

This has been a busy summer for Idaho Technology (ITI) marked by the launch of our upgraded RAZOR® system—the RAZOR EX—and the addition of new personnel to the ITI Sales and Marketing Group. In

this newsletter, you will also find out how to use our LightScanner® system to its optimum capability and become familiar with features of our new LightScanner primer design software.

Improving Biothreat Detection—The RAZOR EX

Reliable biologic agent identification for the field has been limited due to technology with high logistics burdens and the lack of systems with adequate reliability and fidelity. To date, the most field deployable methods have been hand-held immunoassays, but they are not reliable in terms of specificity and sensitivity (yielding high rates of false positives and negatives). Higher specificity platforms, such as the Joint Biological Agent Identification and Diagnostic System/Ruggedized Advanced Pathogen Identification Device (JBAIDS/R.A.P.I.D.®), suffer from a burdensome logistics chain, but come closer to the required speed, specificity, and sensitivity desired in a field system.

With funding from the Defense Threat Reduction Agency, ITI developed the RAZOR system. This is the same technology used by the JBAIDS system, but in a field usable form. The RAZOR project was

started early in 2002 leading to its commercial off-the-shelf status in 2005. Incremental upgrades during 2006–07 have led to our newest version of the RAZOR, the RAZOR EX.



The Razor EX weighs a little more than 10 lb. (4.9 kg), and, similar to the previous RAZOR system, has everything contained within a Pelican™ briefcase. It also has the same central instrument components for performing real-time PCR using the same pouches as the RAZOR. The following improvements for ease of use have been added to the system:

- A new graphical interface that will display real-time fluorescent tracings
- Bar code scanning to upload protocols directly from reagent pouches
- Reverse transcriptase-PCR capability for RNA viruses
- Wireless connectivity
- USB communications
- New desktop software

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The new RAZOR EX will replace the existing RAZOR and will be available January 2008. We will continue to support and maintain the original RAZOR. The RAZOR EX will run the same commercial freeze-dried PCR pouches as the RAZOR, but also performs reverse transcription.

LightScanner FAQs

This column features solutions to frequently asked questions about using the LightScanner system.

How many base pairs should my amplicon be?

For scanning applications, we recommend that your amplicon be up to 500 base pairs. Smaller amplicons are easier to work with, but larger amplicons can be successful with proper PCR conditions.

Why do my calls change for the better with subsequent melts?

Every time you melt a plate, you are denaturing the DNA. As the plate cools, the strands reanneal. This sometimes mimics an additional step of PCR. If your results are changing, this could be caused by excess primer in your reaction. You may either lower the primer concentration for each reaction or increase the amount of PCR cycles.

How does LCGreen® compare to other dyes for sensitivity and stability?

LCGreen dye is a saturating dsDNA dye that is superior to conventional dsDNA dyes, as it can be used at high concentrations without dye redistribution during melting curve analysis. At high concentrations, LCGreen does not inhibit the PCR reaction. LCGreen dye is very sensitive and binds well to double-stranded DNA. LCGreen is also very stable as long as it is stored properly.

Can I multiplex with the LightScanner? What is the limit?

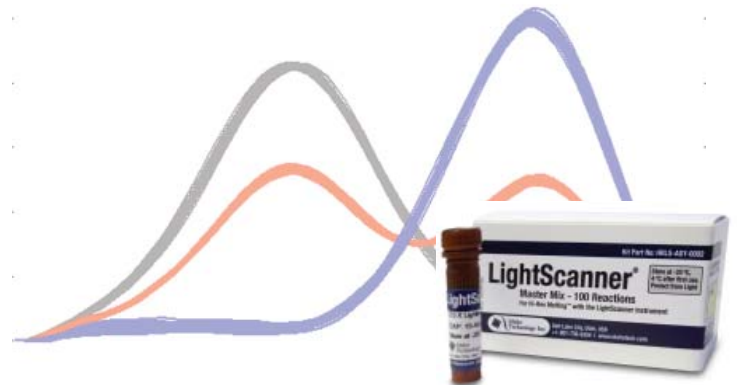
Yes, multiplexing is possible in genotyping only. A user may successfully multiplex up to three small amplicons (< 100 base pairs), as long as each amplicon is separated by at least 7–10 °C in melting temperature.

Is there a specification as to how the DNA should be extracted and prepared?

Any DNA extraction kit is acceptable. Consistency is important as different kits use different buffers. The varying concentrations of salts may require different PCR conditions. You can avoid this by using the same DNA extraction kit for all of your samples.

Is there a list of publications about the LightScanner?

