A Manuscript Microscope 'Sentence Audit' of:

Conserved, divergent and heterochronic gene expression during Brachypodium and Arabidopsis embryo development

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.

Manuscript Source: https://www.biorxiv.org/content/10.1101/2021.03.05.434107v1

Manuscript Authors: Zhaodong Hao, Zhongjuan Zhang, Daoquan Xiang, Prakash Venglat, Jinhui Chen, Peng Gao, Raju Datla & Dolf Weijers

Audit Date: 25/03/21 **Audit Identifier:** 11KJ412QT0RXOTG **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	13
Section: 2	Introduction	14
N/A	--- --- --- --- --- --- ---	0
N/A	--- --- --- --- --- --- ---	0
N/A	--- --- --- --- --- --- ---	0
N/A	--- --- --- --- --- --- ---	0
N/A	--- --- --- --- --- --- ---	0
N/A	--- --- --- --- --- --- ---	0
N/A	--- --- --- --- --- --- ---	0
N/A	--- --- --- --- --- --- ---	0
N/A	--- --- --- --- --- --- ---	0

The Sentence Audit Of The Research Paper

Title **Conserved, divergent and heterochronic gene expression during Brachypodium and Arabidopsis embryo development**

S1 [001] Abstract

S1 [002] Embryogenesis, transforming the zygote into the mature embryo, represents a fundamental process for all flowering plants.

Embryogenesis, ...
... transforming the zygote ...
... into the mature embryo, ...
... represents a fundamental process ...
... for all flowering plants.

S1 [003] Current knowledge of cell specification and differentiation during plant embryogenesis is largely based on studies of the dicot model plant Arabidopsis thaliana.

Current knowledge ...
... of cell specification ...
... and differentiation ...
... during plant embryogenesis is largely based ...
... on studies ...
... of the dicot model plant Arabidopsis thaliana.

S1 [004] However, the major crops are monocots and the transcriptional programs associated with the differentiation processes during embryogenesis in this clade were largely unknown.

However, ...
... the major crops are monocots ...
... and the transcriptional programs associated ...
... with the differentiation processes ...
... during embryogenesis ...
... in this clade were largely unknown.

S1 [005] Here, we combined analysis of cell division patterns with development of a temporal transcriptomic resource during embryogenesis of the monocot model plant Brachypodium distachyon.

Here, ...
... we combined analysis ...
... of cell division patterns ...
... with development ...
... of a temporal transcriptomic resource ...
... during embryogenesis ...
... of the monocot model plant Brachypodium distachyon.

S1 [006] We found that early divisions of the Brachypodium embryo were highly regular, while later stages were marked by less stereotypic patterns.

We found ...

... that early divisions ...

... of the Brachypodium embryo were highly regular, ...

... while later stages were marked ...

... by less stereotypic patterns.

S1 [007] Comparative transcriptomic analysis between Brachypodium and Arabidopsis revealed that the early and late embryogenesis shared a common transcriptional program, whereas mid-embryogenesis was divergent between species.

Comparative transcriptomic analysis ...

... between Brachypodium ...

... and Arabidopsis revealed ...

... that the early ...

... and late embryogenesis shared a common transcriptional program, ...

... whereas mid-embryogenesis was divergent ...

... between species.

S1 [008] Analysis of orthology groups revealed widespread heterochronic expression of potential developmental regulators between the species.

Analysis ...

... of orthology groups revealed widespread heterochronic expression ...

... of potential developmental regulators ...

... between the species.

S1 [009] Interestingly, Brachypodium genes tend to be expressed at earlier stages than Arabidopsis counterparts, which suggests that embryo patterning may occur early during Brachypodium embryogenesis.

Interestingly, ...

... Brachypodium genes tend ...

... to be expressed ...

... at earlier stages ...

... than Arabidopsis counterparts, ...

... which suggests ...

... that embryo patterning may occur early ...

