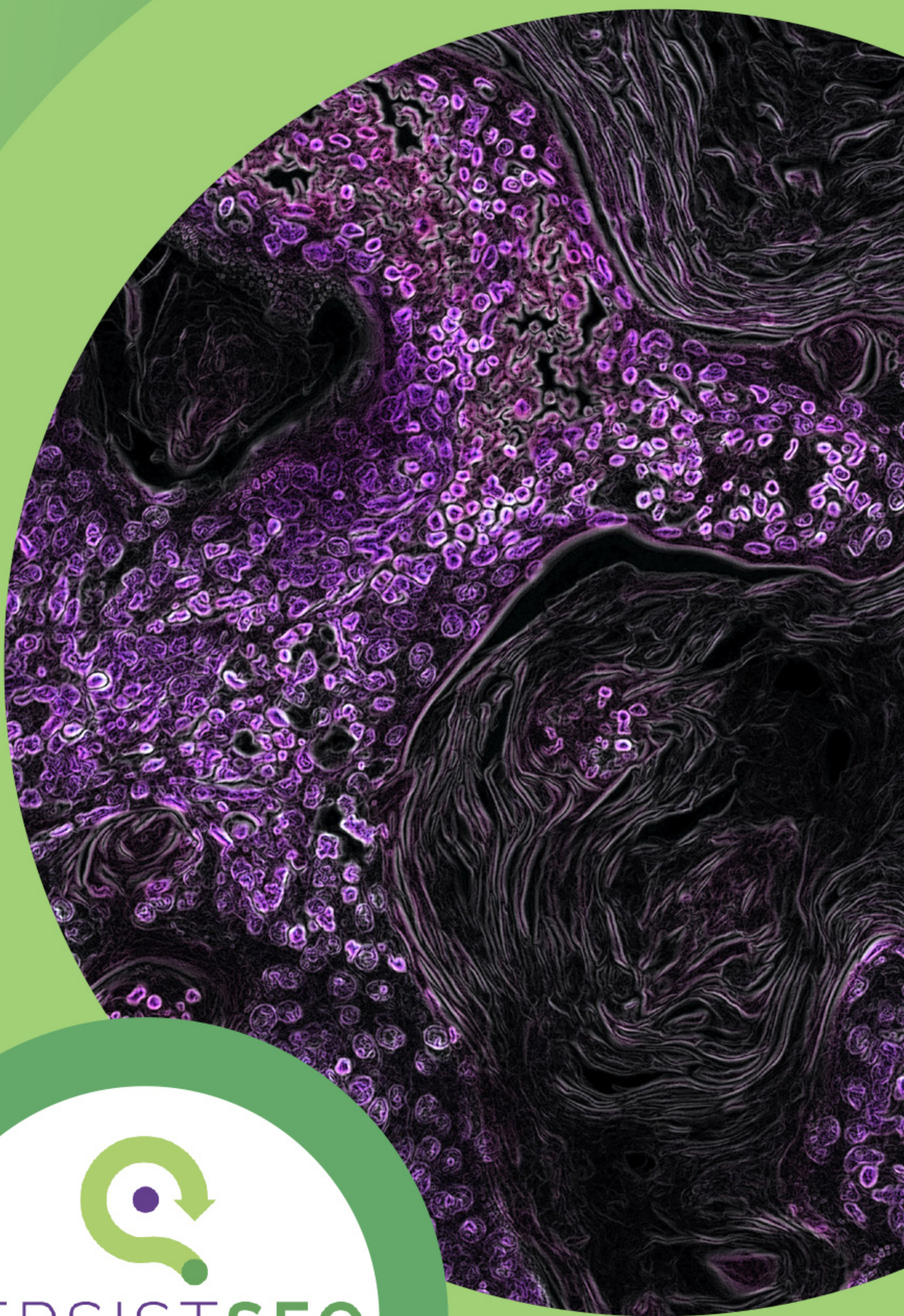


Building a reproducible single-cell sequencing workflow to capture tumour drug persistence



