A Manuscript Microscope 'Sentence Audit' of:

Automated in vivo tracking of cortical oligodendrocytes

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: Review long technical papers in a fraction of the usual time.
- Superior Proofreading: Detect subtle errors that are invisible to traditional methods.
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- Easier Proofreading: Take the hardship out of examining complex academic text.
- Safer Proofreading: Ensure every single word of your manuscript is correct.

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+ 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/10.1101/2021.02.12.430879v1

Manuscript Authors: Yu Kang T. Xu, Cody L. Call, Jeremias Sulam & Dwight E. Bergles

Audit Date: 13/03/21 **Audit Identifier:** 0Y5P66300738L46 **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 conjuctions, prepositions and selected punctuation symbols (i.e. commas, semicolons, square and rounded brackets).

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

Comments and Caveats:

• The sentence parsing is achieved using a prototype python natural language processing pipeline and may result in occasional sentence segmentation or parsing errors.

• 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 of 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	8
Section: 2	INTRODUCTION	23
N/A	--- --- --- --- --- --- ---	0
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The Sentence Audit Of The Research Paper

Title # Automated in vivo tracking of cortical oligodendrocytes

S1 [001] ABSTRACT

S1 [002] Oligodendrocytes exert a profound influence on neural circuits by accelerating axon potential conduction, altering excitability and providing metabolic support.

Oligodendrocytes exert a profound influence ...
... on neural circuits ...
... by accelerating axon potential conduction, ...
... altering excitability ...
... and providing metabolic support.

S1 [003] As oligodendrogenesis continues in the adult brain and is essential for myelin repair, uncovering the factors that control their dynamics is necessary to understand the consequences of adaptive myelination and develop new strategies to enhance remyelination in diseases such as multiple sclerosis.

As oligodendrogenesis continues ...
... in the adult brain ...
... and is essential ...
... for myelin repair, ...
... uncovering the factors ...
... that control their dynamics is necessary ...
... to understand the consequences ...
... of adaptive myelination ...
... and develop new strategies ...
... to enhance remyelination ...
... in diseases ...
... such as multiple sclerosis.

S1 [004] Unfortunately, few methods exist for analysis of oligodendrocyte dynamics, and even fewer are suitable for in vivo investigation.

Unfortunately, ...
... few methods exist ...
... for analysis ...
... of oligodendrocyte dynamics, ...
... and even fewer are suitable ...
... for in vivo investigation.

S1 [005] Here, we describe the development of a fully automated cell tracking pipeline using convolutional neural networks (Oligo-Track) that provides rapid volumetric segmentation and tracking of thousands of cells over weeks in vivo.

Here, ...
... we describe the development ...
... of a fully automated cell tracking pipeline ...
... using convolutional neural networks ...

... (Oligo-Track) ...
... that provides rapid volumetric segmentation ...
... and tracking ...
... of thousands ...
... of cells ...
... over weeks ...
... in vivo.

S1 [006] This system reliably replicated human analysis, outperformed traditional analytic approaches, and extracted injury and repair dynamics at multiple cortical depths, establishing that oligodendrogenesis after cuprizone-mediated demyelination is suppressed in deeper cortical layers.

This system reliably replicated human analysis, ...
... outperformed traditional analytic approaches, ...
... and extracted injury ...
... and repair dynamics ...
... at multiple cortical depths, ...
... establishing ...
... that oligodendrogenesis ...
... after cuprizone-mediated demyelination is suppressed ...
... in deeper cortical layers.

S1 [007] Volumetric data provided by this analysis revealed that oligodendrocyte soma size progressively decreases after their generation, and declines further prior to death, providing a means to predict cell age and eventual cell death from individual time points.

Volumetric data provided ...
... by this analysis revealed ...
... that oligodendrocyte soma size progressively decreases ...
... after their generation, ...
... and declines further ...
... prior to death, ...
... providing a means ...
... to predict cell age ...
... and eventual cell death ...
... from individual time points.

S1 [008] This new CNN-based analysis pipeline offers a rapid, robust method to quantitatively analyze oligodendrocyte dynamics in vivo, which will aid in understanding how changes in these myelinating cells influence circuit function and recovery from injury and disease.

