

Barley germination - DTU Orbit (09/11/2017)

Barley germination: Spatio-temporal considerations for designing and interpreting 'omics' experiments

Germination of barley grain is central to the malting industry and is a valuable model for cereal grain germination. Our current understanding of the complexity of germination at the molecular level is facilitated by access to genomic, transcriptomic, proteomic and metabolomic data. Here we review recent progress in barley germination research and discuss the factors to be considered when designing 'omics' experiments and interpreting the results. These factors include the structural and functional relationships between the various tissues of the barley caryopsis and the timing of the events of germination in the context of industrial malting. For transcriptomics, recent advances in sequencing the barley genome allow next-generation sequencing approaches to reveal novel effects of variety and environment on germination. For proteomics, selection of the source tissue(s) and the protein extraction conditions continue to be key to discovering the roles of individual protein forms and posttranslational modifications, such as glycosylation. Activity-based proteomics, particularly in combination with new gene editing technologies, has great potential to elucidate the network of enzymes in barley germination. Lastly, the application of metabolomics to barley grain germination provides essential data on biochemical processes, including insights into the formation of compounds that contribute to malt quality. To maximize the benefits of the 'omics' revolution to the malting industry, there is a need to integrate these data, taking into account barley variety, time, tissue, and specific physiological processes.

General information

State: Published

Organisations: Department of Systems Biology, Enzyme and Protein Chemistry, University of Sydney

Authors: Daneri-Castro, S. N. (Ekstern), Svensson, B. (Intern), Roberts, T. H. (Ekstern)

Number of pages: 9

Pages: 29-37

Publication date: 2016

Main Research Area: Technical/natural sciences

Publication information

Journal: Journal of Cereal Science

Volume: 70

ISSN (Print): 0733-5210

Ratings:

BFI (2017): BFI-level 2

Web of Science (2017): Indexed yes

BFI (2016): BFI-level 2

Scopus rating (2016): CiteScore 2.65 SJR 1.004 SNIP 1.331

Web of Science (2016): Indexed yes

BFI (2015): BFI-level 2

Scopus rating (2015): SJR 1.259 SNIP 1.366 CiteScore 2.51

Web of Science (2015): Indexed yes

BFI (2014): BFI-level 2

Scopus rating (2014): SJR 1.176 SNIP 1.463 CiteScore 2.59

BFI (2013): BFI-level 2

Scopus rating (2013): SJR 1.008 SNIP 1.436 CiteScore 2.41

ISI indexed (2013): ISI indexed yes

BFI (2012): BFI-level 2

Scopus rating (2012): SJR 1.31 SNIP 1.611 CiteScore 2.61

ISI indexed (2012): ISI indexed yes

BFI (2011): BFI-level 2

Scopus rating (2011): SJR 1.226 SNIP 1.529 CiteScore 2.46

ISI indexed (2011): ISI indexed yes

BFI (2010): BFI-level 2

Scopus rating (2010): SJR 1.739 SNIP 1.725

BFI (2009): BFI-level 2

Scopus rating (2009): SJR 1.541 SNIP 1.598

Web of Science (2009): Indexed yes

BFI (2008): BFI-level 2

Scopus rating (2008): SJR 1.467 SNIP 1.818

Scopus rating (2007): SJR 1.102 SNIP 1.426

Scopus rating (2006): SJR 1.106 SNIP 1.412

Web of Science (2006): Indexed yes
Scopus rating (2005): SJR 1.174 SNIP 1.312
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.173 SNIP 1.288
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 0.952 SNIP 1.331
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 0.866 SNIP 1.093
Scopus rating (2001): SJR 1.145 SNIP 1.308
Scopus rating (2000): SJR 1.301 SNIP 1.352
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 1.772 SNIP 1.692

Original language: English

Barley, Germination, Malting, Proteomics

DOIs:

10.1016/j.jcs.2016.05.012

Source: FindIt

Source-ID: 2304320700

Publication: Research - peer-review › Journal article – Annual report year: 2016