A Manuscript Microscope 'Sentence Audit' of:

Transcriptomic analysis of human and mouse muscle during hyperinsulinemia demonstrates insulin receptor downregulation as a mechanism for insulin resistance

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/10.1101/556571v4

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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

Transcriptomic analysis of human and mouse muscle during hyperinsulinemia demonstrates insulin receptor downregulation as a mechanism for insulin resistance

S1 [001] Abstract

S1 [002] Hyperinsulinemia is commonly viewed as a compensatory response to insulin resistance, yet studies have suggested that chronically elevated insulin may also drive insulin resistance.

Hyperinsulinemia is commonly viewed ...
... as a compensatory response ...
... to insulin resistance, ...
... yet studies have suggested ...
... that chronically elevated insulin ...
... may also drive insulin resistance.

S1 [003] The molecular mechanisms underpinning this potentially cyclic process remain poorly defined, especially on a transcriptome-wide level.

The molecular mechanisms underpinning this potentially cyclic process remain poorly defined, ...
... especially ...
... on a transcriptome-wide level.

S1 [004] To study the direct effects of prolonged exposure to excess insulin in muscle cells, we incubated C2C12 myotubes with elevated insulin for 16 hours, followed by 6 hours of serum starvation, and established that acute AKT and ERK signaling were attenuated in this model of in vitro hyperinsulinemia.

To study the direct effects ...
... of prolonged exposure ...
... to excess insulin ...
... in muscle cells, ...
... we incubated C2C12 myotubes ...
... with elevated insulin ...
... for 16 hours, ...
... followed by 6 hours ...
... of serum starvation, ...
... and established ...
... that acute AKT ...
... and ERK signaling were attenuated ...
... in this model ...
... of in vitro hyperinsulinemia.

S1 [005] Global RNA-sequencing of cells both before and after nutrient withdrawal highlighted genes in the insulin signaling, FOXO signaling, and glucose metabolism pathways indicative of ‘hyperinsulinemia’ and ‘starvation’ programs.

Global RNA-sequencing ...

... of cells both before and after nutrient withdrawal highlighted genes ...
... in the insulin signaling, ...
... FOXO signaling, ...
... and glucose metabolism pathways indicative ...
... of ‘hyperinsulinemia’ ...
... and ‘starvation’ programs.

S1 [006] We observed that hyperinsulinemia led to a substantial reduction in insulin receptor (Insr) gene expression, and subsequently a reduced surface INSR and total INSR protein, both in vitro and in vivo.

We observed ...
... that hyperinsulinemia led ...
... to a substantial reduction ...
... in insulin receptor ...
... (Insr) ...
... gene expression, ...
... and subsequently a reduced surface INSR ...
... and total INSR protein, ...
... both in vitro ...
... and in vivo.

S1 [007] Transcriptomic meta-analysis in >450 human samples demonstrated that fasting insulin reliably and negatively correlated with insulin receptor (INSR) mRNA in skeletal muscle.

Transcriptomic meta-analysis ...
... in >450 human samples demonstrated ...
... that fasting insulin reliably ...
... and negatively correlated ...
... with insulin receptor ...
... (INSR) ...
... mRNA ...
... in skeletal muscle.

S1 [008] Bioinformatic modeling combined with RNAi, identified SIN3A as a negative regulator of Insr mRNA (and JUND, MAX, and MXI as positive regulators of Irs2 mRNA).

Bioinformatic modeling combined ...
... with RNAi, ...
... identified SIN3A ...
... as a negative regulator ...
... of Insr mRNA ...
... (and JUND, ...
... MAX, ...
... and MXI ...
... as positive regulators ...
... of Irs2 mRNA).

S1 [009] Together, our analysis identifies novel mechanisms which may explain the cyclic processes underlying hyperinsulinemia-induced insulin resistance in muscle, a process directly relevant to the etiology and disease progression of type 2 diabetes.

Together, ...
... our analysis identifies novel mechanisms ...

... which ...
... may explain the cyclic processes underlying hyperinsulinemia-induced insulin resistance ...
... in muscle, ...
... a process directly relevant ...
... to the etiology ...
... and disease progression ...
... of type 2 diabetes.

S2 [010] Introduction

S2 [011] Hyperinsulinemia and insulin resistance are cardinal features of type 2 diabetes (T2D) yet their co-association makes it challenging to establish their precise molecular interactions.

Hyperinsulinemia ...
... and insulin resistance are cardinal features ...
... of type 2 diabetes ...
... (T2D) ...
... yet their co-association makes it challenging ...
... to establish their precise molecular interactions.

S2 [012] Insulin resistance has been widely viewed as the primary cause of T2D and hyperinsulinemia is, therefore, a purely compensatory response (1, 2).

Insulin resistance has been widely viewed ...
... as the primary cause ...
... of T2D ...
... and hyperinsulinemia is, ...
... therefore, ...
... a purely compensatory response ...
... (1, 2)...
... .

S2 [013] However, a growing body of evidence suggests the opposite may be true in many cases (3-5).

However, ...
... a growing body ...
... of evidence suggests the opposite ...
... may be true ...
... in many cases ...
... (3-5).

S2 [014] Hyperinsulinemia can be observed prior to insulin resistance in obesity and T2D (6-8).

Hyperinsulinemia can be observed ...
... prior to insulin resistance ...
... in obesity ...
... and T2D ...
... (6-8).

S2 [015] Increased insulin precedes increased BMI (9) and is associated with future T2D in longitudinal studies (10, 11).

Increased insulin precedes increased BMI ...
... (9) ...
... and is associated ...
... with future T2D ...
... in longitudinal studies ...
... (10, 11)...
... .

S2 [016] We recently used a loss-of-function genetic approach to directly demonstrate that hyperinsulinemia can cause age-dependent insulin resistance in the absence of hyperglycemia (12).

We recently used a loss-of-function genetic approach ...
... to directly demonstrate ...
... that hyperinsulinemia can cause age-dependent insulin resistance ...
... in the absence ...
... of hyperglycemia ...
... (12).

S2 [017] Reducing hyperinsulinemia in partial insulin gene knockout mice also prevents and/or reverses diet-induced obesity in adult mice (12-14).

Reducing hyperinsulinemia ...
... in partial insulin gene knockout mice also prevents ...
... and/or reverses diet-induced obesity ...
... in adult mice ...
... (12-14).

S2 [018] Rodents (15, 16), healthy humans (17, 18).

Rodents ...
... (15, 16)...
... , ...
... healthy humans ...
... (17, 18)...
... .

S2 [019] Further, people with type 1 diabetes (19) subjected to prolonged insulin administration have reduced insulin responsiveness independent of hyperglycemia, strongly implying that intermittent hyperinsulinemia can self-perpetuate or cause insulin resistance.

Further, ...
... people ...
... with type 1 diabetes ...
... (19) ...
... subjected ...
... to prolonged insulin administration have reduced insulin responsiveness independent ...
... of hyperglycemia, ...
... strongly implying ...
... that intermittent hyperinsulinemia can self-perpetuate ...
... or cause insulin resistance.

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),
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