businesswire
A BERKSHIRE HATHAWAY COMPANY

The NIMML Institute Announces Publication of New Study Identifying Novel Immunometabolic Targets for Gastrointestinal Acute Radiation Syndrome

Study provides a comprehensive, time-course systems-wide analysis of radiation-induced gene expression changes in the gut during GI acute radiation syndrome

Identifies novel therapeutic targets to address unmet clinical needs in gastrointestinal acute radiation syndrome

Studies leveraged the A.I.-powered TITAN-X Precision Medicine Platform, which has played a crucial role in the development of oral therapeutics for inflammatory and autoimmune diseases

BLACKSBURG, Va.—June 25, 2026—The NIMML Institute ("NIMML"), a 501 (c)(3) nonprofit research institute dedicated to the discovery of novel precision medicines for infectious, inflammatory and autoimmune diseases, today announced the publication of new peer-reviewed article in the *International Journal of Radiation Biology* titled, *"Immunometabolic Mechanisms of Ionizing Radiation in a Mouse Model of Gastrointestinal Acute Radiation Syndrome."* The study is a comprehensive, system-wide transcriptional analysis providing new insights into the response mechanisms underlying ionizing radiation-induced intestinal damage and subsequent mortality, along with identification of novel immunometabolic mechanisms with strong potential for therapeutic development in gastrointestinal acute radiation syndrome ("GI-ARS"). The publication of this research, which is funded by the Defense Threat Reduction Agency ("DTRA") follows the presentation of the associated abstract, "Colonic immunometabolic host response mechanisms to ionizing radiation in a mouse model of acute radiation syndrome" by NIMML at the IMMUNOLOGY2026 conference.

GI-ARS is a severe and often life-threatening consequence of high-dose ionizing radiation ("IR"). Exposure to high doses of IR can cause extensive damage to the gastrointestinal tract by disrupting the rapid renewal of the intestinal epithelium and endothelial barrier functions, leading to increased vascular permeability, translocation of harmful gut microbes, triggering systemic inflammation, sepsis, organ failure and other life-threatening complications. As the presence of radioactive materials, nuclear facilities and geopolitical instability increases, the need for safe and effective medical countermeasures has become increasingly urgent. Although supportive interventions exist, there remains a significant unmet clinical need for safe and effective therapies that directly target radiation-induced gastrointestinal injury.

“This research provides important novel insights into how lethal ionizing radiation disrupts gene expression in the gastrointestinal tract over time,” said Dr. Josep Bassaganya-Riera, corresponding author of the study and NIMML’s President and Founding Director. “By identifying distinct immunometabolic patterns associated with disease progression and mortality, this work advances our understanding of GI-ARS and helps establish a stronger scientific foundation for the development of targeted medical countermeasures for use in nuclear emergencies.”

In the study, researchers conducted a global transcriptomic time-course analysis in a mouse model exposed to sublethal and lethal total body irradiation. Analysis of colonic gene expression across multiple time points identified 23 distinct temporal patterns of differential gene expression, including three clusters associated with mortality. These clusters were enriched in pathways related to innate immunity, adaptive immunity and sterol metabolism.

The findings showed that lethal radiation exposure was associated with a distinct time-dependent response, including early and late inflammatory activity, a late increase in adaptive immune gene expression and downregulation of sterol metabolism pathways. Together, these patterns provide additional insight into the molecular features associated with GI-ARS progression and mortality.

The study also demonstrated dose-dependent effects, with milder responses at lower radiation doses and worsening gastrointestinal injury and mortality at the highest dose. These findings further support the model’s utility for studying GI-ARS and identifying potential for therapeutic development.

“I am excited that we are making meaningful progress toward the treatment of acute GI effects associated with IR exposure, which continues to present an urgent and unmet medical need,” said Heather Meeks, Counter-WMD Technologies Senior Scientist. “Leveraging the capabilities of the NIMML TechBioHub in Blacksburg, including the capabilities of the A.I.-powered TITAN-X Precision Medicine Platform, the NIMML Institute, BioTherapeutics, and NImmune Biopharma, we are pushing the boundaries of scientific discovery. I am confident that our improved understanding of the effects of acute radiation exposure will lead to the discovery of more effective medical countermeasures.”

This breakthrough research was supported by NIMML’s broader expertise and longstanding track record in advanced computational modeling and systems immunology, including the use of its A.I.-powered TITAN-X Precision Medicine Platform. TITAN-X is designed to integrate large-scale datasets with bioinformatics, clinical insights and advanced computational modeling to study immunity as a dynamic, systems-level network interconnected with metabolic processes. By uncovering predictive transcriptional signatures and linking immune and metabolic responses over

time, TITAN-X helps inform the identification of novel therapeutic targets and supports the development of targeted, biomarker-driven countermeasures for GI-ARS.

This comprehensive transcriptional analysis provides important new insight into the mechanisms underlying radiation-induced intestinal damage and mortality and highlights novel immunometabolic pathways that may help guide the development of much-needed therapeutic approaches for GI-ARS, an area of significant unmet medical need.

About the TITAN-X Platform

The TITAN-X Precision Medicine Platform combines A.I. methodologies, bioinformatics, and advanced computational modeling to accelerate the development of precision medicines to address the unmet clinical needs of patients with autoimmune diseases. Building upon NIMML's expertise in engineering large-scale computational models to study immunity as a massively and dynamically interacting system, the TITAN-X Platform integrates each step from new target discovery to enabling biomarker-driven precision clinical drug development. Following bioinformatic analysis of differentially expressed genes from patient biopsy specimens, the TITAN-X Platform can identify transcriptional predictive signatures by using its advanced A.I. algorithms. By analyzing gene expression patterns and integrating clinical data, the TITAN-X Platform can identify responder patterns, facilitating precision medicine approaches for drug development. This ensures that patients receive therapies that are most likely to benefit them according to their unique genetic signatures and clinical profiles, and that are tailored to maximize efficacy, safety, tolerability and minimize adverse side effects. The TITAN-X Platform has shaped the clinical development of omilancor, NX-13 (acquired by Abbvie in March 2024 and now called ABBV-113), NIM-1324 and multiple additional novel MoA targets and drug candidates in preclinical development for I&I indications.

About NIMML

The NIMML Institute is a 501 (c) (3) non-profit foundation focused on applying transdisciplinary, team-science approaches to precision medicine. The NIMML Institute applies its TITAN-X advanced A.I.-powered platform to large-scale transdisciplinary projects aimed at solving important public health problems through precision medicine. NIMML combines the expertise of immunologists, computational biologists, toxicologists, computational modelers, translational and clinical researchers, and molecular biologists to translate novel scientific discoveries into medicines for human diseases. The Institute is headquartered in Blacksburg, VA. For more information, please visit www.NIMML.org.

About NImmune Biopharma

NImmune is a private late-stage precision inflammation and immunology (“I&I”) biopharmaceutical company that leverages a proprietary A.I. platform to rapidly and capital efficiently develop novel best-in-class biomarker-driven immunoregulatory therapeutics for inflammatory and autoimmune diseases. Underpinned by the TITAN-X computational platform that utilizes advanced A.I., advanced computational modeling, and bioinformatics and biomedical research capabilities to pioneer innovation in the development and commercialization of novel best-in-class I&I therapies, NImmune’s business model enables the rapid and capital-efficient clinical development of high conviction drug candidates to New Drug Application (NDA) filing and commercialization. Additional information: www.NIMMUNEBIO.COM.

Media Contact:
Alex Jeffrey/Jonathan Warren
Gasthalter & Co.
nimmune@gasthalter.com
212.257.4170