PERSISTSEQ

Therapeutic resistance in cancer

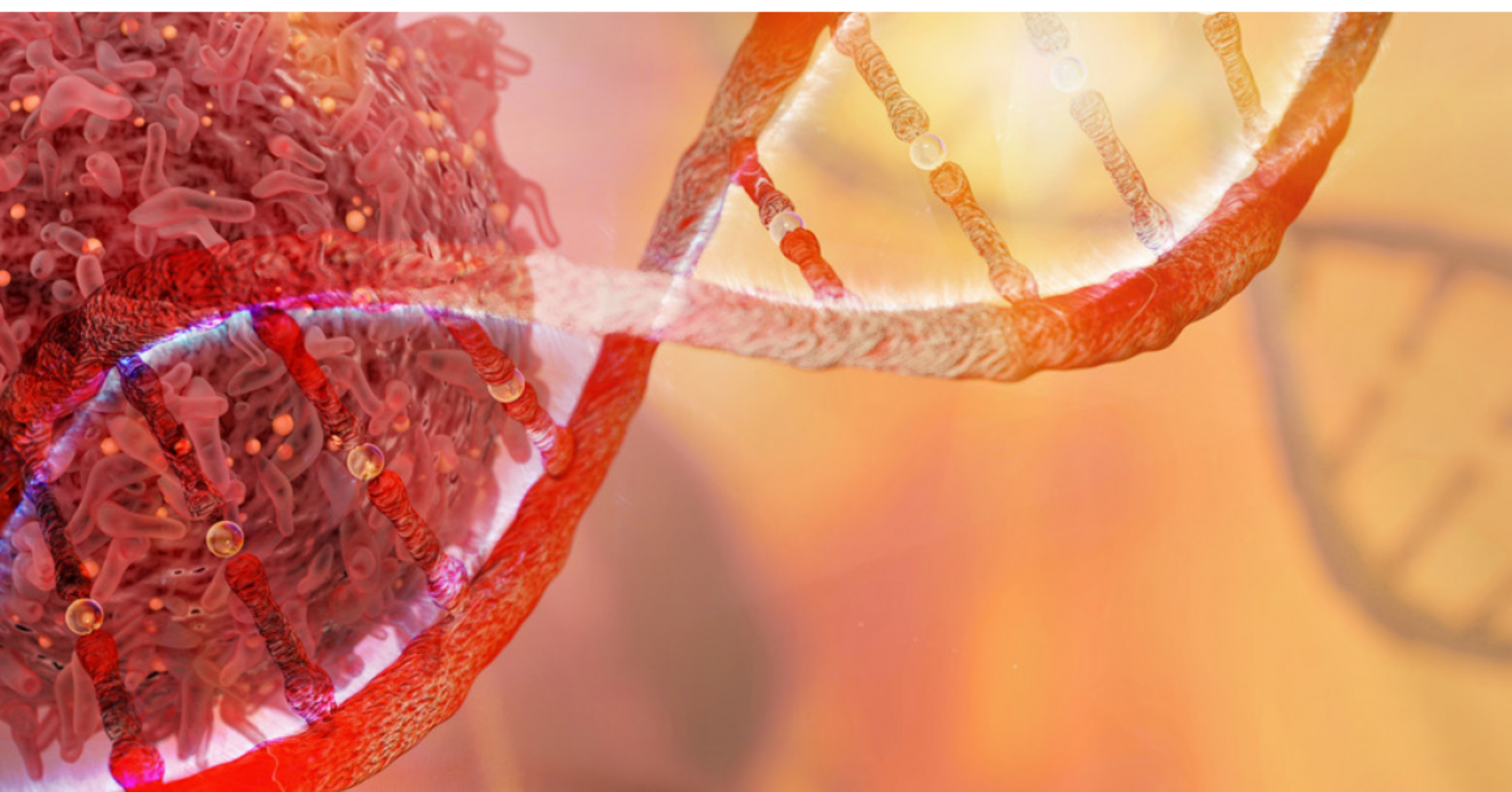
Cancer takes 9.6 million lives each year, 90% of which result from untreatable cancer relapse occurring after initially effective treatment. Therapeutic resistance is one of the primary causes of cancer death and is clinically difficult to predict, prevent or treat. The plasticity of tumours that counteracts therapeutic intervention and gives rise to therapeutic resistance has been explored from many different angles in recent decades. However, there is no comprehensive understanding of the underlying resistance mechanisms, nor how they differ between cancer types or therapies.

- *A better understanding of these mechanisms can contribute to better patient stratification, the development of effective drug strategies targeting the resistance mechanisms and the design of better cancer drugs.*

