Benchmarking various green fluorescent protein variants in Bacillus subtilis, Streptococcus pneumoniae, and Lactococcus lactis for live cell imaging

Green fluorescent protein (GFP) offers efficient ways of visualizing promoter activity and protein localization in vivo, and many different variants are currently available to study bacterial cell biology. Which of these variants is best suited for a certain bacterial strain, goal, or experimental condition is not clear. Here, we have designed and constructed two “superfolder” GFPs with codon adaptation specifically for Bacillus subtilis and Streptococcus pneumoniae and have benchmarked them against five other previously available variants of GFP in B. subtilis, S. pneumoniae, and Lactococcus lactis, using promoter-gfp fusions. Surprisingly, the best-performing GFP under our experimental conditions in B. subtilis was the one codon optimized for S. pneumoniae and vice versa. The data and tools described in this study will be useful for cell biology studies in low-GC-rich Gram-positive bacteria.

General information
Publication status: Published
Organisations: University of Groningen, Kluyver Centre for Genomics of Industrial Fermentation
Corresponding author: Veening, J. W.
Pages: 6481-6490
Publication date: 2013
Peer-reviewed: Yes

Publication information
Journal: Applied and Environmental Microbiology
Volume: 79
Issue number: 20
ISSN (Print): 0099-2240
Ratings:
Scopus rating (2013): CiteScore 4.25
Web of Science (2013): Impact factor 3.952
Original language: English
DOIs:
10.1128/AEM.02033-13
Source: Scopus
Source-ID: 84885074528
Research output: Contribution to journal › Journal article – Annual report year: 2017 › Research › peer-review