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Oxidized phospholipids as novel mediators of neurodegeneration

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Abstract

Neurodegeneration drives the progression of many neurological diseases. Inflammation and oxidative stress occurring in the CNS promote lipid peroxidation, leading to the generation of oxidized phospholipids such as oxidized phosphatidylcholines (OxPCs). OxPCs have been proposed as biomarkers of oxidative stress, where their detection in lesions in multiple sclerosis (MS), frontotemporal lobe dementia, spinal cord injury, and amyotrophic lateral sclerosis (ALS) implies that oxidative insult had occurred. However, recent findings highlight OxPCs as potent neurotoxic species requiring neutralization by microglia. Here, we summarize the science of OxPCs, including lessons from non-CNS diseases. We discuss the potential of OxPCs as common drivers of injury across neurological conditions and encourage investigations of OxPCs as novel neurotoxins.

Keywords: microglia; multiple sclerosis; neurodegeneration; oxidative stress; oxidized phosphatidylcholine.

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