Investigating the molecular mechanism whereby auxin modulates *Arabidopsis thaliana* growth under salinity stress conditions

by

Paul Thomas Ferrandi

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Figure 7.5: Initial analysis of *EXPA11* expression in the 35S::*EXPA11* T3 lines

An RT-qPCR experiment was conducted using *EXPA11* qPCR primers on cDNA synthesised from RNA extracted from No-0 and 35S::*EXPA11* T3 plants grown on soil under standard conditions. Four leaves were pooled per plant for RNA extraction for each of the genotypes. The 35S::*EXPA11* T3 lines that were screened are '2,2-4', '7,1-3', '9,2-5', '18,1-2', '20,1-3', and '21,1-3'. *EXPA11* expression was normalised to the reference gene *MON1*.

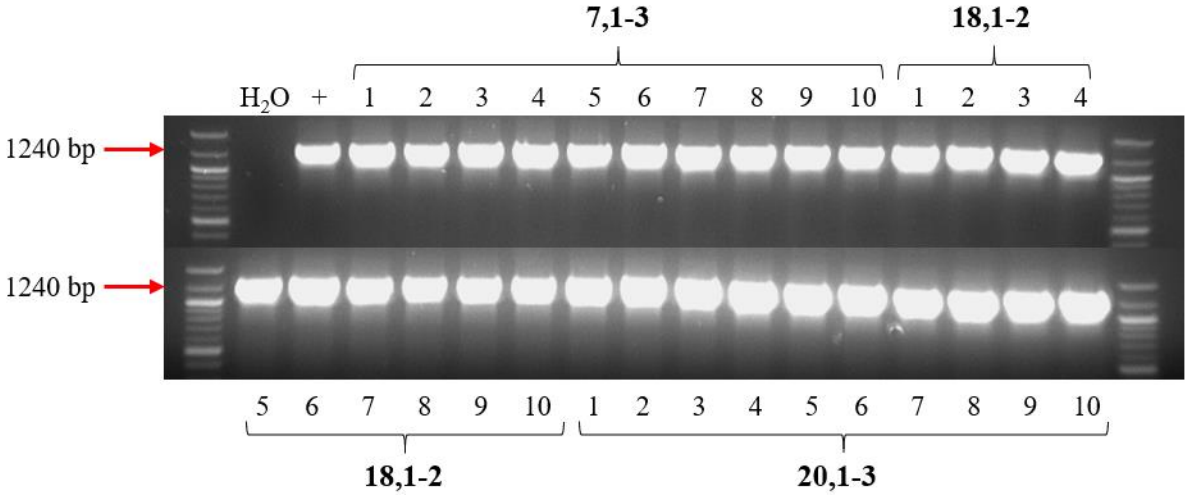

Figure 7.6: Presence of 35S::*EXPA11* construct in T3 lines

For each third transgenic generation (T3) line, DNA extractions were performed on 10 seedlings. The PCR with p35S F and *EXPA11-att*B2 R primers was conducted to confirm the presence of the 35S::*EXPA11* construct in the genomic DNA (gDNA) of the T3 lines. The T3 lines that were screened are '7,1-3', '18,1-2', and '20,1-3'. The positive control used the gDNA from the second transgenic generation (T2) of the T3 line 18,1-2 as template. The MW marker included is the New England Biolabs (NEB) Quick-Load® 100 bp DNA ladder (Catalogue #NO467S).

CHAPTER 8: REFERENCES

Abogadallah, G.M. 2010. Sensitivity of *Trifolium alexandrinum* L. to salt stress is related to the lack of long-term stress-induced gene expression. *Plant Science*. 178(6):491–500. DOI: 10.1016/j.plantsci.2010.03.008.

Acharya, B.R. & Assmann, S.M. 2009. Hormone interactions in stomatal function. *Plant Molecular Biology*. 69(4):451–462. DOI: 10.1007/s11103-008-9427-0.

Ache, P., Becker, D., Ivashikina, N., Dietrich, P., Roelfsema, M.R.G. & Hedrich, R. 2000. GORK, a delayed outward rectifier expressed in guard cells of *Arabidopsis thaliana*, is a K^+-selective, K^+-sensing ion channel. *FEBS Letters*. 486(2):93–98. DOI: 10.1016/S0014-5793(00)02248-1.

Ache, P., Becker, D., Deeken, R., Dreyer, I., Weber, H., Fromm, J. & Hedrich, R. 2001. VFK1, a *Vicia faba* K^+ channel involved in phloem unloading. *The Plant Journal*. 27(6):571–580. DOI: 10.1046/j.1365-313X.2001.01116.x.

Agarwal, P.K., Dave, A. & Agarwal, P. 2018. Transcriptional regulation of salinity stress: role and spatio-temporal expressions of ion-transporter gene promoters. *Biologia Plantarum*. 62(4):641–646. DOI: 10.1007/s10535-018-0815-2.

Ahn, S.J., Shin, R. & Schachtman, D.P. 2004. Expression of KT/KUP Genes in Arabidopsis and the Role of Root Hairs in K^+ Uptake. *Plant Physiology*. 134(3):1135–1145. DOI: 10.1104/pp.103.034660.

Aida, M., Ishida, T., Fukaki, H., Fujisawa, H. & Tasaka, M. 1997. Genes involved in organ separation in Arabidopsis: An analysis of the cup-shaped cotyledon mutant. *Plant Cell*. 9(6):841–857. DOI: 10.1105/tpc.9.6.841.

Al-shareef, N.O. & Tester, M. 2019. Plant Salinity Tolerance. In *eLS. Wiley*. 1–6. DOI: 10.1002/9780470015902.a0001300.pub3.

Albrecht, T. & Argueso, C.T. 2016. Should I fight or should I grow now? The role of cytokinins in plant growth and immunity and in the growth–defence trade-off. *Annals of Botany*. 119(5):mcw211. DOI: 10.1093/aob/mcw211.

Alemán, F., Nieves-Cordones, M., Martínez, V. & Rubio, F. 2009. Differential regulation of the HAK5 genes encoding the high-affinity K^+ transporters of *Thellungiella halophila* and *Arabidopsis thaliana*. *Environmental and Experimental Botany*. 65(2–3):263–269. DOI: 10.1016/j.envexpbot.2008.09.011.

Alexandersson, E., Saalbach, G., Larsson, C. & Kjellbom, P. 2004. Arabidopsis plasma membrane proteomics identifies components of transport, signal transduction and membrane trafficking. *Plant and Cell Physiology*. 45(11):1543–1556. DOI: 10.1093/pcp/pch209.

Ali, M.A., Azeem, F., Nawaz, M.A., Acet, T., Abbas, A., Imran, Q.M., Shah, K.H., Rehman, H.M., et al. 2018. Transcription factors WRKY11 and WRKY17 are involved in abiotic stress responses in Arabidopsis. *Journal of Plant Physiology*. 226(July 2017):12–21. DOI: 10.1016/j.jplph.2018.04.007.

Alvarez, J.P., Pekker, I., Goldshmidt, A., Blum, E., Amsellem, Z. & Eshed, Y. 2006. Endogenous and synthetic microRNAs stimulate simultaneous, efficient, and localized regulation of multiple targets in diverse species. *Plant Cell*. 18(5):1134–1151. DOI: 10.1105/tpc.105.040725.

An, D., Chen, J.G., Gao, Y.Q., Li, X., Chao, Z.F., Chen, Z.R., Li, Q.Q., Han, M.L., et al. 2017. AtHKT1 drives adaptation of *Arabidopsis thaliana* to salinity by reducing floral sodium content. *PLoS Genetics*. 13(10):1–18. DOI: 10.1371/journal.pgen.1007086.

Andrés, F., Kinoshita, A., Kalluri, N., Fernández, V., Falavigna, V.S., Cruz, T.M.D., Jang, S., Chiba, Y., et al. 2020. The sugar transporter SWEET10 acts downstream of FLOWERING LOCUS T during floral transition of *Arabidopsis thaliana*. *BMC Plant Biology*. 20(1):53. DOI: 10.1186/s12870-020-2266-0.

Apse, M.P., Aharon, G.S., Sneddon, W.A. & Blumwald, E. 1999. Salt Tolerance Conferred by Overexpression of a Vacuolar Na^+/H^+ Antiport in Arabidopsis. *Science*. 285(5431):1256–1258. DOI: 10.1126/science.285.5431.1256.

Apse, M.P., Sottosanto, J.B. & Blumwald, E. 2003. Vacuolar cation/H^+ exchange, ion homeostasis, and leaf development are altered in a T-DNA insertional mutant of AtNHX1, the Arabidopsis vacuolar Na^+/H^+ antiporter. *The Plant Journal*. 36(2):229–239. DOI: 10.1046/j.1365-313X.2003.01871.x.

Assaha, D.V.M., Ueda, A., Saneoka, H., Al-Yahyai, R. & Yaish, M.W. 2017. The Role of Na^+ and K^+ Transporters in Salt Stress Adaptation in Glycophytes. *Frontiers in Physiology*. 8(JUL). DOI: 10.3389/fphys.2017.00509.

Awlia, M., Alshareef, N., Saber, N., Korte, A., Oakey, H., Panzarová, K., Trtílek, M., Negrão, S., et al. 2021. Genetic mapping of the early responses to salt stress in *Arabidopsis thaliana*. *The Plant Journal*. 107(2):544–563. DOI: 10.1111/tpj.15310.

Axelsen, K.B. & Palmgren, M.G. 1998. Evolution of Substrate Specificities in the P-Type ATPase Superfamily Evolution of Substrate Specificities in the P-Type ATPase Superfamily. *Journal of Molecular Evolution*. 46(February 1998). DOI: 10.1007/PL00006286.

Bailey, T.L., Johnson, J., Grant, C.E. & Noble, W.S. 2015. The MEME Suite. *Nucleic Acids Research*. 43(W1):W39–W49. DOI: 10.1093/nar/gkv416.

Balazadeh, S., Siddiqui, H., Allu, A.D., Matallana-Ramirez, L.P., Caldana, C., Mehrnia, M., Zanor, M.-I., Kohler, B., et al. 2010. A gene regulatory network controlled by the NAC transcription factor ANAC092 / AtNAC2 / ORE1 during salt-promoted senescence. *The Plant Journal*. 62:250–264. DOI: 10.1111/j.1365-313X.2010.04151.x.

Baloyi, N.M., Dubery, I.A. & Piater, L.A. 2017. Proteomic analysis of Arabidopsis plasma membranes reveals lipopolysaccharide-responsive changes. *Biochemical and Biophysical Research Communications*. 486(4):1137–1142. DOI: 10.1016/j.bbrc.2017.04.016.

Barajas-Lopez, J. de D., Tiwari, A., Zarza, X., Shaw, M.W., Pascual, J., Punkkinen, M., Bakowska, J.C., Munnik, T., et al. 2021. EARLY RESPONSE TO DEHYDRATION 7 Remodels Cell Membrane Lipid Composition during Cold Stress in Arabidopsis. *Plant and Cell Physiology*. 62(1):80–91. DOI: 10.1093/pcp/pcaa139.

Barbez, E., Dünser, K., Gaidora, A., Lendl, T. & Busch, W. 2017. Auxin steers root cell expansion via apoplastic pH regulation in *Arabidopsis thaliana. Proceedings of the National Academy of Sciences*. 114(24):E4884–E4893. DOI: 10.1073/pnas.1613499114.

Bartel, B. & Fink, G.R. 1994. Differential regulation of an auxin-producing nitrilase gene family in *Arabidopsis thaliana*. *Proceedings of the National Academy of Sciences*. 91(July):6649–6653.

Bartling, D., Seedorf, M., Mithofer, A. & Weiler, E.W. 1992. Cloning and expression of an Arabidopsis nitrilase which can convert indole-3-acetonitrile to the plant hormone, indole-3-acetic acid. *European Journal of Biochemistry*. 205:417–424.

Bassil, E. & Blumwald, E. 2014. The ins and outs of intracellular ion homeostasis: NHX-type cation/H^+ transporters. *Current Opinion in Plant Biology*. 22:1–6. DOI: 10.1016/j.pbi.2014.08.002.

Bassil, E., Tajima, H., Liang, Y.-C., Ohto, M., Ushijima, K., Nakano, R., Esumi, T., Coku, A., et al. 2011. The Arabidopsis Na^+/H^+ Antiporters NHX1 and NHX2 Control Vacuolar pH and K^+ Homeostasis to Regulate Growth, Flower Development, and Reproduction. *The Plant Cell*. 23(9):3482–3497. DOI: 10.1105/tpc.111.089581.

Bassil, E., Zhang, S., Gong, H., Tajima, H. & Blumwald, E. 2019. Cation specificity of vacuolar NHX-type cation/H^+ Antiporters. *Plant Physiology*. 179(2):616–629. DOI: 10.1104/pp.18.01103.

Bednarek, S.Y. & Backues, S.K. 2010. Plant dynamin-related protein families DRP1 and DRP2 in plant development. *Biochemical Society Transactions*. 38(3):797–806. DOI: 10.1042/BST0380797.

Benjamini, Y. & Hochberg, Y. 1995. Controlling the False Discovery Rate: A Practical and Powerful Approach to Multiple Testing. *Journal of the Royal Statistical Society*: Series B (Methodological). 57(1):289–300. DOI: 10.1111/j.2517-6161.1995.tb02031.x.

van den Berg, T., Korver, R.A., Testerink, C. & ten Tusscher, K.H.W.J. 2016. Modeling halotropism: A key role for root tip architecture and reflux loop remodeling in redistributing auxin. *Development* (Cambridge). 143(18):3350–3362. DOI: 10.1242/dev.135111.

Berger, B., de Regt, B. & Tester, M. 2012. Trait Dissection of Salinity Tolerance with Plant Phenomics. *In Methods in Molecular Biology*. V. 913. 399–413. DOI: 10.1007/978-1-61779-986-0_27.

Bernfur, K., Larsson, O., Larsson, C. & Gustavsson, N. 2013. Relative Abundance of Integral Plasma Membrane Proteins in Arabidopsis Leaf and Root Tissue Determined by Metabolic Labeling and Mass Spectrometry. *PLoS ONE*. 8(8):e71206. DOI: 10.1371/journal.pone.0071206.

Berthomieu, P., Conéjéro, G., Nublat, A., Brackenbury, W.J., Lambert, C., Savio, C., Uozumi, N., Oiki, S., et al. 2003. Functional analysis of AtHKT1 in Arabidopsis shows that Na^+ recirculation by the phloem is crucial for salt tolerance. *EMBO Journal*. 22(9):2004–2014. DOI: 10.1093/emboj/cdg207.

Bhardwaj, R., Sharma, I., Kanwar, M., Sharma, R., Handa, N., Kaur, H., Kapoor, D. & Poonam. 2013. Aquaporins: Role Under Salt Stress in Plants. In *Ecophysiology and Responses of Plants under Salt Stress*. V. 9781461447. New York, NY: Springer New York. 213–248. DOI: 10.1007/978-1-4614-4747-4_8.

Bohner, A., Kojima, S., Hajirezaei, M., Melzer, M. & Wirén, N. 2015. Urea retranslocation from senescing Arabidopsis leaves is promoted by DUR3-mediated urea retrieval from leaf apoplast. *The Plant Journal*. 81(3):377–387. DOI: 10.1111/tpj.12740.

Boron, A.K., Van Loock, B., Suslov, D., Markakis, M.N., Verbelen, J.-P. & Vissenberg, K. 2015. Over-expression of AtEXLA2 alters etiolated Arabidopsis hypocotyl growth. *Annals of Botany*. 115(1):67–80. DOI: 10.1093/aob/mcu221.

Bose, J., Rodrigo-Moreno, A., Lai, D., Xie, Y., Shen, W. & Shabala, S. 2014. Rapid regulation of the plasma membrane H^+-ATPase activity is essential to salinity tolerance in two halophyte species, *Atriplex lentiformis* and *Chenopodium quinoa*. *The Annals of Botany*. 115. DOI: 10.1093/aob/mcu219.

Bose, J., Munns, R., Shabala, S., Gilliham, M., Pogson, B. & Tyerman, S.D. 2017. Chloroplast function and ion regulation in plants growing on saline soils: lessons from halophytes. *Journal of Experimental Botany*. 68(12):3129–3143. DOI: 10.1093/jxb/erx142.

Boursiac, Y., Chen, S., Luu, D., Sorieul, M., van den Dries, N. & Maurel, C. 2005. Early Effects of Salinity on Water Transport in Arabidopsis Roots. Molecular and Cellular Features of Aquaporin Expression. *Plant Physiology*. 139(2):790–805. DOI: 10.1104/pp.105.065029.

Bradford, M.M. 1976. A rapid and sensitive method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding. *Analytical Biochemistry*. 72(1–2):248–254. DOI: 10.1016/0003-2697(76)90527-3.

Brini, F., Hanin, M., Mezghani, I., Berkowitz, G.A. & Masmoudi, K. 2006. Overexpression of wheat Na^+/H^+ antiporter TNHX1 and H^+-pyrophosphatase TVP1 improve salt- and drought-stress tolerance in *Arabidopsis thaliana* plants. *Journal of Experimental Botany*. 58(2):301–308. DOI: 10.1093/jxb/erl251.

Brodersen, P., Petersen, M., Nielsen, H.B., Zhu, S., Newman, M.A., Shokat, K.M., Rietz, S., Parker, J., et al. 2006. Arabidopsis MAP kinase 4 regulates salicylic acid- and jasmonic acid/ethylene-dependent responses via EDS1 and PAD4. *Plant Journal*. 47(4):532–546. DOI: 10.1111/j.1365-313X.2006.02806.x.

