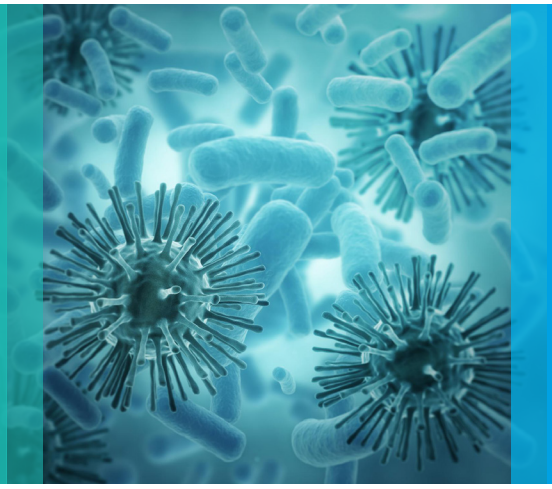

SurePrint Community Design PathoChip 8x60K

Streamlined pathogen detection and identification with a comprehensive solution

PathoChip advantages

- Analyze 6,000 pathogens in a single analysis
- Achieve sensitivity independent of host contamination
- Detect both known and novel pathogens enabled by specific probe designs, including 19 probes targeting SARS-CoV-2
- Identify both RNA and DNA pathogens with a single assay
- Perform easy QC with included human control probes
- Easily analyze data with the Agilent GeneSpring GX software

Agilent DNA Microarrays For Pathogen Detection

The first microbes were identified by microscopy in the 18th century. Since then we have learned how involved microbes are in the regulation of physical environments and organic biospheres, as well as how extensive their relationships—some beneficial, some deleterious—can be with both unicellular and multicellular organisms. Clinical researchers continue to elucidate the impact and importance of microorganisms to human health and disease[1].

Many laboratory techniques can be employed to detect and analyze microbes, including cultural analysis. However, in order to efficiently identify infectious agent(s) associated with a particular disease, researchers have turned to various metagenomic-based tools, such as shotgun sequencing and PCR amplification followed by 16s rRNA sequencing. Although the latter approach is a popular method to identify bacterial species, it is incompatible with viruses and eukaryotic microorganisms. Similarly, shotgun sequencing of total DNA samples may result in reduced yields due to high background from human host DNA. To address these challenges, DNA microarrays can be an effective analysis platform of choice because of their capability to quickly, easily, and economically screen large numbers of samples for broad microbial content.

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SurePrint Community Design PathoChip 8x60K

The Agilent SurePrint Community Design (CD) PathoChip 8x60K is a microarray that can detect both DNA and RNA from thousands of viruses and pathogenic microbes using a variety of starting sample types.

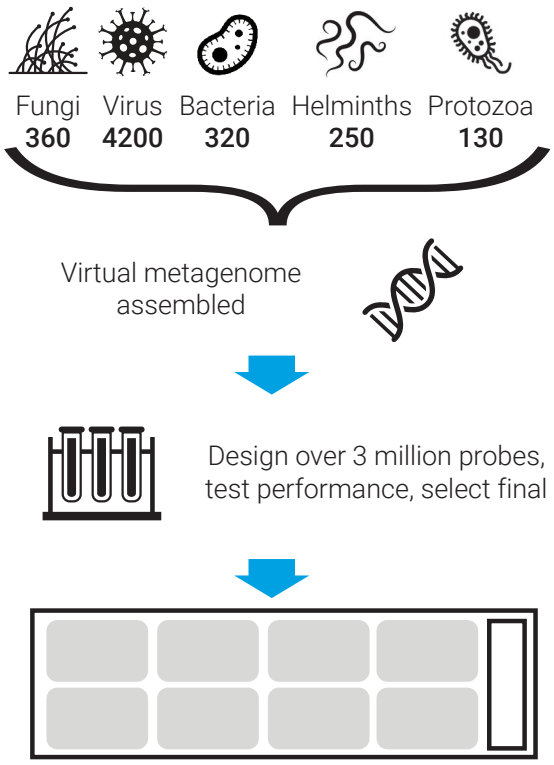
This microarray contains probes for all known and publicly-available virus sequences and hundreds of pathogenic bacteria, fungi, and helminths, thereby providing wide coverage of pathogens in an economical format. For the majority of pathogens, multiple probes targeting independent regions of each genome have been used to improve detection. Furthermore, while the PathoChip probe content was developed from sequences to known targets, the array contains probes specific to sequences that are conserved within and among pathogen families, enabling the detection of new organisms and/or strains. The first version of this assay, originally created in 2014 and continually updated and improved, has been used in multiple research projects that have yielded a number of publications[2-6].

