



Direct fluorophore conjugation to genomic DNA for microarray-based epigenomic profiling

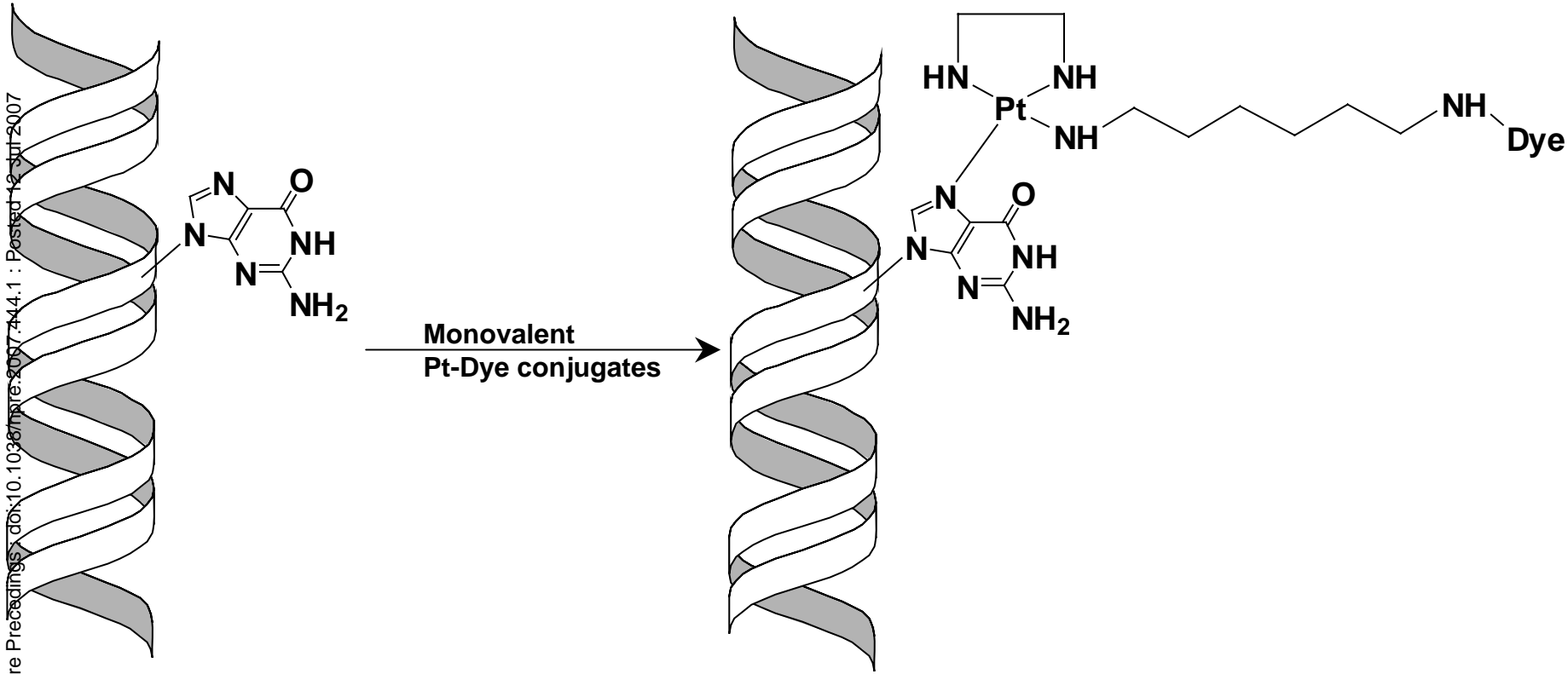
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<http://massgeneral.org/chemicalbiology>

