Research Highlight

Take Two Iron Chelators and Call Me in the Morning

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In a report by Hadziahmetovic et al,¹ oral administration of an iron chelator deferiprone (Ferriprox), which was recently approved by the Food and Drug Administration, showed substantial protection against retinal degeneration both in a chemically induced (NaIO₃) mouse model as well as in a *rd6* mouse, which exhibits a hereditary, slowly progressing retinal degeneration that mainly affects the RPE and photoreceptor cells. These authors previously demonstrated that this iron chelator can spare the retina from iron overload-induced degeneration, has no appreciable retinal toxicity in humans or mice, and is readily absorbed upon oral administration.²

Deferiprone has been used for the management of thalassemia major³ and is currently in clinical trials in the United States for treatment of contrast-induced acute kidney disease and for slowing the progression of chronic kidney disease (http://www.cormedix.com/pipeline_CRMD001.php). *Drug repurposing* is a current buzz phrase in translational medicine. The most recent work by Hadziahmetovic et al¹ may lead to such repurposing of deferiprone and thus represents another potential application of chelator-based therapeutics. While the mechanism of action of deferiprone in reducing the extent of retinal degeneration is not fully understood and may, in fact, involve multiple mechanisms, it likely involves suppression of free radical oxidation reactions catalyzed non-enzymatically by free iron. Development of drugs that target these kinds of reactions is an area of intensive research, including bifunctional molecules that are both chelators and free radical scavengers.⁴ The results of such studies are promising and have clear potential clinical implications for management of a broad spectrum of human retinal degeneration, both hereditary and acquired.

References

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