ICGC ARGO Membership Guidelines

The launch of ICGC ARGO presents an opportunity for countries around the world to combine their efforts to reduce the global burden of cancer, and for all sectors to contribute through shared knowledge. The support structures for ICGC is both extensive and amenable to adaptation to suit the specific needs of ICGC ARGO and are underpinned by an unprecedented level of commitment from clinical and basic research communities, as well as an impressive cadre of international supporters.

Membership and Associate Membership of ICGC ARGO offers:

1. *Standardised, uniform and evolving genomic analyses – built on the foundation of ICGC 25K Genomes and the PCAWG (Pan Cancer Analysis of Whole Genomes) Programs.*
2. *Data coordination and distribution under appropriate ethical and legal frameworks.*
3. *Equitable and fair data sharing arrangements.*
4. *Opportunities for pooled data analyses.*
5. *Network of NGS laboratory partnerships facilitated through ICGC ARGO for clinical consortia to enable advanced molecular analyses.*
6. *Knowledge exchange through the ICGC ARGO community with regular meetings, teleconferences, and opportunities to contribute to leadership and Working Groups.*
7. *Support for program development (open to non-members as well).*

ICGC has laid the foundations and framework to enable the translation of a wide range of 'omics data into tangible clinical benefit for cancer patients. It is only through initiatives such as ICGC ARGO that the mountains of genomic data being generated internationally can be applied to generate novel insights that will underpin advances in the clinical management of people with cancer. ICGC ARGO is the next step for international large-scale efforts and with appropriate governance, will link the wealth of genomic data already amassed with clinical and health information, including lifestyle, patient history, response to therapies and cancer diagnostic data for the international community. ICGC ARGO will build on the strong foundation of previous ICGC programs, extending the network into the arena of clinical medicine and drug development to expand the expertise and learnings of ICGC into healthcare.

To achieve ICGC ARGO goals, the acquisition of accompanying high quality clinical information is of utmost importance.

The sources of cohorts of patients that would constitute ICGC ARGO programs may include:

- Biospecimens from participants enrolled in active clinical trials.
- Analyses of banked samples from past clinical trials.
- Analyses of samples from clinically well-annotated cohorts that satisfy ICGC ARGO clinical data requirements.
- Longitudinal cohort studies.
- Autopsy studies with detailed clinical data.
- Population-based studies with detailed clinical and lifestyle data.
- Real World Data acquired through health systems.

Membership Guidelines

1. ICGC ARGO Membership is based on a Program of work and may contain any number of specific "cohorts or projects" within that umbrella. It is encouraged, that when developing these programmes that the ICGC ARGO Management Committee is consulted for more detailed guidance. Each program will be reviewed by the ICGC ARGO Management Committee to facilitate an interactive process. ICGC ARGO welcomes membership from all organisations, including industry partners. Multiple mechanisms and categories of membership to provide opportunities to contribute to ICGC ARGO have been developed and include:

    a. Full Membership
    b. Associate Membership
    c. ICGC ARGO Citizens
    d. ICGC ARGO Participants

    Each category of membership is described below, and additional mechanisms will be developed over time as the need arises for those that align with the goals of ARGO.

2. An ICGC ARGO Program would generally address a specific cancer type, or a clinically relevant grouping of cancer. Examples include cancers of the Head and Neck, which includes many cancer types and is a reflection of the clinical care pathways that are in place to manage patients. This may include specific clinical trial indications. Cohorts may be a reflection of centralised healthcare facilities such as for paediatric cancer. Broad-based general cancer molecular profiling platforms may also be members, with provision of a proportionate breakdown of cancer types expected.

3. An ICGC ARGO Program must address a key clinical and/or biological question of relevance to the specific cancer type on which the program is focused. This will be different for different cancer types and will impact on sample sizes and analyses performed for individual projects within a programme.

4. Clinical annotation is of utmost importance. Whilst clinical trial data is the Gold Standard, clinically well-annotated cohorts of patients that include the mandatory ICGC ARGO clinical dataset are eligible.

5. The goal of ICGC ARGO is to advance discovery, as a consequence, nucleic acid analysis must go significantly beyond the assessment of selected gene sets using panels such as those currently performed in most clinical diagnostic laboratories. Cognizant of the tractability of biospecimen quantity, quality and fixation methods, minimum requirements are either one of the approaches detailed in (a) below; complemented with methodologies listed in (b). The exact composition per project will be defined through discussion with the ICGC ARGO Management Committee, however, each case **should have a transcriptome** to allow broad pooled data analyses, and a discovery genome sequencing approach. WGS is ideal, however is not often tractable in clinical trials, and

whole exome or a "Clinical Genome" that captures attributes beyond point mutations in genes that are clinically relevant may be used.

a) Expected

- **ICGC Clinical Cancer Genome** – an assay that captures equivalent data readouts to a WGS. This approach is vital for solid tumours, as input material may be intractable for WGS, or WES may be less informative for a particular therapeutic strategy. Most clinical trial biospecimens are fixed in formalin or similar fixatives in uncontrolled environments, and up to 50% have low epithelial cellularity which impacts on WGS in particular. This would make over 95% of clinical trials and eligible population-based cohorts unable to be used.