Non-Enzymatic Conjugation of Fluorescent Dyes to Nucleic Acids

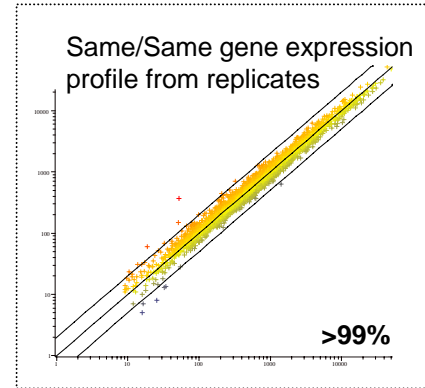
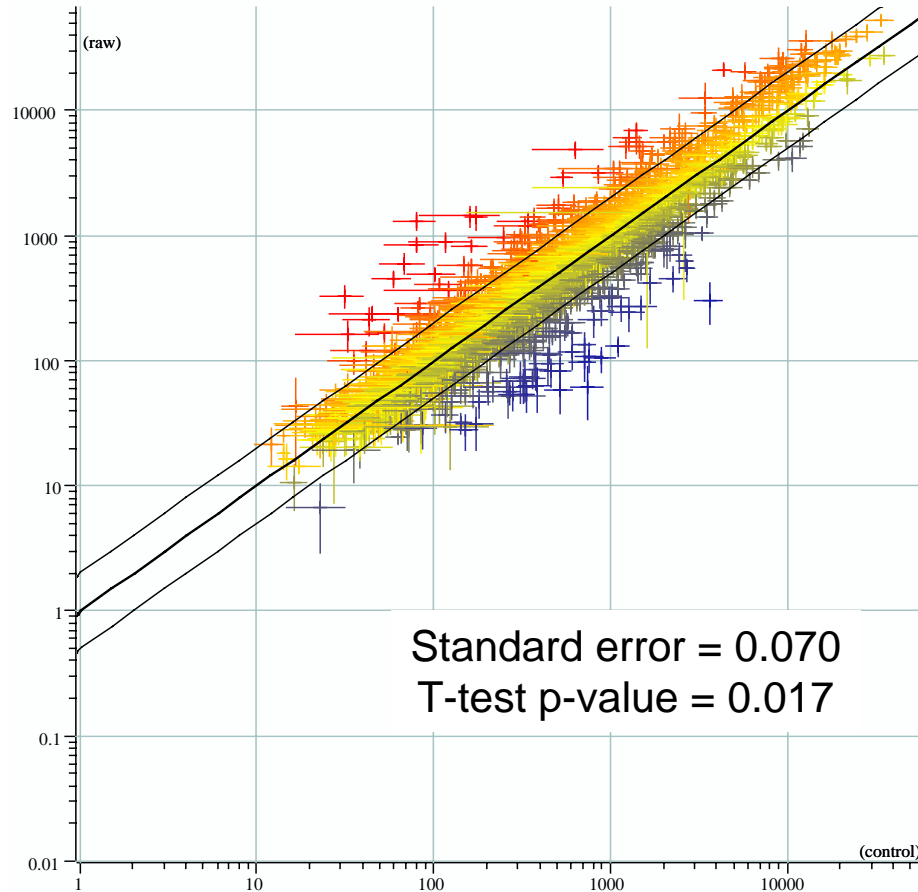
Nature Precedings, doi:10.1038/npre.2007.444.1 : Posted 12 Jul 2007



Platinum-based reagents (such as ULS from Kreatech) selectively react with and label the N7 of Guanine residues

