DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Government Owned Inventions Available for License: 4-Amino-2-(piperidin-3-yl)isoindoline-1,3-diones as Anti-inflammatory Agents for Systemic Degenerative and Neurodegenerative Disorders

AGENCY: National Institutes of Health, HHS.

ACTION: Notice.

SUMMARY: The National Institute on Aging (NIA) seeks research co-development partners and/or licensees for the pre-clinical and clinical development of the compounds as anti-inflammatory therapeutics for systemic degenerative and neurodegenerative disorders.

FOR FURTHER INFORMATION CONTACT: Inquiries related to this license opportunity should be directed to: Nathan Whitman, Ph.D., Technology Transfer Manager, NCI, Technology Transfer Center, Email: *nathan.whitman@nih.gov* or Phone: 240-276-6294.

SUPPLEMENTARY INFORMATION: The immunomodulatory imide drugs (IMiDs) thalidomide and its close analogs (lenalidomide and pomalidomide) are widely used to treat a variety of diseases – such as inflammatory disorders, neurodegenerative diseases, multiple myeloma and other cancers. However, thalidomide is poorly soluble in water and unstable – complicating its delivery, bioavailability and subsequent evaluations. Additionally, thalidomide is plagued by teratogenic adverse effects in current human use. Therefore, there is intense interest in developing analogs that exhibit suitable properties of solubility and stability while retaining desirable biological activity safe for clinical use.

Researchers at the National Institute on Aging (NIA) have synthesized a promising new family of IMiD compounds with improved chemical stability, enhanced water solubility, and potent anti-inflammatory properties. In cell-based studies, these compounds significantly reduced key

inflammation markers, including nitrate and IL-6. Along with the ability to maintain high levels of cell viability, these improvements positionthem as promising therapeutic candidates. Unlike traditional IMiD drugs, these compounds do not bind to the cereblon protein, eliminating concerns of teratogenicity. The compounds also demonstrated a high binding affinity to the sigma and serotonin receptors, both linked to cellular inflammation, which further enhances their potential for treating neurodegenerative disorders, traumatic brain injury, inflammatory disorders, viral infections and cancer.

"This Notice is in accordance with 37 C.F.R. § 404.4 Authority to grant licenses."

NIH Reference Number: E-183-2024.

Related Technologies: E-045-2012-0, E-208-2015-0, E-151-2022-0.

Product Type: Therapeutic.

Therapeutic Area(s): Neurology | Geriatrics.

Development Stage: Pre-clinical *(in vivo* validation).

Publications: Scerba MT, et al. 2-(Piperidin-3-yl)phthalimides reduce classical markers of cellular inflammation in LPS-challenged RAW 264.7 cells and also demonstrate potentially relevant sigma and serotonin receptor affinity in membrane preparations. (PMID 38996940).

Patents: PCT/US2025/034951, filed June 6, 2025.

Potential Commercial Applications:

- Neurodegenerative diseases.
- Inflammatory disorders.
- Autoimmune disorders.
- Viral infections.
- Cancer.

Competitive Advantages:

- Enhanced chemical stability and solubility.
- Greater anti-inflammatory activity.

- Potentially clinically safer than classic IMiDs by lower risk of fetal malformations.

Collaboration Opportunity: Researchers at the NIA seek licensing and/or co-development research collaborations for the pre-clinical and clinical development of the compounds as anti-inflammatory therapeutics for systemic degenerative and neurodegenerative disorders.

Dated: June 10, 2026.

Richard U. Rodriguez,

Associate Director,

Technology Transfer Center,

National Cancer Institute.

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