This new CNN-based analysis pipeline offers a rapid, ...
... robust method ...
... to quantitatively analyze oligodendrocyte dynamics in vivo, ...
... which will aid ...
... in understanding how changes ...
... in these myelinating cells influence circuit function ...
... and recovery ...
... from injury ...
... and disease.

S2 [009] INTRODUCTION

S2 [010] Advances in genetically encoded fluorescent indicators, CRISPR-mediated gene editing and multiphoton microscopy provide unprecedented opportunities for studying cellular dynamics at single-cell resolution in the brains of living animals.

Advances ...
... in genetically encoded fluorescent indicators, ...
... CRISPR-mediated gene editing ...
... and multiphoton microscopy provide unprecedented opportunities ...
... for studying cellular dynamics ...
... at single-cell resolution ...
... in the brains ...
... of living animals.

S2 [011] While these approaches hold the potential for profound discoveries about brain function, they also come with a host of quantitative challenges.

While these approaches hold the potential ...
... for profound discoveries ...
... about brain function, ...
... they also come ...
... with a host ...
... of quantitative challenges.

S2 [012] In particular, living brain tissue is unstable; tissue warping disrupts image quality and uneven refractive indices increase noise and produce anisotropic distortions during longitudinal image acquisition (Lecoq et al., 2019).

In particular, ...
... living brain tissue is unstable; ...
... tissue warping disrupts image quality ...
... and uneven refractive indices increase noise ...
... and produce anisotropic distortions ...
... during longitudinal image acquisition ...
... (Lecoq et al., 2019).

S2 [013] Moreover, large multi-dimensional datasets are cumbersome to quantify, and often require specialized software for 4D visualization and manual curation (Pidhorskyi et al., 2018).

Moreover, ...
... large multi-dimensional datasets are cumbersome ...
... to quantify, ...
... and often require specialized software ...
... for 4D visualization ...
... and manual curation ...
... (Pidhorskyi et al., 2018).

S2 [014] As imaging tools become more advanced and enable researchers to delve deeper into the brain in vivo (Horton et al., 2013), the challenges associated with quantification of enormous datasets become more acute.

As imaging tools become more advanced ...
... and enable researchers ...
... to delve deeper ...
... into the brain in vivo ...
... (Horton et al., 2013), ...
... the challenges associated ...
... with quantification ...
... of enormous datasets become more acute.

S2 [015] Further advances depend critically on the availability of robust analysis platforms to rapidly extract multi-dimensional observations about cellular dynamics.

Further advances depend critically ...
... on the availability ...
... of robust analysis platforms ...
... to rapidly extract multi-dimensional observations ...
... about cellular dynamics.

S2 [016] Developing rigorous analysis tools for in vivo investigation of oligodendrocytes is particularly important.

Developing rigorous analysis tools ...
... for in vivo investigation ...
... of oligodendrocytes is particularly important.

S2 [017] Oligodendrocytes enhance the speed of action potential conduction by ensheathing neuronal axons with concentric wraps of membrane, support neuronal metabolism and control neuronal excitability (Simons and Nave, 2016; Larson et al., 2018).

Oligodendrocytes enhance the speed ...
... of action potential conduction ...
... by ensheathing neuronal axons ...
... with concentric wraps ...
... of membrane, ...
... support neuronal metabolism ...
... and control neuronal excitability ...
... (Simons ...
... and Nave, 2016; ...
... Larson et al., 2018).

S2 [018] While the population of neurons in the brain remains relatively stable throughout life (Bhardwaj et al., 2006; Ming and Song, 2011), new oligodendrocytes are generated in the adult CNS, allowing for dynamic alteration of myelin patterns in both healthy and pathological conditions (El Waly et al., 2014).

While the population ...
... of neurons ...
... in the brain remains relatively stable ...
... throughout life ...
... (Bhardwaj et al., 2006; ...
... Ming ...
... and Song, 2011), ...
... new oligodendrocytes are generated ...
... in the adult CNS, ...

End of Sample Audit

This is a truncated Manuscript Microscope Sample Audit.

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