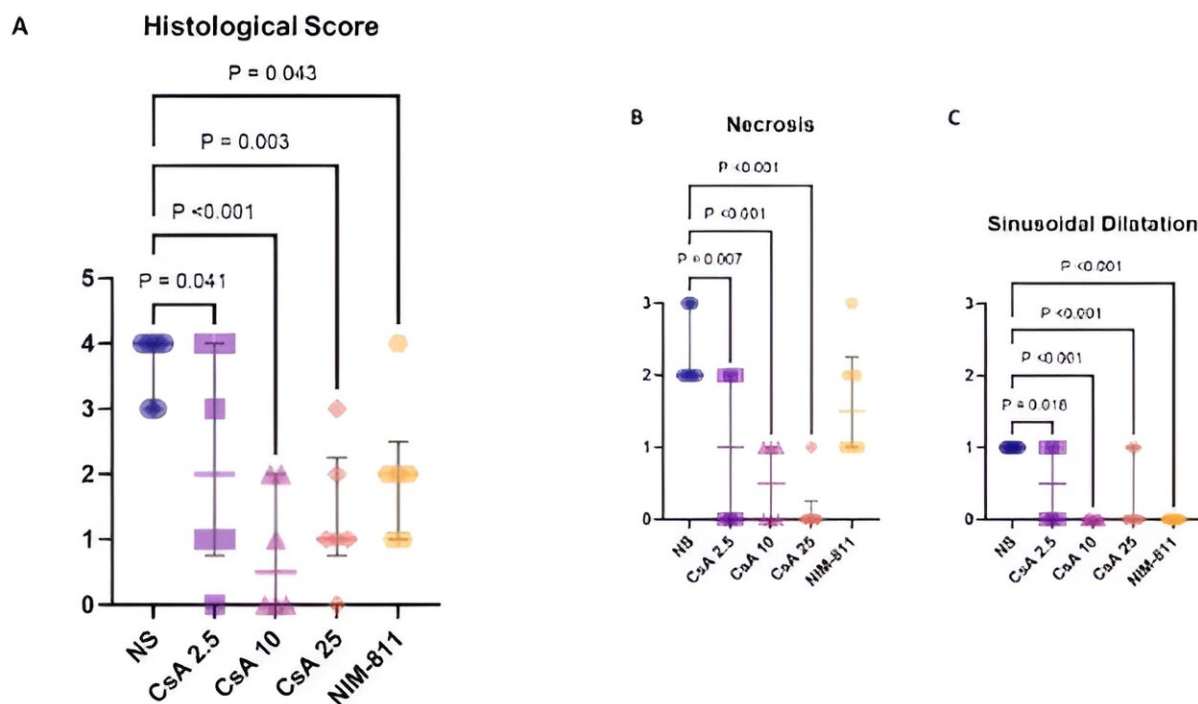


Protective effects of cyclosporine and NIM-811 in murine hepatic ischemia-reperfusion injury

