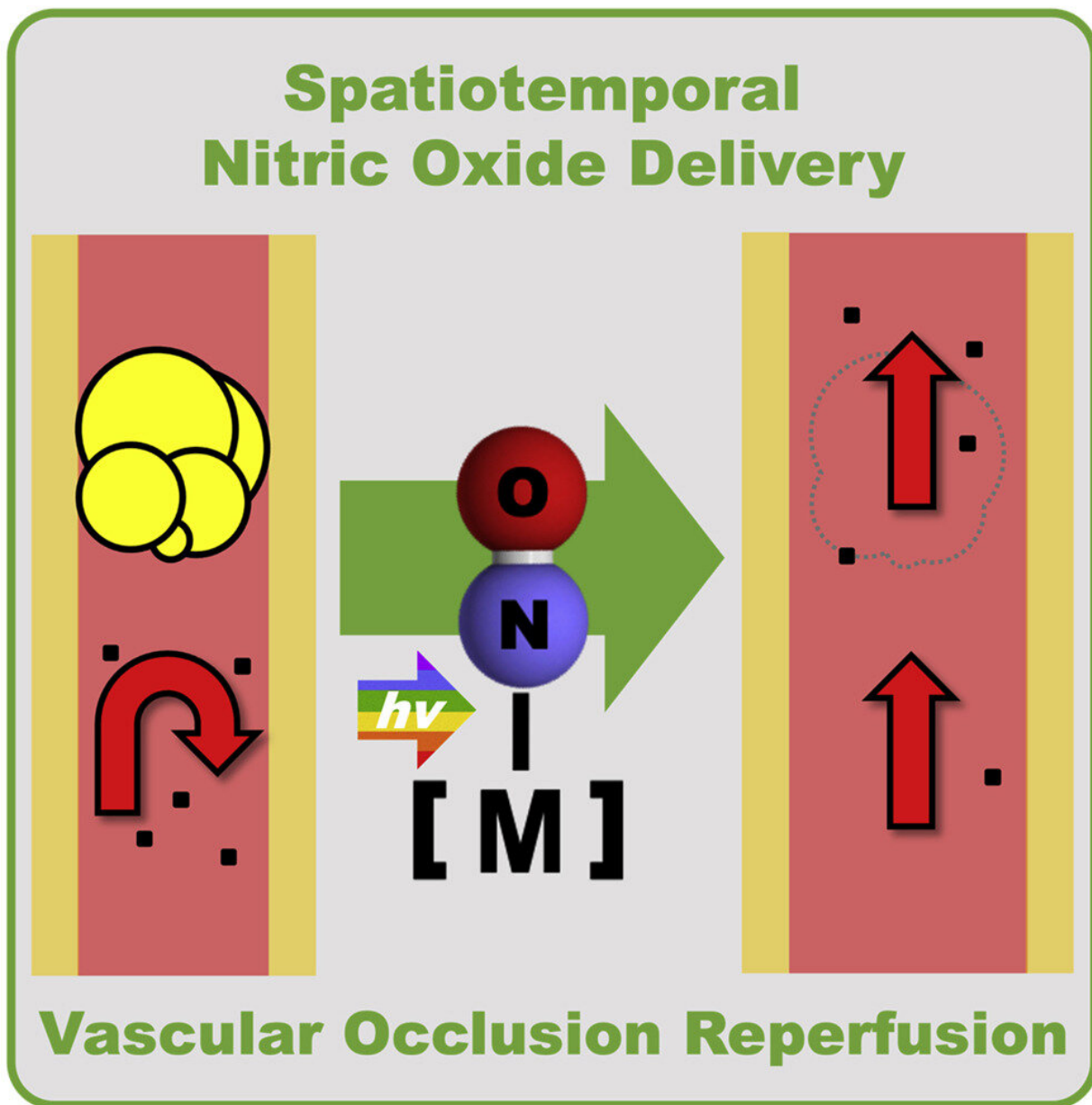


Photodynamic treatment of acute vascular occlusion using iron–nitrosyl complex

April 25 2023, by JooHyeon Heo



The NO delivery with temporal and spatial control by a photodissociable iron–nitrosyl complex. Credit: *Chem* (2023). DOI: 10.1016/j.chempr.2023.02.013

Blood flowing through the blood vessels carries oxygen, nutrients and waste around the body. Obstruction of a blood vessel in our body can cause severe organ damage. In particular, retinal vascular occlusion (RVO) is a common cause of visual impairment. Although several conventional vasodilators and thrombolytic agents have previously been considered as treatment, their clinical applications to vascular diseases are limited mainly because of slow reaction time and lack of precise control of their actions, noted the research team.

A research team, led by Professor Jaeheung Cho in the Department of Chemistry at UNIST, in collaboration with Professor Junyeop Lee (Department of Ophthalmology, Asan Medical Center), and Professor Mu-Hyun Baik (Department of Chemistry, KAIST) has unveiled a promising therapeutic option for treating RVO disorders.

In their study, published in the journal *Chem*, they reported a strategy that aims to pierce clogged [blood vessels](#) with a spatiotemporally controllable nitric oxide transporter, $[\text{Fe}(\text{TBDAP})(\text{NO})(\text{H}_2\text{O})]^{2+}$, which was synthesized and precisely characterized by various physicochemical methods, including X-ray crystallography. According to the research team, their findings suggest an unprecedentedly selective and controllable treatment option for acute vascular occlusive diseases, including cardiovascular and cerebrovascular diseases.

Their findings showed that normal retinal blood vessels were confirmed to be dilated by the photoresponsive iron–nitrosyl complex in the [animal model](#). Furthermore, occluded retinal [blood](#) vessels were effectively re-

perfused after the immediate delivery of nitric oxide using light in animal disease models, noted the research team. These studies suggest an unprecedentedly selective and controllable treatment option for acute vascular occlusive diseases, including cardiovascular and cerebrovascular diseases.

More information: Jisu Choe et al, Photodynamic treatment of acute vascular occlusion by using an iron–nitrosyl complex, *Chem* (2023).

[DOI: 10.1016/j.chempr.2023.02.013](https://doi.org/10.1016/j.chempr.2023.02.013)

Provided by Ulsan National Institute of Science and Technology

Citation: Photodynamic treatment of acute vascular occlusion using iron–nitrosyl complex (2023, April 25) retrieved 27 April 2024 from <https://medicalxpress.com/news/2023-04-photodynamic-treatment-acute-vascular-occlusion.html>

<p>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.</p>
--