

## Multiple diguanylate cyclase-coordinated regulation of pyoverdine synthesis in *Pseudomonas aeruginosa* - DTU Orbit (08/11/2017)

### Multiple diguanylate cyclase-coordinated regulation of pyoverdine synthesis in *Pseudomonas aeruginosa*

The nucleotide signalling molecule bis-(3'-5')-cyclic dimeric guanosine monophosphate (c-di-GMP) plays an essential role in regulating microbial virulence and biofilm formation. C-di-GMP is synthesized by diguanylate cyclase (DGC) enzymes and degraded by phosphodiesterase (PDE) enzymes. One intrinsic feature of c-di-GMP signalling is the abundance of DGCs and PDEs encoded by many bacterial species. It is unclear whether the different DGCs or PDEs coordinately establish the c-di-GMP regulation or function independently of each other. Here, we provide evidence that multiple DGCs are involved in regulation of c-di-GMP on synthesis of the major iron siderophore pyoverdine in *Pseudomonas aeruginosa*. Constitutive expression of the WspG or YedQ DGC in *P. aeruginosa* is able to induce its pyoverdine synthesis. Induction of pyoverdine synthesis by high intracellular c-di-GMP depends on the synthesis of exopolysaccharides and another two DGCs, SiaD and SadC. SiaD was found to boost the c-di-GMP synthesis together with constitutively expressing YedQ. The exopolysaccharides and the SiaD DGC were found to modulate the expression of the RsmY/RsmZ ncRNAs. Induction of the RsmY/RsmZ ncRNAs might enhance the pyoverdine synthesis through SadC. Our study sheds light on a novel multiple DGC-coordinated c-di-GMP regulatory mechanism of bacteria.

### General information

State: Published

Organisations: Department of Chemistry, Organic Chemistry, Nanyang Technological University, University of Copenhagen

Authors: Chen, Y. (Ekstern), Yuan, M. (Ekstern), Mohanty, A. (Ekstern), Yam, J. K. H. (Ekstern), Liu, Y. (Ekstern), Chua, S. L. (Ekstern), Nielsen, T. E. (Intern), Tolker-Nielsen, T. (Ekstern), Givskov, M. (Ekstern), Cao, B. (Ekstern), Yang, L. (Ekstern)

Number of pages: 10

Pages: 498-507

Publication date: 2015

Main Research Area: Technical/natural sciences

### Publication information

Journal: Environmental Microbiology Reports

Volume: 7

Issue number: 3

ISSN (Print): 1758-2229

Ratings:

BFI (2017): BFI-level 1

Web of Science (2017): Indexed Yes

BFI (2016): BFI-level 1

Scopus rating (2016): CiteScore 3.47 SJR 1.475 SNIP 0.952

Web of Science (2016): Indexed yes

BFI (2015): BFI-level 1

Scopus rating (2015): SJR 1.599 SNIP 0.959 CiteScore 3.39

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 1

Scopus rating (2014): SJR 1.524 SNIP 0.861 CiteScore 3.14

Web of Science (2014): Indexed yes

BFI (2013): BFI-level 1

Scopus rating (2013): SJR 1.465 SNIP 0.941 CiteScore 3.24

ISI indexed (2013): ISI indexed yes

Scopus rating (2012): SJR 1.472 SNIP 0.907 CiteScore 2.99

ISI indexed (2012): ISI indexed yes

Web of Science (2012): Indexed yes

Scopus rating (2011): SJR 1.631 SNIP 1.247 CiteScore 2.77

ISI indexed (2011): ISI indexed no

Scopus rating (2010): SJR 1.251 SNIP 0.935

Original language: English

DOIs:

10.1111/1758-2229.12278

Source: FindIt

Source-ID: 2265264813

Publication: Research - peer-review › Journal article – Annual report year: 2015

