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Position Paper

Cancer Core Europe: A European cancer research alliance realizing a research infrastructure with critical mass and programmatic approach to cure cancer in the 21st century

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Abstract Translational cancer research covers the whole cancer research continuum from basic to preclinical to early clinical, late clinical and outcomes research. Basic-preclinical research is the "engine" for early clinical research bridging the early translational research gap. Cancer Core Europe has been created to construct a sustainable, high level, shared research infrastructure platform with research collaborations and taskforces (data sharing, clinical trials, genomics, immunotherapy, imaging, legal & ethical problems, and education & training) having representatives from all seven member centres, in a controlled expansion model. In parallel, a consortium of ten cancer prevention centres was established, Cancer Prevention Europe, to support the complete cancer prevention research continuum. Cancer Core

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Europe is launching at present the Basket of Baskets trial, which is the largest personalized cancer medicine trial effort in Europe. At present, Cancer Core Europe and Cancer Prevention Europe are in the process of integrating therapeutics and prevention strategies to address in partnership the increasing cancer problem. By offering innovative approaches for cancer research, links to the healthcare systems, development of quality-assured multidisciplinary cancer care, as well as the assessment of long-term outcomes, the infrastructure is expected to serve as a hub to connect with other centres in Europe as well as on other continents. In this manner Cancer Core Europe and Cancer Prevention Europe prepare to tackle the "Mission on Cancer", with infrastructure and proofs of concept for therapeutics and prevention, research for assessment of effectiveness, health economics and added value for patients and the healthcare systems.

1. Cancer is a growing health and economic problem

It is estimated that in 2018, there will be 3.91 million new cases of cancer (excluding non-melanoma skin cancer) and 1.93 million deaths from cancer in Europe as a whole. In the EU-28 alone, the estimated number of new cases of cancer is approximately 1.6 million in males and 1.4 million in females, with 790,000 men and 620,000 women dying from the disease in the same year [1]. The most common cancers are breast, colorectal, lung and prostate, which combined amount to half of the overall cancer types. Breast, colorectal and lung cancers are the most common cancer-related deaths followed by pancreatic cancer [1]. The incidence of cancer is estimated to increase by >10% due to population ageing by 2035. Because there is an increase in the long-term survival, it is considered that more than 12 million European citizens are survivors who need professional and social support and a continuous research effort to reduce long-term effects of treatments and avoid secondary cancers. The economic cost of cancer in the EU countries was calculated to be €126 billion in 2009 [2], and the spending on cancer drugs increased from €7.6 billion in 2005 to €19.1 billion in 2014 [3] because more and more patients were better treated but at a very high cost. Comprehensive approaches to these various cancer diseases therefore are needed in all fields, from cancer prevention to precision care, from basic research to clinical trials and cohort surveys and including the help from mathematics, informatics and social sciences. The patient contribution to research and treatment decisions are also mandatory to change the vision of cancer prevention and cure.

2. Historical background

Developing strategies to tackle the increasing challenge posed by cancer has been a primary focus during the last decades, and it has become clear that innovating both in prevention and therapeutics will be essential to address the problem. Toward this end, the former Commissioner Philippe Busquin initiated in 2005 (FP6) the 'EUROCAN+Plus' project to address the coordination and fragmentation of European cancer research. An important conclusion from the project was the proposal to create a European platform of cancer research centres to structure translational cancer research and achieve the necessary critical mass of expertise, resources and patients to break new grounds in cancer research. The project also highlighted the importance of bridging cancer research and the healthcare by engaging Comprehensive Cancer Centers (CCCs) and deemed it necessary to cover the whole cancer research continuum (basic, preclinical, clinical and outcomes research) to focus on patients' problems.

The EurocanPlatform project, funded in FP7 (2011-17), developed strategies to stimulate translational cancer research collaboration among centres, and a central outcome of the project was the creation of Cancer Core Europe in 2014, which is now a legal organisation linking seven leading European Comprehensive Cancer Centres [4]. These include the Gustave Roussy Cancer Campus Grand Paris; Cambridge Cancer Center, Cambridge; the Netherlands Cancer Institute, Amsterdam; the Karolinska Institutet, Stockholm; the Vall d'Hebron Institute of Oncology, Barcelona; the German Center for Cancer Research and the National Centre for Tumour Diseases, Heidelberg and the Istituto Nazionale dei Tumori, Milano.

In parallel, a consortium of ten cancer prevention centres was established (Cancer Prevention Europe) [5] to support the complete cancer prevention research continuum.

3. The cancer research continuum

Translational cancer research covers the whole cancer research continuum from basic/preclinical to early clinical, late clinical and outcomes research. Basic/preclinical research is the 'engine' for early clinical research