



# Data Sheet

## GeneChip® Poplar Genome Array

The GeneChip® Poplar Genome Array is designed specifically to monitor gene expression in Poplar (*Populus sp.*). In total, the Poplar Genome Array contains more than 61,000 probe sets representing over 56,000 transcripts and gene predictions.

This array was created in collaboration with leading poplar researchers through the Affymetrix GeneChip® Consortia Program and was designed based on content from UniGene Build #6 (March 16, 2005) and from GenBank® mRNAs and ESTs for all *Populus* species up to April 26, 2005. Additional array design content was derived from the predicted gene set v1.1 from the *Populus* genome project (*P. trichocarpa*), led by the U.S. Department of Energy and based at the Joint Genome Institute (JGI), Walnut Creek, CA (download date May 4, 2005).

### Applications

Forest trees contain greater than 90 percent of the Earth's terrestrial biomass. The Poplar is a particularly good model genome for trees because of its small genome size (approximately four times larger than *Arabidopsis*), rapid juvenile growth, and ease of clonal propagation.

The GeneChip® Poplar Genome Array can be used to study gene expression in the *Populus* species listed below. This microarray can be used to identify the underlying genetic mechanisms regulating important traits such as response to environmental conditions and growth-related development, and to investigate genetic factors that influence wood formation and paper pulp production.

### Array Profile

The GeneChip Poplar Genome Array is a 49-format, 11-micron array design and contains 11 probe pairs per probe set.

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Department of Energy and based at the Joint Genome Institute (JGI), Walnut Creek, CA, was also used in the design of the array.

Prior to probe selection, the EST and mRNA-derived 3' sequences were compared to the full set of 45,555 JGI poplar predicted genes. Where overlap occurred, the predicted genes were eliminated. The content is designed to detect 7,742 distinct EST/mRNA-based poplar UniGene clusters, and over 23,657 gene predictions which are estimated to overlap minimally based on the above criterion.

The array contains 61,251 poplar probe sets (including seven rRNA probe sets), twelve poplar control probe sets, and 62 reporter probe sets. The array interrogates 56,055 transcripts when considering UniGene clusters, ESTs and mRNAs, predicted gene transcripts, poplar controls, and rRNAs.

### Instrument/Software Requirements

- GeneChip® Scanner 3000, enabled for High-Resolution Scanning<sup>1</sup> or GeneChip Scanner 3000 7G
- GeneChip® Operating Software (GCOS) v1.1.1, contains the High-Resolution Scanning Update or later

<sup>1</sup> GeneChip Scanner 3000 High-Resolution Update is standard on all instruments shipped starting in September 2003 with serial number series 502. Previous versions (serial number series 501) will require the 00-0110 GeneChip Scanner 3000 High-Resolution Update to be installed.

**Table 1.** GenBank® mRNAs and ESTs in dbEST for all *Populus* species, up to April 26, 2005, were included in the design. (UniGene is restricted to *Populus tremula* x *Populus tremuloides*.)

<i>Populus tremula</i> x <i>Populus tremuloides</i>	65,981
<i>Populus balsamifera</i> subsp. <i>trichocarpa</i>	54,660
<i>Populus balsamifera</i> subsp. <i>trichocarpa</i> x <i>Populus deltoides</i>	33,134
<i>Populus tremula</i>	31,288
<i>Populus deltoides</i>	14,645
<i>Populus balsamifera</i> subsp. <i>trichocarpa</i> x <i>Populus nigra</i>	14,281
<i>Populus euphratica</i>	13,903
<i>Populus tremuloides</i>	12,813
<i>Populus canescens</i>	10,446
<i>Populus euramericana</i>	10,157
<i>Populus tomentiglandulosa</i>	1,127
<i>Populus alba</i> x <i>Populus tremula</i>	585
<i>Populus alba</i> x <i>Populus glandulosa</i>	519

## Critical Specifications

Number of arrays in set	One
Number of transcripts	56,055 transcripts, including all UniGene clusters, ESTs and mRNAs, predicted gene transcripts, poplar controls, and rRNAs
Number of probe sets	61,251 poplar probe sets (including 7 rRNA probe sets), plus 12 poplar control probe sets, plus 62 reporter probe sets
Feature size	11 $\mu$ m
Oligonucleotide probe length	25-mer
Probe pairs/sequence	11
Array format	49
Control sequences included:	
Hybridization controls:	<i>bioB</i> , <i>bioC</i> , <i>bioD</i> from <i>E. 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>B. subtilis</i>
Housekeeping/Control genes:	beta-actin, GAPDH, ef1 alpha
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.

## Ordering Information

### GeneChip® Poplar Genome Array

GeneChip® Poplar Genome Array

**900728** Contains 2 Arrays

**900729** Contains 6 Arrays

**900730** Contains 30 Arrays

## Supporting Products

Part Number	Product Name	Description
900493	GeneChip® One-Cycle Target Labeling and Control Reagents <sup>1</sup>	Sufficient for 30 reactions. Contains: <ul style="list-style-type: none"><li>• IVT Labeling Kit</li><li>• One-Cycle cDNA Synthesis Kit</li><li>• Sample Cleanup Module</li><li>• Poly-A RNA Control Kit</li><li>• Hybridization Controls</li></ul>
900494	GeneChip® Two-Cycle Target Labeling and Control Reagents <sup>1,2</sup>	Sufficient for 30 reactions. Contains: <ul style="list-style-type: none"><li>• IVT Labeling Kit</li><li>• Two-Cycle cDNA Synthesis Kit</li><li>• Sample Cleanup Module</li><li>• Poly-A RNA Control Kit</li><li>• Hybridization Controls</li></ul>

<sup>1</sup>Individual Kit components may be ordered separately.

<sup>2</sup>For the intermediate IVT step with unlabeled nucleotides, please order the MEGAscript® T7 Kit directly from Ambion.

Affymetrix® products can be purchased directly from Affymetrix in the United States, many European countries, and many Asian countries. For all other territories, please view a list of our distribution partners, which can be located at: <http://www.affymetrix.com/site/contact/index.affx>.



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