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# Reverting antibiotic tolerance of bacterial persisters by a brominated furanone, (*Z*)-4-bromo-5-(bromomethylene)-3-methylfuran-2(5*H*)-one

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## Abstract

Persister cell is a small sub-population of bacterial cells which are tolerant to antibiotic treatment and hence is considered as a major reason for secondary infections and chronic infections. Since persister cell also facilitates the development of antibiotic-resistant mutants, it becomes a potent target to prevent antibiotic resistant infections. Recently, a synthetic analogue of a natural compound,(*Z*)-4-bromo-5-(bromomethylene)-3-methylfuran-2(5*H*)-one (BF8) was found to reduce persister formation of*Pseudomonas aeruginosa* and *Escherichia coli* and restore the antibiotic susceptibility of isolated persister cells at growth-non-inhibitory concentrations. In addition, BF8 was also found to reduce the persister formation in the culture of *P. aeruginosa* PDO300, a representative of the strains commonly developed in the late stage of cystic fibrosis.

Interestingly, BF8 was also demonstrated as an inhibitor of bacterial signaling system named quorum sensing, however, a signaling compound of *P. aeruginosa* quorum sensing system, *N*-(3-oxo-dodecanoyl)-*L*-homoserine lactone, was also found to restore the susceptibility of isolated persister cells of *P. aeruginosa.*

In the genetic level, a DNA microarray study revealed that BF8 induced genes encoding oxidoreductases in both *E. coli* and *P. aeruginosa* persisters. The results from this study established that BF8 is a promising control of bacterial persistence and also suggested that other targets of BF8 rather than quorum sensing system are responsible for restoring the susceptibility of isolated persister cells.

## Biography

Jiachuan Pan has completed her Ph.D from SyracuseUniversity and in her 5-year study, she found a group of brominated furanones which reduced the antibiotic tolerance in *P. aeruginosa* and *E. coli*. She contributedfour papers as the first author in reputed journals to demonstrate her work in reverting antibiotic tolerance and won a student award from American Society for Microbiology in 2012for her study.