TECHNOLOGY

Eukaryotic Heme Transport as a Drug Target for Helminthic Infections

OVERVIEW

Helminthic infestations by parasitic worms afflict more than two billion people worldwide and cause more than eighty billion dollars of annual crop-loss globally. Novel treatments for these parasitic infections, for which there is no universal cure, can be developed based on studies by a University of Maryland researcher on heme transport using the free-living microscopic roundworm Caenorhabditis elegans.

An equally important public health issue, often compounded by helminthic infections, is iron deficiency. It is the most common nutritional disorder in the world. Novel treatments for iron deficiency can be obtained by using C. elegans as a model for heme transport because heme is a more absorbable source of iron for human consumption.

Heme is a critical factor for sustaining life in a eukaryotic cell. Within these cells, heme is synthesized via a multi-step pathway that is highly conserved through evolution. In contrast, worms, including C. elegans, do not synthesize heme although they require heme-containing proteins for normal metabolism. This finding is novel because heme synthesis was thought to occur in all free-living eukaryotes. Like C. elegans, human and livestock parasitic worms also lack the ability to make heme.

Studies for this technology show that C. elegans is unique because it utilizes dietary heme to fulfill its heme requirement and uses heme as an iron source when iron is not easily available.

Identification of the heme transporter, using the C. elegans model, will allow the design of more bioavailable forms of iron-based nutraceuticals to deliver iron more effectively to iron-deficient populations. Illumination of the worm heme transport pathways also has potential applications for controlling helminthic infections by developing selective drugs that can target the worm but not its human or plant host.

For additional information and licensing opportunities, please contact the Office of Technology Commercialization, University of Maryland. Phone: 301-405-3947. Email: otc@umd.edu.

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Additional Information

INSTITUTION

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PATENT STATUS

Patent(s) pending

LICENSE STATUS

Contact OTC for licensing information

CATEGORIES

- Natural Compounds
- Drug Screen

EXTERNAL RESOURCES

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