... during Brachypodium embryogenesis.

S1 [010] Detailed investigation of auxin-related genes shows that the capacity to synthesize, transport, and respond to auxin is established early in the embryo.

Detailed investigation ...

... of auxin-related genes shows ...

... that the capacity ...

... to synthesize, ...

... transport, ...

... and respond ...

... to auxin is established early ...

... in the embryo.

S1 [011] However, while early PIN1 polarity could be confirmed, it is unclear if an active response is mounted.

However, ...

... while early PIN1 polarity could be confirmed, ...

... it is unclear ...

... if an active response is mounted.

S1 [012] This study presents a resource for studying Brachypodium and grass embryogenesis, and shows that divergent angiosperms share a conserved genetic program that is marked by heterochronic gene expression.

This study presents a resource ...

... for studying Brachypodium ...

... and grass embryogenesis, ...

... and shows ...

... that divergent angiosperms share a conserved genetic program ...

... that is marked ...

... by heterochronic gene expression.

S1 [013] Key message Developmental and transcriptomic analysis of Brachypodium embryogenesis, and comparison with Arabidopsis, identifies conserved and divergent phases of embryogenesis, and reveals widespread heterochrony of developmental gene expression.

Key message Developmental ...

... and transcriptomic analysis ...

... of Brachypodium embryogenesis, ...

... and comparison ...

... with Arabidopsis, ...

... identifies conserved ...

... and divergent phases ...

... of embryogenesis, ...

... and reveals widespread heterochrony ...

... of developmental gene expression.

S2 [014] Introduction

S2 [015] Angiosperms represent a diverse group of plants that share a number of characteristics: a dominant diploid sporophytic state, true embryos with precursors for the major tissues, including meristems, an elaborate vascular transport system, seeds and flowers.

Angiosperms represent a diverse group ...

... of plants ...

... that share a number ...

... of characteristics: ...

... a dominant diploid sporophytic state, ...

... true embryos ...

... with precursors ...

... for the major tissues, ...

... including meristems, ...

... an elaborate vascular transport system, ...

... seeds ...

... and flowers.

S2 [016] Both major groups of angiosperms: dicots and monocots, encompass crops as well as genetic model organisms.

Both major groups ...
... of angiosperms: ...
... dicots ...
... and monocots, ...
... encompass crops ...
... as well ...
... as genetic model organisms.

S2 [017] In both groups, the embryo represents a relatively simple form in which – from a fertilized egg cell – a miniature plant emerges that has primordial organs and tissues, including meristems that sustain post-embryonic growth.

In both groups, ...
... the embryo represents a relatively simple form ...
... in which – ...
... from a fertilized egg cell – a miniature plant emerges ...
... that has primordial organs ...
... and tissues, ...
... including meristems ...
... that sustain post-embryonic growth.

S2 [018] Few models have been used to extensively study progression and genetics of embryo development, and these include the dicots tobacco, Arabidopsis thaliana, and soybean, as well as the monocots rice, maize, and wheat (Armenta-Medina et al. 2021; Palovaara et al. 2016).

Few models have been used ...
... to extensively study progression ...
... and genetics ...
... of embryo development, ...
... and these include the dicots tobacco, ...
... Arabidopsis thaliana, ...
... and soybean, ...
... as well ...
... as the monocots rice, ...
... maize, ...
... and wheat ...
... (Armenta-Medina et al. 2021; ...
... Palovaara et al. 2016).

S2 [019] From these analyses, as well as from earlier comparative embryology (Johri 1984), it is evident that the morphology and developmental progression is very different between dicots and monocots.

From these analyses, ...
... as well ...
... as ...
... from earlier comparative embryology ...
... (Johri 1984), ...
... it is evident ...

End of Sample Audit

This is a truncated Manuscript Microscope Sample Audit.

To get the full audit of this text (or any other research paper),
forward a copy of the research paper to John James at
John.James@OxfordResearchServices.com
