International Agency for Research on Cancer

World Health Organization

Governing Council **GC/61/11**
Sixty-first Session 21/03/2019

Lyon, 16–17 May 2019
Auditorium

REQUEST FOR SUPPORT FROM THE GOVERNING COUNCIL SPECIAL FUND

1. An inter-disciplinary research approach is embedded within the IARC Medium-Term Strategy (2016–2020), with close integration of laboratory sciences, biostatistics, bioinformatics and epidemiology. This strategy requires high quality laboratories and availability of core items of state-of-the-art scientific equipment. It also requires support to research platforms for epidemiological research.

2. In order to ensure continued high quality of IARC's research platforms, two pieces of equipment have been identified as necessary: a) to support DNA extraction in the IARC Biobank; and b) to support the analysis of metabolomics data in the Biomarkers Group. Covering the cost of new equipment from the regular budget has not always been feasible in recent years and obtaining designated funds through competitive grant applications is difficult given the limited number of such opportunities open to the Agency as an international organization.

3. The Agency has developed a unique collaborative project with the National Cancer Center, Republic of Korea (NCC) to investigate the prevention of gastric cancer by *Helicobacter pylori (H. pylori)* eradication in a randomized clinical trial (entitled HELPER). This project also provides a unique set of data and associated biospecimens. The HELPER study has been mainly funded by the NCC to date. The project is now reaching a critical phase and resources are requested from the Governing Council Special Fund (GCSF) to complement the support from the NCC.

4. The Director presented the request for an allocation of €500 000 from the GCSF account for the purchase of scientific equipment (€300 000) and for the investment in the HELPER study (€200 000) to the Scientific Council for its consideration in January 2019 (see Document SC/55/4).

A. Purchase of Scientific Equipment
Equipment for the DNA extraction platform

5. The IARC Biobank is essential to the Agency's mission of coordinating and conducting research on cancer prevention by housing biospecimens from large cohort studies, and when necessary, processing and re-distributing the collected material and associated data.

6. Annually, the IARC Biobank processes over 100 000 samples and performs 4 000–6 000 DNA extractions with two automated DNA extraction systems. However, these systems are no longer supported by the manufacturer as of 1 January 2019, putting at risk the whole DNA extraction activity. Hence, there is an urgent need to replace the current DNA extraction systems.

7. Most requests for DNA extraction made to the IARC Biobank are 'non-standard' and require customized prior treatments of tissue. Additionally, the profile of the requests tends to be of pilot

size with around 30 small projects and 1 or 2 large studies per year, with demanding turnaround times. For this reason, these requests cannot be easily outsourced.

8. The expected life-span of this equipment is a minimum of ten years at full operational capacity. Based on the current price per DNA sample extraction set by the IARC biobank (€6.50), the cost of the investment is expected to be recovered within the set horizon of a decade of use, compatible with the life expectancy of such an equipment.

9. The acquisition of this piece of equipment will meet the needs of multiple groups at IARC (GEP, ICE, NEP, ENV, and MMB) and of IARC collaborators for DNA extracts delivered under tight deadlines.

10. Further to the above request, a gel imager is needed for routine verification of DNA integrity in agarose gels, to complement a current imager servicing two communal laboratory areas, and reduce risks of contamination during transfer of gels across different laboratory spaces.

11. The annual maintenance costs of the requested equipment will be covered by the IARC regular budget as well as from extrabudgetary sources including invoicing for the Biobank services.

Software and databases for metabolomics

12. A strong platform with high-throughput based on mass spectrometry technology has been established at IARC to run metabolomic experiments and explore biochemical mechanisms leading to cancer. Several tens of thousands blood and urine samples have been successfully analysed over the last five years on this platform.

13. The highly complex data collected in metabolomic experiments require sophisticated software and large spectral databases for metabolite annotation and data interpretation. Major investments have been made to support development of computing biology at IARC in 2013 and 2017. A bioinformatician was recruited in 2018 in the Biomarkers Group (BMA) to support the analysis of metabolomic data generated on the BMA platform.

14. Major progress has been made over the last five years in the development of bioinformatics tools and there is a need today to upgrade tools currently used on the platform. This will be essential for the IARC platform, to conduct state-of-the-art metabolomic studies in an increasingly competitive field of research.

