

Analysis of Gene-Expression Data Using J-Express

The J-Express package has been designed to facilitate the analysis of microarray data with an emphasis on efficiency, usability, and comprehensibility. An early version of J-Express was described in an article in *Bioinformatics* in 2001 (Dysvik and Jonassen, 2001). This unit describes the J-Express tool, emphasizing central concepts and principles. Examples show how it can be used to explore gene-expression data sets.

The J-Express system provides a powerful and integrated platform for the analysis of microarray gene-expression data. It is platform-independent in that it requires only the availability of a Java virtual machine on the system. The system includes a range of analysis tools, and, importantly, a project-management system supporting the organization and documentation of an analysis project.

The package can be used not only for analysis of microarray gene-expression data, but Also, to analyze any set of objects where each is represented by a multidimensional vector. For example, it has been used to analyze data from 2-D gel experiments.

J-Express allows the user to import output files from spot-quantitation programs such as GenePix and Scanalyze and to take the data through filtering and normalization procedures to produce log-ratio data (see Basic Protocol 1). Alternatively the user can input externally processed gene-expression data. These data can be log-ratio type data (relative quantitation of mRNA abundances) or more direct mRNA quantitations produced, for example using Affymetrix technology. The program offers a choice of different unsupervised analysis methods including clustering and projection methods (see Basic Protocol 2). Supervised analysis methods including class prediction \will be included in J-Express in the near future. For a discussion of supervised and unsupervised analysis methods, see Background Information.

J-Express automatically keeps track of the processing and analysis steps through which the user takes the data. This helps the user to keep track of his/her own project and allows documentation of produced results and visualizations.