CellMiner and CellMiner Cross-Database (CDB): resources for the exploration of pharmacogenomics using cancerous cell-lines.

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Short title: **CellMiner and CellMiner CDB**

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Background

Determining the influence of molecular alterations on pharmacological responses in cancer cell lines from the omic perspective is the logical first step towards making oncology treatment for patients more effective, specific, and targeted. Our established CellMiner (http://discover.nci.nih.gov/cellminer) and in development CellMinerCDB (https://discover.nci.nih.gov/cellminercdb/) web-applications provide high-quality, clean, and numerically extensive molecular and pharmacological data for these purposes.

Methods

The CellMiner multiple databases described are described in detail at https://discover.nci.nih.gov/cellminer/datasetMetadata.do. The CellMinerCDB databases and website features are described in detail at: https://discover.nci.nih.gov/cellminercdb/.

Results

CellMiner provides extensive drug and molecular data for the NCI-60 cancerous cell lines, with activity profiles generated by the Developmental Therapeutics Program (https://dtp.cancer.gov). Included currently are activity data for 21,766 compounds, 130 Food and Drug Administration (FDA)-approved and 75 clinical trial drugs. The molecular data includes i) transcript expression, ii) genetic variants, iii) transcript expression, iv) protein levels, v) DNA copy number, and vi) DNA methylation levels. CellMinerCDB, provides an interactive web-application that allows the exploration of the larger cell line databases from the i) Cancer Cell Line Encyclopedia (CCLE, http://www.broadinstitute.org/software/cprg/?q=node/11), ii) Cancer Therapeutics Response Portal (CTRP, https://portals.broadinstitute.org/ctrp/), and iii) Genomics of Drug Sensitivity in Cancer (GDSC, http://www.cancerrxgene.org). These databases each contain ~1000 cell lines, and so provide a broader spectrum of cancer types as well as greater numbers within cancer types, and also have overlap with the NCI-60 (cell lines).

Conclusions

The CellMiner/CellMinerCDB web applications empower researchers to take advantage of the individual strengths of these databases in an integrated fashion. Together, they advance the potential of cancer cell line pharmacogenomic data to lay the foundation for, focus and provide validation for both experimental and clinical studies.