government agencies to foster innovation and ensure that advances in healthcare are effectively translated into practice; and
- Formulating a directory for inherited and rare diseases by using HKGI's genomic data, thereby facilitating early diagnosis and treatment by clinical teams, while supporting relevant research and clinical trials to promote precision medicine.

HKGI is strategically aligned with the HKSAR Government's policy direction of transforming the city into an International Health and Medical Innovation Hub. Its advanced genomic research capabilities, cutting-edge technologies, and collaborative partnerships with local and international institutions have positioned it as a vital player in implementing these initiatives. HKGI is expected to contribute to this policy in the following ways:

Creation of a Local Genome Database

HKGI is developing a comprehensive genomic database that serves as a resource for researchers and healthcare providers. This large genomic database, combined with the eHealth Records that contain patients' phenotype information, will offer local researchers and scientists a significant advantage in making scientific discoveries and innovations. It is also instrumental in understanding the genetic basis of diseases prevalent in the local population, which can directly influence public health initiatives and personalised medicine strategies.

Data Analysis and Interpretation

The bioinformatics capabilities of HKGI will be strengthened by utilising artificial intelligence (AI) and machine learning (ML) technologies in the next few years, enabling effective and efficient analysis of vast amounts of genomic data for making scientific discoveries, more accurate diagnoses, and improved treatment outcomes. This aligns with the Government's goal of using data-driven approaches to enhance healthcare solutions.

Advancements in Genomic Research

The establishment of a state-of-the-art sequencing laboratory allows for high-throughput sequencing.

This technological advancement supports research into various genetic conditions, facilitating early diagnosis and personalised therapy development.

Enhancement in Personalised Medicine

With genomic insights, healthcare providers in Hong Kong can tailor treatments based on individual genetic profiles. This aligns with the Government's directive to implement personalised healthcare solutions and improve health outcomes.

Supporting Drug Development

HKGI's genomic data can aid pharmaceutical companies in drug discovery and development, particularly in understanding how genetic variations affect drug response. This collaboration fosters innovation within the pharmaceutical sector, aligning with the broader health innovation objectives.

Development of a Clinical Trial Centre

HKGI's clinical genome database of the local population can significantly accelerate the development of the GBA International Clinical Trial Institute by helping researchers: (i) identify the genetic variations that may impact individual responses to drugs, (ii) recruit suitable candidates with specific genetic profiles for clinical trials, (iii) design clinical trials that are more representative and tailored to the genetic diversity of the local population, (iv) streamline the identification of promising compounds for further research and clinical trials, (v) focus resources on the most relevant candidates to expedite trial timelines and reduce costs, (vi) gain insights on the genetic factors influencing disease prevalence, progression, and treatment outcomes to inform public health strategies and interventions, and (vii) ensure the safety and efficacy of drugs tested in clinical trials.



Training and Capacity Building

HKGI plays a pivotal role in training healthcare professionals on the application of genomics in clinical practice, thus building capacity in the local healthcare workforce. This is vital for ensuring that Hong Kong has a skilled workforce capable of supporting emerging genetic and genomic technologies.

Informing Health Policy

The evidence generated from HKGI's SRE can inform government health policies by providing insights into genetic factors affecting disease prevalence and treatment responses. This data reliability strengthens the foundation for public health strategies.

Advancing Technological Innovation

HKGI's initiatives are closely linked to technological innovations in GBA. As part of a broader regional strategy, the integration of genomic medicine within GBA promotes knowledge sharing, resource optimisation and collaborative research efforts. This synergy not only enhances the accessibility of advanced genomic services but also facilitates the exchange of ideas and expertise, propelling the region's growth as a leader in life sciences and healthcare innovation.

Support for National Initiatives

As part of the national agenda on life sciences and healthcare development, HKGI contributes to enhancing the overall capacity of the region to participate effectively in genomic research and innovation, further integrating Hong Kong into national healthcare strategies.

In conclusion, HKGI has an important role to play in advancing the Government's vision of transforming Hong Kong into a leading International Health and Medical Innovation Hub. By focusing on the acceleration of genomic medicine, HKGI not only enhances healthcare through personalised treatment and genomic sequencing, but also aligns with the Government's initiatives for infrastructure investment, regulatory enhancements and collaborative endeavours in life sciences and healthcare development. As HKGI continues to spearhead research and innovation in this field, it is poised to foster a dynamic ecosystem that attracts talents, encourages technological advancements, and ultimately improves patient outcomes, reinforcing Hong Kong's position as a global leader in health and medical innovation.

2 | Project Governance

Guided by the Government's policy directives on the development of genomic medicine and building Hong Kong as an International Health and Medical Innovation Hub, the planning process of this five-year Strategic Plan was led and directed by the HKGI Board of Directors, with members of the Board and its six functional committees involved in the development process. The HKGI Board is the ultimate authority for confirming and approving the strategies and directions of the Strategic Plan. Executive decisions were provided through the formation of a working group chaired by the Chief Executive Officer to oversee the planning process, brainstorm and formulate the strategic foci, strategic goals, strategic directions, and strategies for achieving HKGI's mission and vision in the next five years for deliberation and consideration of Board members. Membership of the Working Group comprises the heads of HKGI's three branches (the Medical and Scientific Branch, Bioinformatics Branch and Administration Branch) as well as division/unit heads of key functions including laboratory, data security, genetic counselling, corporate communications, talent development, and Board secretariat.

In addition to observing the general principles of governance such as accountability, transparency, fairness and responsibility, the governance of the strategic planning process also emphasises the ESG (Environment, Social, and Governance) concept in

risk management, taking into consideration these three central factors to evaluate the sustainability and societal impact of HKGI's long-term investment in genomic medicine. Strategies which will guide HKGI's future action plans in the next five years were formulated after conducting an ESG review to integrate into its Strategic Plan:



Environmental Factors such as waste management and energy conservation



Social Variables such as talent development and community engagement



Governance Considerations such as transparency, reporting, and compliance to ethical standards

Risks related to ESG issues have been identified, stratified, prioritised, monitored, mitigated, and communicated to key stakeholders to promote environmental sustainability, social responsibility, and effective corporate governance within HKGI. By systematically incorporating ESG considerations into the strategic planning process, HKGI aims not only to mitigate risks but also to create sustainable value for its stakeholders.

3 | Formulation Process

Overall, the process for formulating the Strategic Plan involved the following components:



Analysis and Evaluation

- Environmental scanning and situation analysis of HKGI's internal and external context to identify key challenges and issues; and
- Review of the progress in implementing the strategic goals, strategic directions, and strategies under the Strategic Plan 2022-25 to take stock of progress and map out any prevailing issues and gaps.



Strategic Planning

- Formulation of a Strategic Framework for the next five years to revisit the strategic foci, set the strategic goals, map out the strategic directions, and draw up strategies for progressively achieving HKGI's vision and mission, taking into consideration the Government's policy directives and learning from the experiences of large-scale genome projects around the globe; and
- Analysis of the key enablers for successfully accomplishing the proposed strategies to support enhancements, drive change and facilitate development of genomic medicine in Hong Kong, and setting out a mechanism for monitoring implementation of the strategies through the annual planning process.



Communication and Engagement

- Consultation and discussion with key stakeholders to solicit their views and inputs on the key issues facing HKGI and the proposed strategies for addressing them; and
- Initiate publicity and liaison programmes to explain HKGI's objectives, past achievements, and future plans to stakeholders and the general public.

Environment and Key Challenges

1 | Trends in Global Development of Genomic Medicine

In recent years, the field of human genomics and genomic medicine has witnessed rapid advancements, revolutionising the way we understand and approach healthcare. From personalised medicine to breakthroughs in genetic research, the global landscape of genomics is evolving at a staggering pace. The latest trends shaping the world of human genomics and genomic medicine are summarised below:

Precision Medicine

One of the most significant trends in human genomics is the shift towards precision medicine. By harnessing the power of genomic data, researchers and healthcare providers can tailor treatment plans to individual patients based on their genetic makeup, lifestyle factors, and environmental influences. This personalised approach has the potential to develop targeted therapies for various diseases, including cancer, cardiovascular conditions, chronic diseases, and rare genetic disorders, leading to improved treatment outcomes and reduced adverse reactions to medications.

Genomic Data Sharing

Collaboration and data sharing among researchers and healthcare providers is crucial for advancing genomics and genomic medicine. Large-scale genome projects like the All of Us Research Program in the United States and UK Biobank in the United Kingdom are collecting genetic and health data from diverse populations to better understand the genetic basis of diseases, inform medical care decisions, and accelerate discoveries in genomics.

Technological Advancements

The rapid evolution of gene editing technologies has opened new possibilities in genomic medicine. Such revolutionary tools allow scientists to precisely edit genes, offering potential cures for genetic disorders such as sickle cell anaemia, cystic fibrosis, and muscular dystrophy which were once considered incurable. The use of such technologies in research and clinical trials holds promise for treating a wide range of genetic conditions and for the development of cancer therapy and regenerative medicine. In addition, the integration of AI and ML technologies in human genomics and genomic medicine also presents exciting prospects for accelerating research, enhancing clinical practice, and delivering personalised healthcare solutions that leverage the power of genomic data to improve patient outcomes.

Pharmacogenomics

Pharmacogenomics is an emerging trend in human genomics that focuses on how an individual's genetic makeup influences their response to medications. By analysing genetic variations, healthcare providers can prescribe drugs more effectively, minimising side effects, and optimising treatment outcomes. This personalised approach to prescribing medication is gaining traction globally.

Ethical and Legal Issues

As genomics technology advances, there are important ethical and legal considerations that must be addressed. Privacy concerns, consent for genetic testing, data security, and discrimination based on genetic information are some of the key issues facing the field of genomics. Regulatory bodies and policymakers across the globe are working to establish guidelines and regulations to safeguard patient rights and ensure the responsible use of genomic data.

Global Collaborations

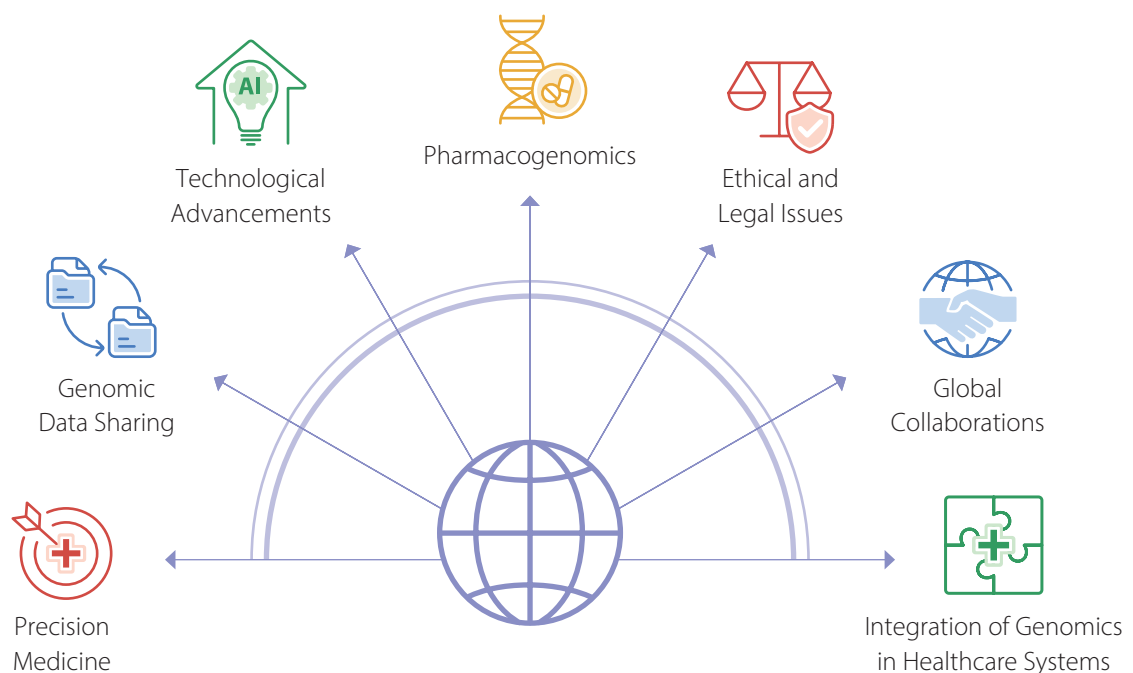
Genomic research is a global endeavour, with countries around the world collaborating to advance scientific knowledge and improve healthcare outcomes. International partnerships and initiatives such as the Global Alliance for Genomics and Health and the International Cancer Genome Consortium bring together scientists, clinicians, and policymakers from different countries to accelerate progress in genomics and genomic medicine, leading to breakthroughs that benefit populations worldwide.

Integration of Genomics in Healthcare Systems

The integration of genomics into healthcare systems is gaining momentum, with countries investing in infrastructure and training to incorporate genomic

data into clinical practice. By leveraging genomics, healthcare providers can offer more precise diagnoses and treatments, leading to better patient outcomes.

In summary, the latest development trends in human genomics and genomic medicine reflect a growing emphasis on personalised and precision healthcare. From cutting-edge technologies like gene-editing technologies to the integration of genomic data into clinical practice, these advancements hold great promise for improving patient outcomes and healthcare systems on a global scale. Looking ahead to 2025 and beyond, we can envision a healthcare landscape where genomic medicine plays a central role in revolutionising disease diagnosis, treatment, prediction and prevention strategies, offering a more personalised and effective approach to healthcare delivery.



2 | The Landscape of Genomic Medicine in Hong Kong

In the landscape of genomic medicine in Hong Kong, the establishment of HKGI has marked a significant shift towards advancing the application of genomics in healthcare. Prior to the inception of HKGI, genetic and genomic services were primarily delivered by the Clinical Genetic Service (CGS) of DH and public hospitals overseen by HA. Since its full operation in 2021, HKGI has emerged as a forefront institution in genomic research and clinical applications in Hong Kong. By developing cutting-edge infrastructure and pioneering initiatives like HKGP, HKGI has accelerated the decoding of genetic information for diagnostic and therapeutic purposes, positively impacting patient care. Collaborating with HA, HKU, the Chinese University of Hong Kong, and other stakeholders, HKGI has spearheaded the incorporation of genomic medicine into clinical practice, offering personalised diagnostics and treatment strategies based on genetic profiles. With HA taking up the CGS from DH in July 2023 to dovetail with the latest developments of genomic medicine in Hong Kong, HKGI has further deepened its ties with HA to strengthen support for patients and their families.

