A Manuscript Microscope 'Sentence Audit' of:

A metabolomics insight into the Cyclic Nucleotide Monophosphate signaling cascade in tomato under non-stress and salinity conditions

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Manuscript Source: https://www.biorxiv.org/content/10.1101/2021.03.22.436432v1

Manuscript Authors: Begoña Miras-Moreno, Leilei Zhang, Biancamaria Senizza & Luigi Lucini

Audit Date: 31/03/21 **Audit Identifier:** ZHT34I26GGUE4DR **Code Version:** 3.6

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• 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:

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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	11
Section: 2	1. INTRODUCTION	16
N/A	--- --- --- --- --- --- ---	0
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Title # A metabolomics insight into the Cyclic Nucleotide Monophosphate signaling cascade in tomato under non-stress and salinity conditions

S1 [001] ABSTRACT

S1 [002] Cyclic Nucleotides Monophosphate (cNMP) are key signalling compounds whose role in plant cell signal transduction is till poorly understood.

Cyclic Nucleotides Monophosphate ...
... (cNMP) ...
... are key signalling compounds whose role ...
... in plant cell signal transduction is till poorly understood.

S1 [003] In this work we used sildenafil, a phosphodiesterase (PDE) inhibitor used in human, to amplify the signal cascade triggered by cNMP using tomato as model plant.

In this work we used sildenafil, ...
... a phosphodiesterase ...
... (PDE) ...
... inhibitor used ...
... in human, ...
... to amplify the signal cascade triggered ...
... by cNMP ...
... using tomato ...
... as model plant.

S1 [004] Metabolomics was then used, together with plant growth and root architecture parameters, to unravel the changes elicited by PDE inhibition either under non-stress and 100 mM NaCl salinity conditions.

Metabolomics was then used, ...
... together ...
... with plant growth ...
... and root architecture parameters, ...
... to unravel the changes elicited ...
... by PDE inhibition either ...
... under non-stress ...
... and 100 mM NaCl salinity conditions.

S1 [005] The PDE inhibitor elicited a significant increase in biomass (+62%) and root length (+56%) under no stress conditions, and affected root architecture in terms of distribution over diameter classes.

The PDE inhibitor elicited a significant increase ...
... in biomass ...
... (+62%) ...
... and root length ...
... (+56%) ...

... under no stress conditions, ...
... and affected root architecture ...
... in terms ...
... of distribution ...
... over diameter classes.

S1 [006] Together with cGMP, others cNMP were modulated by the treatment.

Together ...
... with cGMP, ...
... others cNMP were modulated ...
... by the treatment.

S1 [007] Moreover, PDE inhibition triggered a broad metabolic reprogramming involving photosynthesis and secondary metabolism.

Moreover, ...
... PDE inhibition triggered a broad metabolic reprogramming ...
... involving photosynthesis ...
... and secondary metabolism.

S1 [008] A complex crosstalk network of phytohormones and other signalling compounds could be observed in treated plants.

A complex crosstalk network ...
... of phytohormones ...
... and other signalling compounds could be observed ...
... in treated plants.

S1 [009] Nonetheless, metabolites related to redox imbalance processes and NO signalling could be highlighted in tomato following PDE application.

Nonetheless, ...
... metabolites related ...
... to redox imbalance processes ...
... and NO signalling could be highlighted ...
... in tomato following PDE application.

S1 [010] Despite salinity damped down the growth-promoting effects of sildenafil, interesting implications in plant mitigation to stress-related detrimental effects could be observed.

Despite salinity damped down the growth-promoting effects ...
... of sildenafil, ...
... interesting implications ...
... in plant mitigation ...
... to stress-related detrimental effects could be observed.

S1 [011] HIGHLIGHT The role of Cyclic Nucleotides Monophosphate in plant cell signal transduction involves regulation of plant growth and architecture, together with a broad biochemical reprogramming of metabolism.

HIGHLIGHT The role ...
... of Cyclic Nucleotides Monophosphate ...
... in plant cell signal transduction involves regulation ...

... of plant growth ...
... and architecture, ...
... together ...
... with a broad biochemical reprogramming ...
... of metabolism.

S2 [012] 1. INTRODUCTION

S2 [013] In the last years, an increasing interest in cyclic nucleotide monophosphates (cNMP - in particular, in cAMP and cGMP) has grown, driven by the pivotal role they might play in plant growth and in response to environment.

In the last years, ...
... an increasing interest ...
... in cyclic nucleotide monophosphates ...
... (cNMP - ...
... in particular, ...
... in cAMP ...
... and cGMP) ...
... has grown, ...
... driven ...
... by the pivotal role they ...
... might play ...
... in plant growth ...
... and in response ...
... to environment.

S2 [014] The role of cNMP in plants has been argued for long time, because they are present in nanomolar concentrations, i.e. one order of magnitude lower than in mammalian cells.

The role ...
... of cNMP ...
... in plants has been argued ...
... for long time, ...
... because they are present ...
... in nanomolar concentrations, ...
... i.e. one order ...
... of magnitude lower ...
... than in mammalian cells.

S2 [015] Furthermore, a set of plant cyclases has been proposed, including membrane protein and cytosolic enzyme, with >50 candidate proposed in the Arabidopsis thaliana proteome having different different domain organizations (Wong and Gehring, 2013).

Furthermore, ...
... a set ...
... of plant cyclases has been proposed, ...
... including membrane protein ...
... and cytosolic enzyme, ...
... with >50 candidate proposed ...

... in the Arabidopsis thaliana proteome having different different domain organizations ...

... (Wong ...

... and Gehring, 2013).

S2 [016] Both adenylate and guanylate cyclases have been defined “moonlighting” proteins, since they are a single polypeptide chain holding diverse domain structures and harbouring multiple catalytic domains (Blanco et al., 2020).

Both adenylate ...

... and guanylate cyclases have been defined “moonlighting” ...

... proteins, ...

... since they are a single polypeptide chain holding diverse domain structures ...

... and harbouring multiple catalytic domains ...

... (Blanco et al., 2020).

S2 [017] These cyclases determine the endogenous synthesis of cNMP whereas phosphodiesterase (PDE) activity determines their rate of degradation by cleaving the phosphodiester bond to yield the inactive non cyclic NMP (Swiezawska et al., 2018).

These cyclases determine the endogenous synthesis ...

... of cNMP whereas phosphodiesterase ...

... (PDE) ...

... activity determines their rate ...

... of degradation ...

... by cleaving the phosphodiester bond ...

... to yield the inactive non cyclic NMP ...

... (Swiezawska et al., 2018).

S2 [018] In this way, PDE regulate the amplitude of cNMP levels and the duration of their signal in the cell (Duszyn et al., 2019).

In this way, ...

... PDE regulate the amplitude ...

... of cNMP levels ...

... and the duration ...

... of their signal ...

... in the cell ...

... (Duszyn et al., 2019).

S2 [019] Although the most of scientific evidence in plant physiology relates to cGMP and cAMP, other so-called “non canonical” cNMP such as cytidine, inosine, uridine, and 2′-deoxythymidine 3′,5′-cyclic monophosphate (cCMP, cIMP, cUMP, and cdTMP, respectively) are emerging(Gehring and Turek, 2017).

Although the most of scientific evidence ...

... in plant physiology relates ...

... to cGMP ...

... and cAMP, ...

... other so-called “non canonical” ...

... cNMP ...

... such as cytidine, ...

... inosine, ...

... uridine, ...

... and 2′-deoxythymidine 3′,5′-cyclic monophosphate ...

End of Sample Audit

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