Design Details

To create the SurePrint CD PathoChip, a list of more than 6,000 prokaryotic and eukaryotic human pathogens was compiled. The resulting gene sequences were assembled into a metagenome and divided into 58 virtual "chromosomes," each composed of approximately 5 to 10 million nucleotides in length. Probe sequences against both unique and conserved regions in the metagenome were designed[6,7] using the Agilent array comparative genomic hybridization (aCGH) design algorithm. These sequences were then filtered for low likelihood of cross-hybridization to human genomic sequences in order to minimize background noise.

An initial list of more than 3 million probes was created and then tested for performance in order to assemble the final list of probes included in the design.

The Agilent SurePrint Microarray 8x60K format is designed to process eight samples per slide. The new SurePrint CD PathoChip 8x60K array contains 37,704 probes to unique targets and 23,627 probes to conserved targets. *To address the COVID-19 outbreak, SARS-CoV-2 outbreak, 19 additional probes targeting SARS-CoV-2 probes have been included in the design*.



PathoChip
37,704 probes to unique targets
23,627 probes to conserved targets
1,262 probes to human genome targets

Data Analysis

The Agilent GeneSpring GX Software provides powerful and accessible statistical tools for intuitive analysis and visualization of microarray data. Designed specifically for the needs of biologists, the GeneSpring GX software provides an interactive environment that allows you to quickly and reliably identify targets of interest that are both statistically and biologically meaningful. The GeneSpring GX software can be used to analyze SurePrint CD PathoChip 8X60K data.

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Developed by an Expert

This assay was originally developed by Erle Robertson, MD, PhD, a professor in Otorhinolaryngology in the department of Otorhinolaryngology: Head and Neck Surgery in the Perelman School of Medicine at the University of Pennsylvania.

Order Information

Product Description	Part Number	# Samples/Kit
SurePrint Community Design PathoChip 8x60K	G5988B	8
SureTag Complete DNA Labeling kit	5190-4240	50
SureTag Purification Columns	5190-3391	50
Cot-1 Human DNA	5190-3393	312
Hybridization Gasket Slide kit - 8 microarrays per slide format; 5 gasket slides/pack	G2534-60014	40
Oligo aCGH/ChIP-on-chip Hybridization kit	5188-5200	200
Oligo aCGH/ChIP-on-chip Wash Buffer kit	5188-5226	320

Note: Agilent has not performed verification and validation on these arrays.

Citations

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7. Banerjee, S.; Tian, T.; Wei, Z.; Peck, K. N.; Shih, N.; Chalian, A. A.; O'Malley, B. W.; Weinstein, G. S.; Feldman, M. D.; Alwine, J.; Robertson, E. S. Microbial Signatures Associated with Oropharyngeal and Oral Squamous Cell Carcinomas. *Sci. Rep*. **2017**, *7* (1), 4036.

For additional information on GeneSpring GX software and to request a quote visit:
www.agilent.com/en/product/software-informatics/genomics-software-informatics/gene-expression/genespring-gx

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PR7000-3202

Note: Agilent has not performed verification and validation on these panels.

This information is subject to change without notice.

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