Application Forum

The Importance of Cell Line Authentication

Tissue culture cells are important tools in many laboratories. Unfortunately, many cell lines are misidentified or contaminated with other cells (1,2), wasting substantial time, effort and laboratory resources and potentially invalidating published data. Due to the magnitude of this problem, the National Institutes of Health and many journals now recommend or require cell line authentication before grant approval or acceptance for publication, making cell line authentication an important concern for researchers. Fortunately, cell line authentication need not be daunting: Identification can be achieved by genetic profiling using polymorphic short tandem repeat (STR) loci (3–6), and many institutes are establishing core facilities to perform STR analysis.

To standardize human cell line authentication, the American Tissue Culture Collection (ATCC) Standards Development Organization Workgroup has issued standard ASN-0002 (7), which recommends the use of at least eight STR loci (TH01, TPOX, vWA, CSF1PO, D16S539, D7S820, D13S317 and D5S818) plus Amelogenin for gender identification. Be sure that your cell line authentication processes meet or exceed these standards, especially when using closely related cell lines or cancer cells, which frequently have genetic aberrations. To that end, Promega offers the *GenePrint*® 10 System for co-amplification and three-color fluorescent detection of nine human STR loci, including the ASN-0002 loci and D21S11. These loci collectively provide a genetic profile with a random match probability of 1 in 2.92×10^9 to give you confidence in your cell line's identity.

STR analysis begins with amplification, and the *GenePrint*® 10 System contains all materials necessary to amplify human STR loci, including a hot-start thermostable DNA polymerase. Following amplification, STR alleles are resolved and detected by capillary electrophoresis (CE), and protocols are provided for a wide range of CE instruments including the ABI PRISM® 3100 and 3100-*Avant* Genetic Analyzers and Applied Biosystems® 3130, 3130xl, 3500, and 3500xL Genetic Analyzers. An internal lane standard and allelic ladder also are provided to determine the size of each amplified product and positively identify alleles during subsequent data analysis using GeneMapper®, GeneMapper® *ID*, or GeneMapper® *ID-X* software. The resulting STR profile

is compared with the cell line's reference standard to confirm cell line identity.

Cell line authentication using the *GenePrint*® 10 System allows you to spend less time worrying about your cells and more time doing the important experiments to advance your research. For more information, visit the Promega web site at: www.promega.com/cia/

References

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