

Macao Funding Scheme for Key R&D Projects 2019 Application Guideline for Projects of Precision Medicine

I. Background

Precision medicine, a cutting-edge direction in medical science and technology development, incorporates and integrates biotechnology and information technology in medical clinical practice. Strengthening the research blueprint for precision medicine in a systematic approach is crucial for accelerating the technological breakthrough for major disease prevention and control, establishing dominance in future medical and related industries, and building a new driving force for the development of China's life and health industry.

In conjunction with the relevant tasks of the *Outline of the National Program for Long- and Medium-Term Scientific and Technological Development (2006-2020)*, Macao plans to enhance its research capabilities in precision medicine, especially in areas where it has advantages such as cancer and rheumatism, based on its existing research and development. The research will play an important role in enhancing the comprehensive strengths of Macao's scientific and technological innovation, coordinating with relevant national disciplines and overall technological development needs, and building the life and health industry in Macao.

In order to give full play to Macao's advantages in precision medicine, further integrate existing resources, and improve research and development capabilities and industrialization level, the Macao Science and Technology Development Fund (FDCT) has sought the opinions of researchers in relevant fields in Macao and experts in Mainland China to come up with the city's key R&D plan for precision medicine. The plan intends to meet the needs of China and play the role of Macao in phases by constantly improving local level of research and development and industrialization in the field of artificial intelligence. It will help promote the moderate diversification of Macao's economy with technology innovations that target the status quo of local social, economic and technological development and demands, and contribute to the construction of the international innovation and technology hub in the Guangdong-Hong Kong-Macao Greater Bay Area, and contributes to building China into an innovation-driven country.

II. Overall Objectives

Starting from high-incidence and critical diseases in Macao, the scheme aims at supporting projects that seek to achieve the innovation chain of precision medicine research, establish a multi-level precision medicine knowledge base system and a safe and stable biomedical big data sharing platform to break through in clinical application techniques and biomedical big data analysis techniques of the new generation of

lifeomics.

III. Research Directions

This guideline focuses on two research directions, namely tumor and autoimmune disease research, for a new generation of clinical life science research technology development, large-scale population cohort research, and the integration, storage, utilization and sharing platform construction of precision medicine big data resources, with the principle of full chain planning and integrated implementation.

The implementation period for each direction is 3 years at maximum, and the total amount of grants funded by the FDCT for these two directions is MOP 30 million.

1. Tumor

Content of Research: Establishing a support platform for tumor research based on multi-omics and big data technology platforms, sample libraries, etc.; establishing and improving organoid technology platform system for tumor precision medicine research to provide key technical support for new drug discovery and drug screening; conducting research on drug resistance mechanisms; conducting molecular diagnostics and precision drug research for high-risk tumors in Macao, and identifying new combinations of 3-5 existing anti-tumor drugs and treatment systems.

Description: Projects with good research foundation and highly

integratable resources in the early stage will be prioritized, especially disease cohorts with accurate phenotype and related data established. A professional clinical phenotype research team, dedicated data and sample management sites and a full-time staff team are required.

2. Autoimmune Diseases

Content of Research: Focusing on the characteristics of high-incidence autoimmune diseases in Macao such as rheumatism to screen and develop biomarkers for new diseases and treatments for achieving accurate diagnosis and treatment of autoimmune diseases and conducting research on drug resistance mechanisms; R&D and clinical research of 1-2 candidate drugs based on new targets.

Description: Projects with good research foundation and highly integratable resources in the early stage will be prioritized, especially disease cohorts with accurate phenotype and related data established. A professional clinical phenotype research team, dedicated data and sample management sites and a full-time staff team are required.

IV. Application Requirements

The applicant entities should submit the application in the form of projects according to the content of research in one of the directions listed in this guideline. Any project with subject(s) under it should be declared as a whole that covers all the evaluation criteria. Unless otherwise stated, there should be no more than three subjects under each project. The

leading entity of the project must be a Macao institution. Entities outside Macao are encouraged to participate in the form of cooperation. Each project should contain no more than 6 entities.

The maximum amount that can be applied for by each project is MOP 20 million.

V. Experts Involved in Guideline Preparation

Wang Xiaoning Director/Professor, Institute of Geriatrics, the General
Hospital of the People's Liberation Army

Li Yixue Researcher, Shanghai Institutes for Biological
Sciences, Chinese Academy of Sciences

Zeng Changqing Researcher, Beijing Institute of Genomics, Chinese
Academy of Sciences

Wang Luhua Associate Dean/Chief Physician, Cancer Hospital,
Chinese Academy of Medical Sciences

Guo Hongbo Associate Dean/Professor, Zhujiang Hospital of
Southern Medical University