  The ICGC Clinical Cancer Genome was developed in order to satisfy the need for an NGS assay that was feasible, provided readouts for patient allocation for clinical trials, but also for discovery of novel biomarkers and targets that we know are relevant to cancer. The ICGC Clinical Cancer Genome was developed based on data from the ICGC 25K initiative, PCAWG and published information and extends beyond the gene level, and captures >90% of the discoverable space relevant to cancer. The importance of a common assay is that it permits comparison across all ARGO data for genomic aberrations. The ICGC Clinical Cancer Genome goes well-beyond current diagnostic "panels" and interrogates 95% of features relevant to therapeutic development at high accuracy. It is encouraged that all contributors perform this assay as a baseline and complement this further with additional measures. ***AND/(OR)****

- **Whole Genome Sequencing** ***OR***

- **Whole Exome Sequencing**

b) Expected

- **Whole Transcriptome Sequencing**

c) Encouraged

- **Epigenetic Analyses**

- **Additional analyses** eg: proteomic, metabolomic … are encouraged.

*It is accepted that this may not be possible with established strategies, however, it is encouraged based on the scientific rationale of comparisons across ARGO that newer programmes perform this assay, and where possible, established programmes aim to do so to facilitate standardization.

6. *Membership of ICGC ARGO*

There are no restrictions with regard to Members as to their institution, jurisdiction, or corporate status.

Full Membership: Financial commitment of $10 million US equivalent per program. There are no restrictions as to how a program comes together, or the timing of the investment; however, the investment must be current and active for a minimum of 3 years from the time of membership. The financial commitment may incorporate the cost of operations (salaries, consumables, etc.), infrastructure or material contributions such as samples, but excluding overhead/indirect costs and equipment.

Essential to membership is a commitment and a plan for delivery or access of format and content compliant data to the ICGC ARGO DCC and/or tangible mechanism for data sharing as per ICGC procedures and policies. A clear formal structure and governance mechanism for consortia that come together to join ICGC ARGO needs to be articulated and responsible leads identified. Established consortia, networks and co-operative groups, along with projects or jurisdictions with previously developed ICGC infrastructure are ideally positioned to become ICGC ARGO Members.

It is anticipated that the number of donors committed by a program will be a minimum or 2000 depending on the proposed assays and analyses, and will be arrived at in discussion with the ICGC ARGO Management Committee on a project-by-project basis if required.

Associate Membership: Emerging and smaller scale programs may become Associate Members. Associate members are defined as those that have a commitment equivalent to members but aim to contribute between 500 and 2000 donors with the same obligations as full members with regard to data sharing and an investment of $5 million with the same conditions as for full members. Again, specific project related parameters can be defined in discussion with the ICGC ARGO Management Committee.

Associate and Full Membership will be considered, on a case by case basis, for groups willing to contribute $5 or $10 million respectively in in-kind services, including, but not limited to genome sequencing, clinical data harmonisation, data analysis, compute capacity. Expressions of Interest are encouraged as the first step to membership with accompanying discussion with ARGO members and leadership.

ARGO Citizens: Those organisations or companies that do not meet the eligibility criteria to become Full or Associate Members but wish to contribute to and participate in ARGO in the spirit of its Mission, can become ARGO Citizens. This category is applicable to those with smaller cohorts of patients, or whom are applying for membership based on contribution of ICGC 25k cohorts as legacy data. Citizens may contribute to and participate in broad ARGO activities, similar to Members, but with external party privileges with regard to prospective data access. Citizen may choose how their data is shared with regard to the timing of sharing as described in point 7 below.

ARGO Participants: Individuals may contribute their own data to ICGC ARGO and become ARGO Participants. As molecular testing of cancer becomes more commonplace, individuals may share their data through the ICGC.

7. Data access is tiered, and aimed not to disadvantage Members or Associate Member Data producers, with a framework that encourages data sharing, yet provides data generators with sufficient time to perform analyses:

- Up to 12 months from completion of standardised analyses: Access to Programme submitting data only.
- 12 months: Access to Full Members.
- 18 months: Access to Associate Members.
- 24 months: Accessible by external parties.

***Legacy Data Sets*:** A number of existing ICGC 25k data sets will be re-purposed and included in ICGC-ARGO in its initial stages to form a legacy data set. This involves the re-processing of high-quality genome data sets and submission of additional ICGC ARGO required clinical data elements. After 6 months from completion of standardised analyses and quality control legacy data will be made available to the public. Prior to the 6-month time period legacy data contributors with *ARGO Citizens Membership* will have privileged access to legacy data sets provided they have a current DACO approval in place. Data contributors may also choose to make the data available earlier than this stated time frame.

9. **Industry Partners:** Industry partners are welcome to be part of ICGC ARGO. If organisations wish to contribute data, then they may also become ICGC Members as detailed above. For prospective partners that will not contribute data, in-kind contributions are welcomed for discussion. Please refer to our Framework for Engagement with Industry Guidelines.