

Small Molecules Probing the Function of YjeE

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A significant fraction of sequenced genomes contain many conserved proteins of unknown function with high potential to be antimicrobial targets; however, the lack of functional information prevents further development. The essential phenotypes of these proteins provide many challenges in studying the effects of depletion. This work was an attempt to overcome such problems by using a chemical biology approach which was shown to have predictive power in finding a new phenotype for the *E. coli* protein of unknown function and provided a glimpse of its cellular activities.

紹介論文

Known Bioactive Small Molecules Probe the Function of a Widely Conserved but Enigmatic Bacterial ATPase, YjeE

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Escherichia coli YjeE is a broadly conserved bacterial ATPase of unknown function that has been widely characterized as essential. Here, the transcriptional regulation of the promoter of *yjeE* (P_{yjeE}) was probed using a luciferase reporter and 172 antibiotics of diverse mechanisms. Norfloxacin and other fluoroquinolones were found to be the most potent activator of P_{yjeE} through binding to DNA gyrase. The stimulation of P_{yjeE} by norfloxacin was most impacted by lesions in two-component signal transduction systems with roles in respiration, central metabolism, and oxidative stress responses. This suggested that YjeE may have a critical role in aerobic metabolism. Remarkably, YjeE was found to be dispensable when cells were grown in the absence of oxygen. To the best of our knowledge, these findings represent the first definitive phenotypes for this enigmatic protein.

参考論文

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