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Characterization of pancreatic cancer cell lines based on sensitivity to the MEK inhibitor CI-1040

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Pancreatic cancer is one of the most severe forms of cancer, with a poor prognosis despite treatment. We analyze microarray data on 22 pancreatic ductal adenocarcinoma cell lines to explore the effects of CI-1040, a highly specific inhibitor of MEK1 and MEK2. Using BRDU assay to distinguish sensitive and resistant cell lines, we investigate two different methods, Benjamini & Hochberg FDR controlled t-statistics (the multtest package in Bioconductor), and support vector machine (R-SVM, Zhang et al.), to classify samples, perform feature selection, and predict sensitivity to treatment. We refine our SVM-based predictor by integrating gene-selection information from other models and test its accuracy on new cell lines. We analyze these gene sets for pathway enrichment using EGAN and explore possible drug targets and mechanisms. We examine the relevance of several gene signatures from the literature to further characterize the biology of these cell lines and implications for patient treatment.

Biography

Adrian Bivol holds an M.D. degree from the University of Medicine and Pharmacy "Caro Davila" of Bucharest, Romania (2001). He also holds a Bachelor's Degree in Computer Science, and is currently a graduate student (Computer Science) at the University of San Francisco, California.