With the setting up of its unique clinical and genome database of Southern Chinese population, HKGI is poised to play a pivotal role in the Government's initiatives to develop Hong Kong into an International Health and Medical Innovation Hub and contribute

to the development of the GBA International Clinical Trial Institute as well as Hetao Shenzhen–Hong Kong Science and Technology Innovation Co-operation Zone in the coming five years. This genome database allows for the identification of genetic variations that may impact individual responses to drugs, enabling the formulation of personalised treatment plans for more effective and targeted therapies. It will also improve the efficiency of clinical trials by helping researchers match specific genetic profiles with the requirements of a trial. By understanding the genetic predispositions within the local population, researchers can design clinical trials that are more representative and tailored to the genetic diversity present, leading to more reliable results. In addition, access to a diverse clinical genome database can expedite the drug development process by providing valuable insights into disease mechanisms, biomarkers, and potential drug targets. This can reduce the overall costs associated with drug development by focusing resources on the most relevant candidates and expediting trial timelines. Through strategic partnerships and data-driven insights from its genome database, HKGI will actively engage with pharmaceutical companies, partners in the biotech industry, academic institutions, and other public and private organisations in collaborative research projects and clinical trials, thereby transforming the future landscape of genomic medicine in Hong Kong.



3 | Key Issues and Challenges

While Hong Kong has made significant strides in the field of genomic medicine, several key issues and challenges persist, hindering the full realisation of its potential in healthcare. From rationalising clinical services provision to nurturing talents and enhancing genomic literacy, addressing these challenges is crucial for advancing precision medicine and personalised healthcare in the region.



Clinical Sector

Rationalising Clinical Services Provision

■ One of the primary challenges facing Hong Kong in genomic medicine is the need to rationalise clinical services provision. The integration of genetic testing and personalised treatment approaches into routine clinical practice requires a coordinated effort among healthcare providers, researchers, and policymakers. Ensuring equitable access to genomic services across healthcare settings and specialties is essential for maximising the benefits of precision medicine for all patients.

Setting Standards for Genetic and Genomic Tests

■ Quality and accessibility of genetic and genomic tests are critical factors that influence the success of genomic medicine initiatives. Hong Kong needs to establish robust standards for the development, validation, and utilisation of genetic tests to ensure their accuracy, reliability, and clinical utility. Additionally, efforts to enhance the accessibility of genetic testing services, particularly for underprivileged populations, are essential for promoting equity in healthcare and addressing genetic disparities.



Public and Stakeholders

Enhancing Genomic Literacy Among Stakeholders and Industry Partners

■ Promoting genomic literacy among targeted stakeholders, industry partners, and the public is vital for fostering informed decision-making, collaborations, and ethical practices in genomic medicine. Hong Kong must implement comprehensive educational campaigns to raise awareness about the benefits, risks, and implications of genetic testing and personalised treatments. Empowering individuals with the knowledge and skills to engage meaningfully with genomic information can facilitate patient-centred care, enhance communication between healthcare providers and patients, expand business collaborations, and ensure ethical and responsible use of genetic and genomic data.



Research and Talent

Translating Research Findings into Clinical Use

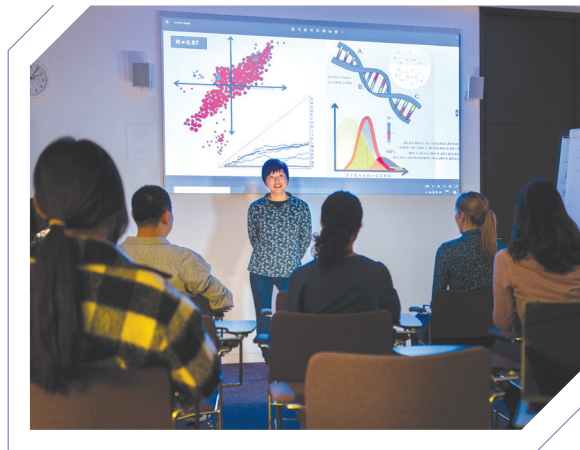
■ An effective mechanism for translating research findings into clinical use is imperative for bridging the gap between genomic research and practical applications in healthcare. Hong Kong must establish streamlined pathways for validating and implementing genomic discoveries in clinical settings. Overcoming barriers such as regulatory hurdles, data sharing limitations, system integration/interoperability restrictions, and resource (like human resource and IT infrastructure) constraints is crucial for accelerating the translation of genomic research into tangible benefits for patients.

Nurturing Talents and Strengthening Workforce

■ The shortage of skilled professionals in genomics poses a significant challenge to the advancement of genomic medicine in Hong Kong. Nurturing talents through specialised training programmes, academic partnerships, and professional development opportunities is key to building a competent workforce capable of leveraging genomic technologies effectively. Investing in education and training initiatives for healthcare professionals, genome curators, genetic counsellors, and bioinformatics specialists is essential for expanding the capacity and expertise in genomic healthcare delivery.

In conclusion, addressing the key issues and challenges facing Hong Kong in the development of genomic medicine is essential for unlocking the full potential of precision healthcare in the region. By rationalising clinical services provision, translating research findings into clinical use, setting standards for genetic and genomic tests, nurturing talents, and enhancing

genomic literacy as well as industry partnership, Hong Kong can overcome barriers to genomic medicine implementation and pave the way for a future where personalised healthcare is accessible, effective, and equitable for all. Collaboration among stakeholders, commitment to excellence, and a patient-centred approach are paramount in navigating the complexities of genomic medicine and harnessing its transformative power for the benefit of the population of Hong Kong.



Strategic Framework

HKGI has reviewed its major achievements and milestones from its first Strategic Plan 2022-25.

After evaluating the current planning context and analysing the environment as well as key challenges ahead, HKGI has decided to continue pursuing its mission and vision over the next five years through the four strategic foci crystallised in its early days of operations. A strategic component was added to the fourth strategic focus on public and stakeholder engagement to highlight the importance of fostering partnership with scientific institutions and industries to promote the development and market readiness of innovative genomic technologies. To adapt to the changing environment, HKGI has updated the strategic goals, directions, and strategies under each of the four strategic foci, which now include:

- (i) Integrate Genomic Medicine into Clinical Care
- (ii) Advance Research in Genomic Science
- (iii) Nurture Talents in Genomic Medicine
- (iv) Enhance Public Genomic Literacy and Foster Industry Partnership

Integrate Genomic Medicine into Clinical Care

Under the strategic focus of driving the incorporation of genomic medicine into the mainstream of medical development in Hong Kong, HKGI will seek to achieve the strategic goals of expediting the adoption of genomic research evidence into clinical practice, enhancing personalised prediction and prevention of disease risk, and improving interoperability of genomic and clinical data systems for better clinical decision-making.

To put research evidence into clinical care, HKGI has planned to build a pool of genomic champions/genomic advocates, form clinical alliance with key stakeholders, including the HA, to put evidence-based genomic medicine into practice, and amplify the clinical utility of its knowledgebase. Leveraging on its unique genome database as well as experiences and global networks, HKGI will contribute to formulating a directory for inherited and rare diseases in collaboration with HA to facilitate early diagnosis and treatment by clinicians for those suffering from rare genetic conditions. To enhance personalised prediction and prevention of disease risk, HKGI will develop local models of PRS for common diseases to achieve this strategic goal.



HKGI will also implement strategies to standardise its genomic and clinical data formats and exchange protocols in accordance with widely accepted international standards to ensure data interoperability with that of other local and international stakeholders to help clinicians improve their clinical decision-making based on individual patients' genomic profiles.

Advance Research in Genomic Science

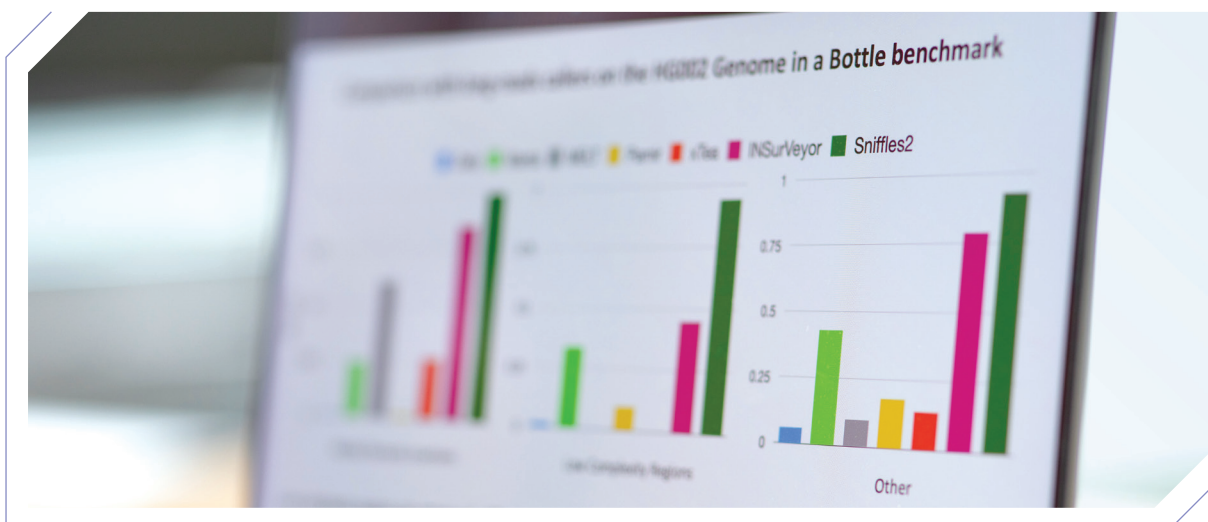
To advance research in genomic science, HKGI will seek to contribute to the overall development of the International Health and Medical Innovation Hub in the next five years. It will also strive to institute effective data sharing and innovative IP policy to boost scientific discoveries.

HKGI is poised to achieve these two strategic goals by adopting a multifaceted approach. To contribute to the development of the International Health and Medical Innovation Hub, HKGI will leverage its extensive genomic and clinical databases to enhance the design, execution, and outcomes of clinical trials. In addition, it will work with its partners to strengthen collaborative genomic research across GBA, positioning Hong Kong as a leading nexus for health and medical innovation. Simultaneously, to promote scientific discoveries through effective data sharing and innovative IP policy,

HKGI will increase support for collaborative data-sharing efforts, facilitating the synthesis of knowledge across various research domains. Furthermore, establishing a creative IP framework will serve as a catalyst for scientific innovation, ensuring that discoveries are not only protected but also effectively translated into applications that can benefit society. Through these strategic directions, HKGI will not only bolster its research capabilities but also foster a vibrant ecosystem that bridges collaboration, innovation, and impactful health solutions.

Nurture Talents in Genomic Medicine

HKGI is committed to nurturing talents in genomic science through a comprehensive approach that addresses both continuous learning and career development. To establish a dynamic genomic talent pool, HKGI will deepen its partnership with educational institutions and foster a culture of lifelong learning among genomics professionals to enhance their educational and CPD opportunities, ensuring that genomics professionals remain at the forefront of their field. Additionally, collaborations with local and international institutions to provide a diverse range of CPD resources will reinforce continuing education and knowledge exchange among genomics professionals, fostering a well-prepared workforce.





Concurrently, to cultivate an ecosystem conducive to attracting and retaining genomics professionals, HKGI will design a clear career progression pathway tailored for its genomic workforce, providing them with actionable steps for advancement. By aligning these strategic directions, HKGI will enhance the capabilities of its workforce while fostering a thriving community of genomics professionals.

Enhance Public Genomic Literacy and Foster Industry Partnership

HKGI aims to enhance public genomic literacy and foster industry partnership through targeted strategic initiatives that emphasise education and collaboration. To deepen public understanding and appreciation of genomic medicine, HKGI will enhance its publicity outreach efforts to engage the general public and specific stakeholder groups, utilising various platforms to disseminate information and raise awareness about the benefits and implications of genomic healthcare. This proactive communication strategy will demystify genomic concepts and encourage dialogue within the community.


Simultaneously, to drive genomics-related innovations through strategic collaborations with scientific institutions and industries, HKGI will focus on strengthening collaborative networks with academics, researchers, and industry partners. These partnerships will be pivotal in advancing the development and market readiness of innovative genomic technologies, ensuring that new advancements are effectively translated into practical applications. By aligning these strategic approaches, HKGI will cultivate an informed public while at the same time accelerating the integration of genomic innovations into healthcare solutions.





Integrate Genomic Medicine into Clinical Care

Strategic Goals	Strategic Directions & Strategies
<p>Expedite adoption of genomic research evidence into clinical practice</p>	<p>Build a pool of genomic champions/genomic advocates</p> <ul style="list-style-type: none"> ■ Actively source genomic champions/genomic advocates in relevant specialties ■ Foster a community of practice, providing platforms for genomic champions/genomic advocates to navigate their journeys of growth and achievement ■ Implement recognition schemes and share success stories to attract aspiring genomic champions/genomic advocates
	<p>Form clinical alliance with key stakeholders, including HA, to put evidence-based genomic medicine into practice</p> <ul style="list-style-type: none"> ■ Participate in professional expert committees to establish best practices based on genomic research evidence ■ Offer WGS as part of routine clinical care to deliver timely diagnosis for cases with clinical needs ■ Develop personalised pharmacogenomic profiles to effectively tailor individual treatment plans
	<p>Amplify the clinical utility of HKGI's knowledgebase</p> <ul style="list-style-type: none"> ■ Expand HKGI's clinical genomic knowledgebase to better serve the local population ■ Contribute to formulating a directory for inherited and rare diseases by using HKGI's genomic data, in collaboration with HA ■ Provide support in genome curation and WGS diagnostics to clinical laboratories in Hong Kong ■ Consolidate population-specific pharmacogenomic findings to inform and optimise drug usage

Strategic Goals	Strategic Directions & Strategies
<p>Enhance personalised prediction and prevention of disease risk</p>	<p>Develop and improve PRS for common diseases in local population</p> <ul style="list-style-type: none"> ■ Evaluate performance of PRS from international studies using HKGP data and develop local PRS models for common diseases in Hong Kong ■ Apply the PRS models to local patients in collaboration with key stakeholders
<p>Improve interoperability of genomic and clinical data systems for better clinical decision-making</p>	<p>Adopt widely accepted standards to standardise genomic and clinical data formats and exchange protocols</p> <ul style="list-style-type: none"> ■ Engage with global expert committees' work on setting standards and best practices in clinical genomics ■ Implement standardised data formats and data exchange protocols in partnership with key stakeholders ■ Deploy robust technological solutions to enable genomic and clinical data integration and promote seamless data sharing across systems
 <p>Vision</p>	<p>Genomic medicine becomes available to all for better health and well-being</p>




Advance Research in Genomic Science

Strategic Goals	Strategic Directions & Strategies
Contribute to the overall development of International Health and Medical Innovation Hub	Harness HKGI's genomic and clinical databases to improve the design, conduct, and outcomes of clinical trials <ul style="list-style-type: none"> Expand the diversity of HKGI's biobank to enhance the robustness and effectiveness of clinical trials Apply innovative genomic technologies to establish genomic and multi-omics profiles of the local population for clinical trials Collaborate with regulatory agencies to promote appropriate use of genomic data in clinical trials according to national and international standards
	Strengthen collaborative genomic research in GBA and beyond, positioning Hong Kong as a leader in health and medical innovation <ul style="list-style-type: none"> Establish research partnership with emphasis on functional and therapeutic genomics, fostering local and international collaborations Collaborate with key research institutions and industry partners to innovate and co-develop health and medical products
Institute effective data sharing and innovative IP policy to boost scientific discoveries	Increase support for collaborative data sharing and synthesis efforts <ul style="list-style-type: none"> Strengthen capabilities and capacity of HKGI's SRE as a collaborative platform for scientific research Deploy advanced technologies and innovative methods to improve data sharing and synthesis Foster interdisciplinary collaboration for data-driven scientific discoveries
	Establish a creative IP framework to help spur innovation, creativity, and entrepreneurship <ul style="list-style-type: none"> Develop HKGI's IP policy, incorporating incentive and novelty elements in consultation with key experts and stakeholders
 Vision	Hong Kong becomes a leading hub of biomedical science



