Licensable Technologies

Rapid Haplotyping by Multicolor Single-Molecule Fluorescence Detection

Applications:

- Determination of phased, single-nucleotide polymorphism (SNP) information
- Clinical disease diagnostics for rapid determination of susceptibility to genetic diseases
- Academic research and pharmaceutical development

Benefits:

- Allows rapid, direct haplotyping
- Permits typing large regions (~200 kb) per assay
- Requires only nanogram quantities of genomic DNA
- Eliminates the need to amplify sample DNA
- Enables a high-throughput-array format for large-scale genomic analysis

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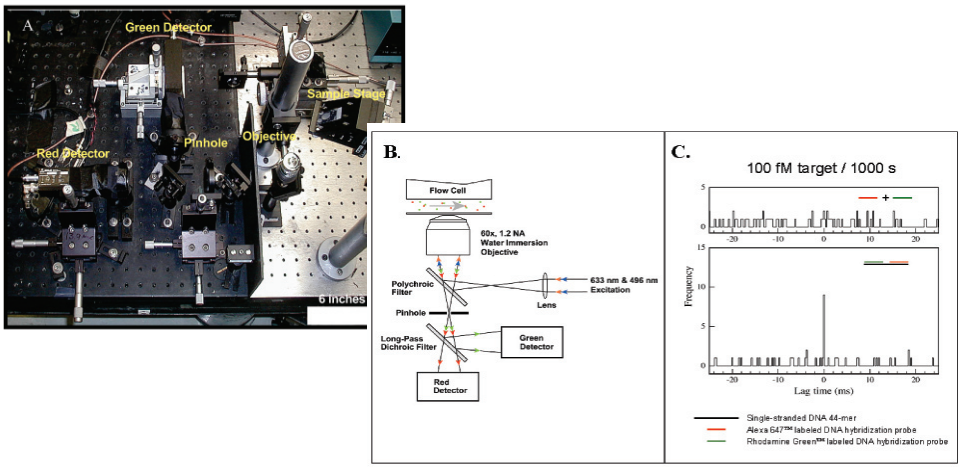

Confocal microscope for photon counting—(A) photo of the instrument; (B) a schematic of the set-up with sample delivery via a flow cell; and (C) two burst cross-correlation frequency histograms for probes with (bottom) and without (top) complementary template.

Summary:

The ability to quickly and accurately determine haplotypes is critical in understanding the effects of an individual's genetic profile on drug response and disease susceptibility and in exploiting this understanding in the design of new drugs and diagnostics. Currently, the only practical method of directly determining a haplotype is allele-specific Polymerase Chain Reaction (PCR). This requires genomic DNA amplification that limits the range of typing to a few kilobases. Single-molecule haplotyping allows direct typing from small amounts of unamplified genomic DNA.

Development Stage:

Concept

Patent Status:

U.S. patent application filed

Licensing Status:

UC/LANL is actively seeking a partner to further develop and commercialize this new technology.

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