

CancerModels.Org - an open global research platform for patient-derived cancer models.

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Overview

Patient-derived cancer models (PDCMs) are an essential tool in cancer research and precision oncology. The heterogeneity of the underlying metadata and the lack of robust standards to describe PDCMs make it difficult for researchers to find models of interest and compare associated data across multiple academic and commercial sources.

Introduction

CancerModels.Org is a research platform that aggregates, standardises, and integrates the complex and diverse data associated with PDCMs using FAIR principles. It provides a unified point for PDCM stakeholders, from basic and clinical researchers to bioinformaticians and tool developers, to search and compare over 8300 PDCMs and associated data, including frequently mutated genes, diagnoses, drug treatments and sequence data from patient-derived xenografts (PDXs), organoids, and cell lines.

Methods

The project is driving the development of and promoting the use of descriptive standards to facilitate data interoperability and promote global sharing of models (e.g. PDX-MI). Currently we are seeking feedback on the In-vitro PDCM MI (manuscript in preparation). We provide expertise and software components to support several worldwide consortia including PDXNet and EurOPDX. The project is supported by NCI and is freely available under an Apache 2.0 licence (<https://github.com/PDCMFinder>).

Results

Users can search for models via a web interface or the REST API and explore molecular data summaries for models of specific cancer types. The data types include gene expression, gene mutation, CNA, biomarkers, imaging, patient treatment, and drug dosing studies. All data is available via cBioPortal. Moreover, the knowledge is enriched with links to external resources - publication platforms, cancer-specific annotation tools (e.g. COSMIC, CIVIC, ClinGen), and raw data archives (EGA, dbGAP, GEO).

Conclusion

CancerModels.Org is open-source and community-driven hence enabling researchers from various backgrounds and institutions to access and contribute to the shared knowledge pool and increase visibility and reusability of their models. This fosters collaboration across disciplines and geographies, breaking down traditional barriers to information and supporting the broader goals of global health equity in addition to accelerating cancer research and developing personalised treatments.