Main goal

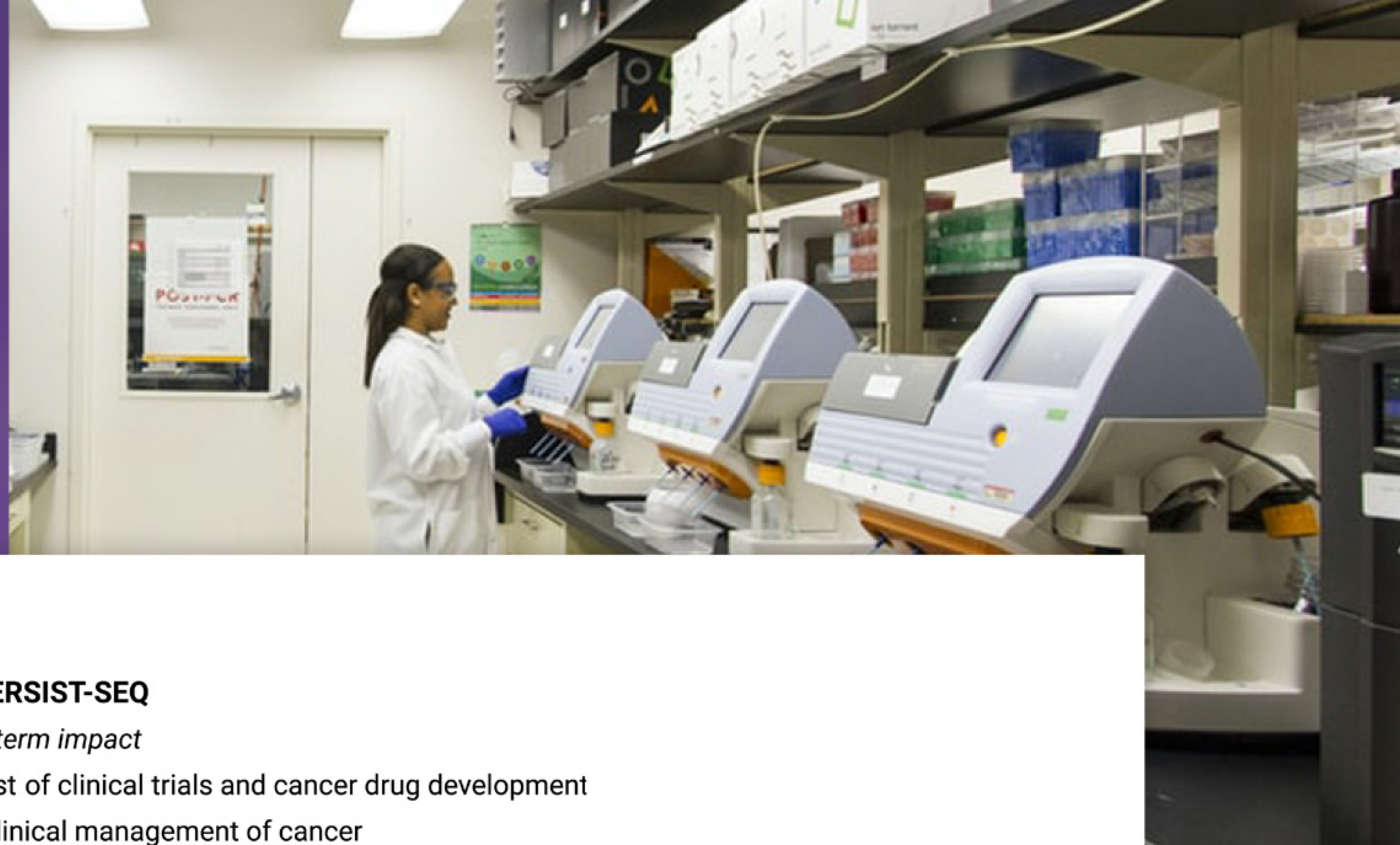
The ultimate goal of the PERSIST-SEQ consortium is to improve the understanding of therapeutic resistance in cancer and create effective strategies to improve cancer treatment and prevent drug resistance. As a result of this effort, the project anticipates a significant step forward for the cancer community and its understanding of tumour plasticity. This can change the way scientists and clinicians view cancer and its related drug development.

In order to achieve this goal, PERSIST-SEQ will develop a standardized approach to single-cell sequencing workflows for the investigation of the pre-treatment of cells.

