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Focused Screening Identifies Evoxine as a Small Molecule That Counteracts CO2-Induced Immune Suppression

CHICAGO –Do non-neuronal cells respond to molecular CO_2 via specific pathways, independent of pH? Are these pathways evolutionarily conserved? Can these pathways be targeted pharmacologically? A new research report published in the April 2016 issue of the *Journal of Biomolecular Screening* (JBS) sheds light on these interesting questions which have been a focus of a close collaboration at Northwestern University.

Pulmonary researchers in the Sporn laboratory and fly geneticists in the Beitel laboratory together have previously shown that elevated CO_2 levels (hypercapnia) can suppress host defenses in models of bacterial infection in both mice and *Drosophila*. Now, by identifying a plant alkaloid, evoxine, that can specifically increase expression of both fly and mammalian innate immune genes in cells exposed to elevated CO_2, this new report provides the first proof-of-principle that it is possible to pharmacologically modulate the signaling pathways by which molecular CO_2 suppresses innate immune responses.

The results also suggest that these CO_2 pathways are evolutionarily conserved. Critically, these experiments validate the use of *Drosophila* cell-based screening to identify small molecules active for CO_2 response pathways that may be medically relevant, and open the door for testing whether small molecules can be used to improve host defenses during hypercapnia in mouse models of bacterial infection. CO_2-induced immune suppression may contribute to pulmonary infections and poor outcomes in hypercapnic patients with chronic obstructive pulmonary disease (COPD), currently the fourth leading cause of death in the U.S., and pharmacological agents that modulate CO_2-induced immune suppression may eventually be used to improve outcomes in these patients.

JBS is one of two MEDLINE-indexed scientific journals published by SLAS (Society for Laboratory Automation and Screening). Visit JBS Online at http://jbx.sagepub.com/content/21/4 to read "Focused Screening Identifies Evoxine as a Small Molecule That Counteracts CO2-Induced Immune Suppression." For more information about SLAS and its journals, visit www.slas.org/jala-jbs.

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education and information exchange and to encourage the study of, and improve the practice of life sciences discovery and technology. For more information, visit www.SLAS.org.

SLAS publishes two internationally recognized, MEDLINE-indexed journals, now in their 21st year of publication. ***The Journal of Laboratory Automation (JALA)*** *and* ***Journal of Biomolecular Screening (JBS)*** *uniquely serve life sciences discovery and technology professionals. Together, JALA and JBS address the full spectrum of issues that are mission-critical to this important audience, enabling scientific research teams to gain insights, increase productivity, elevate data quality, reduce lab process cycle times and enable experimentation that otherwise would be impossible.*

Specifically, ***JALA*** *explores ways in which scientists adapt advancements in technology for scientific exploration and experimentation. In direct relation to this,* ***JBS*** *reports how scientists develop and utilize novel technologies and/or approaches to provide and characterize chemical and biological tools to understand and treat human disease.*

Journal of Biomolecular Screening (JBS): *2013 Impact Factor 2.423. Editor-in-Chief Robert M. Campbell, Ph.D., Eli Lilly and Company, Indianapolis, IN (USA).*

Journal of Laboratory Automation (JALA): *2013 Impact Factor 1.879. Editor-in-Chief Edward Kai-Hua Chow, Ph.D., National University of Singapore (Singapore).*