

Accepted Manuscript

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PII: S0300-483X(17)30326-8
DOI: <https://doi.org/10.1016/j.tox.2017.11.003>
Reference: TOX 51971

To appear in: *Toxicology*

Received date: 21-8-2017
Revised date: 13-10-2017
Accepted date: 2-11-2017

Please cite this article as: Matson, Liana M., McCarren, Hilary S., Cadieux, C.Linn, Cerasoli, Douglas M., McDonough, John H., The Role of Genetic Background in Susceptibility to Chemical Warfare Nerve Agents Across Rodent and Non-Human Primate Models. *Toxicology* <https://doi.org/10.1016/j.tox.2017.11.003>

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The Role of Genetic Background in Susceptibility to Chemical Warfare Nerve Agents Across Rodent and Non-Human Primate Models

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Abstract

Genetics likely play a role in various responses to nerve agent exposure, as genetic background plays an important role in behavioral, neurological, and physiological responses to environmental stimuli. Mouse strains or selected lines can be used to identify susceptibility based on background genetic features to nerve agent exposure. Additional genetic techniques can then be used to identify mechanisms underlying resistance and sensitivity, with the ultimate goal of developing more effective and targeted therapies. Here, we discuss the available literature on strain and selected line differences in cholinesterase activity levels and response to nerve agent-induced toxicity and seizures. We also discuss the available cholinesterase and toxicity literature across different non-human primate species. The available data suggest that robust genetic differences exist in cholinesterase activity, nerve agent-induced toxicity, and chemical-induced seizures. Available cholinesterase data suggest that acetylcholinesterase activity differs across strains, but are limited

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