A Manuscript Microscope 'Sentence Audit' of:

Fusion of the N-terminal 119 amino acids with the RelA-CTD renders its growth inhibitory effects ppGpp-dependent

What is the Manuscript Microscope Sentence Audit?

The Manuscript Microscope Sentence Audit is a research paper introspection system that parses the text of your manuscript into minimal sentence components for faster, more accurate, enhanced proofreading.

Why use a Sentence Audit to proofread your manuscript?

- Accelerated Proofreading: Examine long technical texts in a fraction of the usual time.
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- Reliable Proofreading: Ensure every single word of your manuscript is correct.
- Easier Proofreading: Take the hardship out of crafting academic papers.

Bonus 1: Improved Productivity: Rapidly refine rough drafts to polished papers.
Bonus 2: Improved Authorship: Cultivate a clear, concise, consistent, writing style.
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Manuscript Source: https://www.biorxiv.org/content/10.1101/2021.03.21.436043v1

Manuscript Authors: Krishma Tailor, Prarthi Sagar, Keyur Dave & Jayashree Pohnerkar

Audit Date: 31/03/21 **Audit Identifier:** KU3G80CX7M9OEW2 **Code Version:** 3.6

Features of the Sentence Audit:

The Sentence Audit combines two complementary proofreading approaches:

1. Each sentence of your text is parsed and displayed in isolation for focused inspection.
2. Each individual sentence is further parsed into Minimal Sentence Components for a deeper review of the clarity, composition and consistency of the language you used.

The Minimal Sentence Components shown are the smallest coherent elements of each sentence of your text as derived from it's conjunctions, prepositions and selected punctuation symbols (i.e. commas, semicolons, round and square brackets).

The combined approaches ensure easier, faster, more effective proofreading.

Comments and Caveats:

• The sentence parsing is achieved using a prototype natural language processing pipeline written in Python and may include occasional errors in sentence segmentation.

• Depending on the source of the input text, the Sentence Audit may contain occasional html artefacts that are parsed as sentences (E.g. "Download figure. Open in new tab").

• Always consult the original research paper as the true reference source for the text.

Contact Information:

To get a Manuscript Microscope Sentence Audit of any other research paper, simply forward any copy of the text to John.James@OxfordResearchServices.com.

All queries, feedback or suggestions are also very welcome.

Research Paper Sections:

The sections of the research paper input text parsed in this audit.

Section No.	Headings	Sentences
Section: 1	Abstract	9
Section: 2	Introduction	18
N/A	--- --- --- --- --- --- ---	0
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The Sentence Audit Of The Research Paper

Title # Fusion of the N-terminal 119 amino acids with the RelA-CTD renders its growth inhibitory effects ppGpp-dependent

S1 [001] Abstract

S1 [002] The guanosine nucleotide derivatives ppGpp and pppGpp, are central to the remarkable capacity of bacteria to adapt to fluctuating environment and metabolic perturbations.

The guanosine nucleotide derivatives ppGpp ...
... and pppGpp, ...
... are central ...
... to the remarkable capacity ...
... of bacteria ...
... to adapt ...
... to fluctuating environment ...
... and metabolic perturbations.

S1 [003] These alarmones are synthesized by two proteins, RelA and SpoT in E. coli and the activities of each of the two enzymes are highly regulated for homeostatic control of (p)ppGpp levels in the cell.

These alarmones are synthesized ...
... by two proteins, ...
... RelA ...
... and SpoT ...
... in E. coli ...
... and the activities ...
... of each ...
... of the two enzymes are highly regulated ...
... for homeostatic control ...
... of ...
... (p)ppGpp levels ...
... in the cell.

S1 [004] Although the domain structure and function of RelA are well defined, the findings of this study unfold the regulatory aspect of RelA that is possibly relevant in vivo.

Although the domain structure ...
... and function ...
... of RelA are well defined, ...
... the findings ...
... of this study unfold the regulatory aspect ...
... of RelA ...
... that is possibly relevant ...
... in vivo.

S1 [005] We uncover here the importance of the N-terminal 1-119 amino acids of the enzymatically compromised (p)ppGpp hydrolytic domain (HD) of monofunctional RelA for the (p)ppGpp mediated regulation of RelA-CTD function.

We uncover here the importance ...
... of the N-terminal 1-119 amino acids ...
... of the enzymatically compromised ...
... (p)ppGpp hydrolytic domain ...
... (HD) ...
... of monofunctional RelA ...
... for the ...
... (p)ppGpp mediated regulation ...
... of RelA-CTD function.

S1 [006] We find that even moderate level expression of RelA appreciably reduces growth when the basal levels of (p)ppGpp in the cells are higher than in the wild type, an effect independent of its ability to synthesize (p)ppGpp.

