

Nanogen Issued Patent for Method of Monitoring PCR Using Fluorescent Energy Transfer

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Nanogen, Inc., developer of advanced diagnostic products, announced today it was issued Patent No. 6,911,310, "Hybridization of polynucleotides conjugated with chromophores and fluorophores to generate donor-to-donor energy transfer system" by the U.S. Patent and Trademark Office. The '310 patent relates to a method of monitoring polymerase chain reaction (PCR) amplification of nucleic acid (DNA or RNA) using fluorescent resonant energy transfer (FRET), which is an essential part of molecular diagnostics. Marking the 131st patent to issue to Nanogen, it is closely related to the patents previously issued that describe nanofabrication and self-assembly of photonic molecular structures.

The method described in the '310 patent allows hybridization of DNA to be detected while conducting PCR. The process begins with oligonucleotides that are labeled with donor or acceptor fluorophores, each fluorophore illuminating at a unique wavelength of light upon excitation. When a donor fluorophore is excited, it absorbs energy and transfers it to an acceptor fluorophore that is located within a specific distance to the donor.

Energy transfer is permitted in this way when two oligonucleotides, one labeled with a donor fluorophore and one with an acceptor fluorophore, are hybridized to a target nucleic acid. Hybridization places the donor and acceptor fluorophores within transfer distance from each other. The

transfer of energy brings a shift in the emitted wavelength that can be detected as a change in the color of the light. In the absence of a target, no energy transfer or change in color occurs. By measuring the emission wavelength that results from the energy transfer to the acceptor fluorophore, the presence of the target nucleic acid can be detected.

"Nanogen's research in nanotechnology and fluorescent energy transfer is the continuation of many years of work," said Howard C. Birndorf, Nanogen chairman and chief executive officer. "Our growing intellectual property estate includes valuable technologies involving methods of fluorescent energy transfer that can be used for the creation of useful DNA diagnostic assay systems."

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