Conjugated mRNA Produces Highly Precise Expression Profiles

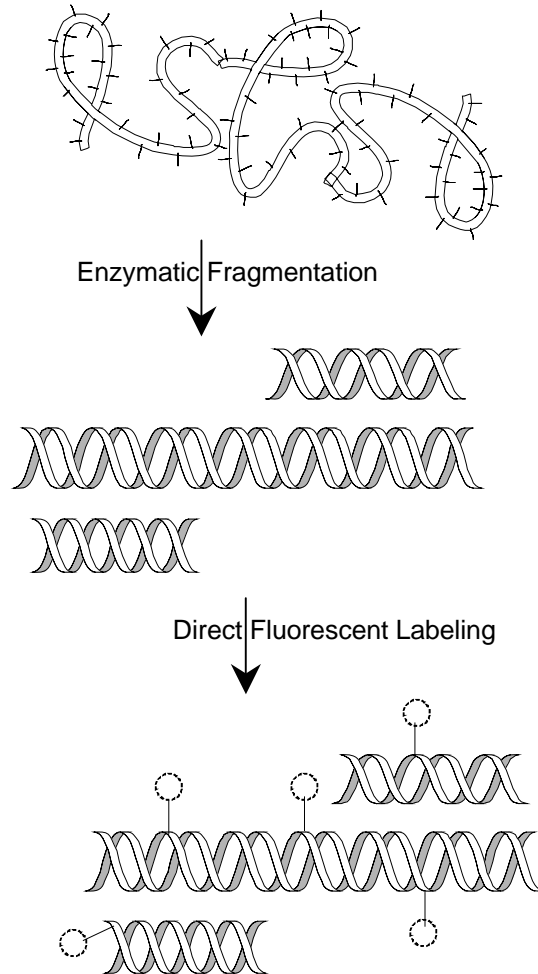
Differential gene expression profile from six replica experiments using HL-60 mRNA (Cy3 labeled) Vs Jurkat mRNA (Cy5 labeled) hybridized to 4800-element cDNA arrays



**Directly labeled mRNA produces high quality
microarray expression profiles**

Genomic DNA Can Similarly Be Directly Fluorescently Labeled

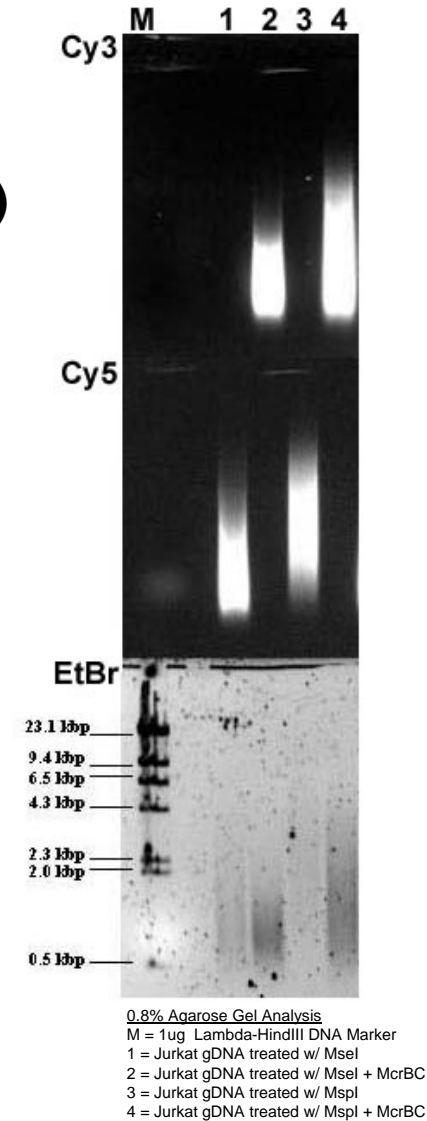
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Genomic DNA (gDNA)