Bustin, S.A., Benes, V., Garson, J.A., Hellemans, J., Huggett, J., Kubista, M., Mueller, R., Nolan, T., et al. 2009. The MIQE Guidelines: Minimum Information for Publication of Quantitative Real-Time PCR Experiments. *Clinical Chemistry*. 55(4):611–622. DOI: 10.1373/clinchem.2008.112797.

Byrt, C.S., Platten, J.D., Spielmeyer, W., James, R.A., Lagudah, E.S., Dennis, E.S., Tester, M. & Munns, R. 2007. HKT1;5-Like Cation Transporters Linked to Na^+ Exclusion Loci in Wheat, Nax2 and Kna1. *Plant Physiology*. 143(4):1918–1928. DOI: 10.1104/pp.106.093476.

Byrt, C.S., Zhao, M., Kourghi, M., Bose, J., Henderson, S.W., Qiu, J., Gilliham, M., Schultz, C., et al. 2017. Non-selective cation channel activity of aquaporin AtPIP2;1 regulated by Ca^{2+} and pH. *Plant, Cell & Environment*. 40(6):802–815. DOI: 10.1111/pce.12832.

Cabello, J. V., Lodeyro, A.F. & Zurbriggen, M.D. 2014. Novel perspectives for the engineering of abiotic stress tolerance in plants. *Current Opinion in Biotechnology*. 26:62–70. DOI: 10.1016/j.copbio.2013.09.011.

Cackett, L. 2019. Characterisation of auxin and auxin-related genes in the response of *Arabidopsis thaliana* to salt stress. University of Cape Town.

Cackett, L., Cannistraci, C.V., Meier, S., Ferrandi, P., Pěnčík, A., Gehring, C., Novák, O., Ingle, R.A., et al. 2022. Salt-Specific Gene Expression Reveals Elevated Auxin Levels in *Arabidopsis thaliana* Plants Grown Under Saline Conditions. *Frontiers in Plant Science*. 13(February). DOI: 10.3389/fpls.2022.804716.

Calderon-Villalobos, L.I., Tan, X., Zheng, N. & Estelle, M. 2010. Auxin Perception - Structural Insights. *Cold Spring Harbor Perspectives in Biology*. 2(7):a005546–a005546. DOI: 10.1101/cshperspect.a005546.

Cellier, F., Conéjéro, G., Ricaud, L., Doan, T.L., Lepetit, M., Gosti, F. & Casse, F. 2004. Characterization of AtCHX17, a member of the cation/H^+ exchangers, CHX family, from *Arabidopsis thaliana* suggests a role in K^+ homeostasis. *Plant Journal*. 39(6):834–846. DOI: 10.1111/j.1365-313X.2004.02177.x.

Chai, C. & Subudhi, P.K. 2016. Comprehensive Analysis and Expression Profiling of the OsLAX and OsABCB Auxin Transporter Gene Families in Rice (*Oryza sativa*) under Phytohormone Stimuli and Abiotic Stresses. *Frontiers in Plant Science*. 7(May):1–13. DOI: 10.3389/fpls.2016.00593.

Chang, I.-F., Hsu, J.-L., Hsu, P.-H., Sheng, W.-A., Lai, S.-J., Lee, C., Chen, C.-W., Hsu, J.-C., et al. 2012. Comparative phosphoproteomic analysis of microsomal fractions of *Arabidopsis thaliana* and *Oryza sativa* subjected to high salinity. *Plant Science*. 185–186:131–142. DOI: 10.1016/j.plantsci.2011.09.009.

Chen, G., Hu, Q., Luo, L., Yang, T., Zhang, S., Hu, Y., Yu, L. & Xu, G. 2015. Rice potassium transporter OsHAK1 is essential for maintaining potassium-mediated growth and functions in salt tolerance over low and high potassium concentration ranges. *Plant Cell and Environment*. 38(12):2747–2765. DOI: 10.1111/pce.12585.

Chen, Y., Hoehenwarter, W. & Weckwerth, W. 2010. Comparative analysis of phytohormone-responsive phosphoproteins in *Arabidopsis thaliana* using TiO_2-phosphopeptide enrichment and mass accuracy precursor alignment. *The Plant Journal*. 63:1–17. DOI: 10.1111/j.1365-313X.2010.04218.x.

Chen, Z., Pottosin, I.I., Cuin, T.A., Fuglsang, A.T., Tester, M., Jha, D., Zepeda-Jazo, I., Zhou, M., et al. 2007. Root Plasma Membrane Transporters Controlling K^+/Na^+ Homeostasis in Salt-Stressed Barley. *Plant Physiology*. 145(4):1714–1725. DOI: 10.1104/pp.107.110262.

Chen, Z., Hu, L., Han, N., Hu, J., Yang, Y., Xiang, T., Zhang, X. & Wang, L. 2015. Overexpression of a miR393-Resistant Form of Transport Inhibitor Response Protein 1 (mTIR1) Enhances Salt Tolerance by Increased Osmoregulation and Na^+ Exclusion in *Arabidopsis thaliana*. *Plant and Cell Physiology*. 56(1):73–83. DOI: 10.1093/pcp/pcu149.

Cheong, M.S. & Yun, D.J. 2007. Salt-stress signaling. *Journal of Plant Biology*. 50(2):148–155. DOI: 10.1007/BF03030623.

Cho, H.-T. 2002. Regulation of Root Hair Initiation and Expansin Gene Expression in Arabidopsis. *the Plant Cell Online*. 14(12):3237–3253. DOI: 10.1105/tpc.006437.

Cho, H. & Cosgrove, D.J. 2000. Altered expression of expansin modulates leaf growth and pedicel abscission in *Arabidopsis thaliana*. *PNAS*. 97(17):9783–9788.

Choi, W.G., Toyota, M., Kim, S.H., Hilleary, R. & Gilroy, S. 2014. Salt stress-induced Ca^{2+} waves are associated with rapid, long-distance root-to-shoot signaling in plants. *Proceedings of the National Academy of Sciences of the United States of America*. 111(17):6497–6502. DOI: 10.1073/pnas.1319955111.

Claussen, M., Luthen, H., Blatt, M. & Bottger, M. 1997. Auxin-induced growth and its linkage to potassium channels. *Planta*. 201.

Clough, S.J. & Bent, A.F. 1998. Floral dip: a simplified method for Agrobacterium-mediated transformation of *Arabidopsis thaliana*. *The Plant Journal*. 16(6):735–743. DOI: 10.1046/j.1365-313x.1998.00343.x.

Colin, L., Ruhnow, F., Zhu, J.-K., Zhao, C., Zhao, Y. & Persson, S. 2023. The cell biology of primary cell walls during salt stress. *The Plant Cell*. 35(1):201–217. DOI: 10.1093/plcell/koac292.

Collett, C.E., Harberd, N.P. & Leyser, O. 2000. Hormonal interactions in the control of Arabidopsis hypocotyl elongation. *Plant Physiology*. 124(2):553–561. DOI: 10.1104/pp.124.2.553.

Collins, C.A., Leslie, M.E., Peck, S.C. & Heese, A. 2017. *Brassinosteroids: Methods and Protocols*. V. 1564. E. Russinova & A.I. Caño-Delgado, Eds. (*Methods in Molecular Biology*). New York, NY: Springer New York. DOI: 10.1007/978-1-4939-6813-8.

Colmenero-Flores, J.M., Martínez, G., Gamba, G., Vázquez, N., Iglesias, D.J., Brumós, J. & Talón, M. 2007. Identification and functional characterization of cation-chloride cotransporters in plants. *Plant Journal*. 50(2):278–292. DOI: 10.1111/j.1365-313X.2007.03048.x.

Cosgrove, D.J. 2015. Plant expansins: diversity and interactions with plant cell walls. *Current Opinion in Plant Biology*. 25:162–172. DOI: 10.1016/j.pbi.2015.05.014.

Cosgrove, D.J. 2016. Catalysts of plant cell wall loosening. *F1000Research*. 5(0):1–13. DOI: 10.12688/f1000research.7180.1.

Cosgrove, D.J. 2022. Building an extensible cell wall. *Plant Physiology*. 189:1246–1277. DOI: https://doi.org/10.1093/plphys/kiac184.

DAVENPORT, R.J., MUÑOZ-MAYOR, A., JHA, D., ESSAH, P.A., RUS, A. & TESTER, M. 2007. The Na^+ transporter AtHKT1;1 controls retrieval of Na^+ from the xylem in Arabidopsis. *Plant, Cell & Environment*. 30(4):497–507. DOI: 10.1111/j.1365-3040.2007.01637.x.

Daxinger, L., Hunter, B., Sheikh, M., Jauvion, V., Gasciolli, V., Vaucheret, H., Matzke, M. & Furner, I. 2007. Unexpected silencing effects from T-DNA tags in Arabidopsis. *Trends in Plant Science*. 13(1):4–6. DOI: 10.1016/j.tplants.2007.10.007.

Demidchik, V. 2014. Mechanisms and physiological roles of K^+ efflux from root cells. *Journal of Plant Physiology*. 171(1). DOI: 10.1016/j.jplph.2014.01.015.

Demidchik, V. & Maathuis, F.J.M. 2007. Physiological roles of nonselective cation channels in plants: from salt stress to signalling and development. *New Phytologist*. 175(3):387–404. DOI: 10.1111/j.1469-8137.2007.02128.x.

Deolu-Ajayi, A.O., Meyer, A.J., Haring, M.A., Julkowska, M.M. & Testerink, C. 2019. Genetic Loci Associated with Early Salt Stress Responses of Roots. *iSCIENCE*. 21:458–473. DOI: 10.1016/j.isci.2019.10.043.

Dharmasiri, N., Dharmasiri, S. & Estelle, M. 2005. The F-box protein TIR1 is an auxin receptor. *Nature*. 435(7041):441–445. DOI: 10.1038/nature03543.

Di, D.W., Zhang, C., Luo, P., An, C.W. & Guo, G.Q. 2015. The biosynthesis of auxin: how many paths truly lead to IAA? *Plant Growth Regulation*. 78(3):275–285. DOI: 10.1007/s10725-015-0103-5.

Dimmer, E.C., Huntley, R.P., Alam-Faruque, Y., Sawford, T., O'Donovan, C., Martin, M.J., Bely, B., Browne, P., et al. 2012. The UniProt-GO Annotation database in 2011. *Nucleic Acids Research*. 40(D1):D565–D570. DOI: 10.1093/nar/gkr1048.

Ding, M., Hou, P., Shen, X., Wang, M., Deng, S., Sun, J., Xiao, F., Wang, R., et al. 2010. Salt-induced expression of genes related to Na^+/K^+ and ROS homeostasis in leaves of salt-resistant and salt-sensitive poplar species. *Plant Molecular Biology*. 73:251–269. DOI: 10.1007/s11103-010-9612-9.

Ding, Z.J., Yan, J.Y., Li, C.X., Li, G.X., Wu, Y.R. & Zheng, S.J. 2015. Transcription factor WRKY46 modulates the development of Arabidopsis lateral roots in osmotic / salt stress conditions via regulation of ABA signaling and auxin homeostasis. *The Plant Journal*. 84:56–69. DOI: 10.1111/tpj.12958.

Donaldson, L., Ludidi, N., Knight, M.R., Gehring, C. & Denby, K. 2004. Salt and osmotic stress cause rapid increases in *Arabidopsis thaliana* cGMP levels. *FEBS Letters*. 569(1–3):317–320. DOI: 10.1016/j.febslet.2004.06.016.

Du, M., Spalding, E.P. & Gray, W.M. 2020. Rapid Auxin-Mediated Cell Expansion. *Annual Review of Plant Biology*. 71(1):379–402. DOI: 10.1146/annurev-arplant-073019-025907.

Dunlap, J.R. & Binzel, M.L. 1996. NaCl Reduces Indole-3-Acetic Acid Levels in the Roots of Tomato Plants lndependent of Stress-lnduced Abscisic Acid. *Plant Physiol*. 112:379–384.

Edwards, K., Johnstone, C. & Thompson, C. 1991. A simple and rapid method for the preparation of plant genomic DNA for PCR analysis. 19(6):1991.

Ekanayake, G., Smith, J.M., Jones, K.B., Stiers, H.M., Robinson, S.J., LaMontagne, E.D., Kostos, P.H., Cornish, P. V., et al. 2021. DYNAMIN-RELATED PROTEIN DRP1A functions with DRP2B in plant growth, flg22-immune responses, and endocytosis. *Plant Physiology*. 185(4):1986–2002. DOI: 10.1093/plphys/kiab024.

Ekberg, K., Palmgren, M.G., Veierskov, B. & Buch-Pedersen, M.J. 2010. A novel mechanism of P-type ATPase autoinhibition involving both termini of the protein. *Journal of Biological Chemistry*. 285(10):7344–7350. DOI: 10.1074/jbc.M109.096123.

Fageria, N.K., Gheyi, H.R. & Moreira, A. 2011. NUTRIENT BIOAVAILABILITY IN SALT AFFECTED SOILS. *Journal of Plant Nutrition*. 34(7):945–962. DOI: 10.1080/01904167.2011.555578.

Falhof, J., Pedersen, J.T., Fuglsang, A.T. & Palmgren, M. 2016. Plasma Membrane H^+-ATPase Regulation in the Center of Plant Physiology. *Molecular Plant*. 9(3):323–337. DOI: 10.1016/j.molp.2015.11.002.

Feng, W., Kita, D., Peaucelle, A., Cartwright, H.N., Doan, V., Duan, Q., Liu, M.-C., Maman, J., et al. 2018. The FERONIA Receptor Kinase Maintains Cell-Wall Integrity during Salt Stress through Ca^{2+} Signaling. *Current Biology*. 28(5):666-675.e5. DOI: 10.1016/j.cub.2018.01.023.

Feng, Z.-J., Xu, S.-C., Liu, N., Zhang, G.-W., Hu, Q.-Z., Xu, Z.-S. & Gong, Y.-M. 2018. Identification of the AQP members involved in abiotic stress responses from Arabidopsis. *Gene*. 646:64–73. DOI: 10.1016/j.gene.2017.12.048.

Feng, Z., Zhang, B., Ding, W., Liu, X., Yang, D.-L., Wei, P., Cao, F., Zhu, S., et al. 2013. Efficient genome editing in plants using a CRISPR/Cas system. *Cell Research*. 23(10):1229–1232. DOI: 10.1038/cr.2013.114.

Feng, Z., Mao, Y., Xu, N., Zhang, B., Wei, P., Yang, D.-L., Wang, Z., Zhang, Z., et al. 2014. Multigeneration analysis reveals the inheritance, specificity, and patterns of CRISPR/Cas-induced gene modifications in Arabidopsis. *Proceedings of the National Academy of Sciences*. 111(12):4632–4637. DOI: 10.1073/pnas.1400822111.

Ferl, R.J. 2004. Minireview 14-3-3 proteins: regulation of signal-induced events. *Physiologia plantarum*. 120:173–178.

Fuglsang, A.T., Visconti, S., Drumm, K., Jahn, T., Stensballe, A., Mattei, B., Jensen, O.N., Aducci, P., et al. 1999. Binding of 14-3-3 protein to the plasma membrane H^+-ATPase AHA2 involves the three C-terminal residues Tyr946-Thr-Val and requires phosphorylation of Thr947. *Journal of Biological Chemistry*. 274(51):36774–36780. DOI: 10.1074/jbc.274.51.36774.

Fuglsang, A.T., Kristensen, A., Cuin, T.A., Schulze, W.X., Persson, J., Thuesen, K.H., Ytting, C.K., Oehlenschlaeger, C.B., et al. 2014. Receptor kinase-mediated control of primary active proton pumping at the plasma membrane. *The Plant Journal*. 80:951–964. DOI: 10.1111/tpj.12680.

Gadsby, D.C. 2009. Ion channels versus ion pumps: the principal difference, in principle. *Nature Reviews Molecular Cell Biology*. 10(5):344–352. DOI: 10.1038/nrm2668.

Galvan-Ampudia, C.S., Julkowska, M.M., Darwish, E., Gandullo, J., Korver, R.A., Brunoud, G., Haring, M.A., Munnik, T., et al. 2013. Halotropism is a response of plant roots to avoid a saline environment. *Current Biology*. 23(20):2044–2050. DOI: 10.1016/j.cub.2013.08.042.

Gálvez, F.J., Baghour, M., Hao, G., Cagnac, O., Rodríguez-Rosales, M.P. & Venema, K. 2012. Expression of LeNHX isoforms in response to salt stress in salt sensitive and salt tolerant tomato species. *Plant Physiology and Biochemistry*. 51:109–115. DOI: 10.1016/j.plaphy.2011.10.012.

Gaxiola, R.A., Rao, R., Sherman, A., Grisafi, P., Alper, S.L. & Fink, G.R. 1999. The *Arabidopsis thaliana* proton transporters, AtNhx1 and Avp1, can function in cation detoxification in yeast. *Proceedings of the National Academy of Sciences of the United States of America*. 96(4):1480–1485. DOI: 10.1073/pnas.96.4.1480.

Gaymard, F., Pilot, G., Lacombe, B., Bouchez, D., Bruneau, D., Boucherez, J., Michaux-Ferrière, N., Thibaud, J., et al. 1998. Identification and Disruption of a Plant Shaker-like Outward Channel Involved in K^+ Release into the Xylem Sap. *Cell*. 94(5):647–655. DOI: 10.1016/S0092-8674(00)81606-2.