April 30 2024



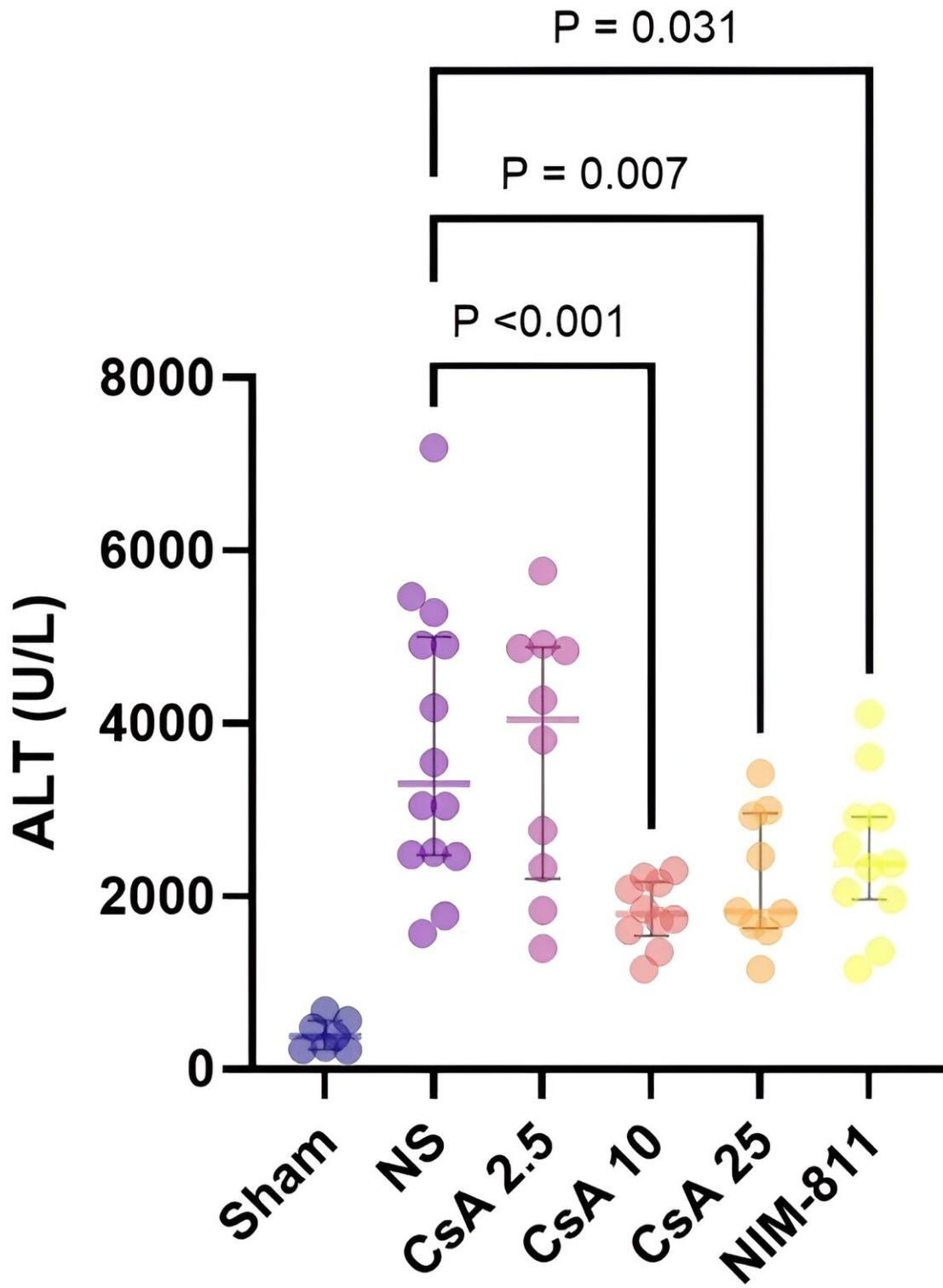
The Effect of cyclosporine and its analog NIM-811 on tissue injury. Credit: *Liver Research* (2024). DOI: 10.1016/j.livres.2024.02.002

During hepatic surgery or liver transplantation, the liver is vulnerable to ischemia-reperfusion injury (IRI), especially when vessels are compressed to control bleeding or during periods of ischemia. The

hallmark of IRI is mitochondrial dysfunction, which generates reactive oxygen species, and cell death through necrosis or apoptosis.

Cyclosporine (CsA), a well-known immunosuppressive agent that inhibits calcineurin, provides the additional effect of inhibiting the mitochondrial permeability transition pore (mPTP), hence preventing mitochondrial swelling and injury. NIM-811, which is the non-immunosuppressive analog of CsA, has a similar effect on mPTP.

In new [research](#) published in the journal *Liver Research*, NIM-811 served as an important control to identify a comparable effect with CsA, without the immunosuppressive action. Compared with the control mice, the mice treated with 10 and 25 mg/kg of CsA and NIM-811 had significantly lower serum alanine transaminase (ALT) levels.



the Effect of cyclosporine and its analog NIM-811 on serum alanine transaminase. Credit: *Liver Research* (2024). DOI: 10.1016/j.livres.2024.02.002

Moreover, the liver tissue showed reduced histological injury scores after treatment with CsA at 2.5, 10, and 25 mg/kg and NIM-811 and significant decrease in apoptosis after treatment with CsA at all doses.

Furthermore, the levels of the pro-inflammatory cytokines, particularly interleukin (IL)-1 β , IL-2, IL-4, IL-10, and keratinocyte chemoattractant/human growth-regulated oncogene, significantly decreased in the mice treated with the highest dose of CsA (25 mg/kg) than those in the control mice.

The findings provide evidence that CsA can reduce hepatic warm IRI in a murine model. Similar findings with the use of its non-immunosuppressive analog NIM-811 suggested that the protection was unlikely mediated by immunosuppressive pathways. Furthermore, these results have potential implications on mitigating IRI during [liver transplantation](#) and resection.

More information: Joshua Hefler et al, Protective effects of cyclosporine and its analog NIM-811 in a murine model of hepatic ischemia-reperfusion injury, *Liver Research* (2024). DOI: [10.1016/j.livres.2024.02.002](https://doi.org/10.1016/j.livres.2024.02.002)

Provided by KeAi Communications Co., Ltd.

Citation: Protective effects of cyclosporine and NIM-811 in murine hepatic ischemia-reperfusion injury (2024, April 30) retrieved 21 June 2024 from

<https://medicalxpress.com/news/2024-04-effects-cyclosporine-nim-murine-hepatic.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.