Nurture Talents in Genomic Medicine

Strategic Goals	Strategic Directions & Strategies
Establish a dynamic genomic talent pool through continuous learning and education	Deepen partnership with educational institutions <ul style="list-style-type: none"> Strategically allocate resources for scholarships and grants to support students with interests in genomics Engage genomic experts to provide students with mentorship, internship, and hands-on research opportunities
	Foster a culture of lifelong learning among genomics professionals <ul style="list-style-type: none"> Strengthen global and local collaborations to provide a diverse range of continuous learning resources
Develop an ecosystem conducive to attracting and retaining genomics professionals	Establish clear career ladders for genomics professionals <ul style="list-style-type: none"> Design an integrated career progression pathway with flexible mobility
	Provide easy access to cutting-edge technology and infrastructure support <ul style="list-style-type: none"> Collaborate with leading institutions and industry partners to offer genomics professionals access to advanced technologies and knowledge sharing
 Vision	Skilled workforce to develop and deliver genomic medicine



Enhance Public Genomic Literacy and Foster Industry Partnership

Strategic Goals	Strategic Directions & Strategies
Deepen public understanding and appreciation of genomic medicine	Enhance publicity outreach to the general public and targeted stakeholders <ul style="list-style-type: none">■ Create relatable content for different stakeholders to improve understanding of genomic medicine■ Broaden and update publicity channels to strengthen public awareness
Drive genomics-related innovations through strategic collaborations with scientific institutions and industries	Strengthen collaborative networks to promote the development and market readiness of genomics-related technologies and products <ul style="list-style-type: none">■ Develop best practices and operational models to advance collaborative partnership
 Vision	Enhanced public genomic literacy and industry partnership

Integrate Genomic Medicine into Clinical Care



Strategic Goals and Strategic Directions

To pursue the strategic focus of integrating genomic medicine into clinical care with a view to realising its vision of making genomic medicine available to all for better health and well-being, HKGI has set three strategic goals for the next five years:

- (i) Expedite the adoption of genomic research evidence into clinical practice
- (ii) Enhance personalised prediction and prevention of disease risk
- (iii) Improve interoperability of genomic and clinical data systems for better clinical decision-making

There are three strategic directions for expediting the adoption of genomic research evidence into clinical practice. In terms of personnel, HKGI will focus on building a pool of genomic champions/genomic advocates who can advocate for and implement these advancements within healthcare settings. In terms of organisational strategy, forming clinical alliances with HA, the largest healthcare provider in Hong Kong, and other key stakeholders will ensure that recently developed evidence-based practices are effectively integrated into clinical workflows. In terms of system integration, HKGI will amplify the clinical utility of its knowledgebase to provide healthcare professionals with vital resources and insights, enabling informed decision-making. HKGI will also contribute to formulating a directory for inherited and rare diseases by using its genomic data, facilitating early diagnosis and treatment while supporting relevant research and clinical trials to promote precision medicine.

To enhance personalised prediction and prevention of disease risk, HKGI will prioritise the development and refinement of PRS tailored to the local population, facilitating targeted prevention strategies. Complementary to these, HKGI will strive to achieve the strategic goal of improving the interoperability of genomic and clinical data systems for better clinical decision-making by adopting widely accepted standards to standardise genomic and clinical data formats and exchange protocols, enabling seamless integration and sharing of critical health information across platforms. Collectively, these strategic directions will foster a more effective and responsive healthcare system, ultimately benefitting both patients and healthcare providers.

Through the strategies formulated under these strategic directions, HKGI will look to address the following key issues and challenges in the development of genomic medicine in Hong Kong:

- The shortage of trained professionals in genomic medicine is addressed by cultivating genomic champions/genomic advocates in relevant specialties, and creating supportive networks;
- The challenge of integrating genomic medicine into existing clinical workflows is mitigated through stakeholder collaboration and standardised data practices; and
- The focus on personalised healthcare ensures that genomic advancements translate directly into improved patient management, addressing societal demands for more effective healthcare solutions.

The integration of genomic medicine into clinical care in Hong Kong represents a transformative shift in healthcare delivery, with significant functional impacts that extend to patients, the healthcare system, industries, and the economy. The benefits of these strategies are manifold:

Patients and Healthcare System

- Patients gain access to cutting-edge, personalised treatments that significantly improve recovery rates and outcomes;
- The healthcare system sees enhanced efficacy and efficiency in service delivery;
- By leveraging genetic data to calculate disease risk with local PRS models for common diseases, healthcare providers can offer tailored preventive strategies and early interventions for high-risk patients;
- Advancement in personalised medicine not only improves patient outcomes, but also reduces the overall burden on the healthcare system by minimising the onset of preventable diseases;
- Improved data interoperability provides healthcare professionals with access to comprehensive patient data, including genetic profiles, thereby enhancing clinical decision-making in terms of diagnosis, treatment, and continuity of care.

Society and Economy

- Industries involved in genomic research and medical technology can expect growth opportunities as clinical practices evolve and new services emerge, thereby bolstering local economic development;
- Early disease detection and intervention will lower healthcare costs, leading in turn to a healthier workforce, higher productivity, and sustainable economic growth;
- The implementation of standardised data systems may catalyse the development of new technologies and services, creating market opportunities for local industries and fostering economic resilience.

In summary, the functional impacts of these integrated strategies are profound, fostering a healthcare environment that champions innovation, improves patient outcomes, and drives economic growth.



Overall, under the strategic focus of accelerating the integration of genomic medicine into clinical care, there are three strategic goals along with five strategic directions:

Strategic Goals	Strategic Directions
Expedite the adoption of genomic research evidence into clinical practice	<ul style="list-style-type: none">■ Build a pool of genomic champions/genomic advocates■ Form clinical alliance with key stakeholders, including HA, to put evidence-based genomic medicine into practice■ Amplify the clinical utility of HKGI’s knowledgebase
Enhance personalised prediction and prevention of disease risk	<ul style="list-style-type: none">■ Develop and improve PRS for common diseases in local population
Improve interoperability of genomic and clinical data systems for better clinical decision-making	<ul style="list-style-type: none">■ Adopt widely accepted standards to standardise genomic and clinical data formats and exchange protocols





Strategic Goal 1 | Expedite the Adoption of Genomic Research Evidence into Clinical Practice



Build a Pool of Genomic Champions/Genomic Advocates

HKGI recognises the transformative potential of genomic medicine in revolutionising patient care and improving health outcomes. To harness this potential, it has formulated several strategies to build a pool of genomic champions/genomic advocates who will facilitate the integration of genomic research evidence into clinical practice over the next five years. These strategies are presented below.

Actively Source Genomic Champions/ Genomic Advocates in Relevant Specialties

In the rapidly evolving field of genomic medicine, specific specialties such as oncology, paediatrics, cardiology, and neurology stand to benefit significantly from genomic applications. By actively sourcing genomic champions/genomic advocates within these specialties, HKGI can:

- Ensure that individuals with specific expertise in genetic applications lead the way in implementing best practices;

- Groom and nurture local genomic champions/genomic advocates who understand the unique challenges and opportunities within their specialties, thereby increasing the likelihood of successful adoption;

- Encourage collaboration among specialties, leading to a more integrated approach to genomic care that recognises the interdisciplinary nature of healthcare challenges.

By focusing on relevant specialties, HKGI seeks to create a robust framework for the deployment of genomic strategies tailored to the needs of different patient populations. Genomic champions/genomic advocates in these areas can act as liaison persons, advocating for adoption of genomic medicine and bridging the gap between research and clinical practice.

Foster a Community of Practice

Building a supportive community of practice is essential for the ongoing development and success of genomic champions/genomic advocates. HKGI aims to provide platforms that facilitate:

- Knowledge sharing among genomic champions/genomic advocates, allowing for the exchange of experiences, challenges, and successes in implementing genomic applications;
- Collaborative learning opportunities, such as workshops, seminars, and interdisciplinary forums, where genomic champions/genomic advocates can grow their skills and enhance their understanding of genomic medicine; and

- Networking opportunities to foster collaborative projects and partnerships that can amplify the impact of genomic initiatives within and beyond the clinical setting.

A strong community of practice will empower genomic champions/genomic advocates to navigate their professional journeys more effectively. This supportive environment not only enriches their expertise but also fosters a culture of innovation and continuous improvement in genomic care.





Implement Recognition Schemes and Share Success Stories to Attract Aspiring Genomic Champions/Genomic Advocates

Recognition plays a crucial role in motivating individuals and teams to pursue excellence in their respective fields. By implementing recognition schemes, HKGI intends to:

- Acknowledge the contributions of genomic champions/genomic advocates who effectively integrate genomic evidence into practice, thereby encouraging others to follow suit;
- Share success stories widely to inspire a sense of possibility and highlight the real-world impact of genomic medicine on patient care; and
- Enhance the visibility of genomic medicine within the broader healthcare community, promoting the value of adopting cutting-edge genomic applications.

Recognition and success stories will serve as powerful motivators, fostering a sense of accomplishment among genomic champions/genomic advocates and attracting aspiring genomic champions/genomic advocates. They will also demonstrate tangible outcomes of genomic applications, thereby reinforcing the importance of genomic medicine in clinical settings and encouraging wider adoption among peers.

The above-mentioned strategies formulated by HKGI to build a pool of genomic champions/genomic advocates are designed to create a sustainable framework for the integration of genomic research into clinical care. By focusing on relevant specialties, fostering community, and implementing recognition schemes, HKGI aims to accelerate the adoption of genomic medicine, ultimately leading to improved health outcomes and a more personalised approach to patient care. This vision not only promises to advance genomic medicine but also positions Hong Kong as a leader in the global shift towards genomic healthcare.



Form Clinical Alliance with Key Stakeholders to Put Evidence into Practice

HKGI is committed to transforming healthcare by integrating genomic research evidence into clinical practice. To achieve this, it has developed several strategies aimed at forming clinical alliance with key stakeholders, including HA, over the next five years. The strategies outlined below are crucial for expediting the adoption of genomic medicine in clinical care:

Participate in Professional Expert Committees to Establish Best Practices

Engaging with professional expert committees is crucial for standardising the incorporation of genomic research evidence into clinical care. HKGI's strategy to participate in these committees intends to:

- Collaborate with experts and stakeholders to establish best practices for genomic medicine based on genomic research evidence, ensuring that genomic findings are utilised effectively within clinical settings;
- Promote the development of guidelines that are evidence-based, ensuring that the integration of genomic data aligns with the latest scientific advancements and ethical standards; and
- Advocate for policies that support the sustainable implementation of genomic research in clinical practice, addressing potential barriers and facilitating smoother transitions.

Participation in expert committees will enhance HKGI's influence in shaping the future of genomic medicine.

By contributing to the establishment of a robust framework for best practices, HKGI can ensure that genomic applications are integrated comprehensively and consistently across various healthcare settings.

Offer WGS as Part of Routine Clinical Care

WGS represents a groundbreaking advancement in our ability to diagnose genetic conditions rapidly and accurately. By collaborating with key stakeholders, mainly HA, to include WGS in routine clinical care, HKGI aims to:

- Provide timely diagnoses for patients with clinical needs, particularly in cases where traditional diagnostic methods fall short;
- Enable a comprehensive genetic evaluation that can uncover rare or complex conditions, ultimately facilitating early intervention and personalised treatment plans; and
- Support clinicians in making informed decisions based on a detailed genetic profile of their patients, thereby enhancing patient outcomes through targeted therapies.

Integrating WGS into clinical practice not only streamlines the diagnostic process but also fosters a more informed approach to patient management. By doing so, clinicians can significantly reduce the time between presentation and diagnosis, providing patients with the timely care they need.

Develop Personalised Pharmacogenomic Profiles

Pharmacogenomics, the study of how genes affect a person's response to drugs, is vital for optimising treatment strategies. HKGI's focus on developing personalised pharmacogenomic profiles aims to:

- Tailor individual treatment plans based on genetic makeup, leading to more effective medication choices and minimised adverse drug reactions;
- Assist healthcare providers in identifying the most suitable therapeutic options for their patients, enhancing the overall efficacy of treatment protocols; and
- Promote precision medicine, where therapies are customised to an individual's unique genetic profile, thereby improving patient adherence and satisfaction with treatment plans.

By developing personalised pharmacogenomic profiles, HKGI not only enhances the quality of care provided to patients but also positions healthcare providers to make informed, data-driven decisions that can lead to better health outcomes, reduced healthcare costs, and improved patient safety.

HKGI's strategies to form clinical alliances through the above-mentioned initiatives are important for accelerating the adoption of genomic research into clinical care. By offering WGS as part of routine clinical care, developing personalised pharmacogenomic profiles, and participating in professional expert committees, HKGI strives to create a cohesive ecosystem where genomic medicine can flourish. This holistic approach will not only enhance patient care but also solidify Hong Kong's position as a leader in the field of genomic medicine, ultimately contributing to improved health outcomes in the community.





Amplify Clinical Utility of HKGI's Knowledgebase

HKGI is poised to accelerate the integration of genomic research into clinical practice, ensuring that healthcare providers can leverage the vast potential of genomic data to improve patient outcomes. It has developed a plan focused on amplifying the clinical utility of its knowledgebase over the next five years through several strategies.

Enhance HKGI's Clinical Genomic Knowledgebase to Better Serve the Local Population

A robust clinical genomic knowledgebase is essential for providing healthcare professionals with the information they need to make informed decisions about patient care. HKGI recognises the importance of enhancing this resource to better serve the local population by:

- Collecting and curating genomic data that is specific to the demographics and health profiles of Hong Kong residents, ensuring that the knowledgebase is relevant and applicable;
- Integrating clinical findings and genomic data to provide comprehensive insights that can facilitate diagnosis, management, and treatment decisions;
- Promoting accessibility and usability of the knowledgebase for clinicians, allowing for timely access to genomic information in a clinical setting; and
- Contributing to the formulation of a directory for inherited and rare diseases by using HKGI's genomic data in collaboration with HA.

By enhancing its knowledgebase, HKGI empowers healthcare providers to better understand the implications of genomic information in their practice, leading to improved clinical decision-making and personalised care for patients. This alignment with local population needs will support the effective adoption of genomic medicine.