Geilfus, C.-M., Ober, D., Eichacker, L.A., Mühling, K.H. & Zörb, C. 2015. Down-Regulation of ZmEXPB6 (Zea mays β-Expansin 6) Protein Is Correlated with Salt-mediated Growth Reduction in the Leaves of *Z. mays* L. *Journal of Biological Chemistry*. 290(18):11235–11245. DOI: 10.1074/jbc.M114.619718.

Geilfus, C.M., Zörb, C. & Mühling, K.H. 2010. Salt stress differentially affects growth-mediating β-expansins in resistant and sensitive maize (*Zea mays* L.). *Plant Physiology and Biochemistry*. 48(12):993–998. DOI: 10.1016/j.plaphy.2010.09.011.

Geisler, M., Aryal, B., Donato, M. & Hao, P. 2017. A Critical View on ABC Transporters and Their Interacting Partners in Auxin Transport. *Plant and Cell Physiology*. 58(July):1601–1614. DOI: 10.1093/pcp/pcx104.

Gendron, J.M., Pruneda-Paz, J.L., Doherty, C.J., Gross, A.M., Kang, S.E. & Kay, S.A. 2012. Arabidopsis circadian clock protein, TOC1, is a DNA-binding transcription factor. *Proceedings of the National Academy of Sciences of the United States of America*. 109(8):3167–3172. DOI: 10.1073/pnas.1200355109.

Georgelis, N., Tabuchi, A., Nikolaidis, N. & Cosgrove, D.J. 2011. Structure-Function Analysis of the Bacterial Expansin EXLX1. *Journal of Biological Chemistry*. 286(19):16814–16823. DOI: 10.1074/jbc.M111.225037.

Georgelis, N., Yennawar, N.H. & Cosgrove, D.J. 2012. Structural basis for entropy-driven cellulose binding by a type-A cellulose-binding module (CBM) and bacterial expansin. *PNAS*. 109(37). DOI: 10.1073/pnas.1213200109/-/DCSupplemental.www.pnas.org/cgi/doi/10.1073/pnas.1213200109.

Gévaudant, F., Duby, G., Stedingk, E. Von, Zhao, R., Morsomme, P. & Boutry, M. 2007. Expression of a Constitutively Activated Plasma Membrane H^+-ATPase Alters Plant Development and Increases Salt Tolerance. *Plant Physiology*. 144(August):1763–1776. DOI: 10.1104/pp.107.103762.

Giannone, R.J., Wurch, L.L., Podar, M. & Hettich, R.L. 2015. Rescuing Those Left Behind: Recovering and Characterizing Underdigested Membrane and Hydrophobic Proteins To Enhance Proteome Measurement Depth. *Analytical Chemistry*. 87(15):7720–7728. DOI: 10.1021/acs.analchem.5b01187.

Gigli-Bisceglia, N., van Zelm, E., Huo, W., Lamers, J. & Testerink, C. 2022. Arabidopsis root responses to salinity depend on pectin modification and cell wall sensing. *Development*. 149(12):1–13. DOI: 10.1242/dev.200363.

Gobert, A., Park, G., Amtmann, A., Sanders, D. & Maathuis, F.J.M. 2006. *Arabidopsis thaliana* Cyclic Nucleotide Gated Channel 3 forms a non-selective ion transporter involved in germination and cation transport. *Journal of Experimental Botany*. 57(4):791–800. DOI: 10.1093/jxb/erj064.

Goh, H.-H., Sloan, J., Malinowski, R. & Fleming, A. 2014. Variable expansin expression in Arabidopsis leads to different growth responses. *Journal of Plant Physiology*. 171(3–4):329–339. DOI: 10.1016/j.jplph.2013.09.009.

Goh, H., Sloan, J., Dorca-fornell, C. & Fleming, A. 2012. Inducible Repression of Multiple Expansin Genes Leads to Growth Suppression during Leaf Development. *Plant Physiology*. 159(August):1759–1770. DOI: 10.1104/pp.112.200881.

Gorecka, K.M., Konopka-Postupolska, D., Hennig, J., Buchet, R. & Pikula, S. 2005. Peroxidase activity of annexin 1 from *Arabidopsis thaliana*. *Biochemical and Biophysical Research Communications*. 336(3):868–875. DOI: 10.1016/j.bbrc.2005.08.181.

Gou, M., Su, N., Zheng, J., Huai, J., Wu, G., Zhao, J., He, J., Tang, D., et al. 2009. An F-box gene, CPR30, functions as a negative regulator of the defense response in Arabidopsis. *The Plant Journal*. 60(5):757–770. DOI: 10.1111/j.1365-313X.2009.03995.x.

Goyal, E., Amit, S.K., Singh, R.S., Mahato, A.K., Chand, S. & Kanika, K. 2016. Transcriptome profiling of the salt-stress response in *Triticum aestivum* cv. Kharchia Local. *Scientific Reports*. 6(1):27752. DOI: 10.1038/srep27752.

Grant, C.E., Bailey, T.L. & Noble, W.S. 2011. FIMO: Scanning for occurrences of a given motif. *Bioinformatics*. 27(7):1017–1018. DOI: 10.1093/bioinformatics/btr064.

Gray-Mitsumune, M., Blomquist, K., McQueen-Mason, S., Teeri, T.T., Sundberg, B. & Mellerowicz, E.J. 2007. Ectopic expression of a wood-abundant expansin PttEXPA1 promotes cell expansion in primary and secondary tissues in aspen. *Plant Biotechnology Journal*. (October):071003005211001-??? DOI: 10.1111/j.1467-7652.2007.00295.x.

Gray, W.M., Del Pozo, J.C., Walker, L., Hobbie, L., Risseeuw, E., Banks, T., Crosby, W.L., Yang, M., et al. 1999. Identification of an SCF ubiquitin-ligase complex required for auxin response in *Arabidopsis thaliana*. *Genes and Development*. 13(13):1678–1691. DOI: 10.1101/gad.13.13.1678.

Gray, W.M., Kepinski, S., Rouse, D., Leyser, O. & Estelle, M. 2001. Auxin regulates SCFTIR1-dependent degradation of AUX/IAA proteins. *Nature*. 414(6861):271–276. DOI: 10.1038/35104500.

Grsic-Rausch, S., Kobelt, P., Siemens, J.M., Bischoff, M. & Ludwig-Müller, J. 2000. Expression and localization of nitrilase during symptom development of the clubroot disease in Arabidopsis. *Plant Physiology*. 122(2):369–378. DOI: 10.1104/pp.122.2.369.

Grsic, S., Sauerteig, S., Neuhaus, K., Albrecht, M., Rossiter, J. & Ludwig-Muller, J. 1998. Physiological analysis of transgenic *Arabidopsis thaliana* plants expressing one nitrilase isoform in sense or antisense direction. *Journal of Plant Physiology*. 153(3–4):446–456. DOI: 10.1016/S0176-1617(98)80173-9.

Hairmansis, A., Berger, B., Tester, M. & Roy, S.J. 2014. Image-based phenotyping for non-destructive screening of different salinity tolerance traits in rice. *Rice*. 7(1):1–10. DOI: 10.1186/s12284-014-0016-3.

Halfter, U., Ishitani, M. & Zhu, J.-K. 2000. The Arabidopsis SOS2 protein kinase physically interacts with and is activated by the calcium-binding protein SOS3. *Proceedings of the National Academy of Sciences*. 97(7):3735–3740. DOI: 10.1073/pnas.97.7.3735.

Han, E.H., Petrella, D.P. & Blakeslee, J.J. 2017. 'Bending' models of halotropism: incorporating protein phosphatase 2A, ABCB transporters, and auxin metabolism. *Journal of Experimental Botany*. 68(12):3071–3089. DOI: 10.1093/jxb/erx127.

Han, M., Wu, W., Wu, W.-H. & Wang, Y. 2016. Potassium Transporter KUP7 Is Involved in K^+ Acquisition and Translocation in Arabidopsis Root under K^+-Limited Conditions. *Molecular Plant*. 9(3):437–446. DOI: 10.1016/j.molp.2016.01.012.

Han, Y.-J., Kim, Y.-M., Hwang, O.-J. & Kim, J.-I. 2015. Characterization of a small constitutive promoter from Arabidopsis translationally controlled tumor protein (AtTCTP) gene for plant transformation. *Plant Cell Reports*. 34(2):265–275. DOI: 10.1007/s00299-014-1705-5.

Hanin, M., Ebel, C., Ngom, M., Laplaze, L. & Masmoudi, K. 2016. New Insights on Plant Salt Tolerance Mechanisms and Their Potential Use for Breeding. *Frontiers in Plant Science*. 7(NOVEMBER2016):1–17. DOI: 10.3389/fpls.2016.01787.

Harper, J.F., Surowy, T.K. & Sussman, M.R. 1989. Molecular cloning and sequence of cDNA encoding the plasma membrane proton pump (H^+-ATPase) of *Arabidopsis thaliana*. *Proceedings of the National Academy of Sciences*. 86(February):1234–1238.

Harper, J.F., Manney, L., Dewitt, N.D., Yoo, M.H. & Sussman, M.R. 1990. The Arabidopsis Family *thaliana* Plasma Membrane H^+-ATPase Multigene family. *The Journal of Biological Chemistry*. 265(23):13601–13608.

Haruta, M., Sabat, G., Stecker, K., Minkoff, B.B. & Sussman, M.R. 2014. A Peptide Hormone and Its Receptor Protein Kinase Regulate Plant Cell Expansion. *Science*. 343(6169):408–411. DOI: 10.1126/science.1244454.

Haswell, E.S. 2007. MscS-Like Proteins in Plants. In *Current Topics in Membranes*. V. 58. 329–359. DOI: 10.1016/S1063-5823(06)58013-5.

Haughn, G.W.G.W. & Somerville, C. 1986. Sulfonylurea-resistant mutants of *Arabidopsis thaliana*. *MGG Molecular & General Genetics*. 204(3):430–434. DOI: 10.1007/BF00331020.

Hauser, F. & Horie, T. 2010. A conserved primary salt tolerance mechanism mediated by HKT transporters: a mechanism for sodium exclusion and maintenance of high K^+/Na^+ ratio in leaves during salinity stress. *Plant, Cell & Environment*. 33(4):552–565. DOI: 10.1111/j.1365-3040.2009.02056.x.

Hayashi, S., Ishii, T., Matsunaga, T., Tominaga, R., Kuromori, T., Wada, T., Shinozaki, K. & Hirayama, T. 2008. The Glycerophosphoryl Diester Phosphodiesterase-Like Proteins SHV3 and its Homologs Play Important Roles in Cell Wall Organization. *Plant and Cell Physiology*. 49(10):1522–1535. DOI: 10.1093/pcp/pcn120.

Hayashi, Y., Nakamura, S., Takemiya, A., Takahashi, Y., Shimazaki, K. & Kinoshita, T. 2010. Biochemical Characterization of In Vitro Phosphorylation and Dephosphorylation of the Plasma Membrane H^+-ATPase. *Plant and Cell Physiology*. 51(7):1186–1196. DOI: 10.1093/pcp/pcq078.

Hirsch, R.E., Lewis, B.D., Spalding, E.P. & Sussman, M.R. 1998. A Role for the AKT1 Potassium Channel in Plant Nutrition. *Science*. 280(5365):918–921. DOI: 10.1126/science.280.5365.918.

Hong, S.M., Bahn, S.C., Lyu, A., Jung, H.S. & Ahn, J.H. 2010. Identification and testing of superior reference genes for a starting pool of transcript normalization in Arabidopsis. *Plant and Cell Physiology*. 51(10):1694–1706. DOI: 10.1093/pcp/pcq128.

Hong, Z., Bednarek, S.Y., Blumwald, E., Hwang, I., Jurgens, G., Menzel, D., Osteryoung, K.W., Raikhel, N.V., et al. 2003. A unified nomenclature for Arabidopsis dynamin-related large GTPases based on homology and possible functions. *Plant Molecular Biology*. 53(3):261–265. DOI: 10.1023/B:PLAN.0000007000.29697.81.

Hornbacher, J., Horst-Niessen, I., Herrfurth, C., Feussner, I. & Papenbrock, J. 2022. First experimental evidence suggests use of glucobrassicin as source of auxin in drought-stressed *Arabidopsis thaliana*. *Frontiers in Plant Science*. 13(October):1–17. DOI: 10.3389/fpls.2022.1025969.

Hou, Q., Zhao, W., Lu, L., Wang, L., Zhang, T., Hu, B., Yan, T., Qi, Y., et al. 2022. Overexpression of HLH4 Inhibits Cell Elongation and Anthocyanin Biosynthesis in *Arabidopsis thaliana*. *Cells*. 11(7):1087. DOI: 10.3390/cells11071087.

Hsu, J.-L., Wang, L.-Y., Wang, S.-Y., Lin, C.-H., Ho, K.-C., Shi, F.-K. & Chang, I.-F. 2009. Functional phosphoproteomic profiling of phosphorylation sites in membrane fractions of salt-stressed *Arabidopsis thaliana*. *Proteome Science*. 7(1):42. DOI: 10.1186/1477-5956-7-42.

Huang, G.T., Ma, S.L., Bai, L.P., Zhang, L., Ma, H., Jia, P., Liu, J., Zhong, M., et al. 2012. Signal transduction during cold, salt, and drought stresses in plants. *Molecular Biology Reports*. 39(2):969–987. DOI: 10.1007/s11033-011-0823-1.

Huang, J., Fujimoto, M., Fujiwara, M., Fukao, Y., Arimura, S. & Tsutsumi, N. 2015. Arabidopsis dynamin-related proteins, DRP2A and DRP2B, function coordinately in post-Golgi trafficking. *Biochemical and Biophysical Research Communications*. 456(1):238–244. DOI: 10.1016/j.bbrc.2014.11.065.

Huang, S., Spielmeyer, W., Lagudah, E.S., James, R.A., Platten, J.D., Dennis, E.S. & Munns, R. 2006. A sodium transporter (HKT7) is a candidate for Nax1, a gene for salt tolerance in durum wheat. *Plant Physiology*. 142(4):1718–1727. DOI: 10.1104/pp.106.088864.

Huh, S.M., Noh, E.K., Kim, H.G., Jeon, B.W., Bae, K., Hu, H.-C., Kwak, J.M. & Park, O.K. 2010. Arabidopsis Annexins AnnAt1 and AnnAt4 Interact with Each Other and Regulate Drought and Salt Stress Responses. *Plant and Cell Physiology*. 51(9):1499–1514. DOI: 10.1093/pcp/pcq111.

Hussan, R.H., Dubery, I.A. & Piater, L.A. 2020. Identification of MAMP-Responsive Plasma Membrane-Associated Proteins in *Arabidopsis thaliana* Following Challenge with Different LPS Chemotypes from *Xanthomonas campestris*. *Pathogens*. 9(787):1–24. DOI: 10.3390/pathogens9100787.

Iglesias, M.J., Terrile, M.C., Bartoli, C.G., D'Ippólito, S. & Casalongué, C.A. 2010. Auxin signaling participates in the adaptative response against oxidative stress and salinity by interacting with redox metabolism in Arabidopsis. *Plant Molecular Biology*. 74(3):215–222. DOI: 10.1007/s11103-010-9667-7.

Iglesias, M.J., Terrile, M.C., Windels, D., Lombardo, M.C., Bartoli, C.G., Vazquez, F., Estelle, M. & Casalongué, C.A. 2014. MiR393 regulation of auxin signaling and redox-related components during acclimation to salinity in Arabidopsis. *PLoS ONE*. 9(9). DOI: 10.1371/journal.pone.0107678.

Irshad, M., Canut, H., Borderies, G., Pont-Lezica, R. & Jamet, E. 2008. A new picture of cell wall protein dynamics in elongating cells of *Arabidopsis thaliana*: Confirmed actors and newcomers. *BMC Plant Biology*. 8:1–16. DOI: 10.1186/1471-2229-8-94.

Isayenkov, S. V & Maathuis, F.J.M. 2019. Plant Salinity Stress: Many Unanswered Questions Remain. *Frontiers in Plant Science*. 10(February). DOI: 10.3389/fpls.2019.00080.

Ivushkin, K., Bartholomeus, H., Bregt, A.K., Pulatov, A., Kempen, B. & de Sousa, L. 2019. Global mapping of soil salinity change. *Remote Sensing of Environment*. 231(March):111260. DOI: 10.1016/j.rse.2019.111260.

Jabnoune, M., Espeout, S., Mieulet, D., Fizames, C., Verdeil, J.L., Conéjéro, G., Rodríguez-Navarro, A., Sentenac, H., et al. 2009. Diversity in expression patterns and functional properties in the Rice HKT transporter family. *Plant Physiology*. 150(4):1955–1971. DOI: 10.1104/pp.109.138008.

Jadamba, C., Kang, K., Paek, N.C., Lee, S.I. & Yoo, S.C. 2020. Overexpression of rice expansin7 (Osexpa7) confers enhanced tolerance to salt stress in rice. *International Journal of Molecular Sciences*. 21(2). DOI: 10.3390/ijms21020454.

Jahn, T., Fuglsang, A.T., Olsson, A., Brüntrup, I.M., Collinge, D.B., Volkmann, D., Sommarin, M., Palmgren, M.G., et al. 1997. The 14-3-3 Protein lnteracts Directly with the C-Terminal Region of the Plant Plasma Membrane H^+-ATPase. *The Plant Cell*. 9(October):1805–1814.

