Letter of intent

File number 175.2021.001
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Applicant

Title
The Dutch Comprehensive Childhood Cancer Commons (NL-4C): a national resource for tackling pediatric cancer worldwide

Abstract
Despite advances in cure rates for children with cancer, one out of four children still die from this disease, making pediatric cancer the leading cause of disease-related death among children in high income countries. Understanding the genetic makeup of pediatric cancer is crucial for improving diagnosis, prognosis and treatment outcome. Compared to adult cancers, pediatric cancers are rare, thereby making it challenging to collect large cohorts and provide harmonized data resources for research purposes. In The Netherlands, almost all pediatric cancer care and research is concentrated in a single national institute, the Princess Máxima Center for Pediatric Oncology. This is the world’s first single national center for pediatric oncology and with approximately 600 new patients and 150 relapse cases annually, this institute comprises the largest childhood cancer institute in Europe. This also provides a unique opportunity to contribute to the world-wide effort in understanding and resolving pediatric cancer by systematically generating a large and uniform childhood cancer data resource.

We would like to express our intent to setup a unique data resource of childhood childhood cancer genomes. We have already initiated a nation-wide childhood cancer biobank that now includes data and material from more than 2,000 patients and have also started collecting whole-exome sequencing, whole-genome sequencing and RNA-seq data in a systematic, institute-wide fashion. Here, we intent to setup a data collection of more than 4,000 pediatric cancer genomes with high quality, structured baseline and deep clinical oncology annotations; the Dutch Comprehensive Childhood Cancer Commons (NL-4C). Aligning this effort within the innovative therapies for children with cancer (ITCC) consortium that the Máxima is a leading partner in, is expected to result in a federated and harmonized data resource of close to 10,000 childhood cancer genomes in Europe by 2027. Using standardized computational analysis pipelines for whole-exome, whole-genome and RNA-seq data, the proposed data collection will be crucial for obtaining insights into cancer biology, identifying therapeutic targets and identifying clinically distinct tumor subtypes.

The NL-4C is an institute-wide effort and involves many different research groups, clinicians and staff. Most of the coordination, implementation and data curation will be done by Dr. Tops (head diagnostics lab), Dr. van Tinteren (scientific head trial and data center) and Dr. Kemmeren (principal investigator, head Big Data Core). International collaboration and coordination will be pursued amongst others with the groups of Dr. Stefan Pfister (DKFZ, Heidelberg, Germany), Dr. Jinghui Zhang (St Jude, Memphis, USA) and Dr. Resnik (Children's hospital Philadelphia, USA) and aligned with already existing international consortia such as the ITCC.

The NL-4C proposal falls within the NWO domain “ZonMW” and fits with the discipline codes 23.30.00 (Medical specialisms), 21.10.00 (Bioinformatics) and 21.40.00 (Genetics). While the NL4C will provide a unique resource, there are several clusters on the roadmap GWI that provide a natural habitat for collaboration and alignment of infrastructural needs. These include Health-Ri, Personal Health Train, BBMRI.nl, Elixir-NL and X-omics.

Organisation responsible for the application

Confirm letter of intent
With submitting this form via ISAAC I declare to have filled in this form completely and truthfully.

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