Provide Support in Genome Curation and WGS Diagnostics to Clinical Laboratories

The success of genomic medicine relies heavily on accurate and reliable diagnostics. HKGI's commitment to supporting genome curation and WGS diagnostics focuses on:

- Collaborating with local clinical laboratories to establish standardised protocols and best practices for genome curation, ensuring that high-quality, consistent data is available for clinical use;
- Enhancing the analytical capabilities of clinical laboratories in Hong Kong by sharing the population-level variant knowledgebase; and
- Providing training and educational resources to laboratory personnel to strengthen local expertise in WGS analysis and interpretation.





Strengthening genome curation and diagnostics will enhance the reliability of genomic testing, enabling clinicians to make well-informed decisions based on accurate and timely data. This will foster trust in genomic medicine and encourage further adoption in clinical care.

Consolidate Population-Specific Pharmacogenomic Findings to Inform and Optimise Drug Usage

Pharmacogenomics plays a critical role in personalising medication regimens based on individual genetic profiles. By consolidating population-specific pharmacogenomic findings, HKGI aims to:

- Gather and analyse data on how local populations respond to different medications, which can inform dose adjustments and drug selections;
- Contribute to the development of suitable guidelines that reflect the unique genetic landscape of the Hong Kong population, thus optimising drug usage and improving therapeutic outcomes; and

- Facilitate collaboration between researchers, clinicians and pharmacologists to translate pharmacogenomic findings into clinical practice, ensuring patients receive the most effective treatments.

By consolidating and utilising population-specific pharmacogenomic data, HKGI can significantly enhance the precision of medication management strategies in Hong Kong. This approach will reduce adverse drug reactions, improve treatment efficacy, and foster a more personalised healthcare experience for patients.

HKGI's strategies to enhance its clinical genomic knowledgebase, support genome curation and WGS diagnostics, and consolidate population-specific pharmacogenomic findings are crucial for expediting the adoption of genomic research evidence into clinical care. Through these efforts, HKGI is not only addressing the immediate healthcare needs of the local population but also laying the groundwork for a sustainable and innovative genomic medicine framework in Hong Kong.



Strategic Goal 2 | Enhance Personalised Prediction and Prevention of Disease Risk

Develop and Improve PRS for Common Diseases in Local Population

HKGI is dedicated to advancing personalised medicine by leveraging genomic data to improve disease risk prediction and prevention strategies. In the next five years, it has planned to implement targeted initiatives to develop and refine PRS for common diseases in the local population. The strategies described below are key to this mission.

Evaluate Performance of PRS from International Studies and Develop Local PRS Models

PRS, which summarise the genetic predisposition to certain diseases based on multiple genetic variants, have made significant strides in research. However, the applicability of these scores can vary significantly across different populations. To develop locally relevant PRS models, HKGI plans to:

- Utilise the existing local genomic datasets made available by HKGP to assess how well PRS derived from international studies performs in the context of the Hong Kong population;

- Identify genetic variants that are particularly relevant to common diseases prevalent in Hong Kong by comparing local genetic data against existing international PRS models; and

- Develop tailored PRS models for specific diseases, ensuring that they are reflective of the unique genetic and environmental factors affecting the Hong Kong population.

By evaluating the performance of existing PRS and adapting them using local data, HKGI can create more accurate and reliable models for disease risk prediction. This localised approach will help address the limitations of using generalised scores, ultimately leading to better-informed health decisions for patients and healthcare providers.





Apply Local PRS Models to Patients in Collaboration with Key Stakeholders

Once the localised PRS models are established, putting them into practice is crucial for maximising their benefits in clinical settings. To achieve this, HKGI plans to collaborate with various stakeholders to:

- Implement PRS assessments as part of routine health evaluations, allowing for early identification of individuals at high risk for specific diseases;
- Provide resources for clinicians to interpret PRS data and make evidence-based recommendations according to patients' risk profiles; and
- Enhance stakeholder engagement to gather feedback and refine PRS applications continuously.

By applying tailored PRS models to local patients, HKGI will facilitate personalised prevention strategies that empower individuals to understand and manage their disease risk proactively. This collaboration with stakeholders will ensure that the implementation of PRS is holistic and integrated into existing healthcare frameworks, promoting community-wide awareness and engagement in disease prevention.

HKGI's strategies to develop and improve PRS for common diseases are pivotal for enhancing personalised prediction and prevention efforts in the Hong Kong population. By evaluating the performance of existing PRS models against local genomic data and applying tailored models in collaboration with key stakeholders, HKGI aims to redefine the landscape of disease risk assessment.



Strategic Goal 3 | Improve Interoperability of Genomic and Clinical Data Systems for Better Clinical Decision-making



Adopt Widely Accepted Standards to Standardise Genomic and Clinical Data Formats and Exchange Protocols

HKGI is committed to enhancing the integration of genomic data into clinical practice, recognising that standardised data formats and exchange protocols are essential for advancing genomic medicine. Over the next five years, it will implement specific strategies aimed at standardising genomic and clinical data formats and exchange protocols for better data sharing by adopting widely accepted standards. The key strategies are explained in the ensuing paragraphs.

Engage with Global Expert Committees' Work on Setting Standards and Best Practices

To establish reliable and effective standards in clinical genomics, HKGI recognises the importance of engaging with international efforts that set standards and policy frameworks for data sharing and genomic practices. By engaging with global expert committees focused in this area, HKGI intends to:

- Collaborate with global leaders in genomics to contribute to and stay informed about the latest developments in data standardisation and best practices;
- Advocate for the needs of the local population to ensure that the specific requirements and contexts of Hong Kong are represented in global discussions, leading to standards that are more inclusive and applicable locally; and

- Share insights and experiences to learn from other regions' successes and challenges, benefiting from a wider range of expertise in developing its standardised practices.

By engaging with global expert committees, HKGI can play a pivotal role in shaping data standards that enhance clinical genomics practices not only locally but also internationally. This collaboration ensures that HKGI's framework aligns with global best practices, facilitating smoother integration and collaboration across borders.

Implement Standardised Data Formats and Exchange Protocols in Partnership with Key Stakeholders

Effective implementation of standardised data formats and exchange protocols requires collaboration among various stakeholders within the healthcare ecosystem. HKGI plans to work closely with key stakeholders, including healthcare institutions, government agencies, academic institutions, and industry partners, to:

- Jointly establish a unified approach to develop a cohesive ecosystem where genomic and clinical data can be seamlessly exchanged and interpreted;
- Identify and address barriers to find solutions that benefit all parties involved; and

- Provide support to all related parties in the adoption of standardised practices, fostering a culture of compliance and continuous improvement.

Collaboration will lead to a standardised framework that is recognised and adopted across different sectors within the healthcare system, greatly enhancing data exchange efficiency, system interoperability, reliability, and scalability. This unified approach will improve overall data quality and integrity, facilitate research, and ultimately enhance patient care.

Deploy Robust Technological Solutions to Enable Data Integration and Seamless Sharing

To support the standardised data formats and exchange protocols, HKGI recognises the necessity of deploying advanced technological solutions that enable effective integration and sharing of genomic and clinical data. This includes:

- Invest in interoperable systems to allow for data exchange across different clinical systems while ensuring compliance with established standards;
- Facilitate seamless data sharing by developing systems that allow for real-time access to genomic and clinical data, supporting clinical decision-making and research initiatives alike; and
- Enhance data security and privacy to ensure that technological solutions are equipped with robust security measures to protect sensitive genomic data while promoting confidence in data sharing.

The deployment of technological solutions will ensure that genomic and clinical data can be efficiently integrated and shared across systems. This will not only streamline workflows but also enhance the precision of diagnoses and treatments, ultimately leading to improved health outcomes for patients.

HKGI's strategies on standardising genomic and clinical data formats and exchange protocols is essential for integrating genomic insights into clinical practice effectively. By participating in global standards-setting committees, collaborating with key stakeholders to adopt widely accepted standards, and deploying technological solutions, HKGI seeks to create a seamless and robust framework for genomic data exchange. This initiative will enhance interoperability, promote data-driven clinical decision-making, and pave the way for advancing personalised medicine in Hong Kong over the coming years.



Advance Research in Genomic Science



Strategic Goals and Strategic Directions

To pursue the strategic focus of advancing research in genomic science with a view to positioning Hong Kong to become a leading research hub of biomedical science, HKGI has formulated two strategic goals:

- (i) **Contribute to the overall development of the International Health and Medical Innovation Hub**
- (ii) **Institute effective data sharing and innovative policy to boost scientific discoveries**

The strategic directions for contributing to the overall development of the International Health and Medical Innovation Hub include harnessing HKGI's extensive genomic and clinical databases to enhance the design, conduct, and outcomes of clinical trials as well as strengthening collaborative genomic research within GBA and beyond to position Hong Kong as a leader in health and medical innovation. The former direction not only ensures that research is informed by comprehensive data but also promotes greater effectiveness and efficiency in trial execution. The latter direction will foster partnerships with key research institutions and industry leaders in the region to drive impactful scientific advancements.

To achieve the second strategic goal of instituting effective data sharing and innovative IP policy to boost scientific discoveries, HKGI will increase support for collaborative data-sharing and synthesis efforts, enabling researchers to access and utilise diverse datasets for more robust findings. Furthermore, the establishment of a creative IP framework will help spur innovation, creativity, and entrepreneurship by protecting discoveries and facilitating their translation into practical applications. Together, these strategic directions will bolster Hong Kong's research landscape and catalyse significant advancements in genomic science.

These strategic directions will address several critical issues and challenges in the development of genomic medicine in Hong Kong:

- The integration of data across research institutions and clinical settings will mitigate the barriers of data silos, enhancing the overall quality and utility of genomic research.
- Establishing collaborations within GBA encourages a unified approach to healthcare and research challenges, maximising resource utilisation and fostering a culture of innovation.
- Implementing a creative IP framework not only encourages scientific inquiry but also ensures that novel discoveries translate into real-world benefits, bridging the gap between research and application.



In implementing the strategies for advancing research in genomic science, HKGI will collaborate closely with its partners in both public and private sectors in the GBA and beyond to bring about benefits of the advancement and application of new genomic technologies to individuals and the society, such as:

Clinical and Public Health Benefits

- Improved clinical trial design and outcomes enable more targeted and efficient trials, reducing the time and costs associated with bringing new treatments to the market.
- Patients stand to gain from faster access to innovative therapies based on robust clinical evidence, ultimately improving health outcomes and quality of life.
- Strengthened collaborative efforts in genomic research enhance public health responses.
- Efficient resource utilisation leads to better management of healthcare challenges, benefiting healthcare organisations in the GBA and beyond.

Research and Innovation Advancement

- Greater access to comprehensive genomic and clinical datasets facilitates high-quality research, fosters robust analyses, and accelerates scientific discoveries.
- A creative and well-defined IP policy safeguards the rights of researchers and encourages the translation of genomic findings into practical applications, thereby incentivising investment in R&D.

Economic Development and Investment Growth

- Increased opportunities for investment in biotechnology and pharmaceutical sectors will bring benefits to related industries and the society.
- New market opportunities in biotechnology and pharmaceutical industries will lead to the creation of more jobs and economic growth.
- A strong and innovative IP framework can attract domestic and international investments, promoting a vibrant healthcare ecosystem that contributes significantly to Hong Kong's economy.

Overall, there are two strategic goals along with four strategic directions to pursue the strategic focus of advancing research in genomic science:

Strategic Goals	Strategic Directions
Contribute to the overall development of International Health and Medical Innovation Hub	<ul style="list-style-type: none">■ Harness HKGI's genomic and clinical databases to improve the design, conduct, and outcomes of clinical trials■ Strengthen collaborative genomic research in GBA and beyond, positioning Hong Kong as a leader in health and medical innovation
Enhance personalised prediction and prevention of disease risk	<ul style="list-style-type: none">■ Increase support for collaborative data sharing and synthesis efforts■ Establish a creative IP framework to help spur innovation, creativity, and entrepreneurship





Strategic Goal 1 | Contribute to the Overall Development of International Health and Medical Innovation Hub



Harness HKGI's Genomic and Clinical Databases to Improve the Design, Conduct, and Outcomes of Clinical Trials

HKGI seeks to strengthen Hong Kong's position as an International Health and Medical Innovation Hub. To achieve this, it has planned to implement strategies that leverage its extensive genomic and clinical databases to enhance the design, conduct, and outcomes of clinical trials over the next five years. The following strategies are key components of this initiative:

Expand Diversity of HKGI's Biobank

A sizable and diverse biobank is vital for improving the robustness and effectiveness of clinical trials. It ensures that study results are applicable to a wider population. By stepping up its efforts to recruit more patients from different disease groups to participate in HKGP, HKGI aims to:

- Expand the size and diversity of its biobank to increase representation of local demographics and capture a broader genetic variation reflective of the local population, thereby enhancing researchers' understanding of disease susceptibility, drug response, and treatment outcomes.
- Enhance generalisability of clinical trial results to ensure that findings are applicable to different ethnic groups, ultimately leading to more effective and personalised healthcare solutions.

- Facilitate comparative studies that can identify specific health differences among various demographic groups, thereby uncovering valuable insights into disease mechanisms and treatment efficacy.

By enhancing the diversity of its biobank, HKGI will significantly improve the validity and relevance of clinical trial outcomes. This strategy will contribute to developing therapies and interventions that are effective across diverse patient populations, thus aligning with the overall goal of improving public health in Hong Kong.

Applying Innovative Genomic Technologies to Establish Genomic and Multi-omics Profiles of Local Population for Clinical Trials

The application of cutting-edge genomic technologies is critical for generating comprehensive genomic and multi-omics profiles that inform clinical trial design and execution. HKGI's strategy in this respect includes:

- Implementing next-generation sequencing and other advanced genomic techniques to build detailed genetic profiles of the local population, including analysis of mutation burden in rare variants to identify biomarkers associated with specific diseases;

- Integrating genomic data with other omics (e.g., transcriptomics, proteomics, metabolomics) to provide a holistic view of biological processes, thereby improving the understanding of disease mechanisms and responses to treatment; and
- Enhancing stratified medicine by establishing detailed profiles to support the design of clinical trials that target specific genetic subgroups, hence improving the precision of treatments and clinical outcomes.

Innovative genomic technologies will enable HKGI to refine the focus of clinical trials, leading to more effective interventions that are tailored to the genetic makeup of the patient populations involved. This approach will foster advancements in personalised medicine and boost the overall success rate of clinical trials in Hong Kong.

Collaborating with Regulatory Agencies to Promote Appropriate Use of Genomic Data in Clinical Trials

Robust regulatory frameworks are essential for the appropriate use of genomic data in clinical trials. HKGI plans to collaborate closely with regulatory agencies by:

- Promoting transparent practices to ensure that the application of genomic data in clinical research adheres to national and international standards;

- Facilitating regulatory approval processes to streamline the procedures for trials involving genomic data, thus increasing the efficiency of bringing innovative treatments to the market; and

- Providing educational resources to stakeholders about the appropriate use of genomic data, ensuring that all participants in clinical trials are well-informed and safeguarded.

