

研究業績 英文表記

和文	
表題	<i>Vibrio parahaemolyticus</i> における RelE/ParE スーパーファミリー毒素は DNA ニッキングエンドヌクレアーゼ活性を有する
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英文	
Title	A RelE/ParE superfamily toxin in <i>Vibrio parahaemolyticus</i> has DNA nicking endonuclease activity
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Abstract	<p>Type II toxins in toxin-antitoxin (TA) systems fold into a similar fold and belong to the RelE/ParE superfamily. However, they display two distinct biochemical activities: RelE toxins are mRNA interferases, while ParE toxins are DNA gyrase (Gyr) inhibitors. Previously, we found a TA system, vp1842/vp1843, on the <i>Vibrio parahaemolyticus</i> genome whose toxin Vp1843 belongs to the RelE/ParE toxin superfamily. Vp1843, unlike RelE toxins, has neither protein synthesis inhibitory activity nor ribonuclease activity. In this study, we examined the inhibitory potency of Vp1843 with <i>Escherichia coli</i> Gyr. The result showed that Vp1843, unlike other ParE toxins, had little Gyr inhibitory activity, but rather converted supercoiled DNA to open-circular DNA. Analysis showed further that Vp1843 cleaves a single strand in DNA, and that the antitoxin Vp1842 neutralized the nicking endonuclease activity of Vp1843. Mutations of Lys37 and Pro45 in Vp1843 abolished its nicking activity, suggesting that they play a crucial role in nicking endonuclease activity. To our knowledge, Vp1843 is the first toxin with DNA nicking endonuclease activity among the RelE/ParE toxin superfamily.</p>
keyword	DNA nicking endonuclease, RelE/ParE superfamily, Toxin-antitoxin, <i>Vibrio parahaemolyticus</i> .

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