International Conference on
Functional and Comparative Genomics & Pharmacogenomics

OMICS Group Conferences
Accelerating Scientific Discovery

November 12-14, 2013   DoubleTree by Hilton Hotel Chicago-North Shore, IL, USA

A Web-based tool for access to gene expression, microRNA transcript levels, the activity of 20,602 compounds, and their pattern comparisons for the NCI-60

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There is increasing interest in the integration of high-throughput data pharmacology. Significant obstacles to this goal have occurred due to the lack of rapid and fluid access to, and integration of that data. A set of cell lines that can clearly benefit the field of cancer pharmacology if made readily accessible is the NCI-60 cancerous cell lines. We present here a set of tools within our CellMiner web-application (at http://discover.nci.nih.gov/cellminer) designed to address this need for the areas of transcript expression, microRNA expression, drug activity, and shortly for variant status for all genes bases on exome sequencing. Using CellMiner, one can rapidly access the data for relative transcript expression levels for 26,065 genes, 360 microRNAs, and 20,602 compounds including 102 Food and Drug Administration (FDA)-approved drugs. The addition of 143,501 variants will be made shortly. Each of these parameters defines patterns across the NCI-60 that can be compared to one another using our "pattern comparison" tool. These abilities allow the exploration of the potential relationships between these parameters. The user may query the data in a manner specific to their area of expertise and interest in a rapid and flexible manner. Expertise in computer science or bioinformatics is not required. Examples of pharmacologically important results using this data will include for transcript versus drug, SLFN11/topotecan; for variant versus drug, with BRAF V600E/vemurafinib; and for the identification of colon tissue-of origin specific genes, TRIM15, RNF43, and VIL1. The data are free and publicly available.

Biography

William C. Reinhold is currently operating as facility head of the Genomics and Bioinformatics Group in the Laboratory of Molecular Pharmacology. He has been a part of this section since April 1998, working with John N. Weinstein, and then Yves Pommier. He has been central in generating multiple datasets for the NCI-60 cancerous cell lines, available at the CellMiner web-application at http://discover.nci.nih.gov/cellminer/. His activities include running the web site, the dissemination and interpretation of this data, and encouraging and facilitating collaborations. He received his B.S. in Biochemistry from the University of Maryland in 1978, and currently has 67 peer-reviewed publications.

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J Data Mining Genomics Proteomics 2013
ISSN: 2153-0602, JDMGP an open access journal

Genomics-2013
November 12-14, 2013

Volume 4 Issue 5

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