

JOHNS HOPKINS APL

# TECHNICAL DIGEST

Volume 37, Number 4

## Countering Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) Threats

Guest Editors' Introduction: Countering Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) Threats

*Kelly A. Van Houten, Christopher C. Carter, and Joshua B. Broadwater*

Simulants for Chemical and Explosive Threats

*David S. Lawrence and Kelly A. Van Houten*

Large-Scale Production of Radiopure  $^{135}\text{Xe}$  from Bremsstrahlung  $\gamma$ -Irradiation of Solid Xenon Difluoride

*Evan P. Lloyd, Ciara B. Sivels, Alan W. Hunt, and Yenuel S. Jones-Alberty*

APL's Contributions to the Odor Detection Canine Community

*Shirley M. Klimkiewicz and David M. Deglau*

Using Knowledge Graphs to Counter Weapons of Mass Destruction

*Ray H. Mariner, Timothy P. Lipka, Phillip T. Koshute, David W. Boyce, Josef C. Behling, and Michael J. Peters*

MLM: Machine Learning for Threat Characterization of Unidentified Metagenomic Reads

*Benjamin D. Baugher, Phillip T. Koshute, N. Jordan Jameson, Kennan C. Lejeune, Joseph D. Baugher, and Christopher M. Gifford*

Assessment of Sequencing for Pathogen-Agnostic Biothreat Diagnostics, Detection, and Actionability for Military Applications

*Christopher E. Bradburne, Robert A. Player, Sarah L. Grady, Ellen R. Forsyth, Kathleen J. Verratti, and Jeffrey B. Bacon*

Wearables-Based Disease Surveillance: SIGMA+ Human Sentinel Networks Concept of Operations

*Ivan Stanish, Jane E. Valentine, Damon C. Duquaine, Robert A. Stoll, Ray H. Mariner, and Dorsey R. Woodson*

## SPECIAL FEATURE

APL Achievement Awards and Prizes: The Lab's Top Inventions, Technical Breakthroughs, and Staff Achievements for 2023 and 2024

*APL Staff Writers*

## IN MEMORIAM

Harry K. Charles Jr. (1944–2025)