

# Improved method for detecting mutant DNAs

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Molecular DNA testing methods offer clinicians powerful tools that serve to confirm or identify disease diagnoses. High sensitivity and high specificity, however, are frequently a challenge to achieve with these methods. In a study scheduled for publication in the November issue of *The Journal of Molecular Diagnostics*, researchers describe a new, robust technique that holds promise for identifying trace mutant DNA sequences (signals) in an overwhelming population of unmutated DNA (noise).

A group of researchers in Korea describe a simple and inexpensive enrichment technique that they have termed mutant enrichment with 3'-modified oligonucleotides (MEMO). This oligonucleotide blocks extension of the normal gene but enables extension of the mutated gene, allowing for increased detection sensitivity.

"The potential applications of MEMO include all situations in which minority alleles of clinical significance are present and sensitive detection is required," commented lead investigators Seung-Tae Lee MD, PhD, and Chang-Seok Ki, MD, PhD, Department of Laboratory Medicine and Genetics, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Korea. "In addition to the application of MEMO to detect cancer mutations, it can be used in other situations, such as variant strain identification in infectious diseases (for example, the YMDD mutation in hepatitis B virus infection and antiviral drug-resistant variants in human immunodeficiency virus infection), minor mutant allele detection in patients with low-level somatic mosaicism or mitochondrial heteroplasmy, and characterization of fetal

mutations from maternal plasma samples."

Using genomic DNA extracted from cancer-derived cell lines containing EGFR, BRAF, JAK2, TP53, or KRAS mutations and from a bone marrow sample containing an NPM1 mutation, the authors were able to demonstrate significant sensitivity to these mutations.

Compared to preexisting methods, MEMO was shown to provide an improved diagnostic performance so that the method can be easily applicable in various medical fields, where molecular assays are important for disease diagnosis or treatment monitoring, and thus may help to improve patient outcomes.

**More information:** The article is "Mutant Enrichment with 3'-Modified Oligonucleotides (MEMO) - A Practical PCR Method for Detecting Trace Mutant DNAs" by Seung-Tae Lee, Ji-Youn Kim, Min-Jung Kwon, Sun Wook Kim, Jae Hoon Chung, Myung-Ju Ahn, Young Lyun Oh, Jong-Won Kim, and Chang-Seok Ki ([doi: 10.1016/j.jmoldx.2011.07.003](https://doi.org/10.1016/j.jmoldx.2011.07.003)). Published online ahead of its issue, it will appear in *The Journal of Molecular Diagnostics*, Volume 13, Issue 6 (November 2011)

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