Australian National University

The molecular basis of bacterial susceptibility to zinc toxicity and how to exploit it.

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Slatyer Seminar Room, Building 46

Dietary zinc deficiency is a global health problem affecting almost two billion people. Infectious diseases associated with zinc deficiency include respiratory infections caused by bacteria. The foremost of these is *Streptococcus pneumoniae* which is responsible for more than 1 million deaths annually.

The association between zinc and immunity is well known, but the mechanism by which zinc provides protection against infectious diseases has remained a mystery.

Previously, we found that manganese was essential for *S. pneumoniae* growth and its ability to cause disease. Intriguingly, we also observed that zinc could bind to the manganese transport protein. Therefore, we sought to determine if zinc could inhibit manganese transport, and to observe what the effects would be on *S. pneumoniae*.

In this talk we show that microbial susceptibility to zinc toxicity is mediated by extracellular cation competition for an ABC transporter essential to the virulence of this human pathogen and elucidate its intracellular consequences. We further show how this susceptibility is harnessed by the innate immune response and could potentially be exploited in the future.

Presented by

Division of Biomedical Science & Biochemistry

Research School of Biology

College of Medicine, Biology & Environment

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