15. The platform currently lacks the software (Compound Discoverer) to support high throughput processing of metabolomic data on one of the high-resolution mass spectrometer (ThermoFisher Scientific QExactive) that has been developed by the manufacturer after the acquisition of this instrument. This software is needed today to analyse samples from a growing number of metabolomic studies.

16. In addition to the acquisition of this new piece of software, upgrading the existing software and databases for metabolomics is also needed. This applies to one high-resolution mass spectrometer (Agilent QTof) and two low-resolution mass spectrometers (AB SCIEX QTRAP and Triple Quad) purchased between 2011 and 2015. This new software will make data processing more efficient and will increase laboratory productivity.

B. Investment in the HELPER study

17. Gastric cancer kills nearly 800 000 people every year but there is currently no proven preventive measures. In response to the lack of definitive answer as to reducing gastric cancer risk, IARC and the Korean NCC initiated in 2014 a large randomized controlled clinical trial (HELPER) to investigate the effect of eradication of *H. pylori*, the major risk factor, with antimicrobial therapy on gastric cancer.

18. This study is currently the only trial which is based on a regularly endoscoped population as part of the Korean National Cancer Screening Program (NCSP). Endoscopic follow-ups will therefore be possible during the study duration of 10 years, providing essential clinical information on gastric cancer etiology and natural history.

19. HELPER has been taking place within the NCSP in 12 designated major university hospitals and seven local divisions of the Korean Association of Health Promotion (KAHP) across the Republic of Korea. The recruitment target is 11 000 people with randomization of 5 000 *H. pylori* positive participants (1:1 male to female ratio) to a quadruple *H. pylori* treatment or identical placebo pills.

20. Currently 9 418 participants have been enrolled and 4 199 have been randomized (as of 22 February 2019) either for treatment or placebo after *H. pylori* testing despite the number of institutions involved in this study, reflecting extremely challenging recruitment so far.

21. This number is not fully sufficient to guarantee statistical power in the time frame originally proposed. Longer follow-up is not a good option due to potential contamination of the placebo group (*H. pylori* treatment outside the study) and the relative urgency to obtain an answer and implement public health interventions to reduce burden of gastric cancer worldwide.

22. The HELPER study has been so far almost exclusively funded by the Korean NCC from 2014 to 2018 (totalling USD 2.4 million) and funding was recently approved by NCC to cover recruitment activities for six more months only (first half of 2019) due to their limited intramural grants.

23. Extra funds are required to assure success of this study as well as to maximize the impact of the vast efforts already put into this unique study. Extra funds requested to GCSF will ensure financing additional six months of study operation to reach at least 5 000 randomized participants in 2019, the target number needed to assure adequate statistical power.

24. The Scientific Council endorsed the funding request to accelerate the HELPER study recruitment. The Scientific Council mentioned that without this extra funding from IARC the study could be jeopardized, because of limited statistical power and possible contamination of the placebo group. Funds are essential to ensure that the value and informativeness of this major trial are realized.

25. The Scientific Council was requested to advise the Director and the Governing Council on the proposed request to use funds from the Governing Council Special Fund to purchase the scientific equipment listed below and to support the HELPER study.

Requested budget

	Approximate cost (€)
Equipment for the DNA extraction platform	
High-throughput DNA extraction system	224 000
Gel imager	20 000
Sub-total	244 000
Software and databases for metabolomics	
Compound Discoverer software	20 500
Software upgrades	35 500
Sub-total	56 000
Investment in the HELPER study	
Staff cost for participating centres	100 000
Research activities and operational costs for participating centres	55 000
Materials and equipment cost	15 000
Monitoring visits	30 000
Sub-total	200 000
Total requested budget	**500 000**

26. The Scientific Council strongly supported this request and the Director would therefore like to seek the approval of the Governing Council at its 61st Session in May 2019 to use €500 000 from the GCSF to purchase equipment and to support the HELPER study.

27. For the information of the Council, as at 1 January 2019, the GCSF account had an opening fund balance of €10.3 million, of which 52% have been committed. Details on the projection of the GCSF account from 2018 to 2019 are provided in Document GC/61/Inf.Doc. No.2.