James, R.A., Davenport, R.J. & Munns, R. 2006. Physiological Characterization of Two Genes for Na^+ Exclusion in Durum Wheat, Nax1 and Nax2. *Plant Physiology*. 142(4):1537–1547. DOI: 10.1104/pp.106.086538.

James, R.A., von Caemmerer, S., Condon, A.G. (Tony), Zwart, A.B. & Munns, R. 2008. Genetic variation in tolerance to the osmotic stress component of salinity stress in durum wheat. *Functional Plant Biology*. 35(2):111. DOI: 10.1071/FP07234.

Janicka-Russak, M., Kabała, K., Wdowikowska, A. & Kłobus, G. 2013. Modification of plasma membrane proton pumps in cucumber roots as an adaptation mechanism to salt stress. *Journal of Plant Physiology*. 170(10):915–922. DOI: 10.1016/j.jplph.2013.02.002.

Janowitz, T., Trompetter, I. & Piotrowski, M. 2009. Phytochemistry Evolution of nitrilases in glucosinolate-containing plants. *Phytochemistry*. 70(15–16):1680–1686. DOI: 10.1016/j.phytochem.2009.07.028.

Jha, D., Shirley, N., Tester, M. & Roy, S.J. 2010. Variation in salinity tolerance and shoot sodium accumulation in Arabidopsis ecotypes linked to differences in the natural expression levels of transporters involved in sodium transport. *Plant Cell and Environment*. 33:793–804. DOI: https://doi.org/10.1111/j.1365-3040.2009.02105.x.

Jiang, Y. & Deyholos, M.K. 2006a. Comprehensive transcriptional profiling of NaCl-stressed Arabidopsis roots reveals novel classes of responsive genes. *BMC plant biology*. 6:25. DOI: 10.1186/1471-2229-6-25.

Jiang, Y. & Deyholos, M.K. 2006b. Comprehensive transcriptional profiling of NaCl-stressed Arabidopsis roots reveals novel classes of responsive genes. *BMC Plant Biology*. 6(25):1–20. DOI: 10.1186/1471-2229-6-25.

Jiang, W., Zhou, H., Bi, H., Fromm, M., Yang, B. & Weeks, D.P. 2013. Demonstration of CRISPR/Cas9/sgRNA-mediated targeted gene modification in Arabidopsis, tobacco, sorghum and rice. *Nucleic Acids Research*. 41(20):1–12. DOI: 10.1093/nar/gkt780.

Jiang, X., Leidi, E.O. & Pardo, J.M. 2010. How do vacuolar NHX exchangers function in plant salt tolerance? *Plant Signaling & Behavior*. 5(7):792–795. DOI: 10.4161/psb.5.7.11767.

Jiang, Y., Yang, B., Harris, N.S. & Deyholos, M.K. 2007. Comparative proteomic analysis of NaCl stress-responsive proteins in Arabidopsis roots. *Journal of Experimental Botany*. 58(13):3591–3607. DOI: 10.1093/jxb/erm207.

Jiang, Z., Zhou, X., Tao, M., Yuan, F., Liu, L., Wu, F., Wu, X., Xiang, Y., et al. 2019. Plant cell-surface GIPC sphingolipids sense salt to trigger Ca^{2+} influx. *Nature*. 572(7769):341–346. DOI: 10.1038/s41586-019-1449-z.

Jin, J., Tian, F., Yang, D.-C., Meng, Y.-Q., Kong, L., Luo, J. & Gao, G. 2017. PlantTFDB 4.0: toward a central hub for transcription factors and regulatory interactions in plants. *Nucleic Acids Research*. 45(D1):D1040–D1045. DOI: 10.1093/nar/gkw982.

Jin, Y., Jing, W., Zhang, Q. & Zhang, W. 2015. Cyclic nucleotide gated channel 10 negatively regulates salt tolerance by mediating Na^+ transport in Arabidopsis. *Journal of Plant Research*. 128(1):211–220. DOI: 10.1007/s10265-014-0679-2.

Julkowska, M.M. & Testerink, C. 2015. Tuning plant signaling and growth to survive salt. *Trends in Plant Science*. 20(9):586–594. DOI: 10.1016/j.tplants.2015.06.008.

Julkowska, M.M., Hoefsloot, H.C.J., Mol, S., Feron, R., Boer, G. De, Haring, M.A., Testerink, C., Physiology, P., et al. 2014. Capturing Arabidopsis Root Architecture Dynamics with ROOT-FIT Reveals Diversity in Responses to Salinity. *Plant Physiology*. 166(November):1387–1402. DOI: 10.1104/pp.114.248963.

Julkowska, M.M., Klei, K., Fokkens, L., Haring, M.A., Schranz, M.E. & Testerink, C. 2016. Natural variation in rosette size under salt stress conditions corresponds to developmental differences between Arabidopsis accessions and allelic variation in the LRR-KISS gene. *Journal of Experimental Botany*. 67(8):2127–2138. DOI: 10.1093/jxb/erw015.

Julkowska, M.M., Koevoets, I.T., Mol, S., Hoefsloot, H., Feron, R., Tester, M., Keurentjes, J.J.B., Korte, A., et al. 2017. Genetic Components of Root Architecture Remodeling in Response to Salt Stress. *The Plant Cell*. 29(December):3198–3213. DOI: 10.1105/tpc.16.00680.

Kamal, K.Y., Khodaeiaminjan, M., Yahya, G., El-Tantawy, A.A., Abdel El-Moneim, D., El-Esawi, M.A., Abd-Elaziz, M.A.A. & Nassrallah, A.A. 2021. Modulation of cell cycle progression and chromatin dynamic as tolerance mechanisms to salinity and drought stress in maize. *Physiologia Plantarum*. 172(2):684–695. DOI: 10.1111/ppl.13260.

Kang, J.S., Frank, J., Kang, C.H., Kajiura, H., Vikram, M., Ueda, A., Kim, S., Bahk, J.D., et al. 2008. Salt tolerance of *Arabidopsis thaliana* requires maturation of N-glycosylated proteins in the Golgi apparatus. *Proceedings of the National Academy of Sciences*. 105(15):5933–5938. DOI: 10.1073/pnas.0800237105.

Karimi, M., Inzé, D. & Depicker, A. 2002. GATEWAY™ vectors for Agrobacterium-mediated plant transformation. *Trends in Plant Science*. 7(5):193–195. DOI: 10.1016/S1360-1385(02)02251-3.

Keller, A., Nesvizhskii, A.I., Kolker, E. & Aebersold, R. 2002. Empirical Statistical Model To Estimate the Accuracy of Peptide Identifications Made by MS/MS and Database Search. *Analytical Chemistry*. 74(20):5383–5392. DOI: 10.1021/ac025747h.

Kempema, L.A., Cui, X., Holzer, F.M. & Walling, L.L. 2007. Arabidopsis transcriptome changes in response to phloem-feeding silverleaf whitefly nymphs. Similarities and distinctions in responses to aphids. *Plant Physiology*. 143(2):849–865. DOI: 10.1104/pp.106.090662.

Kerff, F., Amoroso, A., Sauvage, E., File, P. & Charlier, P. 2008. Crystal structure and activity of *Bacillus subtilis* YoaJ (EXLX1), a bacterial expansin that promotes root colonization. *PNAS*. 105(44):1–6.

Khoza, T., Dubery, I. & Piater, L. 2019. Identification of Candidate Ergosterol-Responsive Proteins Associated with the Plasma Membrane of *Arabidopsis thaliana*. *International Journal of Molecular Sciences*. 20(6):1302. DOI: 10.3390/ijms20061302.

Kiegle, E., Moore, C.A., Haseloff, J., Tester, M.A. & Knight, M.R. 2000. Cell-type-specific calcium responses to drought, salt and cold in the Arabidopsis root. *The Plant Journal*. 23(2):267–278. DOI: 10.1046/j.1365-313x.2000.00786.x.

Kim, D.-Y., Jin, J.-Y., Alejandro, S., Martinoia, E. & Lee, Y. 2010. Overexpression of AtABCG36 improves drought and salt stress resistance in Arabidopsis. *Physiologia Plantarum*. 139(2):170–180. DOI: 10.1111/j.1399-3054.2010.01353.x.

Kim, E.J., Kwak, J.M., Uozumi, N. & Schroeder, J.I. 1998. AtKUP1: An arabidopsis gene encoding high-affinity potassium transport activity. *Plant Cell*. 10(1):51–62. DOI: 10.1105/tpc.10.1.51.

Kim, J.H., Nguyen, N.H., Jeong, C.Y., Nguyen, N.T., Hong, S.-W. & Lee, H. 2013. Loss of the R2R3 MYB, AtMyb73, causes hyper-induction of the SOS1 and SOS3 genes in response to high salinity in Arabidopsis. *Journal of Plant Physiology*. 170(16):1461–1465. DOI: http://dx.doi.org/10.1016/j.jplph.2013.05.011.

Kim, S.-J., Held, M.A., Zemelis, S., Wilkerson, C. & Brandizzi, F. 2015. CGR2 and CGR3 have critical overlapping roles in pectin methylesterification and plant growth in *Arabidopsis thaliana*. *The Plant Journal*. 82(2):208–220. DOI: 10.1111/tpj.12802.

Kim, S.A., Kwak, J., Jae, S.-K., Wang, M.-H. & Nam, H. 2001. Overexpression of the AtGluR2 Gene Encoding an Arabidopsis Homolog of Mammalian Glutamate Receptors Impairs Calcium Utilization and Sensitivity to Ionic Stress in Transgenic Plants. *Plant and Cell Physiology*. 42(1):74–84. DOI: 10.1093/pcp/pce008.

Kiyosue, T., Yamaguchi-Shinozaki, K. & Shinozaki, K. 1994. Cloning of cDNAs for genes that are early-responsive to dehydration stress (ERDs) in *Arabidopsis thaliana* L.: identification of three ERDs as HSP cognate genes. *Plant Molecular Biology*. 25(5):791–798. DOI: 10.1007/BF00028874.

Klein, M., Perfus-Barbeoch, L., Frelet, A., Gaedeke, N., Reinhardt, D., Mueller-Roeber, B., Martinoia, E. & Forestier, C. 2003. The plant multidrug resistance ABC transporter AtMRP5 is involved in guard cell hormonal signalling and water use. *The Plant Journal*. 33(1):119–129. DOI: 10.1046/j.1365-313X.2003.016012.x.

Klein, M., Geisler, M., Suh, S.J., Kolukisaoglu, H.Ü., Azevedo, L., Plaza, S., Curtis, M.D., Richter, A., et al. 2004. Disruption of AtMRP4, a guard cell plasma membrane ABCC-type ABC transporter, leads to deregulation of stomatal opening and increased drought susceptibility. *The Plant Journal*. 39(2):219–236. DOI: 10.1111/j.1365-313X.2004.02125.x.

Ko, J.H., Yang, S.H. & Han, K.H. 2006. Upregulation of an Arabidopsis RING-H2 gene, XERICO, confers drought tolerance through increased abscisic acid biosynthesis. *Plant Journal*. 47(3):343–355. DOI: 10.1111/j.1365-313X.2006.02782.x.

Kojima, S., Bohner, A., Gassert, B., Yuan, L. & Wirén, N. Von. 2007. AtDUR3 represents the major transporter for high-affinity urea transport across the plasma membrane of nitrogen-deficient Arabidopsis roots. *Plant Journal*. 52(1):30–40. DOI: 10.1111/j.1365-313X.2007.03223.x.

Korver, R.A., Koevoets, I.T. & Testerink, C. 2018. Out of Shape During Stress: A Key Role for Auxin. *Trends in Plant Science*. 23(9):783–793. DOI: 10.1016/j.tplants.2018.05.011.

Kotze, I. & Rose, M. 2015. Farming Facts and Futures: Reconnecting South Africa's food systems to its ecosystems. 2–9. Available: http://awsassets.wwf.org.za/downloads/wwf006_ffl_report_low_res.pdf.

Kreps, J.A., Wu, Y., Chang, H.-S., Zhu, T., Wang, X. & Harper, J.F. 2002. Transcriptome Changes for Arabidopsis in Response to Salt, Osmotic, and Cold Stress. *Plant Physiology*. 130(4):2129–2141. DOI: 10.1104/pp.008532.

Kronzucker, H.J. & Britto, D.T. 2011. Sodium transport in plants: a critical review. *New Phytologist*. 189(1):54–81. DOI: 10.1111/j.1469-8137.2010.03540.x.

Kuromori, T., Sugimoto, E. & Shinozaki, K. 2011. Arabidopsis mutants of AtABCG22, an ABC transporter gene, increase water transpiration and drought susceptibility. *The Plant Journal*. 67(5):885–894. DOI: 10.1111/j.1365-313X.2011.04641.x.

Kutz, A., Müller, A., Hennig, P., Kaiser, W.M., Piotrowski, M. & Weiler, E.W. 2002. A role for nitrilase 3 in the regulation of root morphology in sulphur-starving *Arabidopsis thaliana*. *The Plant Journal*. 30(1):95–106. DOI: 10.1046/j.1365-313X.2002.01271.x.

Kwon, Y.R., Lee, H.J., Kim, K.H., Hong, S.W., Lee, S.J. & Lee, H. 2008. Ectopic expression of Expansin3 or Expansinβ1 causes enhanced hormone and salt stress sensitivity in Arabidopsis. *Biotechnology Letters*. 30(7):1281–1288. DOI: 10.1007/s10529-008-9678-5.

Lacombe, B., Pilot, G., Michard, E., Gaymard, F., Sentenac, H., Thibaud, J., Moléculaire, P., Um, A.C.I., et al. 2000. A Shaker-like K^+ Channel with Weak Rectification Is Expressed in Both Source and Sink Phloem Tissues of Arabidopsis. 12(June):837–851.

Laohavisit, A., Richards, S.L., Shabala, L., Chen, C., Colaço, R.D.D.R., Swarbreck, S.M., Shaw, E., Dark, A., et al. 2013. Salinity-Induced Calcium Signaling and Root Adaptation in Arabidopsis Require the Calcium Regulatory Protein Annexin1. *Plant Physiology*. 163(1):253–262. DOI: 10.1104/pp.113.217810.

Larsson, C. & Widell, S. 2000. Isolation of Plant Plasma Membranes and Production of Inside-Out Vesicles. *Aqueous Two-Phase Systems: Methods and Protocols*. 11:159–166. DOI: 10.1385/1-59259-028-4:159.

Latz, A., Mehlmer, N., Zapf, S., Mueller, T.D., Wurzinger, B., Pfister, B., Csaszar, E., Hedrich, R., et al. 2013. Salt Stress Triggers Phosphorylation of the Arabidopsis Vacuolar K^+ Channel TPK1 by Calcium-Dependent Protein Kinases (CDPKs). *Molecular Plant*. 6(4):1274–1289. DOI: https://doi.org/10.1093/mp/sss158.

Lee, H.W. & Kim, J. 2013. EXPANSINA17 Up-Regulated by LBD18 / ASL20 Promotes Lateral Root Formation During the Auxin Response. Plant and Cell Physiology. 54(10):1600–1611. DOI: 10.1093/pcp/pct105.

Lee, H., Ganguly, A., Baik, S. & Cho, H.-T. 2021. Calcium-dependent protein kinase 29 modulates PIN-FORMED polarity and Arabidopsis development via its own phosphorylation code. *The Plant Cell*. 33(11):3513–3531. DOI: 10.1093/plcell/koab207.

Lee, H.W., Kim, M.J., Kim, N.Y., Lee, S.H. & Kim, J. 2012. LBD18 acts as a transcriptional activator that directly binds to the EXPANSIN14 promoter in promoting lateral root emergence of Arabidopsis. *Plant Journal*. 73(2):212–224. DOI: 10.1111/tpj.12013.

Lee, Y., Choi, D. & Kende, H. 2001. Expansins: Ever-expanding numbers and functions. *Current Opinion in Plant Biology*. 4(6):527–532. DOI: 10.1016/S1369-5266(00)00211-9.

Lehmann, T., Janowitz, T., Sánchez-Parra, B., Alonso, M.-M.P., Trompetter, I., Piotrowski, M. & Pollmann, S. 2017. Arabidopsis NITRILASE 1 Contributes to the Regulation of Root Growth and Development through Modulation of Auxin Biosynthesis in Seedlings. *Frontiers in Plant Science*. 8(January):1–15. DOI: 10.3389/fpls.2017.00036.

Leidi, E.O., Barragán, V., Rubio, L., El-Hamdaoui, A., Ruiz, M.T., Cubero, B., Fernández, J.A., Bressan, R.A., et al. 2010. The AtNHX1 exchanger mediates potassium compartmentation in vacuoles of transgenic tomato. *The Plant Journal*. 61(3):495–506. DOI: 10.1111/j.1365-313X.2009.04073.x.

Li, B., Takahashi, D., Kawamura, Y. & Uemura, M. 2020. Plasma membrane proteome analyses of *Arabidopsis thaliana* suspension-cultured cells during cold or ABA treatment: Relationship with freezing tolerance and growth phase. *Journal of Proteomics*. 211(August 2019):103528. DOI: 10.1016/j.jprot.2019.103528.

Li, H., Yu, M., Du, X.-Q., Wang, Z.-F., Wu, W.-H., Quintero, F.J., Jin, X.-H., Li, H.-D., et al. 2017. NRT1.5/NPF7.3 Functions as a Proton-Coupled H^+/K^+ Antiporter for K^+ Loading into the Xylem in Arabidopsis. *The Plant Cell*. 29(8):2016–2026. DOI: 10.1105/tpc.16.00972.

