

**Lysocin E is a new antibiotic that targets menaquinone in the bacterial membrane****Panthee Suresh**

Infectious diseases are still one of the leading causes of morbidity and mortality worldwide. Recent data indicates that we will face challenge by drug resistant pathogens in unprecedented manner. Moreover, we clearly see an increase in ageing of the population in the developed countries. Elderly people are more prone to infections due to obvious decrease in immunity. Moreover, in developing countries poor hygienic conditions and irrational use of antimicrobial agents has led to the increased infection rate with drug resistant strains. In the world of increasing existing infections, new infections, and infections by multidrug resistant pathogens, ways to cure infectious diseases are crucial. In this research, authors developed a screening approach to screen therapeutically effective antimicrobial agents from the very early steps of screening and succeeded to identify a novel antimicrobial agent, lysocin E, that had a novel mechanism of action.

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**Abstract**

To obtain therapeutically effective new antibiotics, we first searched for bacterial culture supernatants with antimicrobial activity *in vitro* and then performed a secondary screening using the silkworm infection model. Through further purification of the *in vivo* activity, we obtained a compound with a previously uncharacterized structure and named it 'lysocin E'. Lysocin E interacted with menaquinone in the bacterial membrane to achieve its potent bactericidal activity, a mode of action distinct from that of any other known antibiotic, indicating that lysocin E comprises a new class of antibiotic. This is to our knowledge the first report of a direct interaction between a small chemical compound and menaquinone that leads to bacterial killing. Furthermore, lysocin E decreased the mortality of infected mice. To our knowledge, lysocin E is the first compound identified and purified by quantitative measurement of therapeutic effects in an invertebrate infection model that exhibits robust *in vivo* effects in mammals.

**Reference**

Kaito, C., Akimitsu, N., Watanabe, H. & Sekimizu, K. Silkworm larvae as an animal model of bacterial infection pathogenic to humans. *Microb. Pathog.* 32, 183–190 (2002)