A Manuscript Microscope 'Sentence Audit' of:

Molecular features of RNA silencing against phloem-restricted polerovirus TuYV enable amplification of silencing signal from host transcripts

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.
- Superior Proofreading: Detect subtle errors that are invisible to traditional methods.
- Focused Proofreading: Inspect each individual sentence component in isolation.
- 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.
Bonus 3: Improved Reputation: Become known for rigorously precise publications.

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Audit Date: 31/03/21 **Audit Identifier:** TH2HC506787L525 **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
N/A	--- --- --- --- --- --- ---	0
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The Sentence Audit Of The Research Paper

Title

Molecular features of RNA silencing against phloem-restricted polerovirus TuYV enable amplification of silencing signal from host transcripts

S1 [001] **Abstract**

S1 [002] In plants and some animal lineages, RNA silencing is an efficient and adaptable defense mechanism against viruses.

In plants ...
... and some animal lineages, ...
... RNA silencing is an efficient ...
... and adaptable defense mechanism ...
... against viruses.

S1 [003] To counter it, viruses encode suppressor proteins that interfere with RNA silencing.

To counter it, ...
... viruses encode suppressor proteins ...
... that interfere ...
... with RNA silencing.

S1 [004] Phloem-restricted viruses are spreading at an alarming rate and cause substantial reduction of crop yield, but how they interact with their hosts at the molecular level is still insufficiently understood.

Phloem-restricted viruses are spreading ...
... at an alarming rate ...
... and cause substantial reduction ...
... of crop yield, ...
... but how they interact ...
... with their hosts ...
... at the molecular level is still insufficiently understood.

S1 [005] Here, we investigate the antiviral response against phloem-restricted turnip yellows virus (TuYV) in the model plant Arabidopsis thaliana.

Here, ...
... we investigate the antiviral response ...
... against phloem-restricted turnip yellows virus ...
... (TuYV) ...
... in the model plant Arabidopsis thaliana.

S1 [006] Using a combination of genetics, deep sequencing, and mechanical vasculature enrichment, we show that the main axis of silencing active against TuYV involves 22-nt vsiRNA production by DCL2, and their preferential loading into AGO1.

Using a combination ...
... of genetics, ...

... deep sequencing, ...
... and mechanical vasculature enrichment, ...
... we show ...
... that the main axis ...
... of silencing active ...
... against TuYV involves 22-nt vsiRNA production ...
... by DCL2, ...
... and their preferential loading ...
... into AGO1.

S1 [007] Unexpectedly, and despite the viral encoded VSR P0 previously shown to mediate degradation of AGO proteins, vascular AGO1 undergoes specific post-translational stabilization during TuYV infection.

Unexpectedly, ...
... and ...
... despite the viral encoded VSR P0 previously shown ...
... to mediate degradation ...
... of AGO proteins, ...
... vascular AGO1 undergoes specific post-translational stabilization ...
... during TuYV infection.

S1 [008] We also identify vascular novel secondary siRNA produced from conserved plant transcripts and initiated by DCL2-processed AGO1-loaded vsiRNA, supporting a viral strategy to modulate host response.

We also identify vascular novel secondary siRNA produced ...
... from conserved plant transcripts ...
... and initiated ...
... by DCL2-processed AGO1-loaded vsiRNA, ...
... supporting a viral strategy ...
... to modulate host response.

S1 [009] Collectively, our work uncovers the complexity of antiviral RNA silencing against phloem-restricted TuYV and prompts a re-assessment of the role of its suppressor of silencing P0 during genuine infection.

Collectively, ...
... our work uncovers the complexity ...
... of antiviral RNA silencing ...
... against phloem-restricted TuYV ...
... and prompts a re-assessment ...
... of the role ...
... of its suppressor ...
... of silencing P0 ...
... during genuine infection.

S2 [010] Introduction

S2 [011] To defend themselves against pathogens, plants have developed a molecular arsenal allowing them to detect and resist the incoming threat.

