Peer-Reviewed Study Shows YK-4-250 to be Both Preventative and Curative Countermeasures Against Lethal Radiation Injury

Independent, government-funded research in Scientific Reports shows oral YK-4-250 improves survival and intestinal recovery before and after radiation exposure



Radshield YK-4-250

NORFOLK, VA, UNITED STATES, September 5, 2026 /EINPresswire.com/ -- Peer-Reviewed Study Shows YK-4-250 Significantly Improves Survival After Lethal Radiation Injury

Independent, government-funded research published in Scientific Reports demonstrates significant survival and intestinal recovery benefits from oral YK-4-250

NORFOLK, Va. — August 5, 2026 — Trocar Pharma, Inc., a biodefense pharmaceutical company developing medical countermeasures against radiation injury, today highlighted newly published peer-reviewed research demonstrating significant preclinical survival benefits for YK-4-250, the company's lead investigational compound for gastrointestinal acute radiation syndrome (GI-ARS).

The study, independently conducted by researchers at the Armed Forces Radiobiology Research Institute (AFRRI), the Uniformed Services University of the Health Sciences, Oakwood University, and the University of Oklahoma Health Sciences Center, was published in Scientific Reports, a Nature Portfolio journal.

The work builds on research initially supported through the National Institute of Allergy and

Infectious Diseases (NIAID) radiation countermeasures program, reflecting the longstanding federal interest in developing medical countermeasures for radiation injury.

In controlled mouse studies, oral YK-4-250 significantly improved 30-day survival following lethal partial-body radiation exposure. In a prophylactic model, survival increased from 56% in vehicle-treated animals to 81% in animals receiving YK-4-250. In a mitigation model in which treatment began one day after radiation exposure, survival increased from 58% to 88%.

The post-exposure findings are particularly significant for emergency preparedness because they demonstrate activity when treatment begins after radiation exposure has already occurred.

The paper, titled “YK-4–250 mitigates gastrointestinal radiation syndrome and promotes overall survival following partial body radiation injury,” was authored by Vidya P. Kumar, Yali Kong, Kan Wang, and colleagues. The publication appears in Scientific Reports 16, 23964 (2026), DOI: 10.1038/s41598-026-53734-7.

Key Findings

In addition to improved survival, the researchers observed evidence of intestinal repair and reduced radiation-induced damage in treated animals:

81% survival at Day 30 in the prophylactic model versus 56% for controls.
88% survival at Day 30 in the post-exposure mitigation model versus 58% for controls.
Significantly greater numbers of viable intestinal crypts and lower mucosal injury scores in treated animals by Day 7.
Reduced levels of 4-hydroxynonenal, a marker of radiation-induced lipid damage, by 56% at Day 4 and 66% at Day 7.
Reduced bacterial translocation to the liver and improved intestinal barrier integrity.
Increased expression of ACE2, a protective enzyme in the renin-angiotensin pathway, in irradiated intestinal tissue.
Oral doses up to 100 mg/kg were well tolerated in a pilot safety study over 17 days of observation.

YK-4-250 is a tempol-conjugated angiotensin receptor blocker (TCARB) designed to combine antioxidant activity with modulation of the angiotensin II type 1 receptor pathway, two mechanisms implicated in radiation-induced gastrointestinal injury. The compound is designed for oral administration and to act at the intestinal site of radiation injury.

“Radiation injury to the gastrointestinal tract is one of the most consequential and least addressed problems in radiation medicine — there is still no approved treatment for it,” said Milton L. Brown, MD, PhD, Chairman of the Board and Co-Founder of Trocar Pharma and corresponding author of the study. “Seeing meaningful improvements in survival and intestinal recovery in these preclinical models is encouraging. It is also only one step. This is preclinical

work conducted in animal models, and substantial development remains before we know whether these effects translate to people."

The research was generated by an independent, multi-institutional academic and government research team and was subject to independent peer review. Key elements of the research were supported by U.S. government sources, including the National Institute of Allergy and Infectious Diseases (NIAID) radiation countermeasures program, AFRRI intramural research funds, and a Department of Veterans Affairs Merit Award, alongside support from Georgetown University.

The research also included contributions from Oakwood University, an HBCU, where Dr. Stanton Dulan conducted a key experiment while serving as a postdoctoral fellow in Dr. Brown's laboratory.

"This publication matters to us for a specific reason: it is independent," said Damian V. Dolland, Co-Founder and Chief Financial Officer of Trocar Pharma. "The underlying work was supported in significant part through government research programs and academic collaborations. For a preclinical-stage biodefense asset, that kind of third-party validation is important as we advance the compound through additional development."

GI-ARS is a severe form of radiation injury resulting from high-dose exposure that damages the intestinal lining, compromises the gut barrier, and can lead to systemic infection and death. While several FDA-approved medical countermeasures address hematopoietic acute radiation syndrome, the bone-marrow form of radiation injury, there is currently no FDA-approved therapy specifically indicated for GI-ARS.

Trocar Pharma has engaged with the FDA regarding the potential development of YK-4-250 under the FDA's Animal Rule pathway. The company's development plans include formal Good Laboratory Practice (GLP) toxicology studies, submission of an Investigational New Drug (IND) application, and a Phase 1 clinical study to evaluate safety and pharmacokinetics.

All results described in the publication were generated in animal models. No human clinical data exist for YK-4-250, and its safety and effectiveness in humans have not been established. YK-4-250 is investigational and has not been approved by the FDA or any other regulatory authority for any use.

About Trocar Pharma

Trocar Pharma, Inc. is a Norfolk, Virginia-based biodefense pharmaceutical company developing RadShield™ (YK-4-250), an investigational oral therapeutic candidate for gastrointestinal acute radiation syndrome. The compound was developed from research originating at Georgetown University and is exclusively licensed from Georgetown University together with related composition-of-matter and use patents.

Trocar Pharma is led by Milton L. Brown, MD, PhD, Chairman of the Board and Co-Founder, a co-inventor of YK-4-250, a Fellow of the National Academy of Inventors, and an experienced pharmaceutical researcher in drug discovery and translational medicine, alongside Damian V. Dolland, Co-Founder and Chief Financial Officer.

Forward-Looking Statements

This release contains forward-looking statements regarding the potential of YK-4-250, Trocar Pharma's development plans, and the regulatory pathway described herein. These statements are based on current expectations and are subject to substantial risks and uncertainties, including the possibility that preclinical results may not predict clinical outcomes, further development may not succeed, and regulatory approval may

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