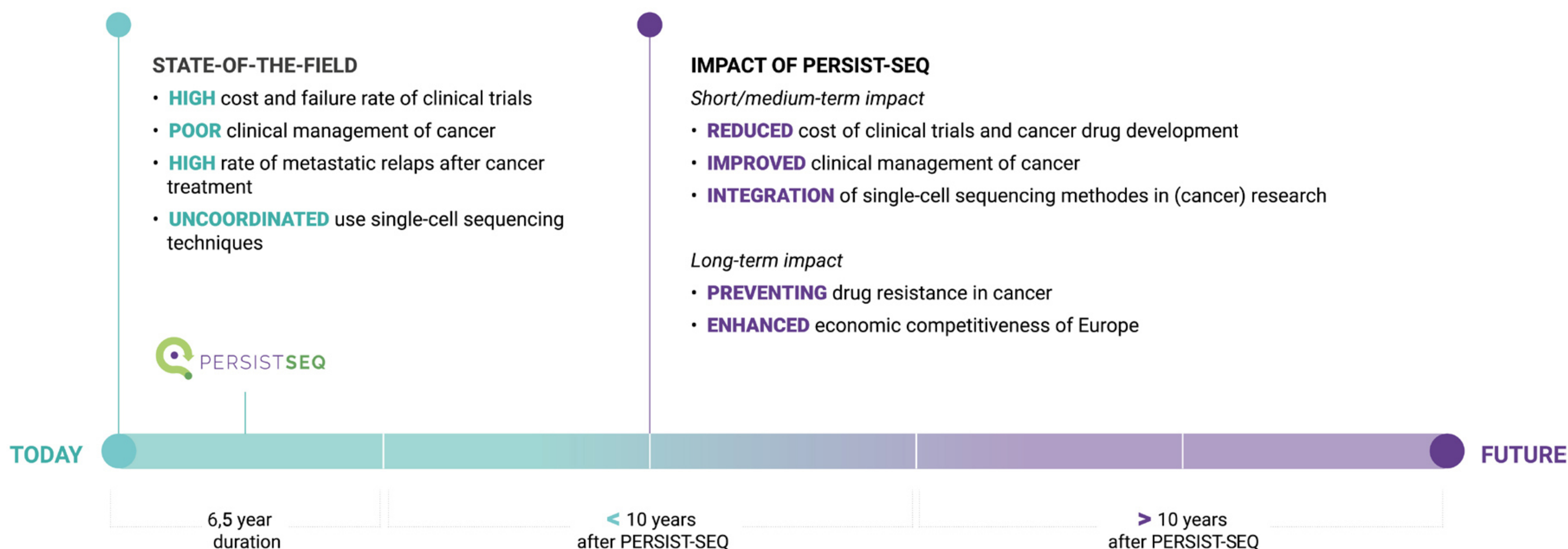


Expected impact

We envision the following short-term and long-term impacts that will affect all major PERSIST-SEQ stakeholders during the project and directly upon successful project completion.



Expected impact



Open access model

Importantly, PERSIST-SEQ will employ an open access model to build and sustain its benchmarking procedures and centralized European data infrastructure.

This model reduces the duplication of effort, thereby promoting collaboration across disciplines and ensuring efficient adoption of state-of-the-art single cell technologies. By presenting an approach which is replicable, the PERSIST-SEQ consortium will empower a further investigation of unaddressed tumors and therapies.

➤ *Therefore, the real impact of the project will stem from the growth of innovation capacity associated with the use of this approach across academic and industrial centers around the world.*

Our scientific approach

To address the challenges presented by therapeutic resistance in cancer, PERSIST-SEQ has formed a coalition of field-leading researchers and medical oncologists on

cancer resistance who will leverage their ingenious cancer modelling approaches and cutting-edge techniques to perform the sequencing of single tumour cells.

Cancer models

Existing cancer models offer incomplete but complementary representations of tumour development and plasticity as it occurs in vivo (observed in a living being). Currently, PERSIST-SEQ represents the largest coordinated effort that will not only combine state-of-the-art cancer models in a clinically meaningful way, but also document best practices in doing so, thereby ultimately creating a new standard for scientific quality in future research.

Sequencing techniques

As a basis, the PERSIST-SEQ consortium will use the most widely employed and recognized sequencing techniques from the 10x Genomics platform – the current standard of single-cell sequencing – to generate data from samples supplied by the consortium labs.

Workflow

The PERSIST-SEQ project will be organised around (beyond) state-of-the-art single-cell sequencing techniques and will be easily adaptable to integrate emerging (single-cell) technologies. The workflow will include wet-lab approaches to isolate single cells from clinical samples for 3D culturing, sequencing, imaging for spatial analysis, data management that is FAIR by design, and bioinformatics approaches required to extract key insights.

Facts and Figures

PERSIST-SEQ:	A public-private partnership between 13 European organisations, including academic institutions, small- and medium-sized enterprises, public organisations and pharmaceutical companies
PARTICIPATING COUNTRIES:	Germany, Italy, Spain, The Netherlands, The UK
START DATE:	1 July 2021
PROJECT DURATION:	6,5 years
BUDGET:	€14 million euros
ACADEMIC PROJECT LEAD:	Prof. Alexander van Oudenaarden, Hubrecht Institute
INDUSTRY PROJECT LEAD:	Dr. Ultan McDermott, AstraZeneca
FUNDER:	Innovative Medicines Initiative 2 Joint Undertaking

Disclaimer

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Contact information

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Partners



XENOPAT

Linked third parties



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See www.imi.europa.eu for more details.