To defend themselves ...

... against pathogens, ...

... plants have developed a molecular arsenal allowing them ...

... to detect ...

... and resist the incoming threat.

S2 [012] In turn, pathogens have adopted numerous evasions strategies and can exploit plant defenses with the resulting arms race leading to complex and ever-changing host-microbe interactions.

In turn, ...

... pathogens have adopted numerous evasions strategies ...

... and can exploit plant defenses ...

... with the resulting arms race leading ...

... to complex ...

... and ever-changing host-microbe interactions.

S2 [013] One such focal point of plant defense and viral counter-defense is RNA silencing, with traces of such interactions evident across both plant and virus diversity (Pumplin & Voinnet, 2013; Yang & Li, 2018).

One ...

... such focal point ...

... of plant defense ...

... and viral counter-defense is RNA silencing, ...

... with traces ...

... of such interactions evident ...

... across both plant ...

... and virus diversity ...

... (Pumplin & Voinnet, 2013; ...

... Yang & Li, 2018).

S2 [014] All RNA silencing pathways rest on the action of small RNA (sRNA) whose production depends on the enzymatic activity of RNAse III proteins called Dicer-like (DCLs).

All RNA silencing pathways rest ...

... on the action ...

... of small RNA ...

... (sRNA) ...

... whose production depends ...

... on the enzymatic activity ...

... of RNAse III proteins called Dicer-like ...

... (DCLs).

S2 [015] In the case of RNA viruses, production of viral small interfering (vsi)RNA is triggered by double-stranded (ds)RNA replication intermediates or intramolecular foldback structures in the viral genome mainly by the action of DCL4 and DCL2, generating 21- and 22-nt vsiRNA duplexes respectively (Blevins et al, 2006; Bouché et al, 2006; Deleris et al, 2006).

In the case ...

... of RNA viruses, ...

... production ...

... of viral small interfering ...

... (vsi)RNA is triggered ...

... by double-stranded ...

... (ds)RNA replication intermediates ...

... or intramolecular foldback structures ...

... in the viral genome mainly ...

... by the action ...

... of DCL4 ...

... and DCL2, ...

... generating 21- ...

... and 22-nt vsiRNA duplexes respectively ...

... (Blevins et al, 2006; ...

... Bouché et al, 2006; ...

... Deleris et al, 2006).

S2 [016] This first layer of detection and degradation is reinforced by specialized effector proteins called ARGONAUTE (AGO) that associate with the vsiRNA to form the antiviral RNA-inducted silencing complex (RISC) (Carbonell & Carrington, 2015).

This first layer ...

... of detection ...

... and degradation is reinforced ...

... by specialized effector proteins called ARGONAUTE ...

... (AGO) ...

... that associate ...

... with the vsiRNA ...

... to form the antiviral RNA-inducted silencing complex ...

... (RISC) ...

... (Carbonell & Carrington, 2015).

S2 [017] The RISC complex can target RNA in a sequence-specific manner, leading to endonucleolytic cleavage (slicing) catalyzed by the AGO and/or via translational repression coupled with mRNA decay (Poulsen et al, 2013).

The RISC complex can target RNA ...

... in a sequence-specific manner, ...

... leading ...

... to endonucleolytic cleavage ...

... (slicing) ...

... catalyzed ...

... by the AGO ...

... and/or ...

... via translational repression coupled ...

... with mRNA decay ...

... (Poulsen et al, 2013).

S2 [018] The silencing signal can further be amplified through the conversion of single stranded (ss)RNA targets into dsRNA thanks to host-encoded RNA-dependent RNA polymerase (RDR) proteins, providing new template for secondary vsiRNA production by DCLs, that are important to achieve optimal silencing for some viruses (Qu et al, 2008; Donaire et al, 2008; Wang et al, 2010; Garcia-Ruiz et al, 2010).

The silencing signal can further be amplified ...

End of Sample Audit
