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# Abstract Book

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## UNVEILING THERAPEUTIC POTENTIAL OF BACTERIOPHAGE TREATMENT IN ACINETOBACTER BAUMANNII-INFECTED ZEBRAFISH EMBRYO MODEL

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**Introduction:** There is an urgent demand for the development of new therapeutic approaches to combat multidrug-resistant *Acinetobacter baumannii*, and bacteriophages appear to be a highly promising solution. Phages are suitable to precisely target the infection-causing bacteria without disrupting the beneficial microbiota. The zebrafish (*Danio rerio*) embryo model represents an insightful animal model for preclinical studying of various infectious diseases and for discovery of novel safe and effective antimicrobial drugs.

**Methods:** Systemic bacterial infection was established by microinjection of 2000 cells of nosocomial carbapenem-resistant *A. baumannii* strain 6077/12 into the bloodstream of 48 hour old zebrafish embryos. Infected embryos were treated by parenteral administration of 4 different doses (10, 50, 100, 500 PFU) of bacteriophage vB\_AbaM\_ISTD at 6 hours after infection (hpi). Efficacy of treatment was evaluated according to embryo survival, morphological malformations and bacterial burden (CFU) over a 3-day period.

**Results:** *A. baumannii*-infected embryos treated with bacteriophage resulted with 100% survival rate, while 70% of untreated embryos survived to 24 hpi and none to the end of the experiment. Viable bacterial cell count and embryo morphology observations indicated that the administered phage effectively reduced *A. baumannii* infection *in vivo*. The most effective dose was 500 PFU, decreasing the bacterial load by 3.09 log units during 24 hpi, while lower bacteriophage doses (10, 50 and 100 PFU) produced less prominent, but also significant bacterial reduction of 2.10, 2.19 and 2.67 log units, respectively.

**Conclusion:** Parenteral administration of phage ISTD demonstrated potent therapeutic activity against *A. baumannii* infection in every investigated dose.

Key words: bacteriophage; Acinetobacter; zebrafish; therapy; antimicrobial

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