Li, P., Zhang, G., Gonzales, N., Guo, Y., Hu, H., Park, S. & Zhao, J. 2016. Ca^{2+}-regulated and diurnal rhythm-regulated Na^+/Ca^{2+} exchanger AtNCL affects flowering time and auxin signalling in Arabidopsis. *Plant, Cell & Environment*. 39(2):377–392. DOI: 10.1111/pce.12620.

Li, W.-T., Wei, Y.-M., Wang, J.-R., Liu, C.-J., Lan, X.-J., Jiang, Q.-T., Pu, Z.-E. & Zheng, Y.-L. 2010. Identification, localization, and characterization of putative USP genes in barley. *Theoretical and Applied Genetics*. 121(5):907–917. DOI: 10.1007/s00122-010-1359-9.

Li, X., Li, M., Zhou, B., Yang, Y., Wei, Q. & Zhang, J. 2019. Transcriptome analysis provides insights into the stress response crosstalk in apple (Malus × domestica) subjected to drought, cold and high salinity. *Scientific Reports*. 9(1):9071. DOI: 10.1038/s41598-019-45266-0.

Li, Y., Darley, C.P., Ongaro, V., Fleming, A., Schipper, O., Baldauf, S.L. & McQueen-Mason, S.J. 2002. Plant expansins are a complex multigene family with an ancient evolutionary origin. *Plant Physiology*. 128(3):854–864. DOI: 10.1104/pp.010658.

Liang, Y.S., Bae, H.-J., Kang, S.-H., Lee, T., Kim, M.G., Kim, Y.-M. & Ha, S.-H. 2009. The Arabidopsis beta-carotene hydroxylase gene promoter for a strong constitutive expression of transgene. *Plant Biotechnology Reports*. 3(4):325–331. DOI: 10.1007/s11816-009-0106-7.

Liao, C., Zheng, Y. & Guo, Y. 2017. MYB30 transcription factor regulates oxidative and heat stress responses through ANNEXIN-mediated cytosolic calcium signaling in Arabidopsis. *New Phytologist*. 216(1):163–177. DOI: 10.1111/nph.14679.

Lin, C., Choi, H. & Cho, H. 2011. Root Hair-Specific EXPANSIN A7 Is Required for Root Hair Elongation in Arabidopsis. *Molecules and Cells*. (31):393–397. DOI: 10.1007/s10059-011-0046-2.

Lin, H., Yang, Y., Quan, R., Mendoza, I., Wu, Y., Du, W., Zhao, S., Schumaker, K.S., et al. 2009. Phosphorylation of SOS3-LIKE CALCIUM BINDING PROTEIN8 by SOS2 Protein Kinase Stabilizes Their Protein Complex and Regulates Salt Tolerance in Arabidopsis. *The Plant Cell*. 21(5):1607–1619. DOI: 10.1105/tpc.109.066217.

Lin, W., Zhou, X., Tang, W., Takahashi, K., Pan, X., Dai, J., Ren, H., Zhu, X., et al. 2021. TMK-based cell-surface auxin signalling activates cell-wall acidification. *Nature*. 599(7884):278–282. DOI: 10.1038/s41586-021-03976-4.

Liu, J. 2000. The Arabidopsis thaliana SOS2 gene encodes a protein kinase that is required for salt tolerance. Proceedings of the National Academy of Sciences. 97(7):3730–3734. DOI: 10.1073/pnas.060034197.

Liu, J. & Zhu, J.-K. 1998. A Calcium Sensor Homolog Required for Plant Salt Tolerance. *Science*. 280(5371):1943–1945. DOI: 10.1126/science.280.5371.1943.

Liu, H.U.A., Tang, R., Zhang, Y.U.E., Wang, C., Lv, Q., Gao, X., Li, W. & Zhang, H. 2010. AtNHX3 is a vacuolar K^+/H^+ antiporter required for low-potassium tolerance in *Arabidopsis thaliana*. *Plant Cell and Environment*. 33:1989–1999. DOI: 10.1111/j.1365-3040.2010.02200.x.

Liu, W., Li, R.J., Han, T.T., Cai, W., Fu, Z.W. & Lu, Y.T. 2015. Salt stress reduces root meristem size by nitric oxidemediated modulation of auxin accumulation and signaling in Arabidopsis. *Plant Physiology*. 168(1):343–356. DOI: 10.1104/pp.15.00030.

Liu, W., Xu, L., Lin, H. & Cao, J. 2021. Two expansin genes, atexpa4 and atexpb5, are redundantly required for pollen tube growth and atexpa4 is involved in primary root elongation in *Arabidopsis thaliana*. *Genes*. 12(2):1–16. DOI: 10.3390/genes12020249.

Liu, X., ZHAI, S., ZHAO, Y., SUN, B., LIU, C., YANG, A. & ZHANG, J. 2013. Overexpression of the phosphatidylinositol synthase gene (ZmPIS) conferring drought stress tolerance by altering membrane lipid composition and increasing ABA synthesis in maize. *Plant, Cell & Environment*. 36(5):1037–1055. DOI: 10.1111/pce.12040.

LIU, H., WANG, Q., YU, M., ZHANG, Y., WU, Y. & ZHANG, H. 2008. Transgenic salt-tolerant sugar beet (*Beta vulgaris* L.) constitutively expressing an *Arabidopsis thaliana* vacuolar Na^+/H^+ antiporter gene, AtNHX3, accumulates more soluble sugar but less salt in storage roots. *Plant, Cell & Environment*. 31(9):1325–1334. DOI: 10.1111/j.1365-3040.2008.01838.x.

Livak, K.J. & Schmittgen, T.D. 2001. Analysis of Relative Gene Expression Data Using Real-Time Quantitative PCR and the $2^{-\Delta\Delta CT}$ Method. *Methods*. 25(4):402–408. DOI: 10.1006/meth.2001.1262.

López-Márquez, D., Del-Espino, Á., López-Pagán, N., Rodríguez-Negrete, E.A., Rubio-Somoza, I., Ruiz-Albert, J., Bejarano, E.R. & Beuzón, C.R. 2021. miR825-5p targets the TIR-NBS-LRR gene MIST1 and down-regulates basal immunity against *Pseudomonas syringae* in Arabidopsis. *Journal of Experimental Botany*. 72(20):7316–7334. DOI: 10.1093/jxb/erab354.

Lü, P., Kang, M., Jiang, X., Dai, F., Gao, J. & Zhang, C. 2013. RhEXPA4, a rose expansin gene, modulates leaf growth and confers drought and salt tolerance to Arabidopsis. *Planta*. 237(6):1547–1559. DOI: 10.1007/s00425-013-1867-3.

Luan, S. 2009. The CBL–CIPK network in plant calcium signaling. *Trends in Plant Science*. 14(1):37–42. DOI: 10.1016/j.tplants.2008.10.005.

Luo, Q., Teng, W., Fang, S., Li, H., Li, B., Chu, J., Li, Z. & Zheng, Q. 2019. Transcriptome analysis of salt-stress response in three seedling tissues of common wheat. *The Crop Journal*. 7(3):378–392. DOI: 10.1016/j.cj.2018.11.009.

Ma, L., Zhang, H., Sun, L., Jiao, Y., Zhang, G., Miao, C. & Hao, F. 2012. NADPH oxidase AtrbohD and AtrbohF function in ROS-dependent regulation of Na^+/K^+ homeostasis in Arabidopsis under salt stress. *Journal of Experimental Botany*. 63(1):305–317. DOI: 10.1093/jxb/err280.

Ma, L., Ye, J., Yang, Y., Lin, H., Yue, L., Luo, J., Long, Y., Fu, H., et al. 2019. The SOS2-SCaBP8 Complex Generates and Fine-Tunes an AtANN4-Dependent Calcium Signature under Salt Stress. *Developmental Cell*. 48(5):697-709.e5. DOI: 10.1016/j.devcel.2019.02.010.

Ma, S., Du, C., Taylor, D.C. & Zhang, M. 2021. Concerted increases of FAE1 expression level and substrate availability improve and singularize the production of very-long-chain fatty acids in Arabidopsis seeds. *Plant Direct*. 5(6):1–14. DOI: 10.1002/pld3.331.

Maathuis, F.J.M. 2006. The role of monovalent cation transporters in plant responses to salinity. *Journal of Experimental Botany*. 57(5):1137–1147. DOI: 10.1093/jxb/erj001.

Maathuis, F.J.M. & Amtmann, A. 1999. K^+ Nutrition and Na^+ Toxicity: The Basis of Cellular K^+/Na^+ Ratios. *Annals of Botany*. 84(2):123–133. DOI: 10.1006/anbo.1999.0912.

Maathuis, F.J.M., Filatov, V., Herzyk, P., C. Krijger, G., B. Axelsen, K., Chen, S., Green, B.J., Li, Y., et al. 2003. Transcriptome analysis of root transporters reveals participation of multiple gene families in the response to cation stress. *The Plant Journal*. 35(6):675–692. DOI: 10.1046/j.1365-313X.2003.01839.x.

MacMillan, C.P., Mansfield, S.D., Stachurski, Z.H., Evans, R. & Southerton, S.G. 2010. Fasciclin-like arabinogalactan proteins: specialization for stem biomechanics and cell wall architecture in Arabidopsis and Eucalyptus. *The Plant Journal*. 62(4):689–703. DOI: 10.1111/j.1365-313X.2010.04181.x.

Majda, M. & Robert, S. 2018. The Role of Auxin in Cell Wall Expansion. *International Journal of Molecular Sciences*. DOI: 10.3390/ijms19040951.

Malabarba, J., Meents, A.K., Reichelt, M., Scholz, S.S., Peiter, E., Rachowka, J., Konopka-Postupolska, D., Wilkins, K.A., et al. 2021. ANNEXIN1 mediates calcium-dependent systemic defense in Arabidopsis plants upon herbivory and wounding. *New Phytologist*. 231(1):243–254. DOI: 10.1111/nph.17277.

Manishankar, P., Wang, N., Köster, P., Alatar, A.A. & Kudla, J. 2018. Calcium signaling during salt stress and in the regulation of ion homeostasis. *Journal of Experimental Botany*. 69(17):4215–4226. DOI: 10.1093/jxb/ery201.

Mansour, M.M.F. 2013. Plasma membrane permeability as an indicator of salt tolerance in plants. *Biologia plantarum*. 57(1):1–10. DOI: 10.1007/s10535-012-0144-9.

Manunza, B., Deiana, S., Pintore, M. & Gessa, C. 1998. Interaction of Ca^{2+} and Na^+ ions with polygalacturonate chains: a molecular dynamics study. *Glycoconjugate journal*. 15(3):297–300. DOI: 10.1023/a:1006905314435.

Marmagne, A., Rouet, M.-A., Ferro, M., Rolland, N., Alcon, C., Joyard, J., Garin, J., Barbier-Brygoo, H., et al. 2004. Identification of New Intrinsic Proteins in Arabidopsis Plasma Membrane Proteome. *Molecular & Cellular Proteomics*. 3(7):675–691. DOI: 10.1074/mcp.M400001-MCP200.

Marmagne, A., Ferro, M., Meinnel, T., Bruley, C., Kuhn, L., Garin, J., Barbier-Brygoo, H. & Ephritikhine, G. 2007. A High Content in Lipid-modified Peripheral Proteins and Integral Receptor Kinases Features in the Arabidopsis Plasma Membrane Proteome. *Molecular & Cellular Proteomics*. 6(11):1980–1996. DOI: 10.1074/mcp.M700099-MCP200.

Marten, I., Hoth, S., Deeken, R., Ache, P., Ketchum, K.A., Hoshi, T. & Hedrich, R. 1999. AKT3, a phloem-localized K^+ channel, is blocked by protons. *PNAS*. 96(June):7581–7586.

Martínez-Atienza, J., Jiang, X., Garciadeblas, B., Mendoza, I., Zhu, J.-K., Pardo, J.M. & Quintero, F.J. 2007. Conservation of the Salt Overly Sensitive Pathway in Rice. *Plant Physiology*. 143(2):1001–1012. DOI: 10.1104/pp.106.092635.

Mäser, P., Eckelman, B., Vaidyanathan, R., Horie, T., Fairbairn, D.J., Kubo, M., Yamagami, M., Yamaguchi, K., et al. 2002. Altered shoot/root Na^+ distribution and bifurcating salt sensitivity in Arabidopsis by genetic disruption of the Na^+ transporter AtHKT1. *FEBS Letters*. 531(2):157–161. DOI: 10.1016/S0014-5793(02)03488-9.

Matsuo, M., Ueda, K., Ryder, T. & Ashcroft, F. 2003. The sulfonylurea receptor: an ABCC transporter that acts as an ion channel regulator. ABC proteins. 551–575.

Mayer, M. & Ludewig, U. 2006. Role of AMT1;1 in NH_4^+ Acquisition in *Arabidopsis thaliana*. *Plant Biology*. 8(4):522–528. DOI: 10.1055/s-2006-923877.

McQueen-Mason, S. & Cosgrove, D.J. 1994. Disruption of hydrogen bonding between plant cell wall polymers by proteins that induce wall extension. *Plant Biology*. 91(July):6574–6578.

McQueen-Mason, S.J. & Cosgrove, D.J. 1995. Expansin Mode of Action on Cell Walls. *Plant Physiol*. (107):87–100.

Mekawy, A.M.M., Assaha, D.V.M., Yahagi, H., Tada, Y., Ueda, A. & Saneoka, H. 2015. Growth, physiological adaptation, and gene expression analysis of two Egyptian rice cultivars under salt stress. *Plant Physiology and Biochemistry*. 87:17–25. DOI: 10.1016/j.plaphy.2014.12.007.

Mellacheruvu, D., Wright, Z., Couzens, A.L., Lambert, J., St-denis, N.A., Li, T., Miteva, Y. V, Hauri, S., et al. 2013. The CRAPome: a contaminant repository for affinity purification – mass spectrometry data. *Nature Methods*. 10(August). DOI: http://dx.doi.org/10.1038/nmeth.2557.

Mian, A.A., Senadheera, P. & Maathuis, F.J.M. 2011. Improving Crop Salt Tolerance: Anion and Cation Transporters as Genetic Improving Crop Salt Tolerance: Anion and Cation Transporters as Genetic Engineering Targets. *Plant Stress*. (June).

Miki, D., Zhang, W., Zeng, W., Feng, Z. & Zhu, J.K. 2018. CRISPR/Cas9-mediated gene targeting in Arabidopsis using sequential transformation. *Nature Communications*. 9(1):1–9. DOI: 10.1038/s41467-018-04416-0.

Miki, Y., Takahashi, D., Kawamura, Y. & Uemura, M. 2019. Temporal proteomics of Arabidopsis plasma membrane during cold- and de-acclimation. *Journal of Proteomics*. 197(October 2018):71–81. DOI: 10.1016/j.jprot.2018.11.008.

Miller, G., Suzuki, N., Ciftci-Yilmaz, S. & Mittler, R. 2010. Reactive oxygen species homeostasis and signalling during drought and salinity stresses. *Plant, Cell and Environment*. 33(4):453–467. DOI: 10.1111/j.1365-3040.2009.02041.x.

Møller, I.M., Jensen, P.E. & Hansson, A. 2007. Oxidative modifications to cellular components in plants. *Annual Review of Plant Biology*. 58:459–481. DOI: 10.1146/annurev.arplant.58.032806.103946.

Morsomme, P. & Boutry, M. 2000. The plant plasma membrane H^+-ATPase: structure, function and regulation. *Biochima et Biophysica Acta*. 1465.

Morton, M.J.L., Awlia, M., Al-Tamimi, N., Saade, S., Pailles, Y., Negrão, S. & Tester, M. 2019. Salt stress under the scalpel – dissecting the genetics of salt tolerance. *Plant Journal*. 97(1):148–163. DOI: 10.1111/tpj.14189.

Mullan, D.J., Colmer, T.D. & Francki, M.G. 2007. Arabidopsis–rice–wheat gene orthologues for Na^+ transport and transcript analysis in wheat–*L. elongatum* aneuploids under salt stress. *Molecular Genetics and Genomics*. 277(2):199–212. DOI: 10.1007/s00438-006-0184-y.

Munns, R. 2002. Comparative physiology of salt and water stress. *Plant, cell & environment*. 25(2):239–250. DOI: 10.1046/j.0016-8025.2001.00808.x.

Munns, R. 2005. Genes and Salt Tolerance. *New Phytologist*. 167(3):645–663.

Munns, R. & Tester, M. 2008. Mechanisms of Salinity Tolerance. *Annual Review of Plant Biology*. 59(1):651–681. DOI: 10.1146/annurev.arplant.59.032607.092911.

Munns, R., Day, D.A., Fricke, W., Watt, M., Arsova, B., Barkla, B.J., Bose, J., Byrt, C.S., et al. 2020. Energy costs of salt tolerance in crop plants. *New Phytologist*. 225(3):1072–1090. DOI: 10.1111/nph.15864.

Munns, R., Passioura, J.B., Colmer, T.D. & Byrt, C.S. 2020. Osmotic adjustment and energy limitations to plant growth in saline soil. *New Phytologist*. 225(3):1091–1096. DOI: 10.1111/nph.15862.

Nakamura, R.L., Mckendree, W.L., Hirsch, R.E., Sedbrook, J.C., Gaber, R.F. & Sussman, M.R. 1995. Expression of an Arabidopsis Potassium Channel Gene in Guard Cells. *Plant Physiology*. 109:371–374. DOI: https://doi.org/10.1104/pp.109.2.371.

