

EU-LIFE recommendations to the Cancer Mission draft

EU-LIFE, the alliance of leading independent research institutes in the life sciences, hereby presents its reaction to the [Cancer mission draft](#).

EU-LIFE welcomes the draft cancer mission, supports the goal to save 3 million lives by 2030 and the work by the Cancer Mission Board.

Regarding concrete recommendations on the cancer draft plan **EU-LIFE supports the initiative taken by the European Academy of Cancer Sciences (EACS)**, in consultation with many stakeholders, to draft a more detailed cancer research plan to assist the Cancer Mission Board in finalising the Cancer Mission outline¹.

In addition, we have consulted internally with our community of researchers and professionals in the cancer field working across 15 European countries and hereby we provide the feedback below.

EU-LIFE recommendations

- We are concerned that implementation of a Europe-wide technology-based platform to understand cancer, as described in Understanding cancer - UNCAN platform - Recommendation 1, is possibly (a) too simplistic, and (b) incompatible with the complexity of tumours within their environments. Instead of a centralized approach, we propose a federated one, leveraging on existing research and supporting novel discovery-based research to understand cancer complexity and heterogeneity.
- We are glad to see that 8 out of the 13 recommendations highlight the importance of R&I in prevention, diagnosis, treatment, improvement of quality of life of cancer patients. However, considering that most of the #13 recommendations strongly depend on insights gained from studies on the molecular mechanisms underlying cancer initiation and early dissemination - and given that early diagnosis will similarly rely on findings from research - we call for higher emphasis **on high-risk / high gain Collaborative Research** and on bottom-up approaches, especially – but not only - in Recommended Actions 1, 2 and 5.
- We support emphasis on **genomic approaches** (Recommendations 2, 4 and 5). However, cancer is not uniquely driven by genetics, and lifestyle and environment play important roles. Genomic approaches should be complemented with studies that emphasise **understanding underlying molecular and cellular mechanisms of disease and exploiting them towards treatment**, including:
 - Cancer cell dormancy and its implications in cancer recurrence/relapse and metastasis.
 - Tumour genomic heterogeneity and tumour evolution including visualisation of early lesions, identification of progenitor cells and specific early biomarkers, validation of new early biomarkers in mouse models & clinical samples. To this end, we recommend that specific calls would include **exploitation of novel technologies** e.g. single cell RNA sequencing and patient-derived 3D organoid models in “Understand” and “Treatment” actions.
 - Cancer immunotherapy - more research for enhancing the benefits of immunotherapy, eg modifying immune susceptibility of tumours

^{1 1} <https://febs.onlinelibrary.wiley.com/doi/full/10.1002/1878-0261.12763>

- Environment and lifestyle related risks: how will lifestyle, and sociodemographic factors be accounted for and which part of the program will be “extended to other diseases” (Recommendation 2).
 - Identifying novel “actionable” genomic targets independent of histology of origin in line with a pathway-driven therapeutic approach.
 - Longitudinal follow-up studies of pre-malignant cases to recognise the role of serial genetic abnormalities in association with environmental factors, lifestyle etc. Such studies may be supported by existing consortia of pre-malignant patients with available patient data and biobanks.
- Support to **precision oncology** should be put up front and be one of the pillars of the mission. We recommend more research on exploiting tumour cell vulnerabilities for novel targeted personalised therapies. Increase and support **drug repurposing for cancer treatments**: There are many good (targeted) drugs available for disease A, and it remains difficult to get that drug available for, for example, a rare cancer. Within the Cancer mission, pharma should be stimulated to follow this approach, which could fit into the section ‘personalised medicine’: for example develop ways to stimulate repurposing of approved drugs for rare cancers.
 - Consider that **animal models are key to determine the genetic causes of disease** and their microenvironmentally-regulated links to the processes behind initiation and progression of cancer. This strategy is essential to build a good strategy of prevention and early detection for cancer. Cancer is a multifactorial disease that depends on alterations occurring at the cellular level that **influence and are influenced by the organism**. With the goal of understanding what happens at the cellular level, it is fundamental to determine CAUSALITY, and this cannot be performed in patients, or in patients’ cells *per se*. This is because the cancer cells have already undergone transformation and the progressive changes that were part of the process of cancer formation have already accumulated and been selected for.
 - Creating Oncology-focused living labs is a good strategy (Recommendation 12). Nevertheless, this recommendation should also contemplate the **inclusion of labs with dual interest in the biology of the normal healthy organism and cancer**. The reasons are two-fold: 1) often the same molecules and pathways used by cancer cells are shared between normal and malignant processes and it is important to understand the differences between the two; 2) to define good targets to fight cancer, they should be specific to cancer and be absent (or differ) in normal cells and tissues. This is a requirement to minimise secondary effects of the therapy.
 - Specific programs should include the exploitation of **machine learning and artificial intelligence** for predicting the response to anticancer therapies and clinical outcome and inclusive training sets to avoid exclusion of women and non-Caucasian ethnicities from effective treatment.
 - Action to support **Quality of Life (QoL)** (Recommendations 7 and 8) have received insufficient focus in the past. It is now essential to **allocate substantial investments to support QoL studies**; the same solutions can both have preventative as well as health outcome-related benefits.
 - We agree with support to the creation of **national comprehensive cancer centers** (Action 8). Member states should be encouraged to create national comprehensive centers using state funds and use EU funding for networking and cooperative actions.



- Make a single, bold recommendation focused on **policy about cancer prevention** using the #4 out #13 recommendations, which is of utmost importance and requires the input of cancer research(ers) and experts in the field.
- The biggest preventative measure would be to de-fund the tobacco industry and/or end the lobbying in this sector. The same strategy for sugar and food industries. It would be important to further explore this in recommendation 9 (equity).
- We positively view a focus on data sharing, data standardisation and interoperability and on the need of multidisciplinary teams to reach the mission's goals.
- We believe that the Mission on Cancer Outline should better describe the interactions with ongoing Cancer initiatives both in Europe and worldwide.
- We also recommend the establishment of a Pan-European Tumour Board (including a molecular board) for referring difficult or intriguing cases, thus giving equal access for an expert opinion across Europe.

Barcelona, 28th September 2020

About EU-LIFE

EU-LIFE is an alliance of research centres whose mission is to support and strengthen European research excellence (www.eu-life.eu). EU-LIFE members are leading research institutes in their countries and internationally renowned for producing excellent research, widely transferring knowledge and nurturing talent. The basis for the foundation of EU-LIFE was the perception that there was a gap in the science policy landscape regarding the representation of independent research centres. Since its foundation in 2013, EU-LIFE has become a stakeholder in European policy participating regularly in the EC policy dialogue.

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