The collaboration with regulatory agencies will strengthen the governance of clinical trials utilising genomic data, promoting trust and confidence among participants and the broader community. This emphasis on ethical and legal oversight will ensure that Hong Kong remains at the forefront of health and medical innovation.

HKGI's commitment to harnessing its genomic and clinical databases enhances the design, conduct, and outcomes of clinical trials. By expanding biobank diversity, applying innovative genomic technologies, and fostering collaboration with regulatory agencies, HKGI is poised to make significant strides in health and medical innovation in Hong Kong over the next five years. These concerted efforts will contribute to the development of effective, personalised healthcare solutions that can ultimately improve patient outcomes and position Hong Kong as a leader in the global biomedical landscape.



Strengthen Collaborative Genomic Research in GBA and Beyond

HKGI is strategically focusing on enhancing collaborative genomic research not only within GBA but also on a global scale. By doing so, it aims to position Hong Kong as a leader in health and medical innovation, contributing significantly to the overall development of the International Health and Medical Innovation Hub over the next five years. The following strategies are integral to this vision:

Establishing Research Partnerships in Functional and Therapeutic Genomics to Foster Local and International Collaborations

Functional and therapeutic genomics play critical roles in advancing our understanding of genetic contributions to diseases and developing targeted treatments. HKGI recognises the necessity of establishing robust research partnerships to:

- **Enhance Scientific Collaboration** – By partnering with local and international institutions, HKGI can cultivate a network that brings together diverse expertise in genomics, medicine, and bioinformatics, facilitating groundbreaking research.
- **Focus on Disease Mechanisms and Treatments** – A concentrated emphasis on functional genomics allows for the exploration of gene functions and their roles in diseases, paving the way for novel therapeutic approaches to tackle prevalent health issues in the region.
- **Attract Global Talent and Investment** – Forming collaborative research partnerships positions Hong Kong as a desirable location for innovative research, creating opportunities to attract international talent and funding dedicated to genomic exploration.

Through these partnerships, HKGI can generate impactful research findings that translate into tangible health solutions, thereby enhancing Hong Kong's reputation as a leader in genomic and therapeutic innovations. The collaborative nature of these efforts will foster an inclusive and productive research environment that prioritises addressing critical health challenges.

Collaborating with Key Research Institutions and Industry Partners to Innovate and Co-develop Health and Medical Products

In the rapidly evolving field of health and medical innovation, collaboration between research institutions and industry partners is essential for translating scientific discoveries into practical applications. HKGI will host networking workshops, thematic symposiums, collaborative hackathons, panel discussions and webinars, collaborative proposal workshops, and international exchange programmes, to attract potential collaborators from academia, industry, and healthcare sectors. It plans to foster these collaborations to:

- **Co-Develop Innovative Health Solutions** – By partnering with industry leaders, HKGI can leverage cutting-edge technologies and resources to accelerate the development of health and medical products, ranging from diagnostic tools to novel therapeutic modalities.
- **Facilitate Knowledge Exchange** – Collaborations with academic and industry players create a rich environment for knowledge sharing, enabling researchers to access industry insights and technologies that can enhance their research efforts.

- Enhance Clinical Translation – Partnering with clinical research organisations ensures that genomic findings are efficiently translated into clinical applications, thereby improving patient outcomes and addressing local health needs.

Collaborative engagement with key institutions and industry partners will expedite the development of innovative health solutions, ensuring that scientific breakthroughs lead to practical applications that benefit society. This collaboration will position Hong Kong as a focal point for health and medical innovation, attracting both local and international stakeholders who are eager to contribute to the advancement of genomics and healthcare.

HKGI's strategies to strengthen collaborative genomic research in GBA and beyond are pivotal for positioning Hong Kong as a leader in health and medical innovation. By establishing research partnerships focused on functional and therapeutic genomics and fostering collaborations with key research institutions and industry partners, HKGI is laying the groundwork for a vibrant health innovation ecosystem. These efforts will not only advance scientific research but will also drive meaningful improvements in healthcare delivery and outcomes, solidifying Hong Kong's status as a prominent hub for genomic research and medical innovation over the next five years.





Strategic Goal 2 | Institute Effective Data Sharing and Innovative IP Policy to Boost Scientific Discoveries

HKGI is dedicated to fostering scientific innovation and discovery. Over the next five years, it plans to implement several key strategies aimed at enhancing data sharing and establishing a creative IP framework. These initiatives are vital for advancing scientific research and facilitating breakthroughs in genomic medicine and beyond.



Increase Support for Collaborative Data Sharing and Synthesis Efforts

Strengthen HKGI's SRE as Collaborative Platform for Scientific Research

Collaboration and data sharing are fundamental to accelerating scientific discoveries. HKGI recognises that fostering a synergistic environment is crucial for enabling researchers to leverage each other's expertise and resources.

To promote collaborative data sharing and synthesis, HKGI plans to:

- Strengthen the capabilities and capacity of its SRE;
- Develop a collaborative platform to enhance its SRE by improving infrastructure and tools that facilitate seamless collaboration among researchers, institutions, and industry partners; and
- Increase resources available for research collaborations to encourage more interdisciplinary projects that can lead to innovative scientific findings.





Deploy Advanced Technologies and Innovative Methods to Improve Data Sharing and Synthesis

To improve data sharing and synthesis, HKGI will utilise state-of-the-art technologies like cloud computing, AI and ML technologies to create sophisticated data sharing solutions that streamline access to genomic and clinical data. The AI-driven utilisation of big data, particularly from the perspectives of genomics, transcriptomics, and multi-omics, is crucial for harnessing massive sequencing data to aid clinical diagnosis and management, as well as scientific discoveries that potentially lead to IP commercialisation and entrepreneurship.

HKGI also plans to enhance its data integration methods, such as database integration, “Extract, Transform, Load” processes, data warehousing, Application Programming Interface, and Federated Data Systems. By developing tools that enable efficient synthesis of disparate datasets, HKGI seeks to promote standardisation of data formats, enhanced interoperability and accessibility, interdisciplinary collaborative research, and improved efficiency in research.

Foster Interdisciplinary Collaboration for Data-Driven Discoveries

Interdisciplinary research in genomic science offers significant advantages, including:

- **Comprehensive Perspective** – By integrating knowledge from various fields such as genetics, bioinformatics, epidemiology and healthcare, researchers can gain a more holistic understanding of complex biological systems and disease mechanisms.
- **Enhanced Innovation** – Collaboration between diverse disciplines fosters creativity and innovation, leading to the development of novel hypotheses and solutions that might not emerge from a single-field approach.
- **Improved Research Techniques** – Interdisciplinary teams can leverage advanced methodologies and technologies from different areas, enhancing the accuracy and efficiency of genomic analyses and interpretations.
- **Increased Funding Opportunities** – Collaborative projects often attract greater funding from various sources, as they can address broader scientific challenges and appeal to multiple stakeholders.

- **Better Translation to Practice** – Interdisciplinary research facilitates the translation of genomic discoveries into practical applications in medicine and public health, ensuring that scientific advancements have real-world impacts.

- **Addressing Diverse Health Challenges** – By bringing together experts from different domains, interdisciplinary research can tackle complex health issues from multiple angles, leading to more effective interventions and treatments.

Recognising the advantages of interdisciplinary research, HKGI aims to bring together experts from different fields to drive innovative approaches to research challenges and data-driven scientific discoveries. Planned strategies include building an interdisciplinary collaborative culture, establishing cross-discipline partnerships, promoting the use of multidisciplinary data-sharing platforms, organising cross-disciplinary training workshops/seminars, and developing joint research initiatives, etc.

By increasing support for collaborative data sharing and synthesis efforts, HKGI will enhance its research capabilities, leading to more robust scientific discoveries. Such initiatives will not only promote innovation but also contribute to a culture of shared knowledge and collective advancement in the scientific community.





Establish a Creative IP Framework to Help Spur Innovation, Creativity, and Entrepreneurship

Develop HKGI's IP Policy Incorporating Incentive and Novelty Elements in Consultation with Key Experts and Stakeholders

A creative and well-defined IP framework is essential for fostering scientific innovation and protecting the interests of researchers and institutions. HKGI aims to develop such an IP policy in genomic science by:

- Incorporating incentive and novelty elements to encourage innovation, creativity, and entrepreneurship;
- Engaging with legal experts, researchers, and industry representatives to design an IP policy that balances the need for protection with the importance of collaboration in the scientific community; and
- Adopting a flexible approach that considers the unique challenges and opportunities present in genomic research, ensuring that it is adaptable and supportive of innovation.

Upon the formulation of an appropriate IP policy, HKGI will further promote IP awareness among its key stakeholders and research collaborators to inform them about the importance of IP and the provisions of the new policy to cultivate an understanding of how to protect and share their inventions.

Emphasis will be placed on making use of the IP framework to encourage collaborative innovations and incentivise interdisciplinary research. It is expected that the establishment of such an IP framework will stimulate scientific discoveries and innovations by protecting intellectual assets and promoting a culture of collaboration. This supportive environment will empower researchers to pursue groundbreaking ideas without fear of losing their contributions, ultimately driving forward the advancement of science.

HKGI's strategic initiatives to promote scientific discoveries through effective data sharing and an innovative IP framework are fundamental to its mission of enhancing health and medical innovation in Hong Kong. By strengthening collaborative environments, deploying advanced data-sharing technologies, and developing a creative IP policy, HKGI positions itself as a critical player in the global scientific community. These strategies will not only drive innovation but also foster a dynamic ecosystem where researchers can thrive, paving the way for significant advancements in genomic medicine and beyond over the next five years.

Nurture Talents in Genomic Medicine



Strategic Goals and Strategic Directions

To nurture talents in genomic medicine with a view to realising the vision of having skilled professionals to develop and deliver genomic medicine in Hong Kong, HKGI will pursue the following strategic goals:

- (i) **Establish a dynamic genomic talent pool through continuous learning and education**
- (ii) **Develop an ecosystem conducive to attracting and retaining genomics professionals**

To establish a dynamic genomic talent pool of genomics professionals, a collaborative approach will be adopted along two strategic directions, namely, deepening partnership with educational institutions, and fostering a culture of lifelong learning among genomics professionals. To develop an ecosystem conducive to attracting and retaining genomics professionals, HKGI will move along two complementary strategic directions, i.e., establishing clear career ladders for genomics professionals, and offering them easy access to cutting-edge technology and infrastructure support for professional development.

Through the strategies formulated under these directions, HKGI seeks to effectively tackle the following key issues and challenges in the development of genomic medicine in Hong Kong:

- **Shortage of Skilled Professionals** – Addressing the lack of trained professionals capable of leveraging genomic technologies through deepening partnership with educational institutions.
- **Talents Retention** – Mitigating talent retention challenges in a competitive job market by establishing clear career progression pathways and offering development opportunities.
- **Need for Updated Skills** – Ensuring ongoing skill upgrades for genomics professionals to keep pace with rapid advancements in genomic medicine by fostering a culture of lifelong learning.
- **Need for Practical Experience** – Bridging the gap between theoretical education and practical application by providing mentorship, internships, and hands-on research opportunities.
- **Inadequate Access to Cutting-Edge Technology** – Offering genomics professionals access to advanced sequencing technologies, high-performance computing resources, and knowledge exchange opportunities through collaboration with leading institutions and industry partners.

By focusing on the two strategic goals of establishing a dynamic genomic talent pool and developing an ecosystem conducive to attracting and retaining genomics professionals, HKGI aims to achieve significant functional impacts across various sectors as described in the ensuing paragraphs.

To establish a dynamic genomic talent pool, HKGI will deepen partnerships with educational institutions. This involves strategically allocating resources for scholarships and grants to support students interested in genomics. By easing the financial burden on aspiring genomics professionals, HKGI can encourage more students to pursue degrees in relevant fields, thereby expanding the talent pool. Additionally, engaging genomic experts to provide mentorship, internship, and hands-on research opportunities is essential for bridging the gap between academia and practical application. Such interactions allow students to gain invaluable experience, enhance their skills, and build professional networks, thereby increasing their employability in the genomics sector.

Furthermore, fostering a culture of lifelong learning among genomics professionals is critical for ensuring that they remain current with rapid advancements in the field. Strengthening global and local collaborations to provide a diverse range of continuous learning resources, such as workshops, seminars, and online courses, encourages professionals to upgrade their skills regularly. This approach addresses the challenge of a static workforce, where outdated knowledge can

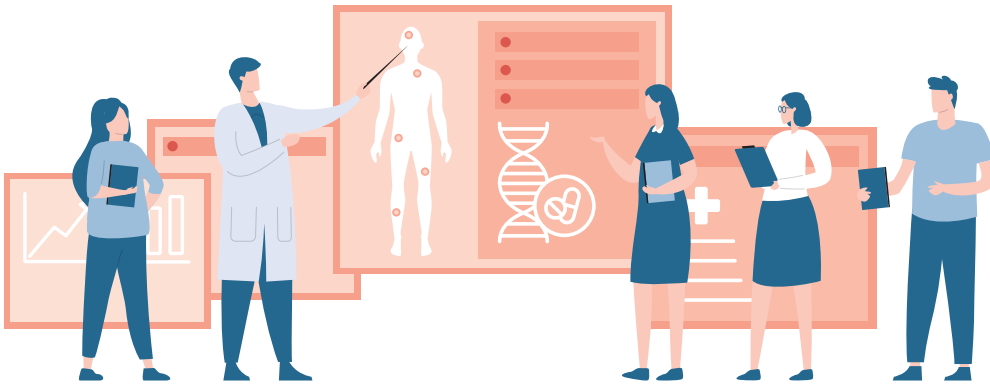
impede progress in genomic medicine. By promoting ongoing professional development, HKGI seeks to ensure that its workforce is equipped to leverage emerging technologies and methodologies in genomic research and clinical practice.

To develop an ecosystem conducive to attracting and retaining genomics professionals, HKGI has planned to establish clear career ladders for its genomics professionals by designing an integrated career progression pathway with flexible mobility. This well-defined structure allows individuals to see clear advancement opportunities, making careers in genomic medicine more appealing. By outlining paths for professional growth, HKGI seeks to foster job satisfaction and improve staff retention, tackling the challenges of maintaining a stable skilled workforce in a competitive market.

Additionally, providing easy access to cutting-edge technology and infrastructure support is essential for the development of skilled professionals. Collaborating with leading institutions and industry partners to create a centralised resource hub equipped with advanced sequencing technologies and high-performance computing resources will empower genomics professionals to engage in high-quality research projects. This access not only enhances their technical skills but also fosters an innovative environment where professionals can experiment and collaborate on breakthrough ideas, ultimately benefiting the genomic medicine landscape in Hong Kong.