We find ...
... that even moderate level expression ...
... of RelA appreciably reduces growth ...
... when the basal levels ...
... of ...
... (p)ppGpp ...
... in the cells are higher ...
... than in the wild type, ...
... an effect independent ...
... of its ability ...
... to synthesize ...
... (p)ppGpp.

S1 [007] This is evidenced by the growth inhibitory effects of oversynthesis of the RelA-CTD in the relA+ strain but not in relA null mutant, suggesting the requirement of the functional RelA protein for basal level synthesis of (p)ppGpp, accordingly corroborated by the restoration of the growth inhibitory effects of the RelA-CTD expression in the relA1 spoT202 mutant.

This is evidenced ...
... by the growth inhibitory effects ...
... of oversynthesis ...
... of the RelA-CTD ...
... in the relA+ strain ...
... but not ...
... in relA null mutant, ...
... suggesting the requirement ...
... of the functional RelA protein ...
... for basal level synthesis ...
... of ...
... (p)ppGpp, ...
... accordingly corroborated ...
... by the restoration ...
... of the growth inhibitory effects ...
... of the RelA-CTD expression ...
... in the relA1 spoT202 mutant.

S1 [008] The N-terminal 119 amino acids of RelA fused in-frame with the RelA-CTD, both from 406-744 amino acids (including TGS) and from 454-744 amino acids (sans TGS) caused growth inhibition only in spoT1 and spoT202 relA1 mutants, uncovering the hitherto unrealized (p)ppGpp-dependent regulation of RelA-CTD function.

The N-terminal 119 amino acids ...
... of RelA fused in-frame ...
... with the RelA-CTD, ...
... both from 406-744 amino acids ...
... (including TGS) ...
... and from 454-744 amino acids ...
... (sans TGS) ...
... caused growth inhibition ...
... only in spoT1 ...
... and spoT202 relA1 mutants, ...
... uncovering the hitherto unrealized ...
... (p)ppGpp-dependent regulation ...
... of RelA-CTD function.

S1 [009] An incremental rise in the (p)ppGpp levels is proposed to progressively modulate the interaction of RelA-CTD with the ribosomes, with possible implications in the feedback regulation of the N-terminal (p)ppGpp synthesis function, a proposal that best explains the nonlinear relationship between (p)ppGpp synthesis and increased ratio of RelA:ribosomes, both in vitro as well as in vivo.

An incremental rise ...
... in the ...
... (p)ppGpp levels is proposed ...
... to progressively modulate the interaction ...
... of RelA-CTD ...
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... with possible implications ...
... in the feedback regulation ...
... of the N-terminal ...
... (p)ppGpp synthesis function, ...
... a proposal ...
... that best explains the nonlinear relationship ...
... between ...
... (p)ppGpp synthesis ...
... and increased ratio ...
... of RelA:ribosomes, ...
... both in vitro ...
... as well ...
... as in vivo.

S2 [010] Introduction

S2 [011] Environmental stressors elicit largely conserved adaptive responses in bacteria (and plants), mediated and coordinated by the hyperphosphorylated nucleotides, ppGpp and pppGpp (together called (p)ppGpp).

Environmental stressors elicit largely conserved adaptive responses ...

... in bacteria ...

... (and plants), ...

... mediated ...

... and coordinated ...

... by the hyperphosphorylated nucleotides, ...

... ppGpp ...

... and pppGpp ...

... (together called ...

... (p)ppGpp).

S2 [012] These signalling nucleotides control various cellular activities at transcriptional, translational, and posttranslational levels (Hauryliuk et al., 2015).

These signalling nucleotides control various cellular activities ...

... at transcriptional, ...

... translational, ...

... and posttranslational levels ...

... (Hauryliuk et al., 2015).

S2 [013] Recent studies have realized that the intracellular pool size of (p)ppGpp does not act as a biphasic switch rather, incremental levels of (p)ppGpp exert differential effects on cell physiology including its role in virulence, pathogenesis, antibiotic resistance/tolerance, sporulation, biofilm and persisters' cell formation (Dozot et al., 2006, Geiger et al., 2010, Ochi et al., 1981, Poole, 2012, Schofield et al., 2018); this is besides the well characterised stringent response (Cashel et al., 1996, Potrykus & Cashel, 2008).

Recent studies have realized ...

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... (p)ppGpp does not act ...

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... (p)ppGpp exert differential effects ...

... on cell physiology including its role ...

... in virulence, ...

... pathogenesis, ...

... antibiotic resistance/tolerance, ...

... sporulation, ...

... biofilm ...

... and persisters' cell formation ...

... (Dozot et al., 2006, ...

... Geiger et al., 2010, ...

... Ochi et al., 1981, ...

... Poole, 2012, ...

... Schofield et al., 2018); ...

... this is besides the well characterised stringent response ...

... (Cashel et al., 1996, ...

... Potrykus & Cashel, 2008).

End of Sample Audit

This is a truncated Manuscript Microscope Sample Audit.

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