Modified iron transport protein for removal of excessive iron and treatment of bacterial infections

Technology #2735

This technology is a modified iron transport protein that may be used as a bacteriostatic agent and for non-toxic removal of iron for the treatment of iron overload disorders.

Unmet Need: Non-toxic method of iron chelation for treatment of iron overload disorders

Iron overload is the unhealthy accumulation of iron in the body that can originate from hereditary factors or develop in patients that receive regular blood transfusions. Iron also plays a role in infections as it serves as an essential nutrient for many types of bacteria. Current treatment efforts have relied on small molecule iron chelators for their ability to target excessive iron for secretion into the urine. Although capable of reducing harmful levels of iron in tissues, their clinical use is limited as many have dangerous side-effects and require intolerable methods of administration.

The Technology: Modified iron transport protein for non-toxic treatment of iron overload disorders and bacterial infections

This technology utilizes a modified version of the natural iron transporter neutrophil gelatinase associated lipocalin (NGAL) to bind excess iron and clear it from the body. While the modified NGAL retains the iron-binding properties of its parent protein, it bypasses renal absorption and is therefore secreted in urine. As such, the modified NGAL is able to efficiently clear excess iron from the body. Additionally, the modified NGAL is able to interfere with siderophore-mediated iron acquisition in bacteria, making it a potential bacteriostatic agent for the treatment of bacterial infections, including urinary tract infections.

This technology has been demonstrated to efficiently remove excess iron in mouse models of both acquired and hereditary iron overload.

Applications:

- Treatment of iron overload disorders, both hereditary and acquired
- Antidote for acute iron poisoning
- Treatment of bacterial infections such as urinary tract infections
- Research tool for studying endogenous iron chelation and secretion pathways
• Research tool for studying the role of iron in innate immunity

**Advantages:**

• Non-toxic strategy for removing excess iron  
• Readily excreted in urine  
• Prevents bacterial growth  
• Stable under acidic conditions

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**Patent Information:**

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Patent Issued (US [9,534,027](https://www.google.com/search?q=9,534,027))

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**Related Publications:**


**Tech Ventures Reference:**

• IR 2652, 2735, CU12170, CU13307

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