Ndimba, B.K., Chivasa, S., Simon, W.J. & Slabas, A.R. 2005. Identification of Arabidopsis salt and osmotic stress responsive proteins using two-dimensional difference gel electrophoresis and mass spectrometry. *PROTEOMICS*. 5(16):4185–4196. DOI: 10.1002/pmic.200401282.

Negrão, S., Schmöckel, S.M. & Tester, M. 2017. Evaluating physiological responses of plants to salinity stress. *Annals of Botany*. 119(1):1–11. DOI: https://doi.org/10.1093/aob/mcw191.

Nelson, C.J., Hegeman, A.D., Harms, A.C. & Sussman, M.R. 2006. A Quantitative Analysis of Arabidopsis Plasma Membrane Using Trypsin-catalyzed ^{18}O Labeling. *Molecular & Cellular Proteomics*. 5(8):1382–1395. DOI: 10.1074/mcp.M500414-MCP200.

Nesvizhskii, A.I., Keller, A., Kolker, E. & Aebersold, R. 2003. A Statistical Model for Identifying Proteins by Tandem Mass Spectrometry. *Analytical Chemistry*. 75(17):4646–4658. DOI: 10.1021/ac0341261.

Nieves-Cordones, M., Lara, A., Ródenas, R., Amo, J. & Rivero, R.M. 2019. Modulation of K^+ translocation by AKT1 and AtHAK5 in Arabidopsis plants. *Plant Cell and Environment*. 13573:0–3. DOI: 10.1111/pce.13573.

Nieves-Cordones, M., Alemán, F., Martínez, V. & Rubio, F. 2010. The *Arabidopsis thaliana* HAK5 K^+ Transporter Is Required for Plant Growth and K^+ Acquisition from Low K^+ Solutions under Saline Conditions. *Molecular Plant*. 3(2):326–333. DOI: 10.1093/mp/ssp102.

Nieves-Cordones, M., Martínez, V., Benito, B. & Rubio, F. 2016. Comparison between Arabidopsis and rice for main pathways of K^+ and Na^+ uptake by roots. *Frontiers in Plant Science*. 7(JULY2016):1–14. DOI: 10.3389/fpls.2016.00992.

Niitylä, T., Fuglsang, A.T., Palmgren, M.G., Frommer, W.B. & Schulze, W.X. 2007. Temporal Analysis of Sucrose-induced Phosphorylation Changes in Plasma Membrane Proteins of Arabidopsis. *Molecular and Cellular Proteomics*. 6:1711–1726. DOI: 10.1074/mcp.M700164-MCP200.

Normanly, J., Grisafi, P., Fink, G.R. & Bartel, B. 1997. Arabidopsis mutants resistant to the auxin effects of indole-3-acetonitrile are defective in the nitrilase encoded by the NIT1 gene. *The Plant Cell*. 9(10):1781–1790. DOI: 10.1105/tpc.9.10.1781.

Ohta, M., Hayashi, Y., Nakashima, A., Hamada, A., Tanaka, A., Nakamura, T. & Hayakawa, T. 2002. Introduction of a Na^+/H^+ antiporter gene from *Atriplex gmelini* confers salt tolerance to rice. *FEBS Letters*. 532(3):279–282. DOI: 10.1016/S0014-5793(02)03679-7.

Olías, R., Eljakaoui, Z., Li, J.U.N. & Morales, P.A.Z.A.D.E. 2009. The plasma membrane Na^+/H^+ antiporter SOS1 is essential for salt tolerance in tomato and affects the partitioning of Na^+ between plant organs. *Plant, Cell and Environment*. 32:904–916. DOI: 10.1111/j.1365-3040.2009.01971.x.

Osakabe, Y., Arinaga, N., Umezawa, T., Katsura, S., Nagamachi, K., Tanaka, H., Ohiraki, H., Yamada, K., et al. 2013. Osmotic Stress Responses and Plant Growth Controlled by Potassium Transporters in Arabidopsis. *The Plant Cell*. 25(2):609–624. DOI: 10.1105/tpc.112.105700.

Ossowski, S., Schwab, R. & Weigel, D. 2008. Gene silencing in plants using artificial microRNAs and other small RNAs. *Plant Journal*. 53(4):674–690. DOI: 10.1111/j.1365-313X.2007.03328.x.

Ouyang, J., Shao, X. & Li, J. 2000. Indole-3-glycerol phosphate, a branchpoint of indole-3-acetic acid biosynthesis from the tryptophan biosynthetic pathway in *Arabidopsis thaliana*. *Plant Journal*. 24(3):327–334. DOI: 10.1046/j.1365-313X.2000.00883.x.

Pacifici, E., Di Mambro, R., Dello Ioio, R., Costantino, P. & Sabatini, S. 2018. Acidic cell elongation drives cell differentiation in the Arabidopsis root. *The EMBO Journal*. 37(16):1–9. DOI: 10.15252/embj.201899134.

De Paepe, A., Vuylsteke, M., Van Hummelen, P., Zabeau, M. & Van Der Straeten, D. 2004. Transcriptional profiling by cDNA-AFLP and microarray analysis reveals novel insights into the early response to ethylene in Arabidopsis. *Plant Journal*. 39(4):537–559. DOI: 10.1111/j.1365-313X.2004.02156.x.

Palmgren, M. 2001. PLANT PLASMA MEMBRANE H^+-ATPases: *Annual Review of Plant Physiology and Plant Molecular Biology*. 52(June). DOI: 10.1146/annurev.arplant.52.1.817.

Palmgren, M.G., Sommarin, M., Serrano, R. & Larsson, C. 1991. Identification of an autoinhibitory domain in the C-terminal region of the plant plasma membrane H^+-ATPase. *Journal of Biological Chemistry*. 266(30):20470–20475.

Pang, Q., Chen, S., Dai, S., Chen, Y., Wang, Y. & Yan, X. 2010. Comparative Proteomics of Salt Tolerance in *Arabidopsis thaliana* and *Thellungiella halophila*. *Journal of Proteome Research*. 9(5):2584–2599. DOI: 10.1021/pr100034f.

Park, Y.B. & Cosgrove, D.J. 2015. Xyloglucan and its interactions with other components of the growing cell wall. *Plant and Cell Physiology*. (56):180–194.

Park, H.J., Kim, W.Y. & Yun, D.J. 2016. A new insight of salt stress signaling in plant. *Molecules and Cells*. 39(6):447–459. DOI: 10.14348/molcells.2016.0083.

Park, J., Kim, Y., Kim, S., Jung, J., Woo, J. & Park, C. 2011. Integration of Auxin and Salt Signals by the NAC Transcription Factor NTM2 during Seed Germination in Arabidopsis. *Plant Physiology*. 156(June):537–549. DOI: 10.1104/pp.111.177071.

Park, W.J., Kriechbaumer, V., Muller, A., Piotrowski, M., Meeley, R.B., Gierl, A. & Glawischnig, E. 2003. The Nitrilase ZmNIT2 Converts Indole-3-Acetonitrile to Indole-3-Acetic Acid. *Plant Physiology*. 133(October):794–802. DOI: 10.1104/pp.103.026609.Arabidopsis.

Parry, G., Calderon-Villalobos, L.I., Prigge, M., Peret, B., Dharmasiri, S., Itoh, H., Lechner, E., Gray, W.M., et al. 2009. Complex regulation of the TIR1/AFB family of auxin receptors. *Proceedings of the National Academy of Sciences*. 106(52):22540–22545. DOI: 10.1073/pnas.0911967106.

Pedersen, P.L. & Carafoli, E. 1987. Ion motive ATPases. I. Obiquity, properties, and significance to cell function. *Trends in Biochemical Sciences*. 12:146–150.

Pederson, B.P., Buch-Pedersen, M.J., Morth, J.P., Palmgren, M.G. & Nissen, P. 2007. Crystal structure of the plasma membrane proton pump. *Nature*. 450(7172):1111–1114. DOI: 10.1038/nature06417.

Philippar, K., Fuchs, I., Luthen, H., Hoth, S., Bauer, C.S., Haga, K., Thiel, G., Ljung, K., et al. 1999. Auxin-induced K^+ channel expression represents an essential step in coleoptile growth and gravitropism. *PNAS*. 96.

Philippar, K., Büchsenschütz, K., Abshagen, M., Fuchs, I., Geiger, D., Lacombe, B. & Hedrich, R. 2003. The K^+ Channel KZM1 Mediates Potassium Uptake into the Phloem and Guard Cells of the C4 Grass *Zea mays*. *Journal of Biological Chemistry*. 278(19):16973–16981. DOI: 10.1074/jbc.M212720200.

Philippar, K., Ivashikina, N., Ache, P., Christian, M., Lüthen, H., Palme, K. & Hedrich, R. 2004. Auxin activates KAT1 and KAT2, two K^+-channel genes expressed in seedlings of *Arabidopsis thaliana*. *The Plant Journal*. 37(6):815–827. DOI: 10.1111/j.1365-313X.2003.02006.x.

Piette, A., Derua, R., Waelkens, E., Boutry, M. & Duby, G. 2011. A Phosphorylation in the C-terminal Auto-inhibitory Domain of the Plant Plasma Membrane H^+-ATPase Activates the Enzyme with No Requirement for Regulatory 14-3-3 Proteins. *The Journal of Biological Chemistry*. 286(21):18474–18482. DOI: 10.1074/jbc.M110.211953.

Piotrowski, M. 2008. Primary or secondary? Versatile nitrilases in plant metabolism. *Phytochemistry*. 69(15):2655–2667. DOI: 10.1016/j.phytochem.2008.08.020.

Pitann, B., Schubert, S. & Mühling, K.H. 2009. Decline in leaf growth under salt stress is due to an inhibition of H^+-pumping activity and increase in apoplastic pH of maize leaves. *Journal of Plant Nutrition and Soil Science*. 172(4):535–543. DOI: 10.1002/jpln.200800349.

Pitann, B., Kranz, T., Zörb, C., Walter, A., Schurr, U. & Mühling, K.H. 2011. Apoplastic pH and growth in expanding leaves of *Vicia faba* under salinity. *Environmental and Experimental Botany*. 74(1):31–36. DOI: 10.1016/j.envexpbot.2011.04.015.

Platten, J.D., Cotsaftis, O., Berthomieu, P., Bohnert, H., Davenport, R.J., Fairbairn, D.J., Horie, T., Leigh, R.A., et al. 2006. Nomenclature for HKT transporters, key determinants of plant salinity tolerance. *Trends in Plant Science*. 11(8):372–374. DOI: 10.1016/j.tplants.2006.06.001.

Pottosin, I. & Dobrovinskaya, O. 2014. Non-selective cation channels in plasma and vacuolar membranes and their contribution to K^+ transport. *Journal of Plant Physiology*. 171(9):732–742. DOI: 10.1016/j.jplph.2013.11.013.

Prakash, L. & Prathapasenan, G. 1990. NaCl- and Gibberellic Acid-induced Changes in the Content of Auxin and the Activities of Cellulase and Pectin Lyase During Leaf Growth in Rice (*Oryza sativa*). *Annals of Botany*. 65:251–257.

Qadir, M., Quillérou, E., Nangia, V., Murtaza, G., Singh, M., Thomas, R.J., Drechsel, P. & Noble, A.D. 2014. Economics of salt-induced land degradation and restoration. *Natural Resources Forum*. 38(4):282–295. DOI: 10.1111/1477-8947.12054.

Qiu, S., Ma, N., Che, S., Wang, Y., Peng, X., Zhang, G., Wang, G. & Huang, J. 2014. Repression of OsEXPA3 Expression Leads to Root System Growth Suppression in Rice. *Crop Science*. 54(October):2201–2213. DOI: 10.2135/cropsci2013.11.0746.

Radwanski, E.R. & Last, R.L. 1995. Tryptophan biosynthesis and metabolism: Biochemical and molecular genetics. *Plant Cell*. 7(7):921–934. DOI: 10.1105/tpc.7.7.921.

Ramakrishna, P., Ruiz Duarte, P., Rance, G.A., Schubert, M., Vordermaier, V., Vu, L.D., Murphy, E., Vilches Barro, A., et al. 2019. EXPANSIN A1-mediated radial swelling of pericycle cells positions anticlinal cell divisions during lateral root initiation. *Proceedings of the National Academy of Sciences*. 116(17):8597–8602. DOI: 10.1073/pnas.1820882116.

Rasheed, S., Bashir, K., Matsui, A., Tanaka, M. & Seki, M. 2016. Transcriptomic analysis of soil-grown *Arabidopsis thaliana* roots and shoots in response to a drought stress. *Frontiers in Plant Science*. 7(FEB2016). DOI: 10.3389/fpls.2016.00180.

Rate, D.N., Cuenca, J. V, Bowman, G.R., Guttman, D.S. & Greenberg, J.T. 1999. The Gain-of-Function Arabidopsis acd6 Mutant Reveals Novel Regulation and Function of the Salicylic Acid Signaling Pathway in Controlling Cell Death, Defenses, and Cell Growth. *The Plant Cell*. 11(9):1695. DOI: 10.2307/3871047.

Rayle, D.L. & Cleland, R. 1970. Enhancement of Wall Loosening and Elongation by Acid Solutions. *Plant physiology*. 250–253.

Rayle, D.L. & Cleland, R.E. 1992. The Acid Growth Theory of auxin-induced cell elongation is alive and well. *Plant physiology*. 99(4):1271–1274. DOI: 10.1104/pp.99.4.1271.

Ren, H. & Gray, W.M. 2015. SAUR Proteins as Effectors of Hormonal and Environmental Signals in Plant Growth. *Molecular Plant*. 8(8):1153–1164. DOI: 10.1016/j.molp.2015.05.003.

Ren, H., Park, M.Y., Spartz, A.K., Wong, J.H. & Gray, W.M. 2018. A subset of plasma membrane-localized PP2C.D phosphatases negatively regulate SAUR-mediated cell expansion in Arabidopsis. *PLOS Genetics*. 14(6):e1007455. DOI: 10.1371/journal.pgen.1007455.

Ren, X.L., Qi, G.N., Feng, H.Q., Zhao, S., Zhao, S.S., Wang, Y. & Wu, W.H. 2013. Calcineurin B-like protein CBL10 directly interacts with AKT1 and modulates K^+ homeostasis in Arabidopsis. *Plant Journal*. 74(2):258–266. DOI: 10.1111/tpj.12123.

Ren, Z., Gao, J., Li, L., Cai, X., Huang, W., Chao, D., Zhu, M., Wang, Z., et al. 2005. A rice quantitative trait locus for salt tolerance encodes a sodium transporter. *Nature Genetics*. 37(10):1141–1146. DOI: 10.1038/ng1643.

Rengasamy, P. 2002. Transient salinity and subsoil constraints to dryland farming in Australian sodic soils: An overview. Australian *Journal of Experimental Agriculture*. 42(3):351–361. DOI: 10.1071/EA01111.

Rengasamy, P. 2010. Soil processes affecting crop production in salt-affected soils. *Functional Plant Biology*. 37(7):613–620. DOI: 10.1071/FP09249.

Reynolds, G.D., Wang, C., Pan, J. & Bednarek, S.Y. 2018. Inroads into Internalization: Five Years of Endocytic Exploration. *Plant Physiology*. 176(1):208–218. DOI: 10.1104/pp.17.01117.

Rivandi, J., Miyazaki, J., Hrmova, M., Pallotta, M., Tester, M. & Collins, N.C. 2011. A SOS3 homologue maps to HvNax4, a barley locus controlling an environmentally sensitive Na^+ exclusion trait. *Journal of Experimental Botany*. 62(3):1201–1216. DOI: 10.1093/jxb/erq346.

Rodriguez, M.C., Mehta, D., Tan, M. & Uhrig, R.G. 2021. Quantitative Proteome and PTMome Analysis of *Arabidopsis thaliana* Root Responses to Persistent Osmotic and Salinity Stress. *Plant and Cell Physiology*. 62(6):1012–1029. DOI: 10.1093/pcp/pcab076.

Roy, S.J., Gilliham, M., Berger, B., Essah, P.A., Cheffings, C., Miller, A.J., Davenport, R.J., Liu, L.H., et al. 2008. Investigating glutamate receptor-like gene co-expression in *Arabidopsis thaliana*. *Plant, Cell and Environment*. 31(6):861–871. DOI: 10.1111/j.1365-3040.2008.01801.x.

Rubio, F., Santa-María, G.E. & Rodríguez-Navarro, A. 2000. Cloning of Arabidopsis and barley cDNAs encoding HAK potassium transporters in root and shoot cells. *Physiologia Plantarum*. 109(1):34–43. DOI: 10.1034/j.1399-3054.2000.100106.x.

Rubio, F., Nieves-Cordones, M., Horie, T. & Shabala, S. 2020. Doing 'business as usual' comes with a cost: evaluating energy cost of maintaining plant intracellular K^+ homeostasis under saline conditions. *New Phytologist*. 225(3):1097–1104. DOI: 10.1111/nph.15852.

Rudashevskaya, E.L., Ye, J., Jensen, O.N., Fuglsang, A.T. & Palmgren, M.G. 2012. Phosphosite Mapping of P-type Plasma Membrane H^+-ATPase in Homologous and Heterologous. *The Journal of Biological Chemistry*. 287(7):4904–4913. DOI: 10.1074/jbc.M111.307264.

