Macao Funding Scheme for Key R & D Projects 2021

Application Guideline for Projects of Precision Medicine

I. Background

At the forefront of the development of medical technology, precision medicine is the convergence and application of biotechnology and information technology in medical clinical practice. The systematic strengthening of the research layout of precision medicine is of vital importance for accelerating technological breakthroughs in the prevention and control of major diseases, taking up the dominant role in the development of future medicine and related industries, and creating a new driving force for the development of the life and health industry. The Mainland has also elaborated relevant plans in the National Medium-and-long-term Program for Scientific and Technological Development Outline (2021-2035) and the Healthy China 2030 initiative.

The SAR government has attached great importance to the development of the big health industry, among which precision medicine is an area where Macao owns a good foundation and certain advantages. Carrying out key research on important and complex diseases such as tumors or metabolic diseases is of great significance for promoting the development of Macao's life and health technology and the big health industry, as well as enhancing Macao's comprehensive strength in scientific and technological innovation.

In order to fully leverage Macao's advantages in the field of precision medicine, further integrate existing advantaged resources and enhance R&D capabilities and industrialization levels, the Science and Technology Development Fund (FDCT) has, upon seeking opinions from researchers of relevant fields in Macao and expertise from experts in the Mainland, proposed a key R & D project of precision medicine in Macao that aims to: bring Macao's advantages into full play in a planned and step-by-step manner to accommodate the needs of our country; cater to the needs of Macao's social, economic and technologcial development; promote the moderate diversification of Macao's economy through technological innovations in support of the deve International Innovation and Technology Hub in the Guangdong-Hong Kong-Macao Greater Bay Area, thereby contributing to China's development into an innovative country.

II. Overall Objectives

Taking the common, major and complicated diseases in Macao as the entry point, to collaborate in making new progress on the entire innovation chain of precision medicine research, to establish a multi-level knowledge base system for precision medicine and a safe, stable and operable sharing platform for biomedical big data, to break through the new generation the technologies of biomics clinical application and biomedical big data analysis, to establish a new treatment plan with equal emphasis on diagnosis and treatment to achieve accuracy in both aspects.

III. Research Fields

Field 1: Accurate diagnosis, early warning and screening of major diseases

To carry out population-based (cohort) multi-omics analysis of major and complicated diseases such as tumors or metabolic diseases, as well as individualized early warnings, screenings and diagnosis.

Performance Indicators: Establishment of a major disease diagnosis database and a multi-omics database, individualized health records, comprehensive risk assessments and early warning programs for diseases with a scale of more than 10,000 people, mainly consisting of residents of the Guangdong-Hong Kong-Macao Greater Bay Area; discovery of 5-6 biomarkers associated with tumors, metabolic or other diseases, design and creation of 3-5 molecular probes and 1 or more kits (Applications are to be submitted to the medical products administration department in China, the United States or Europe).

Field 2: Enhancement of the precision of clinical treatment plans for major diseases

To carry out clinical research on individualized or multi-omics information for patients suffering from major and complicated diseases such as tumors or metabolic diseases; to formulate or improve new individualized treatment plans.

Performance Indicators: Improvement of the efficacy of the individualized treatment, at least 20% higher compared to that of the traditional one; discovery of 2-3 biomarkers for disease diagnosis or new treatment targets, and validation in the cohort dataset consisting of more than 1,000 people, as well as design and creation 1 or more kits (Applications are to be submitted to the medical products administration department in China, the United States or Europe).

IV. Application Requirements

The applying entity shall file the application in the form of a project

in one of the research topics in any of the fields listed in this Guideline. Each project should be submitted for the application as a whole, and in principle, all the required performance indicators must be covered. Unless otherwise specified, a project should include no more than 3 topics. The leading entity of the project must be a local one but cooperation with entities from outside Macao are also welcome. Every project should be undertaken by no more than 6 entities. Every project leader or topic leader(s) must be qualified to work full-time in Macao.

The implementation period of the project is 3 years. The maximum application amount for each project MOP 10 million.

V. Experts Involved in the Formulation of the Guideline

He Fuchu	Academician, Chinese Academy of Engineering
Wang Xiaoning	Professor, Chinese PLA General Hospital
Li Yixue	Researcher, Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences
Hui Rutai	Researcher, Fuwai Hospital
Zeng Changqing	Researcher, Beijing Institute of Genomics, Chinese Academy of Sciences