Fragmented gDNA

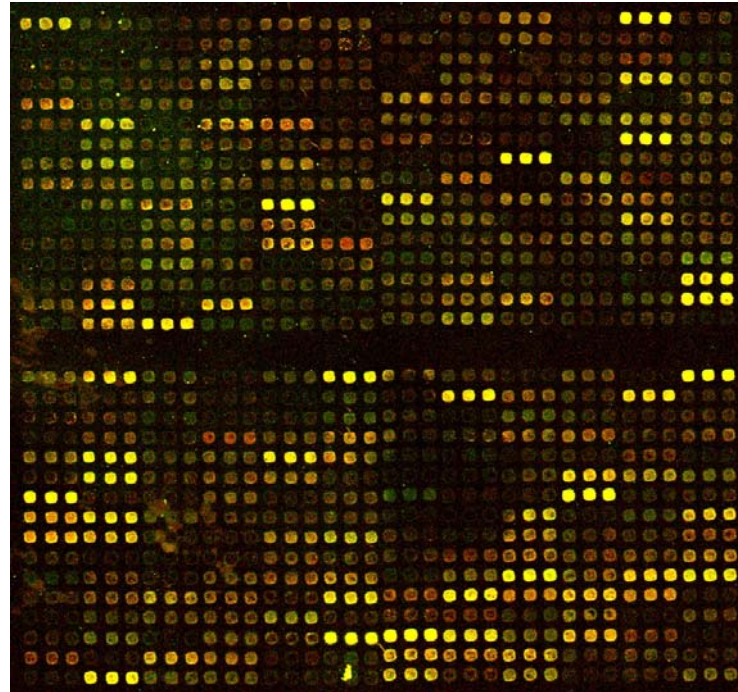
Labeled gDNA



Genomic DNA can be differentially digested with methylation-sensitive restriction enzymes and directly fluorescently labeled

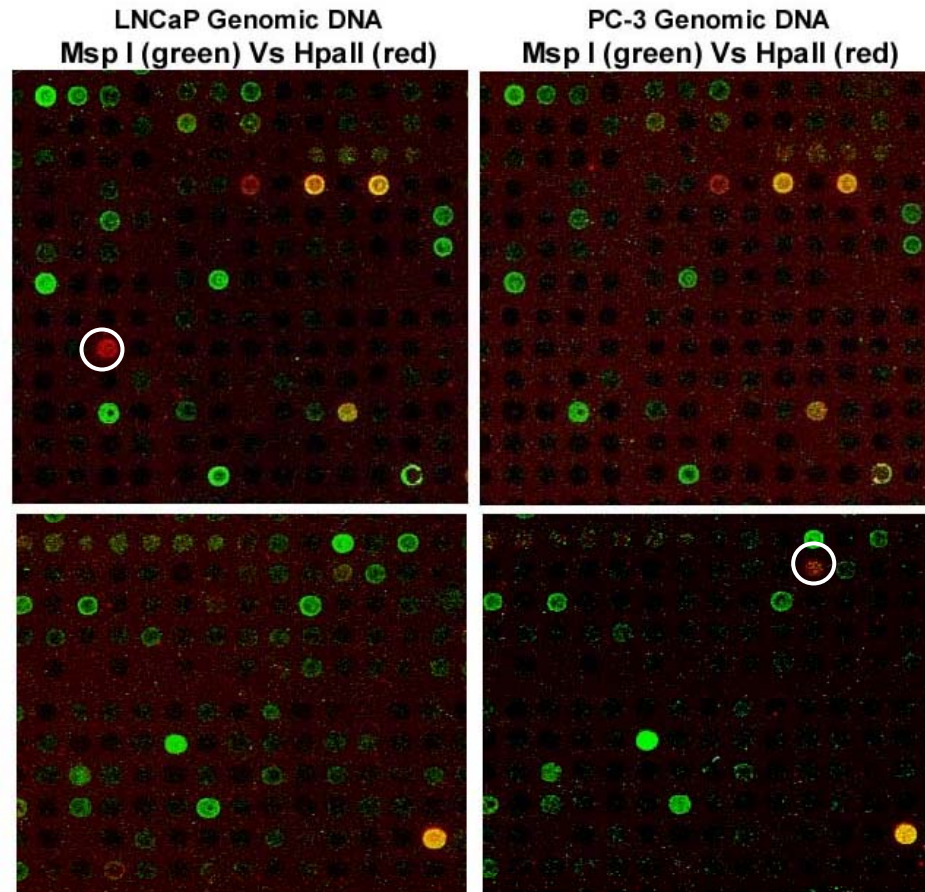
Epigenomic Profiling with Directly Labeled Genomic DNA