Yes, please go to <http://www.idahotech.com/LightScanner/SupportForm-LS.html> for a list of references.



Dennis D'Alfonso—Food Security Global Sales Manager



Dennis D'Alfonso is ITI's new Global Sales Manager for Food Security with responsibility for the sale of the R.A.P.I.D. LT Food Security equipment and consumables.

Dennis has a bachelor's degree in Chemistry

from the State University College of New York at Buffalo and Masters level work at Wayne State University in Detroit. His education is complemented with 8 years of technical experience (4 in a clinical chemistry lab and 4 as a technical representative) plus 28

years of sales and sales management experience in both the clinical and industrial lab markets.

For the past 17 years, Dennis's experience has encompassed the technical sale of capital equipment and consumables as well as strategic account management positions in the industrial market with a focus on food security-pathogen detection equipment/consumables, microorganism identification equipment/consumables, and microbiological media.

Dennis is an American Society of Clinical Pathologists (ASCP) Registered Chemist. He can be contacted at dennis_dalfonso@idahotech.com or on (801) 230-8614.

LightScanner Primer Design Software

The LightScanner Primer Design software enables users to design primer sets that amplify small segments within larger regions specifically for mutation discovery using Hi-Res Melting™.

This software allows users to import sequences from various sources including the following: European Molecular Biology Laboratory (EMBL), FASTA, GenBank, or regular text files. After the sequence of interest is imported into the software, the exon annotations will be read, highlighted, and converted to uppercase. Each exon is assigned its own page indicated by tabs at the top of the screen. A common set of design parameters will be used to design primers for every exon. Exons that are larger than the recommended size for scanning will be broken up into two or more fragments for optimum results. Once all acceptable primer pairs have been found, the results will be summarized

with all of the information related to that primer set. Primer sets can then be exported and ordered from your favorite oligonucleotide vendor.

For optimal results using the LightScanner, scanning assays designed using the LightScanner Primer Design software should be used in combination with the LightScanner Master Mix. The LightScanner Primer Design software will be available soon to all LightScanner customers. Please contact Rachel Jones at (801) 736-6354 x. 438 or rachel_jones@idahotech.com for additional information.



Photos of the Quarter



Upper Millcreek Canyon
(photographer: Lindsey Cutler)



Trail Near Pinebrook
(photographer: Lyle Nay)

Dates to Remember

October

- 22–24** National Defense Industrial Association (NDIA) Joint Chemical-Biological Decontamination and Protection
Virginia Beach, Virginia
www.ndia.org
- 23–27** American Society of Human Genetics (ASHG)
San Diego, California
www.ashg.org/genetics/ashg/menu-annmeet.shtml

November

- 7–10** Association for Molecular Pathology (AMP)
Los Angeles, California
www.amp.org/2007

December

- 9–10** American Society of Hematology
Atlanta, Georgia
<http://www.hematology.org/meetings/2007/index.cfm>

January

- 12–16** Plant & Animal Genome XIV
San Diego, California
<http://www.intl-pag.org>

Editor's Note: If you have comments or suggestions for articles, please e-mail the editor at loretta_orgill@idahotech.com.

Department of State Note: The JBAIDS System, R.A.P.I.D. System, RAZOR Instrument, and RAZOR EX Instrument are controlled for export under the International Traffic in Arms Regulations (ITAR), administered by the U.S. Department of State, Directorate of Defense Trade Controls (DDTC) and may not be exported or transferred to any foreign national without prior approval of the DDTC.

R.A.P.I.D.[®] and RAZOR[®] Systems Training

ITI offers training courses for the R.A.P.I.D. and RAZOR systems. Training for two people is included with the purchase of the R.A.P.I.D. or RAZOR instruments, and more can attend for an additional cost. The training courses are three days for the R.A.P.I.D. and one day for the RAZOR. Courses focus on concepts of operation, sample preparation, reagent setup, and software. If you would like to attend or schedule a training course, please contact our training staff at 1-800-735-6544 x. 439.



LightScanner Webinars on the Internet

The following webinars and tutorials can be accessed via <http://www.idahotech.com/Support/Webinars.html>

- *LightScanner Step-by-Step Animation*
- *Audio Slideshow - The LightScanner System*
- *Somatic Mutation Detection in Primary Tumor Samples*
- *LightScanner Primer Design Software Training*
- *Screening Genetic Variants Associated with Dyslipidemia using the LightScanner System*

If you have any questions about the topics of these webinars or would like more information, please contact Rachel Jones at rachel_jones@idahotech.com or (801) 736-6354 x. 438.



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