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AIT (/en/) > Research Topics (/en/research-topics) > Improvement of Plant Quality + Vigor (/en/research-topics/improvement-of-plant-quality-vigor)

IMPROVEMENT OF PLANT QUALITY + VIGOR

Plants frequently encounter adverse growth conditions. Drought, extreme temperatures, soil contamination with salts or heavy metals, and pathogen infections are examples of environmental constraints that limit agronomic yield. Our team combines the strengths of complementary approaches to unravel novel stress tolerance mechanisms and to identify genotypes with desired, complex traits such as vigor and drought resistance.

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PLANT STRESS TOLERANCE MECHANISMS

Our work focuses on how signal transduction regulates the coordinated response of metabolism and chromatin function (gene expression) which ultimately determines whether a plant is able to acclimate to fluctuating and/or adverse conditions. We apply a combination of genetic, biochemical and physiological approaches to unravel molecular mechanisms underlying stress tolerance and explore their potential for innovative crop improvement strategies. **Read more (/en/research-topics/improvement-of-plant-quality-vigor/plant-stress-tolerance-mechanisms)**

GENETIC MARKERS FOR SELECTION AND AUTHENTICATION

Our team is dedicated to the development and application of DNA-based genetic markers to identify marker-trait associations for genotyping in breeding and selection processes, for species identification, diversity analysis, paternity testing, or for the

proof of a sample's origin and authenticity. **Read more** (/en/research-topics/improvement-of-plant-quality-vigor/genetic-markers-for-selection-and-authentication)

PLANT STRESS TOLERANCE MECHANISMS

(/en/research-topics/improvement-of-plant-quality-vigor/plant-stress-tolerance-mechanisms)

GENETIC MARKERS – SELECTION & AUTHENTICATION

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DNA BANK & GENOTYPING SERVICES

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ANALYTICAL SERVICES

(/en/research-topics/environmental-pathogen-detection/analytical-services)

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NEWS

Camelina shows us how to master climate change (/en/news-events/single-view/detail/6731?cHash=535940d65e59fa42f2374eb2df0070f7)

AIT at the Global Bioeconomy Summit 2020 (/en/news-events/single-view/detail/6601?cHash=ca5831720ef4c2c30b370d6020981fc2)

AIT and RTDS have launched BIOVEXO website (/en/news-events/single-view/detail/6424?cHash=c5466212d21eb8ea81d80084141af917)

SELECTED PUBLICATIONS

H. Stampfl, M. Fritz, S. Dal Santo, C. Jonak (2016). The GSK3/Shaggy-like kinase ASKα contributes to pattern-triggered immunity in Arabidopsis thaliana. Plant Phys, 171, 1366-1377.

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W. Rozhon, W. Wang, F. Berthiller, J. Mayerhofer, T. Chen, E. Petutschnig, T. Sieberer, B. Poppenberger, C. Jonak (2014). Bikinin-like inhibitors targeting GSK3/Shaggy-like kinases: characterisation of novel compounds and elucidation of their catabolism in planta. BMC Plant Biology, 14, 172.

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O. Popova, H.Q. Dinh, W. Aufsatz, C. Jonak (2013). The RdDM Pathway Is Required for Basal Heat Tolerance in Arabidopsis. Mol. Plant, 6, 396-410.

S. Dal Santo, H. Stampfl, J. Krasensky, S. Kempa, Y. Gibon, E. Petutschnig, W. Rozhon, A. Heuck, T. Clausen, C. Jonak (2012). Stress-Induced Glycogen Synthase Kinase 3 (GSK3) Regulates the Redox Stress Response by Phosphorylating Glucose-6-Phosphate Dehydrogenase in Arabidopsis thaliana. Plant Cell, 24, 3380-3392.

J. Krasenksy and C. Jonak (2012). Drought, salt, and temperature stress-induced metabolic rearrangements and regulatory networks. J Exp Bot. 63, 1593-1608.

M.T. Hauser, W. Aufsatz, C. Jonak, C. Luschnig (2011). Transgenerational epigenetic inheritance in plants. Biochim Biophys Acta, 1809, 459-468.

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