iCAN: digital precision cancer medicine for discoveries and improved treatments

IPAAC INNOVATIVE PARTNERSHIP FOR ACTION AGAINST CANCER

Co-funded by the Health Programme of the European Union

TYPE	Large-scale pan-cancer project performing deep molecular profiling of tumors and linking this patient longitudinal health data for discoveries and improved treatments.	LAST UPDATE	March 2022	FINLAND ● NATIONAL Translation cancer research
STATUS	Fully implemented and ongoing			

PROBLEM & OBJECTIVE

PROBLEM Without new solutions cancer prevalence and cancer care costs are increasing alarmingly. Therapeutic development has for long focused on cancer-specific changes ignoring the patient's response.

OBJECTIVE The objective is to improve understanding of the cross-talk between cancer cells and the patient and thereby identify actionable mechanisms and targets for new diagnostic and therapeutic approaches contributing to improved treatments and quality of life for patients.

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KEY COMPONENTS / STEPS

- The 8-year funding for the iCAN flagship project enables development into a sustainable competence cluster enabling high-quality research and innovation and attracting top talent and investments.
- The iCAN Flagship Project is a globally unique pan-cancer biobank study combining deep molecular profiling (e.g. whole-exome sequencing of germ line and tumour tissue DNA and tumour RNA) of at least 15 000 tumors with digital health data including EHRs, national registries and patient reported outcomes. The study utilizes a biobank consent and pseudonymized samples/data and is undertaken in a safe data environment as described in the Finnish Secondary Usage of Health Data Act.
- iCAN has initiated within the South regional center of the national cancer center with a goal to expand to all regional centers in the second funding period 2023-266.and aims to expand project has started as a regional effort and in the future aims to expand nationally.
- iCAN is governed by a Steering Board with guidance from an international Scientific and Impact Advisory Board and from a national Patient and Citizen Advisory Board. The iCAN flagship project research plan has been approved as a biobank study by the HUS Helsinki University Hospital IRB.

KEY CONTEXTUAL FACTORS

- As part of the national Academy of Finland Flagship programme the project is executed as a partnership between academic research, health care system, companies and patients – a public-private-patient-partnership to ensure high-quality research spurring innovations and applications to benefit patients and the society at large. To this end patients are represented at all levels and citizen engagement is encouraged through co-creational activities such as cancerchallenge.eu.
- The iCAN flagship is part of the implementation of Finland's Health Growth Strategy initiated in 2014 aiming for innovations and societal and economic benefits. An update proposal is being prepared in coordination by The Finnish Innovation Fund SITRA. iCAN is part of the national cancer center FICAN and leverages the enabling legislation for biobanking and secondary use of health information. iCAN has proposed the development of a national precision medicine program in Finland within the national cancer center FICAN.

MAIN IMPACTS / ADDED VALUE

- Improved understanding of the cross-talk between cancer cells and the patient providing actionable mechanisms and targets for innovations and new diagnostic and therapeutic approaches.
- Contributing to the improvement and implementation of precision cancer medicine through adaptive clinical trials and increased involvement of patients.
- Providing a blueprint for sustainable development of precision cancer medicine in a public-private-patient partnership
- Aligned with Finland's Health Growth Strategy and the Flagship Programme iCAN is developing as a competence cluster with an annual turnover exceeding 30 M€ and aiming for new R&D investment of 100 M€ by 2026.

LESSONS LEARNED

- There is an urgent need to find solutions by which precision medicine research and diagnostics/treatments can be further integrated to maximize the benefits for patients. This includes new types of adaptive clinical trials and ways in which information on tumor/host characteristics can be taken into account when making decision on treatment options.
- Setting up the large-scale pan cancer project linking many types of molecular and health data in a safe GDPR-compliant data environment enabling innovative data analysis is challenging but critical.

REFERENCES & DOCUMENTATION

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