

GeneChip® Yeast Genome 2.0 Array

The GeneChip® Yeast Genome 2.0 Array contains probe sets to detect transcripts from both *Saccharomyces cerevisiae* and *Schizosaccharomyces pombe*, which are the two most commonly studied species of yeast. The Yeast Genome 2.0 Array includes approximately 5,744 probe sets for 5,841 of the 5,845 genes present in *S. cerevisiae* and 5,021 probe sets for all 5,031 genes present in *S. pombe*.

The evolutionary divergence between *S. cerevisiae* and *S. pombe* more than 500 million years ago caused enough sequence divergence between the two species to require selection of separate probe sets for all genes, even the closest cross-species orthologs. Because both species are included on a single array, the Yeast Genome 2.0 Array provides a flexible and affordable platform for researchers studying *S. cerevisiae*, *S. pombe*, or both species.

Applications

Using comparative genomics to model biochemical and genetic pathways is a powerful approach to understand biology. Although yeast is unicellular, it is an ideal model organism for studying eukaryotic cellular and disease processes. The shorter cell cycle of yeast compared to higher eukaryotes makes it easier to observe cell processes, study biochemical functions, and screen compounds.

S. cerevisiae—or budding yeast—is easy to manipulate *in vitro* and is commonly used to determine the biological functions of genes and regulatory elements. Its high degree of homology with the human genome has made *S. cerevisiae* a key model organism for understanding the function of certain human genes.

Additionally, *S. cerevisiae* is an important organism for identifying pathways required for fungal survival in the mammalian host environment and for studying phenotypic variation and instability.

A favorite tool of many research groups around the world, the fission yeast—*S. pombe*—is a fundamental model for studying differential gene regulation, cell-cycle control, signal transduction, cellular morphogenesis, and genome organization. Sequencing by the Sanger Center revealed that 172 *S. pombe* proteins were similar to those involved in human diseases, with 50 showing high homology and approximately 20 having relevance for cancer genetics (Wood *et al.*).

The Yeast Genome 2.0 Array enables thorough examination of gene expression patterns of both *S. cerevisiae* and *S. pombe* under various conditions for a better understanding of biological pathways. Finally, the detailed pattern of gene expression offered by the Yeast Genome 2.0 Array can help researchers optimize culture conditions to improve yields of recombinant proteins in metabolite production.

Specifications

Number of probe sets, <i>S. cerevisiae</i>	5,744
Number of probe sets, <i>S. pombe</i>	5,021
Number of transcripts, <i>S. cerevisiae</i>	5,841
Number of transcripts, <i>S. pombe</i>	5,031
Number of arrays in set	One
Array format	169
Feature size	11 µm
Oligonucleotide probe length	25-mer
Probe pairs per sequence	11
Hybridization controls	<i>bioB</i> , <i>bioC</i> , <i>bioD</i> , from <i>Escherichia coli</i> and <i>cre</i> from P1 bacteriophage
Poly-A controls	<i>dap</i> , <i>lys</i> , <i>phe</i> , <i>thr</i> , <i>trp</i> from <i>Bacillus subtilis</i>
Housekeeping/control genes	GAPDH, actin, <i>EAF5</i> , <i>SRB4</i> , <i>TFIID</i> , <i>RIP1</i> , <i>URA3</i> , and <i>WBP1</i>
Detection sensitivity	1:100,000*

*As measured by detection in comparative analysis between a complex target containing spiked control transcriptions and a complex target with no spikes.

Array profile

The Yeast Genome 2.0 Array is a 169-format, 11 µm array design, and it contains 11 probe pairs per probe set. Content for the array was selected from the public data sources GenBank[®] and Sanger Center for the *S. cerevisiae* and *S. pombe* genomes, respectively.

Instrument/software requirements

- GeneChip[®] Scanner 3000
- Affymetrix[®] GeneChip[®] Command Console[®] Software (AGCC)

Reference

Wood V., *et al.* The genome sequence of *Schizosaccharomyces pombe*. *Nature* **415**:817-880 (2002).

Ordering information

Part number	Description
GeneChip[®] Yeast Genome 2.0 Array	
900553	Contains 2 arrays
900554	Contains 6 arrays
900555	Contains 30 arrays

Supporting products

Part number	Description
GeneChip[®] 3' IVT Express Kit	
901228	10 reactions
901229	30 reactions

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