Overall, there are two strategic goals along with four strategic directions to nurture talents in genomic medicine in the coming five years:

Strategic Goals	Strategic Directions
Establish a dynamic genomic talent pool through continuous learning and education	<ul style="list-style-type: none">■ Deepen partnership with educational institutions■ Foster a culture of lifelong learning among genomics professionals
Develop an ecosystem conducive to attracting and retaining genomics professionals	<ul style="list-style-type: none">■ Establish clear career ladders for genomics professionals■ Provide easy access to cutting-edge technology and infrastructure support





Strategic Goal 1 | Establish a Dynamic Genomic Talent Pool Through Continuous Learning and Education

HKGI is committed to fostering a robust and dynamic talent pool in the field of genomics through continuous learning and education. Recognising the rapidly evolving nature of genomic science, HKGI has outlined a plan to enhance education and professional development of genomics professionals in the coming five years. The strategies deliberated below are crucial to achieving this strategic goal.



Deepen Partnership with Educational Institutions

Deepening partnerships with educational institutions is a fundamental strategic direction to achieve the strategic goal of establishing a dynamic genomic talent pool through continuous learning and education. This approach focuses on enhancing the educational framework and practical experiences available to aspiring genomics professionals.

Strategically Allocate Resources for Scholarships and Grants

One primary strategy involves strategically allocating resources for scholarships and grants to support students interested in genomics. HKGI will collaborate with universities to create dedicated scholarship funds for students pursuing degrees in genetics, bioinformatics, and related fields. These scholarships would spur students' interest in genomic science and medicine, making it more feasible for deserving candidates to enter the workforce with a specialised education. In addition, grants will be allocated to support innovative projects within academic institutions that focus on genomic research, further encouraging student engagement in the field.

By making education more accessible, these financial supports will increase enrolment in genomics-related programmes, thereby expanding the talent pool. A more diverse group of students entering the field not only addresses the current shortage of skilled

professionals but also fosters innovation through varied perspectives and ideas.

Engage Genomic Experts for Mentorship, Internship and Hands-on Research Opportunities

The second strategy focuses on engaging genomic experts to provide students with mentorship, internship, and hands-on research opportunities. HKGI will initiate structured mentorship programmes pairing students with experienced genomic researchers and industry professionals. Internship at HKGI or partnered organisations will also be arranged for students to gain practical experience in genomic techniques and research methodologies. Moreover, organising workshops and seminars where experts share insights and guidance can further enhance learning and motivation.

These engagements enrich students' educational experiences by bridging the gap between theory and practice. Mentorship from seasoned professionals not only provides valuable guidance for students' career paths but also cultivates a culture of learning and collaboration. Internships and hands-on experiences equip students with the necessary skills and competencies, ensuring that they emerge as well-prepared professionals ready to tackle challenges in genomic medicine.



Foster a Culture of Lifelong Learning among Genomics Professionals

To advance the strategic goal of establishing a dynamic genomic talent pool through continuous learning and education, fostering a culture of lifelong learning among genomics professionals is crucial. This strategic direction emphasises the importance of ongoing education and skill enhancement in a rapidly evolving field.

Strengthen Global and Local Collaborations to Provide a Diverse Range of CPD Resources

One effective implementation strategy involves forming partnerships with international genomic research institutions and local universities to create a comprehensive learning ecosystem. For example, HKGI could collaborate with well-known genomic research centres around the world to facilitate workshops and seminars focusing on the latest advancements in genomic technologies and methodologies. Furthermore, local collaborations with universities could include guest lectures from experts, joint research projects, and access to specialised training programmes tailored to current industry needs.

By strengthening these collaborations, HKGI can provide genomics professionals with access to a rich array of learning resources, including cutting-edge research findings, advanced training programmes, and networking opportunities. This access ensures that professionals remain current with the latest developments in genomic medicine, fostering their ability to apply new knowledge within their work environments. Additionally, exposure to diverse perspectives and innovative practices from global partners encourages creativity and adaptability among professionals, which are essential qualities in a fast-paced field like genomics.

Moreover, a culture of lifelong learning not only enhances individual career prospects but also contributes to the overall growth of the genomic medicine landscape in Hong Kong. As professionals engage in continuous education and skill development, they become more competent in their roles, leading to improved patient outcomes and heightened innovation in clinical practices. Ultimately, fostering lifelong learning will cultivate a proactive, knowledgeable, and adaptable workforce capable of addressing the complex challenges in genomic medicine and contributing to advancements in healthcare.



Strategic Goal 2 | Develop an Ecosystem Conducive to Attracting and Retaining Genomics Professionals

HKGI is strategically focused on creating an ecosystem that supports the career development of genomics professionals. Recognising the rapidly evolving landscape of genomic science and the need for a skilled workforce, HKGI plans to implement targeted strategies in collaboration with key stakeholders over the next five years.



Establish Clear Career Ladders for Genomics Professionals

To achieve the strategic goal of developing an ecosystem conducive to attracting and retaining genomics professionals, establishing clear career ladders is essential. This strategic direction focuses on creating transparent and structured career progression pathways that allow professionals in the field of genomics to understand their potential career trajectories. One effective implementation strategy is to design an integrated career progression pathway with flexible mobility.

Design an Integrated Career Progression Pathway

This strategy involves outlining a comprehensive framework that delineates various roles and responsibilities within the genomics sector, along with associated skills, qualifications, and experiences required for each position. For instance, HKGI could develop distinct tracks for research scientists, genome curators, and data analysts, detailing the benchmark achievements needed for advancement, such as specific training programmes, research contributions, or certification requirements. Additionally, the pathway would incorporate flexible mobility options that allow professionals to shift between roles, such as transitioning from a laboratory research position to a clinical application role or exploring managerial tracks.

The implementation of this integrated career progression pathway has a profound impact on nurturing talents in genomic medicine. By providing clear and structured pathways, professionals can visualise their career development, thereby enhancing job satisfaction and motivation. When individuals understand the steps required to advance in their careers, they are more likely to invest in their personal and professional growth, leading to enhanced skills and competencies in the workforce.

Moreover, the flexibility embedded in the pathway allows professionals to tailor their career journeys according to their interests and strengths, promoting a culture of exploration and innovation within the field. This adaptability not only encourages job retention but also helps create a more versatile and skilled workforce capable of addressing diverse challenges in genomic medicine.

Ultimately, establishing clear career ladders will foster a more engaged, knowledgeable, and dedicated group of professionals in genomics. This strategic approach contributes significantly to the long-term success and sustainability of the genomics workforce in Hong Kong, ensuring a continuous pipeline of talent ready to advance the frontiers of genomic medicine.



Provide Easy Access to Cutting-edge Technology and Infrastructure Support

To advance the strategic goal of developing an ecosystem conducive to attracting and retaining genomics professionals, providing easy access to cutting-edge technology and infrastructure support is pivotal. This strategic direction focuses on equipping professionals in the field of genomics with the tools and resources necessary to excel in their roles, thereby attracting them to remain in the field to contribute, evolve and grow. A key implementation strategy involves collaborating with leading institutions and industry partners to offer genomics professionals access to advanced technologies and knowledge sharing.

Collaboration for Offering Genomics Professionals Access to Advanced Technologies and Knowledge Sharing

This strategy entails forging partnerships with renowned genomic research institutions, biotechnology companies, and technology providers to offer genomics professionals access to advanced technologies and knowledge exchange opportunities. For instance, HKGI could collaborate with universities specialising in genomics to set up a facility equipped with state-of-the-art sequencers, bioinformatics tools, and computing resources. This hub would offer training workshops, hands-on sessions, and technical support to help professionals develop proficiency in utilising these advanced technologies. The hub could also facilitate collaborative projects where professionals can work alongside experts from various fields, fostering knowledge exchange and innovation.

The impact of providing easy access to cutting-edge technology and infrastructure support is significant in nurturing talents within genomic medicine. By granting professionals access to the latest sequencing technologies and computational resources, they

can engage in high-quality research and clinical applications, enhancing their technical expertise and problem-solving skills. This hands-on experience is crucial in preparing them to tackle complex challenges in genomic medicine.

Moreover, the provision of such shared resources would foster a collaborative environment that encourages networking and interdisciplinary interactions among professionals. Such exposure not only broadens their understanding of genomic applications but also opens opportunities for mentorship and collaboration, further enriching their professional development.

Overall, this strategic approach to providing access to advanced technology and infrastructure will cultivate a highly skilled, innovative, and adaptable workforce in genomic medicine. By empowering professionals with the necessary tools and collaborative opportunities, HKGI will ensure that the genomics community in Hong Kong remains at the forefront of research and clinical advancements, ultimately benefitting patient care and public health outcomes.

HKGI's strategic goal to develop an ecosystem conducive to the career development of genomics professionals is essential for maintaining a competitive edge in the rapidly evolving field of genomic science. By establishing clear career progression pathways and providing easy access to cutting-edge technology and infrastructure support, HKGI aims to attract, develop, and retain skilled professionals who can contribute significantly to genomic research and healthcare. These efforts, in collaboration with key stakeholders, will ultimately enhance the capabilities of the genomics workforce in Hong Kong, fostering a thriving environment for innovation and excellence in health and medical fields over the next five years.

Enhance Public Genomic Literacy and Industry Partnership



Public Genomic Literacy and Industry Partnership Development



Public Genomic Literacy

Public genomic literacy refers to the understanding and knowledge that individuals and communities possess regarding genomic concepts, technologies, and implications. In an era where genomics is increasingly shaping healthcare, public understanding becomes essential for harnessing its potential. In Hong Kong, a region with significant advancements in biotechnology and healthcare research, public genomic literacy plays a crucial role in the advancement of genomic medicine.

Understanding Public Genomic Literacy

Public genomic literacy involves more than basic knowledge of genetics. It encompasses an awareness of how genomic information affects health, disease prevention and treatment. This includes an understanding of genetic testing, the role of genomics in personalised medicine, privacy concerns, and ethical considerations surrounding genetic data. A literate public can better engage in health-related decisions, advocate for their health rights, and contribute to informed discussions about genomic research and policy.

Benefits of Enhancing Public Genomic Literacy

Enhancing public genomic literacy plays a pivotal role in the advancement of genomic medicine in the following ways:

- **Improved Patient Engagement** – In the healthcare system of Hong Kong where genomic medicine is becoming more prevalent, public genomic literacy enhances patient engagement. Informed patients are more likely to participate in genetic testing, adhere to personalised treatment plans, and communicate effectively with healthcare providers. This engagement fosters a collaborative healthcare environment that can lead to better health outcomes.
- **Education and Community Outreach** – Enhancing public genomic literacy requires concerted efforts in education and community outreach. Schools, healthcare institutions, and research organisations in Hong Kong have initiated programmes aimed at educating the public about genomics. By fostering a culture of learning, these initiatives empower individuals with the knowledge necessary to navigate the complexities of genomic information.

■ **Informed Public Policy and Ethical Considerations** – As genomic technologies evolve, so do the ethical and policy challenges associated with them. A well-informed public can advocate for responsible genomic practices, influencing policymakers to establish regulations that protect individuals' rights and privacy. This engagement ensures that Hong Kong's genomic medicine landscape is governed by ethical standards that reflect the values and concerns of its citizens.

■ **Promotion of Research and Innovation** – Public support for genomic research is bolstered by a high level of genomic literacy. When people understand the benefits and potential of genomic medicine, they are more likely to support funding for research initiatives. In Hong Kong, such support can lead to increased investment in genomic research, fostering innovation and advancing the development of new treatments and technologies.

■ **Awareness of Public Health Initiatives** – Genomic medicine has significant implications for public health, including disease prevention and the management of genetic disorders. Public genomic literacy equips citizens with the knowledge to participate in health initiatives, such as screening programmes for hereditary diseases. In a diverse city like Hong Kong where genetic predispositions to certain conditions can vary, informed citizens can contribute to more effective public health strategies.

Public genomic literacy is a foundational element for the successful advancement of genomic medicine in Hong Kong. By promoting understanding and awareness, it enhances patient engagement, informs public policy, fosters research innovation, and encourages participation in public health initiatives. As Hong Kong continues to position itself as a leader in health and medical innovation, efforts to improve genomic literacy will be essential in ensuring that the benefits of genomic medicine are accessible to all, paving the way for a healthier future.





Industry Partnership

Industry partnership development refers to the strategic collaboration between businesses, academic institutions, research organisations, and healthcare providers to achieve common goals, particularly in innovation and commercialisation. In the rapidly evolving field of genomic medicine, such partnerships are critical, especially in a vibrant financial and technological landscape like Hong Kong. These collaborations play an essential role in translating scientific discoveries into real-world applications, driving advancements in healthcare solutions.

Understanding Industry Partnership

Industry partnership development involves building relationships that leverage the strengths, resources, and expertise of different organisations. In genomic medicine, partnerships foster collaborative research, shared knowledge, and joint ventures aimed at developing new diagnostic tools, therapies, and technologies. This collaborative approach not only accelerates innovation but also mitigates risks and costs associated with R&D.

Importance of Industry Partnership

The roles of industry partnership in advancing genomic medicine can be summarised as follows:

- **Accelerating Research and Innovation** – Collaborations between academic institutions and industry stakeholders facilitate the acceleration of research efforts in genomic medicine. By pooling resources, expertise, and technology, partners can expedite clinical trials and the development of new treatments. In Hong Kong, where cutting-edge research is prevalent, such partnerships can lead to the rapid translation of laboratory discoveries into clinical practices that benefit patients.
- **Access to Funding and Resources** – The R&D of genomic technologies require significant investment. Industry partners can provide the necessary funding and infrastructure, enhancing the capacity of research institutions. In Hong Kong, collaboration with biotech companies can attract both local and international investment, ensuring that groundbreaking research is well-funded and sustainable.

■ **Enhancing Clinical Applications** – The partnership between researchers and industry enables the development of practical applications for genomic medicine. By aligning academic research with commercial goals, partnerships can ensure that new discoveries are translated into diagnostic tools and therapeutic solutions that meet clinical needs. This is particularly important in Hong Kong, where a growing ageing population requires innovative healthcare solutions to address various health challenges.

■ **Facilitating Commercialisation and Market Readiness** – Industry partnerships play a key role in the commercialisation and market readiness of innovative genomic technologies and medical products. Collaborations help bridge the gap between research and market application, ensuring that new products not only meet scientific standards but also align with market demands and regulatory requirements. This alignment is crucial for the successful introduction of new therapies and technologies in Hong Kong's healthcare market.

■ **Fostering Knowledge Exchange** – Industry partnership development promotes a bi-directional flow of knowledge. Researchers gain insights into market needs and patient preferences, while industry partners benefit from the latest scientific advancements. This exchange of information is essential in developing personalised treatments and improving healthcare outcomes in Hong Kong's diverse population.

■ **Strengthening Global Competitiveness** – As globalisation continues to shape the biotech landscape, industry partnerships position Hong Kong as a competitive player in the global genomic medicine market. By collaborating with international institutions and companies, local stakeholders can gain exposure to global trends, technologies, and best practices. This not only enhances local research capabilities but also creates opportunities for Hong Kong's biotech firms to establish a presence in international markets.

