

Rapid identification techniques for useful Biomolecules

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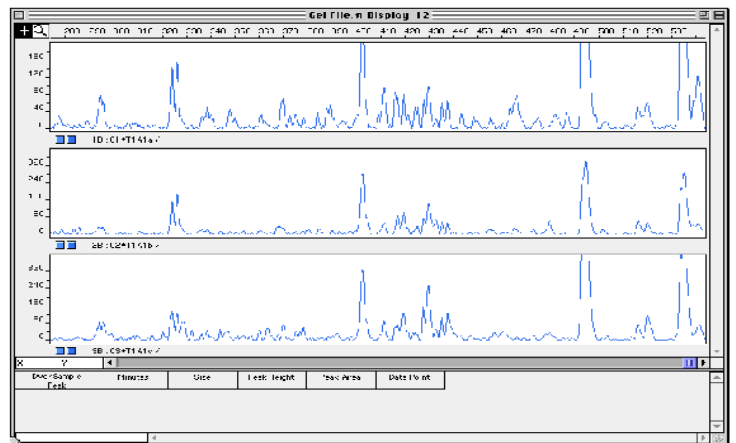
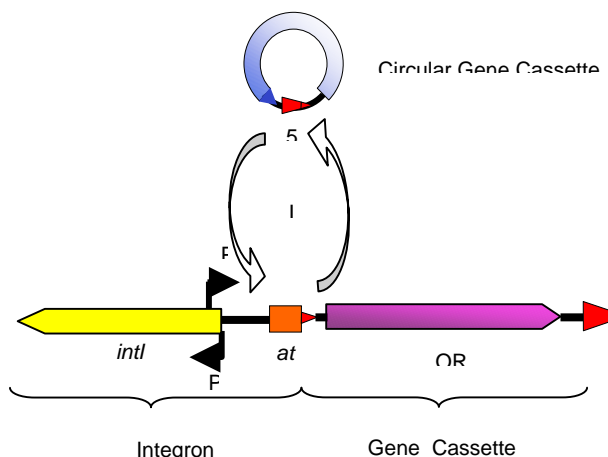
Background:

The gene cassette metagenome is a very large and diverse group of mobile genes that are available to a wide variety of microorganisms through the processes of horizontal gene transfer. Research to date indicates that gene cassettes largely contain genes of adaptive significance, so allowing organisms containing appropriate gene cassettes to survive environmental challenges. Gene cassettes have already been shown to produce proteins that confer antibiotic resistance, heavy metal resistance, UV protection and a variety of other specialised adaptive functions.

Work to date:

A variety of molecular techniques have been developed to identify, categorise, characterise, express and manipulate gene cassettes. These include mass environmental screening for different types of gene cassettes as well as providing data on their relative abundances. In addition, enrichment techniques that enhance the recovery of those gene cassettes responding to specific stressors are under development.

Integron / Cassette systems



A graphic depiction of the integron / gene cassette system showing the functional elements

A distribution analysis of the gene cassettes in a single soil sample

Outcomes:

These techniques will allow the rapid isolation of individual and synergistic groups of gene cassettes with specific biological functions related to particular challenges. These gene cassettes could then be utilised to produce gene products that may have significant therapeutic, industrial or environmental applications.

Funding is sought:

- >To enable extensive field trials of existing methods
- >To develop new methodologies for the analysis and assembly of customised gene cassette systems.
- >To commercialise this technology.

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