Ryu, H. & Cho, Y.-G. 2015. Plant hormones in salt stress tolerance. *Journal of Plant Biology*. 58(3):147–155. DOI: 10.1007/s12374-015-0103-z.

Sablowski, R. & Carnier Dornelas, M. 2014. Interplay between cell growth and cell cycle in plants. *Journal of Experimental Botany*. 65(10):2703–2714. DOI: 10.1093/jxb/ert354.

Salehin, M., Bagchi, R. & Estelle, M. 2015. SCF TIR1/AFB -Based Auxin Perception: Mechanism and Role in Plant Growth and Development. *The Plant Cell*. 27(1):9–19. DOI: 10.1105/tpc.114.133744.

Sampedro, J., Lee, Y., Carey, R.E. & Cosgrove, D.J. 2005. Use of genomic history to improve phylogeny and understanding of births and deaths in a gene family. *The Plant Journal*. (44):409–419. DOI: 10.1111/j.1365-313X.2005.02540.x.

Sanger, M., Daubert, S. & Goodman, R.M. 1990. Characteristics of a strong promoter from figwort mosaic virus: comparison with the analogous 35S promoter from cauliflower mosaic virus and the regulated mannopine synthase promoter. *Plant Molecular Biology*. 14(3):433–443. DOI: 10.1007/BF00028779.

dos Santos Maraschin, F., Memelink, J. & Offringa, R. 2009. Auxin-induced, SCF^{TIR1}-mediated poly-ubiquitination marks AUX/IAA proteins for degradation. *The Plant Journal*. 59(1):100–109. DOI: 10.1111/j.1365-313X.2009.03854.x.

Sanz-Fernández, M., Rodríguez-González, A., Sandalio, L.M. & Romero-Puertas, M.C. 2021. Role of potassium transporter KUP8 in plant responses to heavy metals. *Physiologia Plantarum*. 173:180–190. DOI: 10.1111/ppl.13345.

De Schepper, V., De Swaef, T., Bauweraerts, I. & Steppe, K. 2013. Phloem transport: a review of mechanisms and controls. *Journal of Experimental Botany*. 64(16):4839–4850. DOI: 10.1093/jxb/ert302.

Schmidt, R.C., Müller, A., Hain, R., Bartling, D. & Weiler, E.W. 1996. Transgenic tobacco plants expressing the *Arabidopsis thaliana* nitrilase II enzyme. *Plant Journal*. 9(5):683–691. DOI: 10.1046/j.1365-313X.1996.9050683.x.

Schwab, R., Palatnik, J.F., Riester, M., Schommer, C., Schmid, M. & Weigel, D. 2005. Specific effects of microRNAs on the plant transcriptome. *Developmental Cell*. 8(4):517–527. DOI: 10.1016/j.devcel.2005.01.018.

Schwab, R., Ossowski, S., Riester, M., Warthmann, N. & Weigel, D. 2006. Highly Specific Gene Silencing by Artificial MicroRNAs in Arabidopsis. *The Plant Cell*. 18(5):1121–1133. DOI: 10.1105/tpc.105.039834.

Schwab, R., Ossowski, S., Warthmann, N. & Weigel, D. 2010. Directed gene silencing with artificial microRNAs. *Methods in molecular biology* (Clifton, N.J.). 592:71–88. DOI: 10.1007/978-1-60327-005-2_6.

Senadheera, P., Singh, R.K. & Maathuis, F.J.M. 2009. Differentially expressed membrane transporters in rice roots may contribute to cultivar dependent salt tolerance. *Journal of Experimental Botany*. 60(9):2553–2563. DOI: 10.1093/jxb/erp099.

Shabala, S. & Cuin, T.A. 2007. Potassium transport and plant salt tolerance. *Physiologia Plantarum*. 133(4):651–669. DOI: 10.1111/j.1399-3054.2007.01008.x.

Shabala, S. & Shabala, L. 2011. Ion transport and osmotic adjustment in plants and bacteria. *BioMolecular Concepts*. 2:407–419. DOI: 10.1515/BMC.2011.032.

Shabala, S.N. & Lew, R.R. 2002. Turgor Regulation in Osmotically Stressed Arabidopsis Epidermal Root Cells. Direct Support for the Role of Inorganic Ion Uptake as Revealed by Concurrent Flux and Cell Turgor Measurements. *Plant Physiology*. 129(May):290–299. DOI: 10.1104/pp.020005.tempts.

Shabala, L., Cuin, T.A., Newman, I.A. & Shabala, S. 2005. Salinity-induced ion flux patterns from the excised roots of Arabidopsis sos mutants. *Planta*. 222(6):1041–1050. DOI: 10.1007/s00425-005-0074-2.

Shabala, S., Shabala, L., Bose, J., Cuin, T. & Newman, I. 2013. Ion Flux Measurements Using the MIFE Technique. In *Plant Mineral Nutrients*. V. 953. 171–183. DOI: 10.1007/978-1-62703-152-3_11.

Shabala, S., Chen, G., Chen, Z.H. & Pottosin, I. 2019. The energy cost of the tonoplast futile sodium leak. *New Phytologist*. 225(3):1105–1110. DOI: 10.1111/nph.15758.

Shavrukov, Y. 2013. Salt stress or salt shock: which genes are we studying? *Journal of Experimental Botany*. 64(1):119–127. DOI: 10.1093/jxb/ers316.

Shi, H., Ishitani, M., Kim, C. & Zhu, J. 2000. The Arabidopsis thaliana salt tolerance gene SOS1 encodes a putative Na^+/H^+ antiporter. *PNAS*. 97:1–6.

Shi, H., Quintero, F.J., Pardo, J.M. & Zhu, J. 2002. The Putative Plasma Membrane Na^+/H^+ Antiporter SOS1 Controls Long-Distance Na^+ Transport in Plants. *The Plant Cell*. 14(February):465–477. DOI: 10.1105/tpc.010371.et.

Shi, H., Kim, Y., Guo, Y., Stevenson, B. & Zhu, J. 2003. The Arabidopsis SOS5 Locus Encodes a Putative Cell Surface Adhesion Protein and Is Required for Normal Cell Expansion. 15(January):19–32. DOI: 10.1105/tpc.007872.).

Shirasawa-Seo, N., Mitsuhara, I., Nakamura, S., Murakami, T., Iwai, T., Nishizawa, Y., Hibi, T. & Ohashi, Y. 2002. Constitutive Promoters Available for Transgene Expression Instead of *CaMV* 35S RNA Promoter: Arabidopsis Promoters of Tryptophan Synthase Protein β Subunit and Phytochrome B. *Plant Biotechnology*. 19(1):19–26. DOI: 10.5511/plantbiotechnology.19.19.

Shrivastava, P. & Kumar, R. 2015. Soil salinity: A serious environmental issue and plant growth promoting bacteria as one of the tools for its alleviation. *Saudi Journal of Biological Sciences*. 22(2):123–131. DOI: 10.1016/j.sjbs.2014.12.001.

Sickler, C.M., Edwards, G.E., Kiirats, O., Gao, Z. & Loescher, W. 2007. Response of mannitol-producing *Arabidopsis thaliana* to abiotic stress. *Functional Plant Biology*. 34(4):382. DOI: 10.1071/FP06274.

Silberbush, M. & Ben-Asher, J. 2001. Simulation study of nutrient uptake by plants from soilless cultures as. *Plant and Soil*. (1976):59–69.

Simon, N.M.L., Kusakina, J., Fernández-López, Á., Chembath, A., Belbin, F.E. & Dodd, A.N. 2017. The energy-signaling Hub SnRK1 is important for sucrose-induced Hypocotyl Elongation. *Plant Physiology*. 176(2):1299–1310. DOI: 10.1104/pp.17.01395.

Singh, R.K., Kota, S. & Flowers, T.J. 2021. Salt tolerance in rice: seedling and reproductive stage QTL mapping come of age. *Theoretical and Applied Genetics*. 134(11):3495–3533. DOI: 10.1007/s00122-021-03890-3.

Sklodowski, K., Riedelsberger, J., Raddatz, N., Riadi, G., Caballero, J., Chérel, I., Schulze, W., Graf, A., et al. 2017. The receptor-like pseudokinase MRH1 interacts with the voltage-gated potassium channel AKT2. *Scientific Reports*. 7(1):44611. DOI: 10.1038/srep44611.

Skou, J.C. & Esmann, M. 1992. The Na, K-ATPase. *Journal of Bioenergetics and Biomembranes*. 24(3):249–261.

Sloan, J., Backhaus, A., Malinowski, R., McQueen-Mason, S. & Fleming, A.J. 2009. Phased Control of Expansin Activity during Leaf Development Identifies a Sensitivity Window for Expansin-Mediated Induction of Leaf Growth. *Plant Physiology*. 151(December):1844–1854. DOI: 10.1104/pp.109.144683.

Smith, W.K., Ma, Y., Yu, J., Cheng, Y.-Y., Zhang, P., Han, T.-T. & Lu, Q.-Y. 2022. Characterization of a strong constitutive promoter from paper mulberry vein banding virus. *Archives of Virology*. 167(1):163–170. DOI: 10.1007/s00705-021-05310-9.

Sondergaard, T.E., Schulz, A. & Palmgren, M.G. 2004. Update on energization of nutrient transport energization of transport processes in plants. Roles of the plasma membrane H^+-ATPase. *Plant physiology*. 136(1):2475–2482. DOI: 10.1104/pp.104.048231.Cells.

Spartz, A.K., Lee, S.H., Wenger, J.P., Gonzalez, N., Itoh, H., Inzé, D., Peer, W.A., Murphy, A.S., et al. 2012. The SAUR19 subfamily of SMALL AUXIN UP RNA genes promote cell expansion. *Plant Journal*. 70(6):978–990. DOI: 10.1111/j.1365-313X.2012.04946.x.

Spartz, A.K., Ren, H., Park, M.Y., Grandt, K.N., Lee, S.H., Murphy, A.S., Sussman, M.R., Overvoorde, P.J., et al. 2014. SAUR Inhibition of PP2C-D Phosphatases Activates Plasma Membrane H^+-ATPases to Promote Cell Expansion in Arabidopsis. *The Plant Cell*. 26(5):2129–2142. DOI: 10.1105/tpc.114.126037.

Spartz, A.K., Lor, V.S., Ren, H., Olszewski, N.E., Miller, N.D., Wu, G., Spalding, E.P. & Gray, W.M. 2017. Constitutive Expression of Arabidopsis SMALL AUXIN UP RNA19 (SAUR19) in Tomato Confers Auxin-Independent Hypocotyl Elongation. *Plant Physiology*. 173(2):1453–1462. DOI: 10.1104/pp.16.01514.

Strader, L.C. & Bartel, B. 2009. The Arabidopsis PLEIOTROPIC DRUG RESISTANCE8/ABCG36 ATP Binding Cassette Transporter Modulates Sensitivity to the Auxin Precursor Indole-3-Butyric Acid. *The Plant Cell*. 21(7):1992–2007. DOI: 10.1105/tpc.109.065821.

Strader, L.C. & Zhao, Y. 2016. Auxin perception and downstream events. *Current Opinion in Plant Biology*. 33:8–14. DOI: 10.1016/j.pbi.2016.04.004.

Sugawara, S., Hishiyama, S., Jikumaru, Y., Hanada, A., Nishimura, T., Koshiba, T., Zhao, Y., Kamiya, Y., et al. 2009. Biochemical analyses of indole-3-acetaldoximedependent auxin biosynthesis in Arabidopsis. Proceed*ings of the National Academy of Sciences of the United States of America*. 106(13):5430–5435. DOI: 10.1073/pnas.0811226106.

Sun, Y., Kong, X., Li, C., Liu, Y. & Ding, Z. 2015. Potassium retention under salt stress is associated with natural variation in salinity tolerance among Arabidopsis accessions. *PLoS ONE*. 10(5):4–8. DOI: 10.1371/journal.pone.0124032.

Sunarpi, Horie, T., Motoda, J., Kubo, M., Yang, H., Yoda, K., Horie, R., Chan, W., et al. 2005. Enhanced salt tolerance mediated by AtHKT1 transporter-induced Na^+ unloading from xylem vessels to xylem parenchyma cells. *The Plant Journal*. 44(6):928–938. DOI: 10.1111/j.1365-313X.2005.02595.x.

Tabuchi, A., Li, L. & Cosgrove, D.J. 2011. Matrix solubilization and cell wall weakening by b-expansin (group-1 allergen) from maize pollen. *The Plant Journal*. (68):546–559. DOI: 10.1111/j.1365-313X.2011.04705.x.

Takahashi, K., Hayashi, K. -i. & Kinoshita, T. 2012. Auxin Activates the Plasma Membrane H^+-ATPase by Phosphorylation during Hypocotyl Elongation in Arabidopsis. *Plant Physiology*. 159(2):632–641. DOI: 10.1104/pp.112.196428.

Tang, M., Liu, X., Deng, H. & Shen, S. 2011. Over-expression of JcDREB, a putative AP2/EREBP domain-containing transcription factor gene in woody biodiesel plant *Jatropha curcas*, enhances salt and freezing tolerance in transgenic *Arabidopsis thaliana*. *Plant Science*. 181(6):623–631. DOI: 10.1016/j.plantsci.2011.06.014.

Tateda, C., Zhang, Z. & Greenberg, J.T. 2015. Linking pattern recognition and salicylic acid responses in Arabidopsis through ACCELERATED CELL DEATH6 and receptors. *Plant Signaling & Behavior*. 10(10):e1010912. DOI: 10.1080/15592324.2015.1010912.

Tenhaken, R. 2015. Cell wall remodeling under abiotic stress. *Frontiers in Plant Science*. 5(January):1–9. DOI: 10.3389/fpls.2014.00771.

Tester, M. & Davenport, R. 2003. Na^+ tolerance and Na^+ transport in higher plants. *Annals of Botany*. 91(5):503–527. DOI: 10.1093/aob/mcg058.

Thimann, K. V & Mahadevan, S. 1964. Nitrilase. I. Occurrence, Preparation, and General Properties of the Enzyme. *Archives of Biochemistry and Biophysics*. 105:133–141.

Tilbrook, J. & Roy, S. 2014. Salinity tolerance. Plant Abiotic Stress, Second Edition. 133–178. DOI: 10.1002/9781118764374.ch6.

Titiz, O., Tambasco-Studart, M., Warzych, E., Apel, K., Amrhein, N., Laloi, C. & Fitzpatrick, T.B. 2006. PDX1 is essential for vitamin B6 biosynthesis, development and stress tolerance in Arabidopsis. *The Plant Journal*. 48(6):933–946. DOI: 10.1111/j.1365-313X.2006.02928.x.

Tran, L.-S.P., Nakashima, K., Sakuma, Y., Simpson, S.D., Fujita, Y., Maruyama, K., Fujita, M., Seki, M., et al. 2004. Isolation and Functional Analysis of Arabidopsis Stress-Inducible NAC Transcription Factors That Bind to a Drought-Responsive cis-Element in the early responsive to dehydration stress 1 Promoter. *The Plant Cell*. 16(September):2481–2498. DOI: 10.1105/tpc.104.022699.Shinozaki.

Tsukaya, H. 2002. Interpretation of Mutants in Leaf Morphology: Genetic Evidence for a Compensatory System in Leaf Morphogenesis That Provides a New Link between Cell and Organismal Theories. *International Review of Cytology*. 217. DOI: https://doi.org/10.1016/S0074-7696(02)17011-2.

Tyerman, S.D., McGaughey, S.A., Qiu, J., Yool, A.J. & Byrt, C.S. 2021. Adaptable and Multifunctional Ion-Conducting Aquaporins. *Annual Review of Plant Biology*. 72(1):703–736. DOI: 10.1146/annurev-arplant-081720-013608.

Ulmasov, T., Murfett, J., Hagen, G. & Guilfoyle, T.J. 1997. Aux/IAA proteins repress expression of reporter genes containing natural and highly active synthetic auxin response elements. *The Plant Cell.* 9(11):1963–1971. DOI: 10.1105/tpc.9.11.1963.

Uozumi, N., Kim, E.J., Rubio, F., Yamaguchi, T., Muto, S., Tsuboi, A., Bakker, E.P., Nakamura, T., et al. 2000. The Arabidopsis HKT1 Gene Homolog Mediates Inward Na^+ Currents in *Xenopus laevis* Oocytes and Na^+ Uptake in Saccharomyces cerevisiae. *Plant Physiology*. 122(4):1249–1260. DOI: 10.1104/pp.122.4.1249.

Vera-Estrella, R., Barkla, B.J. & Pantoja, O. 2014. Comparative 2D-DIGE analysis of salinity responsive microsomal proteins from leaves of salt-sensitive *Arabidopsis thaliana* and salt-tolerant *Thellungiella salsuginea*. *Journal of Proteomics*. 111:113–127. DOI: 10.1016/j.jprot.2014.05.018.

Veselov, D.S., Sabirzhanova, I.B., Sabirzhanov, B.E. & Chemeris, A. V. 2008. Changes in expansin gene expression, IAA content, and extension growth of leaf cells in maize plants subjected to salinity. *Russian Journal of Plant Physiology*. 55(1):101–106. DOI: 10.1007/s11183-008-1012-5.

Vialaret, J., Di Pietro, M., Hem, S., Maurel, C., Rossignol, M. & Santoni, V. 2014. Phosphorylation dynamics of membrane proteins from Arabidopsis roots submitted to salt stress. *PROTEOMICS*. 14(9):1058–1070. DOI: 10.1002/pmic.201300443.