■ **Building a Skilled Workforce** – Industry partnerships often involve educational and training initiatives that develop a skilled workforce in genomic medicine. Collaborations with universities can enhance academic programmes, ensuring that students acquire relevant skills and knowledge. A well-trained workforce is crucial for driving innovation and sustaining advancements in genomic medicine within Hong Kong.

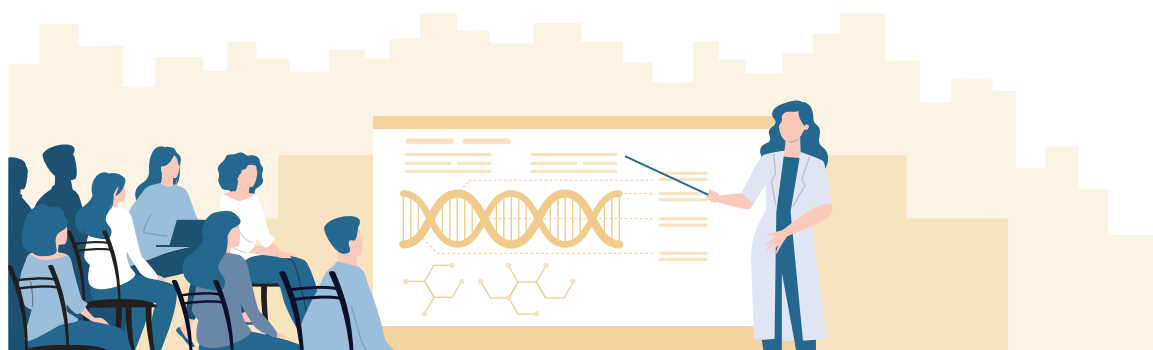
Industry partnership development is vital for advancing genomic medicine in Hong Kong. By fostering collaboration among academic institutions, industry stakeholders, and healthcare providers, these partnerships accelerate research, facilitate funding, enhance clinical applications, and promote knowledge exchange. Additionally, they ensure the commercialisation and market readiness of innovative genomic technologies and medical products. Ultimately, they contribute to strengthening Hong Kong's position as a leader in health and medical innovation, thereby improving healthcare outcomes for its population. As the field of genomic medicine continues to evolve, robust industry partnerships will be essential in realising its full potential.

Strategic Goals and Strategic Directions

To realise the vision of increased public genomic literacy and industry partnership in Hong Kong, HKGI will pursue the strategic goals of deepening public understanding and appreciation of genomic medicine, and forging collaborations with leading scientific institutions and industry innovators to expedite the market readiness of genomic technologies.

Overall, there are two strategic goals and two strategic directions to enhance public genomic literacy and develop industry partnership in the coming five years:

Strategic Goals	Strategic Directions
Deepen public understanding and appreciation of genomic medicine	<ul style="list-style-type: none">■ Enhance publicity outreach to the general public and targeted stakeholders
Drive genomics-related innovations through strategic collaborations with scientific institutions and industries	<ul style="list-style-type: none">■ Strengthen collaborative networks to promote the development and market readiness of genomics-related technologies and products





Strategic Goal 1 | Deepen Public Understanding and Appreciation of Genomic Medicine

HKGI is committed to enhancing public genomic literacy as part of its broader mission to promote the understanding and integration of genomic medicine into healthcare. Recognising the importance of an informed public in advancing the field, HKGI plans to implement several targeted strategies over the next five years aimed at deepening public understanding and appreciation of genomic medicine. The strategies outlined below are central to this effort.



Enhance Publicity Outreach to the General Public and Targeted Stakeholders

As genomic medicine continues to evolve, it is essential for the public and stakeholders to grasp its significance, benefits, and implications. Enhanced public understanding fosters community support, encourages utilisation of genomic services, and empowers individuals to make informed healthcare decisions. To achieve this, HKGI has formulated the following key strategies:

- **Create Relatable Content** – HKGI will develop engaging, accessible content tailored explicitly to different stakeholder groups, including patients, healthcare providers, educators, students, and the general public. By using relatable language and real-world examples, HKGI aims to demystify complex genomic concepts and highlight their relevance to everyday life. This targeted approach ensures that the information resonates with each audience, thereby increasing engagement and understanding.
- **Broaden and Update Publicity Channels and Platforms** – To reach a broader audience, HKGI will diversify its communication channels. This includes leveraging social media, community outreach events, webinars, newsletters, and educational workshops. Additionally, HKGI will keep existing channels up to date, ensuring that the information shared is current, accurate, and actionable. This

multifaceted approach will significantly enhance public awareness of genomic medicine and its potential impact on health.

These strategies aim to create a comprehensive outreach framework that enhances public genome literacy. By providing relatable content through diverse channels and maximising visibility, HKGI hopes to cultivate a community that understands and appreciates the value of genomic medicine. An informed public is better equipped to engage with healthcare providers regarding genomic testing, personalised medicine, and preventative health measures, ultimately leading to improved health outcomes.

HKGI's focus on enhancing public genomic literacy through targeted publicity outreach is essential for advancing genomic medicine in Hong Kong. By deepening public understanding and appreciation of genomics, HKGI seeks to empower individuals and communities to make informed health decisions while fostering a supportive environment for the continued growth and acceptance of genomic innovations. Over the next five years, these initiatives will play a critical role in shaping the future of healthcare in Hong Kong, ensuring that the benefits of genomic medicine are accessible and understood by all.



Strategic Goal 2 | Drive Genomics-related Innovations through Strategic Collaborations with Scientific Institutions and Industries



Strengthen Collaborative Networks to Promote the Development and Market Readiness of Genomics-related Technologies and Products

To achieve the strategic goal of driving genomics-related innovations through strategic collaborations with scientific institutions and industries, strengthening collaborative networks is important. This strategic direction focuses on promoting the development and market readiness of genomics-related technologies and products by fostering effective partnerships among various stakeholders. A key implementation strategy within this direction is to develop best practices and operational models that advance collaborative partnerships.

Develop Best Practices and Operational Models to Advance Collaborative Partnership

This strategy involves identifying and codifying successful collaboration practices across various projects and partnerships in the genomics sector. HKGI will conduct workshops and forums that bring together academic researchers, industry representatives, and policymakers to share insights and experiences on effective collaboration. By analysing case studies of successful genomic product developments, such as the creation of targeted gene therapies or advanced diagnostic tools, HKGI can distil best practices that enhance cooperation among partners. Furthermore, establishing operational models that outline roles, responsibilities, and communication channels can also help streamline collaborative efforts, ensuring that all parties are aligned toward common goals.

The implementation of this strategy has a profound impact on industry partnership development. By creating a structured framework for collaboration, stakeholders are more likely to engage in meaningful partnerships that yield significant results. Clear and well-defined best practices and operational models enhance trust and understanding among partners, thereby streamlining cooperation and facilitating coordination of joint efforts. This organised approach fosters an environment where innovative ideas can flourish, leading to the accelerated development of genomics-related technologies and products, which are crucial for addressing today's healthcare challenges.

Moreover, strengthened collaborative networks benefit the entire genomics ecosystem by catalysing the translation of scientific research into market-ready solutions. As partnerships deepen and more companies invest in genomics innovations, the potential for groundbreaking advancements increases. This not only boosts the competitiveness of Hong Kong's genomics industry on a global scale but also enhances the overall landscape of healthcare delivery and patient outcomes.

In summary, developing best practices and operational models to strengthen collaborative networks will significantly contribute to the growth of industry partnerships in genomics. By fostering an environment of cooperation and shared success, HKGI can drive forward the development and market readiness of vital genomics-related technologies and products, ensuring that innovation remains at the forefront of the healthcare landscape.

Key Enablers

Genomic medicine, which utilises genomic information to guide the diagnosis, treatment, and prevention of diseases, is rapidly evolving as a pivotal aspect of modern healthcare. Advancing the development of genomic medicine in Hong Kong requires a multi-faceted approach, leveraging various key enablers that can facilitate research, clinical application, and integration into healthcare. The primary enablers are deliberated below.

1 | Robust Information Technology Infrastructure

Data Management and Storage

One of the primary challenges in genomic medicine is the vast amount of data generated during genomic sequencing and analysis. The adoption of new information technologies (IT), particularly in data management and storage solutions, enables efficient handling of these large datasets. Advanced databases, cloud computing, and big data analytics tools allow for the secure storage, retrieval, and analysis of genomic data. By providing robust, scalable and high-capacity storage solutions, healthcare providers and researchers can effectively manage patient data, research findings, and clinical information, facilitating smoother operations and faster outcomes.

Data Sharing and Collaboration

In genomic medicine, collaboration between researchers, clinicians, and institutions is crucial for advancing understanding and treatment of genetic disorders. The adoption of new information technologies enables seamless data sharing through centralised platforms and integrated health information systems. Initiatives such as the HKGP exemplify collaborative efforts that can be enhanced through IT infrastructure. Such platforms can facilitate access to genomic databases, allowing researchers from diverse fields to collaborate on studies, share insights, and innovate solutions, thus accelerating advancements in genomic medicine.

Data Security and Compliance

With the sensitive nature of genomic data, ensuring data security and compliance with regulations is paramount. IT plays a vital role in implementing robust security measures to protect patient information from unauthorised access and breaches. Furthermore, adherence to local and international regulations regarding data privacy and ethical use of genomic information is facilitated through established IT security frameworks such as the conduct of an Institute-wide Security Risk Assessment and Audit. In Hong Kong, compliance with the Personal Data (Privacy) Ordinance is essential, and IT systems can help ensure that all data handling practices are in line with legal requirements.

Advanced Analytics and ML

The application of advanced analytics and ML in genomic medicine is growing. The use of new information technologies provides the necessary computational power and tools to analyse genomic data, allowing for the identification of patterns and correlations that can inform clinical practices. Algorithms can be developed to predict patient responses to specific therapies, enhancing the concept of personalised medicine. Integrating ML with genomic research can lead to more accurate diagnoses and tailored treatment plans, ultimately improving patient outcomes.

Clinical Decision-Making

Incorporating genomic information into clinical workflows necessitates robust IT support systems. Decision support systems powered by advanced IT solutions and systems can analyse genomic data alongside clinical information to provide healthcare professionals with evidence-based recommendations. For instance, clinicians can access patient-specific genomic information to determine the most effective treatment options, minimising adverse effects and maximising therapeutic efficacy.

This integration enhances the clinical decision-making process, ensuring that healthcare providers can deliver personalised healthcare based on individual genetic profiles.

Education and Training

As genomic medicine becomes a more integral part of healthcare, continuous education and training for healthcare professionals are necessary. Information technologies can enhance e-learning platforms and training programmes that focus on the latest developments in genomic medicine. By utilising online resources, webinars, and interactive platforms, healthcare professionals can stay updated on advancements in the field and integrate new knowledge into clinical practice.

From the above deliberations, it can be seen that continued investment in IT infrastructure and innovation, such as expanding data centre capacity to accommodate growing volume of genomic data and developing AI-driven analysis to enhance platform scalability and data processing speed, will further propel Hong Kong to the forefront of genomic medicine, ultimately benefiting patient care and public health.



2 | Collaborative Research Networks

Collaborative research networks are essential for the advancement of genomic medicine in Hong Kong, as they facilitate the exchange of knowledge, resources, and expertise across various stakeholders. These networks act as key enablers in the ways listed below.

Pooling Resources and Expertise

Collaborative networks allow institutions to share expensive equipment, technologies, and facilities, reducing costs and expanding access to advanced genomic tools and methodologies. By bringing together researchers from various disciplines, such as genomics, bioinformatics, clinical medicine, and public health, these networks foster interdisciplinary collaboration, leading to innovative solutions and comprehensive approaches to genomic research.

Accelerating Research and Innovation

Collaborative networks can secure funding for large-scale research initiatives, enabling ambitious projects that single institutions may not be able to undertake alone. This increases the pace of discovery and innovation in genomic medicine. Collaborative efforts enhance the speed of research through shared data, findings, and insights, leading to quicker advancements in understanding genetic conditions and developing new therapies.

Enhancing Clinical Applications

Partnerships between academic institutions and clinical settings enable the translation of research findings into clinical practice. This ensures that genomic advancements are rapidly applied in patient care, improving outcomes. Collaborative networks facilitate the recruitment of diverse patient populations for clinical trials, which is critical for the validation of genomic tests and treatments across different demographics.

Fostering International Collaboration

By connecting local researchers and institutions with international networks, Hong Kong can participate in global genomic projects, enhancing its knowledge base and contributing to worldwide advancements. Collaborating with international networks provides access to large genomic databases, allowing local researchers to compare findings and contribute to global studies, which is crucial for rare diseases and diverse genetic disorders.

Building a Knowledge Ecosystem

Collaborative networks can develop joint educational programmes and workshops that promote skills development in genomics among healthcare professionals and researchers, creating a knowledgeable workforce capable of driving advancements. Established researchers can mentor emerging scientists, fostering talent development and encouraging innovation within the fields of genomics and personalised medicine.

Engaging Patients and Communities

Collaborative networks can involve patient advocacy groups in research initiatives, ensuring that the needs and concerns of patients are considered. This engagement enhances the relevance and impact of genomic medicine. Networks that include community organisations can facilitate research that addresses local health disparities and conditions prevalent in Hong Kong, making genomic medicine more accessible and applicable to the population.

Strengthening Policy and Ethical Framework

Research networks can engage policymakers to develop supportive regulations and ethical guidelines surrounding genomic research and medicine, ensuring that advancements occur within a framework that protects patient rights. Networks can create strategies for public outreach and education, promoting understanding of genomic medicine and fostering community trust in genomic research.



3 | Investment in Genomic R&D

Investing in genomic R&D is crucial for advancing genomic medicine in Hong Kong. These investments facilitate innovation, improve healthcare outcomes, and position the region as a leader in the field. R&D investment serves as a key enabler by:

Fostering Innovation and Technological Advancement

Investments in genomic R&D provide access to the latest technologies, such as high-throughput sequencing, gene-editing technologies, and bioinformatics tools. These technologies enable researchers to conduct more comprehensive and sophisticated studies. Financial support can also lead to the creation of innovative therapies and diagnostic tools for genetically-based conditions, ultimately improving patient care.

Enhancing Research Capacity

Funding allows for the establishment and maintenance of state-of-the-art laboratories, research facilities, and genomic databases. A robust infrastructure is essential for conducting high-quality genomic research and analysis. Competitive funding and a vibrant research environment attract top-tier researchers and professionals from around the world, enhancing the expertise available in Hong Kong's genomic medicine landscape.

Facilitating Collaborative Research Initiatives

Investments can support collaborations between government, academia, and industry. These partnerships can lead to joint research projects, sharing of resources, and innovative approaches to tackle pressing health issues. Funding supports participation in global research initiatives, allowing Hong Kong institutions to contribute to and benefit from international advances in genomic science.



Supporting Clinical Applications

Investments in R&D enable the translation of research findings into clinical settings. This ensures that discoveries in the laboratory can quickly improve patient treatment and outcomes. Funding is critical for conducting clinical trials that validate new genomic tests and therapies, which can lead to their adoption in standard medical practice.