Microarray-based epigenomic profiling using Jurkat gDNA and oligo arrays



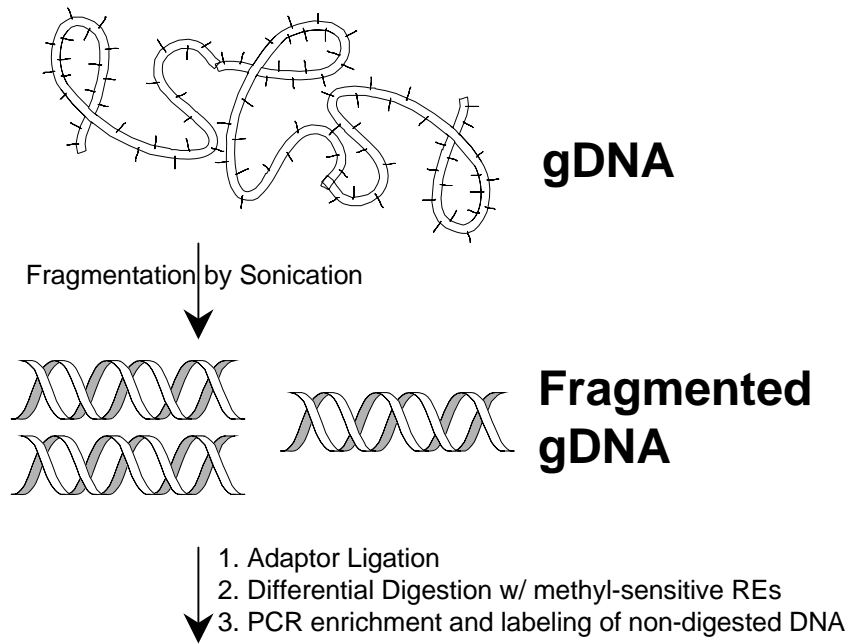
Methylation-dependent gDNA Fragmentation and Direct Labeling (MFDL)
can be used for Microarray-based epigenomic profiling

Epigenomic Profiling with Directly Labeled Genomic DNA

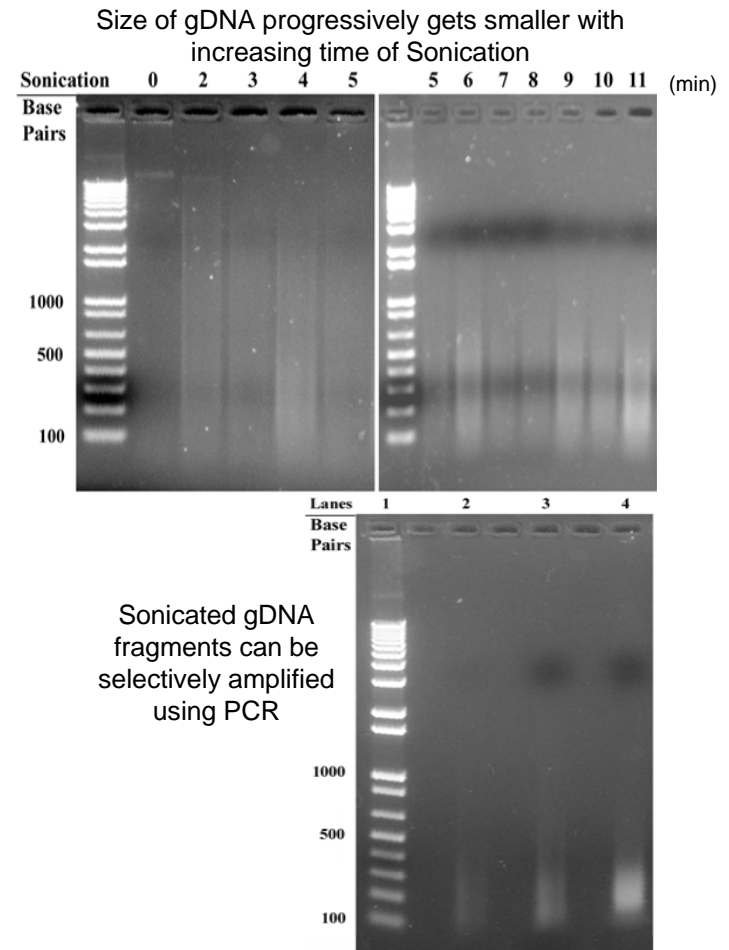


Methylation-dependent gDNA Fragmentation and Direct Labeling (MFDL)
can be used for Microarray-based epigenomic profiling
to identify differentially-methylated loci

Size Fractionation of gDNA by Sonication



**Microarray-based
Epigenomic Profiling**



Genomic DNA can be size-fractionated by sonication
(using published protocols) prior to MFDL
for epigenomic profiling