Volkov, V., Wang, B., Dominy, P.J., Fricke, W. & Amtmann, A. 2004. *Thellungiella halophila*, a salt-tolerant relative of *Arabidopsis thaliana*, possesses effective mechanisms to discriminate between potassium and sodium. *Plant, Cell and Environment*. 27(1):1–14. DOI: 10.1046/j.0016-8025.2003.01116.x.

Vorwerk, S., Biernacki, S., Hillebrand, H., Janzik, I., Müller, A., Weiler, E.W. & Piotrowski, M. 2001. Enzymatic characterization of the recombinant *Arabidopsis thaliana* nitrilase subfamily encoded by the NIT2/NIT1/NIT3-gene cluster. *Planta*. 212(4):508–516. DOI: 10.1007/s004250000420.

Vroemen, C.W., Mordhorst, A.P., Albrecht, C., Kwaaitaal, M.A.C.J. & De Vries, S.C. 2003. The CUP-SHAPED COTYLEDON3 gene is required for boundary and shoot meristem formation in Arabidopsis. *Plant Cell*. 15(7):1563–1577. DOI: 10.1105/tpc.012203.

Wang, B., Chu, J., Yu, T., Xu, Q., Sun, X., Yuan, J., Xiong, G., Wang, G., et al. 2015. Tryptophan-independent auxin biosynthesis contributes to early embryogenesis in Arabidopsis. *Proceedings of the National Academy of Sciences of the United States of America*. 112(15):4821–4826. DOI: 10.1073/pnas.1503998112.

Wang, C.-F., Han, G., Yang, Z., Li, Y. & Wang, B. 2022. Plant Salinity Sensors: Current Understanding and Future Directions. *Frontiers in Plant Science*. 13(April):1–13. DOI: 10.3389/fpls.2022.859224.

Wang, C., Li, J. & Yuan, M. 2007. Salt Tolerance Requires Cortical Microtubule Reorganization in Arabidopsis. *Plant and Cell Physiology*. 48(11):1534–1547. DOI: https://doi.org/10.1093/pcp/pcm123.

Wang, J., Zhu, J., Zhang, Y., Fan, F., Li, W., Wang, F., Zhong, W., Wang, C., et al. 2018. Comparative transcriptome analysis reveals molecular response to salinity stress of salt-tolerant and sensitive genotypes of indica rice at seedling stage. *Scientific Reports*. 8(1):2085. DOI: 10.1038/s41598-018-19984-w.

Wang, M., Wang, Y., Sun, J., Ding, M., Deng, S., Hou, P., Ma, X., Zhang, Y., et al. 2013. Overexpression of PeHA1 enhances hydrogen peroxide signaling in salt-stressed Arabidopsis. *Plant Physiology and Biochemistry*. 71:37–48. DOI: 10.1016/j.plaphy.2013.06.020.

Wang, P., Li, Z., Wei, J., Zhao, Z., Sun, D. & Cui, S. 2012. A Na^+/Ca^{2+} Exchanger-like Protein (AtNCL) Involved in Salt Stress in Arabidopsis. *Journal of Biological Chemistry*. 287(53):44062–44070. DOI: 10.1074/jbc.M112.351643.

Wang, Q., Guan, C., Wang, P., Lv, M.-L., Ma, Q., Wu, G.-Q., Bao, A.-K., Zhang, J.-L., et al. 2015. AtHKT1;1 and AtHAK5 mediate low-affinity Na^+ uptake in *Arabidopsis thaliana* under mild salt stress. *Plant Growth Regulation*. 75(3):615–623. DOI: 10.1007/s10725-014-9964-2.

Wang, Q., Guan, C., Wang, P., Ma, Q., Bao, A.K., Zhang, J.L. & Wang, S.M. 2019. The effect of AtHKT1;1 or AtSOS1 mutation on the expressions of Na^+ or K^+ transporter genes and ion homeostasis in *Arabidopsis thaliana* under salt stress. *International Journal of Molecular Sciences*. 20(5). DOI: 10.3390/ijms20051085.

Wang, T., Bum, Y., Caporini, M.A., Rosay, M., Zhong, L. & Cosgrove, D.J. 2013. Sensitivity-enhanced solid-state NMR detection of expansin's target in plant cell walls. *PNAS*. 110(41):16444–16449. DOI: 10.1073/pnas.1316290110/-/DCSupplemental.www.pnas.org/cgi/doi/10.1073/pnas.1316290110.

Wang, T., Tohge, T., Ivakov, A., Mueller-roeber, B., Fernie, A.R., Mutwil, M., Schippers, J.H.M., Persson, S., et al. 2015. Salt-Related MYB1 Coordinates Abscisic Acid Biosynthesis and Signaling during Salt Stress in Arabidopsis. *Plant Physiology*. 169(October):1027–1041. DOI: https://doi.org/10.1104/pp.15.00962.

Wang, Y., Li, K. & Li, X. 2009. Auxin redistribution modulates plastic development of root system architecture under salt stress in *Arabidopsis thaliana*. *Journal of Plant Physiology*. 166(15):1637–1645. DOI: 10.1016/j.jplph.2009.04.009.

Wang, Y., Papanatsiou, M., Eisenach, C., Karnik, R., Williams, M., Hills, A., Lew, V.L. & Blatt, M.R. 2012. Systems Dynamic Modeling of a Guard Cell Cl^- Channel Mutant Uncovers an Emergent Homeostatic Network Regulating Stomatal Transpiration. *Plant Physiology*. 160(4):1956–1967. DOI: 10.1104/pp.112.207704.

Wei, H., Jing, Y., Zhang, L. & Kong, D. 2021. Phytohormones and their crosstalk in regulating stomatal development and patterning. *Journal of Experimental Botany*. 72(7):2356–2370. DOI: 10.1093/jxb/erab034.

West, G., Inzé, D. & Beemster, G.T.S. 2004. Cell Cycle Modulation in the Response of the Primary Root of Arabidopsis to Salt Stress. *Plant Physiology*. 135(2):1050–1058. DOI: 10.1104/pp.104.040022.

Wigoda, N., Moshelion, M. & Moran, N. 2014. Is the leaf bundle sheath a "smart flux valve" for K^+ nutrition? *Journal of Plant Physiology*. 171(9):715–722. DOI: 10.1016/j.jplph.2013.12.017.

Wolf, S., Hématy, K. & Höfte, H. 2012. Growth Control and Cell Wall Signaling in Plants. *Annual Review of Plant Biology*. 63(1):381–407. DOI: 10.1146/annurev-arplant-042811-105449.

Won, C., Shen, X., Mashiguchi, K., Zheng, Z., Dai, X., Cheng, Y., Kasahara, H., Kamiya, Y., et al. 2011. Conversion of tryptophan to indole-3-acetic acid by tryptophan aminotransferases of Arabidopsis and YUCCAs in Arabidopsis. *Proceedings of the National Academy of Sciences of the United States of America*. 108(45):18518–18523. DOI: 10.1073/pnas.1108436108.

Woodward, A.W. & Bartel, B. 2005. Auxin: Regulation, action, and interaction. *Annals of Botany*. 95(5):707–735. DOI: 10.1093/aob/mci083.

Wu, H., Zhang, X., Giraldo, J.P. & Shabala, S. 2018. It is not all about sodium: revealing tissue specificity and signalling roles of potassium in plant responses to salt stress. *Plant and Soil*. 431(1–2). DOI: 10.1007/s11104-018-3770-y.

Wu, S.-J., Ding, L. & Zhu, J.-K. 1996. SOS1, a Genetic Locus Essential for Salt Tolerance and Potassium Acquisition. *The Plant Cell*. 8(4):617. DOI: 10.2307/3870339.

Xiao, Y., Wu, X., Liu, D., Yao, J., Liang, G., Song, H., Ismail, A.M., Luo, J.-S., et al. 2020. Cell Wall Polysaccharide-Mediated Cadmium Tolerance Between Two *Arabidopsis thaliana* Ecotypes. *Frontiers in Plant Science*. 11(May):1–13. DOI: 10.3389/fpls.2020.00473.

Xie, Y.-J., Xu, S., Han, B., Wu, M.-Z., Yuan, X.-X., Han, Y., Gu, Q., Xu, D.-K., et al. 2011. Evidence of Arabidopsis salt acclimation induced by up-regulation of HY1 and the regulatory role of RbohD-derived reactive oxygen species synthesis. *The Plant Journal*. 66(2):280–292. DOI: 10.1111/j.1365-313X.2011.04488.x.

Xu, H., Jiang, X., Zhan, K., Cheng, X., Chen, X., Pardo, J.M. & Cui, D. 2008. Functional characterization of a wheat plasma membrane Na^+/H^+ antiporter in yeast. *Archives of Biochemistry and Biophysics*. 473:8–15. DOI: 10.1016/j.abb.2008.02.018.

Xu, R., Wang, Y., Zheng, H., Lu, W., Wu, C., Huang, J., Yan, K., Yang, G., et al. 2015. Salt-induced transcription factor MYB74 is regulated by the RNA-directed DNA methylation pathway in Arabidopsis. *Journal of Experimental Botany*. 66(19):5997–6008. DOI: 10.1093/jxb/erv312.

Xu, Z., Wang, M., Shi, D., Zhou, G., Niu, T., Hahn, M.G., O'Neill, M.A. & Kong, Y. 2017. DGE-seq analysis of MUR3-related Arabidopsis mutants provides insight into how dysfunctional xyloglucan affects cell elongation. *Plant Science*. 258:156–169. DOI: 10.1016/j.plantsci.2017.01.005.

Yamada, M., Tanaka, S., Miyazaki, T. & Aida, M. (in press). Expression of the auxin biosynthetic genes YUCCA1 and YUCCA4 is dependent on the boundary regulators CUP-SHAPED COTYLEDON genes in the *Arabidopsis thaliana* embryo. *Plant Biotechnology*. 39(1):21.0924a. DOI: 10.5511/plantbiotechnology.21.0924a.

Yan, A., Wu, M., Yan, L., Hu, R., Ali, I. & Gan, Y. 2014. AtEXP2 is involved in seed germination and abiotic stress response in Arabidopsis. *PLoS ONE*. 9(1):1–10. DOI: 10.1371/journal.pone.0085208.

Yan, S., Che, G., Ding, L., Chen, Z., Liu, X., Wang, H., Zhao, W., Ning, K., et al. 2016. Different cucumber CsYUC genes regulate response to abiotic stresses and flower development. *Scientific Reports*. 6(January):1–12. DOI: 10.1038/srep20760.

Yang, L., Lang, C., Wu, Y., Meng, D., Yang, T., Li, D., Jin, T. & Zhou, X. 2022. ROS1-mediated decrease in DNA methylation and increase in expression of defense genes and stress response genes in *Arabidopsis thaliana* due to abiotic stresses. *BMC Plant Biology*. 22(1):104. DOI: 10.1186/s12870-022-03473-4.

Yang, T., Zhang, S., Hu, Y., Wu, F., Hu, Q., Chen, G., Cai, J., Wu, T., et al. 2014. The role of a potassium transporter oshak5 in potassium acquisition and transport from roots to shoots in rice at low potassium supply levels. *Plant Physiology*. 166(2):945–959. DOI: 10.1104/pp.114.246520.

Yeo, A.R., Lee, À.S., Izard, P., Boursier, P.J. & Flowers, T.J. 1991. Short- and long-term effects of salinity on leaf growth in rice (*Oryza sativa* L.). *Journal of Experimental Botany*. 42(7):881–889. DOI: 10.1093/jxb/42.7.881.

Zarrini, H.N., Fusetti, F., Elzenga, J.T.M. & Lanfermeijer, F.C. 2012. Arabidopsis leaf plasma membrane proteome using a gel free method: Focus on receptor-like kinases. *Journal of Plant Molecular Breeding (JPMB)*. 1(1):25–33. Available: http://www.suba.bcs.uwa.edu.au.

van Zelm, E., Zhang, Y. & Testerink, C. 2020. Salt Tolerance Mechanisms of Plants. *Annual Review of Plant Biology*. 71(1):403–433. DOI: 10.1146/annurev-arplant-050718-100005.

Zenoni, S., Fasoli, M., Tornielli, G.B., Dal Santo, S., Sanson, A., de Groot, P., Sordo, S., Citterio, S., et al. 2011. Overexpression of PhEXPA1 increases cell size, modifies cell wall polymer composition and affects the timing of axillary meristem development in *Petunia hybrida*. *New Phytologist*. 191(3):662–677. DOI: 10.1111/j.1469-8137.2011.03726.x.

Zhai, S.-M., Gao, Q., Xue, H.-W., Sui, Z.-H., Yue, G.-D., Yang, A.-F. & Zhang, J.-R. 2012. Overexpression of the phosphatidylinositol synthase gene from *Zea mays* in tobacco plants alters the membrane lipids composition and improves drought stress tolerance. *Planta*. 235(1):69–84. DOI: 10.1007/s00425-011-1490-0.

Zhang, H.-X. & Blumwald, E. 2001. Transgenic salt-tolerant tomato plants accumulate salt in foliage but not in fruit. *Nature Biotechnology*. 19(8):765–768.

Zhang, Z.J. & Peck, S.C. 2011. Simplified enrichment of plasma membrane proteins for proteomic analyses in *Arabidopsis thaliana*. *PROTEOMICS*. 11(9):1780–1788. DOI: 10.1002/pmic.201000648.

Zhang, P., Wang, R., Yang, X., Ju, Q., Li, W., Lü, S., Tran, L.-S.P. & Xu, J. 2020. The R2R3-MYB transcription factor AtMYB49 modulates salt tolerance in Arabidopsis by modulating the cuticle formation and antioxidant defence. *Plant Cell and Environment*. 43:1925–1943. DOI: 10.1111/pce.13784.

Zhang, X., Adamowski, M., Marhava, P., Tan, S., Zhang, Y., Rodriguez, L., Zwiewka, M., Pukyšová, V., et al. 2020. Arabidopsis Flippases Cooperate with ARF GTPase Exchange Factors to Regulate the Trafficking and Polarity of PIN Auxin Transporters. *The Plant Cell*. 32(5):1644–1664. DOI: 10.1105/tpc.19.00869.

Zhang, Y.M., Zhang, H.M., Liu, Z.H., Li, H.C., Guo, X.L. & Li, G.L. 2014. The wheat NHX antiporter gene TaNHX2 confers salt tolerance in transgenic alfalfa by increasing the retention capacity of intracellular potassium. *Plant Molecular Biology*. 87(3):317–327. DOI: 10.1007/s11103-014-0278-6.

Zhao, Y. 2010. Auxin biosynthesis and its role in plant development. *Annual Review of Plant Biology*. 61:49–64. DOI: 10.1146/annurev-arplant-042809-112308.Auxin.

Zhao, Y. 2018. Essential Roles of Local Auxin Biosynthesis in Plant Development and in Adaptation to Environmental Changes. *Annual Review of Plant Biology*. 69(1). DOI: 10.1146/annurev-arplant-042817-040226.

Zhao, C., Zhang, H., Song, C., Zhu, J.K. & Shabala, S. 2020. Mechanisms of Plant Responses and Adaptation to Soil Salinity. *The Innovation*. 1(1):100017. DOI: 10.1016/j.xinn.2020.100017.

Zhao, J., Li, P., Motes, C.M., Park, S. & Hirschi, K.D. 2015. CHX14 is a plasma membrane K-efflux transporter that regulates K^+ redistribution in *Arabidopsis thaliana*. *Plant, Cell & Environment*. 38(11):2223–2238. DOI: 10.1111/pce.12524.

Zhao, J., Li, L., Liu, Q., Liu, P., Li, S., Yang, D., Chen, Y., Pagnotta, S., et al. 2019. A MIF-like effector suppresses plant immunity and facilitates nematode parasitism by interacting with plant annexins. *Journal of Experimental Botany*. 70(20):5943–5958. DOI: 10.1093/jxb/erz348.

Zhao, Y., Hull, A.K., Gupta, N.R., Goss, K.A., Alonso, J., Ecker, J.R., Normanly, J., Chory, J., et al. 2002. Trp-dependent auxin biosynthesis in Arabidopsis: Involvement of cytochrome P450s CYP79B2 and CYP79B3. *Genes and Development*. 16(23):3100–3112. DOI: 10.1101/gad.1035402.

Zhiming, Y., Bo, K., Xiaowei, H., Shaolei, L., Youhuang, B., Wona, D., Ming, C., Hyung-taeg, C., et al. 2011. Root hair-specific expansins modulate root hair elongation in rice. *The Plant Journal*. (66):725–734. DOI: 10.1111/j.1365-313X.2011.04533.x.

Zhou, H., Wang, C., Tan, T., Cai, J., He, J. & Lin, H. 2018. Patellin1 Negatively Modulates Salt Tolerance by Regulating PM Na^+/H^+ Antiport Activity and Cellular Redox Homeostasis in Arabidopsis. *Plant and Cell Physiology*. 59(8):1630–1642. DOI: 10.1093/pcp/pcy081.

Zhou, H., Duan, H., Liu, Y., Sun, X., Zhao, J. & Lin, H. 2019. Patellin protein family functions in plant development and stress response. *Journal of Plant Physiology*. 234–235(November 2018):94–97. DOI: 10.1016/j.jplph.2019.01.012.

Zörb, C., Mühling, K.H., Kutschera, U. & Geilfus, C.M. 2015. Salinity stiffens the epidermal cell walls of salt-stressed maize leaves: Is the epidermis growth-restricting? *PLoS ONE*. 10(3):1–15. DOI: 10.1371/journal.pone.0118406.