Improving Population Health

Targeted investments can support research focused on prevalent genetic diseases within Hong Kong's population, tailoring solutions to local health challenges. Funding can also enhance genomic initiatives aimed at population screening and preventative measures, ultimately improving health outcomes for the broader community.

Encouraging Private Sector Growth

Investments in genomic R&D can stimulate the growth of biotechnology and pharmaceutical companies in Hong Kong. This sector's expansion leads to job creation, economic growth, and commercial availability of genomic technologies. Financial backing supports the transition of research discoveries into viable medical products and services, ensuring that innovations reach the market and benefit patients.

Strengthening Educational Pathways

Funding can be directed towards scholarships, training initiatives, and educational programmes in genomics, helping to build a skilled workforce prepared to advance the field. Investments can also support interdisciplinary programmes combining genomics with other fields, such as data science and public health, leading to a holistic understanding of genomic medicine.

Establishing Ethical Frameworks

Investments can be directed towards research focused on the ethical implications of genomic medicine, ensuring that advancements are made in a socially responsible manner. Financial support for research on health policy and regulation can help shape a framework that governs the ethical use of genomic technologies, enhancing public trust.

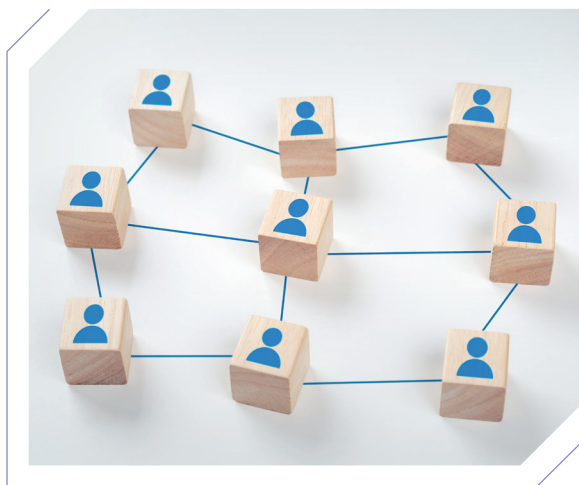
As the GBA region continues to prioritise and increase its investments in genomic research, it sets the stage for significant advancements in healthcare that will ultimately benefit patients and improve public health outcomes across the area.

4 | Skilled Workforce

A skilled workforce is a fundamental enabler of progress in genomic medicine, as it ensures that the necessary expertise and capabilities are available to leverage advancements in genomics effectively. Here is how a skilled workforce contributes to the development of genomic medicine in Hong Kong:

Driving Research and Innovation

A skilled workforce with specialised knowledge in genomic sequencing, bioinformatics, and molecular biology is crucial for conducting high-quality research and developing innovative technologies. Professionals trained in these areas are better equipped to push the boundaries of what is possible in genomic science. A diverse workforce that combines expertise from genetics, clinical medicine, data science, ethics, genetic counselling, and public health can foster interdisciplinary collaboration, leading to novel approaches in research and the development of genomic medicine applications.



Translating Research into Clinical Practice

Trained healthcare professionals, including geneticists, clinicians and laboratory technologists, are essential for translating genomic research findings into clinical applications. Their skills ensure that genomic tests and therapies are integrated effectively into patient care. A skilled workforce is necessary for interpreting genomic data, counselling patients about genetic risks, and managing treatment plans tailored to individual genetic profiles, thereby enhancing personalised medicine approaches.

Enhancing Education and Training

A strong workforce can contribute to the development of educational programmes and training initiatives that cultivate the next generation of genomics professionals. Investing in education ensures a continuous pipeline of skilled workers who can address the evolving challenges in the field. Experienced professionals can mentor and train newer generations of scientists and healthcare professionals, ensuring the transfer of knowledge and expertise vital for advancing genomic medicine.

Promoting Research and Clinical Collaboration

Skilled professionals often engage in collaborative research projects, sharing knowledge and resources across institutions. Their ability to communicate and work in interdisciplinary teams enhances innovation and accelerates research outcomes. A knowledgeable workforce can also liaise effectively with stakeholders, including researchers, clinicians, industry partners, and policymakers, to advocate for genomic initiatives and collaboratively address challenges in the field.



Ensuring Quality and Compliance

Skilled personnel are essential for ensuring that genomic research and clinical practices adhere to ethical guidelines and regulatory standards. Their understanding of compliance helps maintain the integrity of genomic studies and the protection of patient data. Trained laboratory personnel are important for implementing quality control measures in genomic testing, ensuring the accuracy and reliability of laboratory results that guide clinical decisions.

Fostering Public Engagement and Awareness

A skilled workforce, particularly those in healthcare and education, can play a key role in public outreach efforts, helping to demystify genomic medicine for the general population. They can educate patients and communities about the benefits and implications of genomic testing and personalised medicine. Professionals trained in genetic counselling can foster trust and transparency, addressing public concerns and improving community acceptance of genomic medicine.

Supporting Health Policy Development

A skilled workforce can contribute to the evidence base needed for informed health policy decisions regarding genomic medicine. Their insights can shape policies that promote research, access to genomic services, and equitable healthcare. Professionals with expertise in genomics can advocate for increased resources and funding for genomic initiatives, ensuring that the workforce is adequately supported to drive advancements in the field.

Boosting Regional Competitiveness

A highly skilled workforce enhances Hong Kong's attractiveness as a hub for genomic medicine, appealing to both local and international investors. The presence of trained professionals can stimulate growth in the biotechnology and pharmaceutical sectors, fostering economic development. A strong workforce enables Hong Kong to participate effectively in international collaborations, allowing for knowledge exchange and positioning the region as a leader in genomic research and clinical practices.

5 | Regulatory Frameworks and Ethical Guidelines

Regulatory frameworks and ethical guidelines are critical enablers in the advancement of genomic medicine in Hong Kong. They provide the necessary structure to ensure that genomic research and clinical practices are conducted responsibly, ethically, and in alignment with national and international standards. Here is how these frameworks function as key enablers:

Ensuring Patient Safety and Rights

Regulatory frameworks, such as data protection laws, ensure that patient genomic data is handled confidentially and securely. These foster trust in genomic services among patients, encouraging participation in research and clinical trials. Ethical guidelines outline the processes for obtaining informed consent from patients before genetic testing or participation in clinical studies. This ensures that individuals are fully aware of the implications of their participation, safeguarding their rights and autonomy.

Facilitating Responsible Research Practices

Regulations establish clear guidelines for research methodologies, ensuring that studies are conducted rigorously and transparently. This promotes the credibility and reproducibility of genomic research. Institutional Review Boards and Ethics Committees play a vital role in reviewing research proposals to assess their ethical implications. This oversight helps prevent potential misconduct and ensures that research adheres to ethical standards.

Promoting Public Trust and Engagement

Well-defined regulations and ethical guidelines foster transparency in genomic research and healthcare practices. This accountability builds public trust, which is essential for patient engagement and willingness to participate in genomic studies. Regulatory bodies can promote awareness of ethical considerations in genomic medicine, helping the public understand the importance of regulations in protecting their interests and health.



Guiding Innovation and Development

While regulations are essential for safety and ethics, they should also enable rather than stifle innovation. A well-designed regulatory framework encourages the development of new genomic technologies and therapies by providing clear pathways for approval and commercialisation. Regulatory environments that evolve in response to advancements in genomic science ensure that they remain relevant and conducive to innovation. This agility fosters an atmosphere where researchers can explore new ideas and technologies.

Enhancing Clinical Application of Genomics

Regulatory frameworks can establish clinical guidelines that govern how genomic testing should be incorporated into practice. This standardisation ensures that healthcare providers are equipped to utilise genomic data effectively and responsibly in patient care. Clear regulations regarding insurance coverage and reimbursement for genomic testing and treatments promote wider access to such services. This economic support is crucial for integrating genomic medicine into standard healthcare practices.

Encouraging Data Sharing and Collaboration

Regulations that encourage data sharing and collaboration play a crucial role in advancing genomic medicine by establishing a framework that facilitates innovation while ensuring privacy and ethical standards. They establish standards for interoperability and data formats, ensure privacy through data protection laws, promote transparency via open data initiatives, incentivise partnerships across sectors,

and incorporate safe harbour provisions to protect responsible data sharing and foster innovation. By involving stakeholders in the creation of regulations, these regulatory frameworks cultivate a collaborative culture that drives advancements in genomic medicine and related fields.

Supporting Education and Training

Regulatory frameworks can influence the introduction of ethical training and education in genomics for healthcare professionals. This ensures that practitioners understand the ethical implications of their work and are equipped to make informed decisions. Ongoing education in regulations and ethics related to genomic medicine ensures that healthcare providers stay informed about current practices and standards, enhancing the quality of patient care.

Addressing Public Health Concerns

Regulatory frameworks can address disparities in access to genomic medicine, ensuring that all population segments benefit from advancements in the field. This is particularly critical for addressing health inequities and promoting overall public health. Regulations can also facilitate the monitoring and evaluation of genomic medicine practices, ensuring that they align with public health goals and ethical standards, while allowing for timely corrections when necessary.

It should be noted that by establishing a robust and adaptive regulatory environment, Hong Kong can not only advance its genomic medicine initiatives but also ensure that these advancements are ethical, equitable, and beneficial for the entire population.

6 | Patient Engagement, Public Awareness and Education

Patient engagement, public awareness and education are vital enablers in the advancement of genomic medicine. They foster a well-informed populace that is receptive to genomic advancements, encouraging active participation in healthcare decisions and research. A detailed explanation of how these factors influence the progress of genomic medicine in Hong Kong is presented below.

Empowering Patients

When patients are educated about genomics, they can make informed choices regarding genetic testing and treatments. This empowerment leads to greater participation in their own healthcare and opens avenues for personalised medicine. Engaged patients are more likely to participate in clinical trials and research studies. Their involvement can provide valuable insights and improve the relevance of research to diverse populations, enhancing the quality of genomic studies.

Strengthening Collaborations with Healthcare Providers

Well-informed patients can communicate more effectively with healthcare providers, leading to more productive doctor-patient relationships and better healthcare outcomes. Engaged patients are likely to participate actively in shared decision-making processes regarding their care, leading to treatment plans that align with their preferences and values.

Encouraging Preventative Health Strategies

Public education about the benefits of genetic screening for hereditary diseases can promote early detection and preventive health measures. When patients understand the value of knowing their genetic risks, they are more likely to seek testing. Patients equipped with genomic information can make informed lifestyle choices that reduce their risk for certain conditions, enhancing public health outcomes overall.

Enhancing Health Literacy

Tailored programmes that focus on genomic concepts can improve health literacy among the general population. This understanding empowers individuals to engage actively with healthcare providers about their genomic health and related concerns. Incorporating genomic education into broader health curriculums in schools and universities helps create a knowledgeable future workforce capable of navigating and advancing genomic medicine.

Building Trust in Genomic Technologies

Public awareness initiatives that explain the benefits and limitations of genomic medicine help build trust. When individuals understand what genomic testing entails and its potential impacts on health, they are more likely to embrace these technologies. Initiatives focused on awareness can clarify common misconceptions about genetics and genomics, mitigating fears related to issues like privacy, discrimination, and ethical considerations.



Fostering a Supportive Environment for Innovation

Increased public awareness lays the groundwork for acceptance of genomic innovations, which is essential for their successful implementation. A well-informed community is more likely to support ongoing research and funding for genomic initiatives. Informed and engaged patients can advocate for the resources and policies needed to advance genomic medicine. This grassroots support can influence health policy and funding decisions.

Supporting Ethical Considerations

Public awareness initiatives can include discussions about the ethical implications of genomic medicine, fostering a culture of ethical inquiry among stakeholders. This involvement ensures that societal values and concerns are integrated into genomic practices. As patient and public engagement increases, feedback can be used to shape ethical guidelines and regulations that govern genomic medicine in Hong Kong, aligning practices with community expectations.

Utilising Technology for Engagement

Social media, mobile apps, and online forums provide platforms for disseminating information about genomic medicine and engaging with communities. These technologies can reach a broad audience quickly and effectively. Online tools can facilitate feedback from patients and the public, which can be used to inform ongoing education initiatives and responsiveness to community needs and concerns.

The key enablers discussed in this Chapter collectively contribute to the advancement of genomic medicine in Hong Kong. By fostering a collaborative environment, investing in technology and research, ensuring a skilled workforce, and engaging the public, the region can position itself as a leader in the field of genomic medicine, improving healthcare outcomes and paving the way for innovative treatment solutions.



Implementation and Monitoring

1 | Implementation

This Strategic Plan serves as the overarching document for guiding all aspects of HKGI's development and planning in the coming five years, including services, facilities, manpower, investments, business support and financial resources, etc. It provides the basis on which HKGI's executives develop the annual plan programme initiatives through a longer-term planning approach.

Strategies and key actions of the Strategic Plan will be implemented through the annual planning process steered by the Chief Executive Officer to ensure the Annual Plans align with the Strategic Plan. In this regard, the five Annual Plans covering the period 2025-26 to 2029-30 will be the specific action plans for implementing the Strategic Plan.

For planning purposes, it is expected that HKGI will further recruit about 60,000 to 70,000 samples for WGS in the next five years of operations.

2 | Monitoring

Monitoring of the implementation of the Strategic Plan will be led and overseen by the HKGI Board of Directors and its six functional committees. Specific action plans for implementing strategies of the Strategic Plan will be formulated for each of the five years 2025-26, 2026-27, 2027-28, 2028-29, and 2029-30 for consideration and approval of the Board towards the end of the previous fiscal year. A progress report on the implementation of these annual plan initiatives will be submitted to the Board after each fiscal year for Board members to monitor progress in the implementation of the strategies laid down in the Strategic Plan. Annual plan initiatives under the jurisdiction of individual Board committees and their implementation progress will be presented to the respective committees for consideration before submission to the Board. Moreover, the strategies and key actions set out in the Strategic Plan will be guided and monitored by the Health Bureau of the HKSAR Government.



Abbreviations

AI	Artificial Intelligence
ATCG	The codes representing the four different bases of DNA nucleotides (A – Adenine, T – Thymine, C – Cytosine and G – Guanine)
CGS	Clinical Genetic Service
CPD	Continuing Professional Development
DH	Department of Health
DNA	Deoxyribonucleic Acid
ESG	Environment, Social, and Governance Concept of Risk Management
GBA	Guangdong-Hong Kong-Macao Greater Bay Area
HA	Hospital Authority
HKGI	Hong Kong Genome Institute
HKGP	Hong Kong Genome Project
HKSAR	Hong Kong Special Administrative Region
HKU	University of Hong Kong
IP	Intellectual Property
IT	Information Technology
ML	Machine Learning
PHG	Public Health Genomics Foundation of the University of Cambridge
PRS	Polygenic Risk Scores
R&D	Research and Development
SRE	Synergistic Research Environment
WGS	Whole Genome Sequencing

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