

ADAM JOZWIAK, PhD

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EDUCATION

Institute of Biochemistry and Biophysics Polish Academy of Sciences, Warsaw, Poland

October 2008 – September 2013 **PhD in Biochemistry** (with honors), Department of Lipid Biochemistry (Postgraduate School of Molecular Biology).

University of Warsaw, Warsaw, Poland

October 2004 – June 2008 **MSc in Chemistry** (with honors), Laboratory of Natural Products Chemistry, Department of Chemistry.

October 2004 – July 2007 **BSc in Biotechnology**, Laboratory of Plant Biochemistry, Department of Biology.

RESEARCH EXPERIENCE

Weizmann Institute of Science, Rehovot, Israel

April 2019 – present **Research Assistant, Department of Plant and Environmental Sciences.**

June 2015 – March 2019 **Postdoctoral Fellow, Department of Plant and Environmental Sciences** – Investigating the biosynthesis and function of triterpenoids in plants.

Institute of Biochemistry and Biophysics Polish Academy of Sciences, Warsaw, Poland

October 2013 – May 2015 **Postdoctoral Fellow, Department of Lipid Biochemistry** – Investigating the role of polyprenol reductases in *Arabidopsis thaliana*.

October 2008 – September 2013 **PhD Project, Department of Lipid Biochemistry** – The biosynthesis of dolichols in *A. thaliana* - effect of stress on the subsequent steps of the pathway.

Laboratory of Mass Spectrometry, Institute of Organic Chemistry, PAS, Warsaw, Poland

April 2015 Project: Structural analysis of pharmaceuticals and their contaminations.
 Supervisor: Witold Danikiewicz PhD, Professor

University of Glasgow, Institute of Molecular Cell and Systems Biology, Glasgow, UK

December 2014 Project: Studies on the effect of abiotic stress on root architecture.
 Supervisor: Anna Amtmann PhD, Professor

Tohoku University, Institute of Multidisciplinary Research for Advanced Materials, Sendai, Japan

August 2014 Project: Isolation and analysis of rubber-like compounds from mangrove plants and herbs.
 Supervisor: Hiroshi Sagami PhD, Professor

University Roma Tre, Department of Biology, Rome, Italy

October 2011 Project: Effect of hypolipidemic drug simvastatin on rat muscle performance.
 Supervisor: Valentina Pallottini PhD, Professor

University of Stockholm, Department of Biochemistry and Biophysics, Stockholm, Sweden

October 2009 Project: Coenzyme Q, tocopherols and their derivatives as gene expression modulators.
Supervisor: Gustav Dallner MD, Professor

Karolinska Institutet, Department of Molecular Medicine and Surgery, Stockholm, Sweden

November 2009 Training on HPLC with UV/EC/Radiomatic detectors for analysis of lipids with antioxidant activity.
Supervisor: Kerstin Brismar MD, Professor

RESEARCH GRANTS

2021 – 2022 Principal Investigator: Asaph Aharoni PhD
Weizmann Institute of Science, Israel
Mizutani Foundation for Glycoscience
Role: Co-author. I provided preliminary data, developed the aims, and wrote the grant.

2018 – 2022 Principal Investigator: Asaph Aharoni PhD
Weizmann Institute of Science, Israel
Israel Ministry of Agriculture
Role: Co-author. I provided preliminary data, developed the aims, and wrote the grant with PI.

FELLOWSHIPS AND AWARDS

2022 The Azrieli systems biology innovative award.
2020: Feinberg Graduate School prize for outstanding achievements in postdoctoral research.
2019: Metabolomics Society Early Career Travel Award.
2016: Dean of Faculty Fellowship for postdoctoral fellows, Weizmann Institute.
2014: Royal Society of Edinburgh - Research Fellowship.
Japan Society for the Promotion of Science (JSPS) - Research Fellowship.
2010 and 2012: Intramural grant from the IBB PAS Postgraduate School of Molecular Biology for the best short-term research project.
2009: Mazovian Scholarship granted to most promising PhD students in Mazovia voivodeship for innovative research ideas.

PATENTS

1. WO 2020/049572 A1 – Cellulose-synthase-like Enzymes And Uses Thereof.
2. IL 268269 D0 – Production Of High-value Saponins By The Use Of Cellulose-synthase-like Family Enzymes.
3. Acyl activating enzyme and any transgenic cell, tissue, and organism comprising same, US Patent Application, submitted.
4. Polyketide synthase and any transgenic cell, tissue, and organism comprising same, US Patent Application, submitted.
5. Polyketide cyclase and any transgenic cell, tissue, and organism comprising same, US Patent Application, submitted.
6. Prenyltransferase and any transgenic cell, tissue, and organism comprising same, US Patent Application, submitted.
7. Cannabichromenic acid synthase and any transgenic cell, tissue, and organism comprising same, US Patent Application, submitted.
8. Transgenic helichrysum umbraculigerum cell, tissue, or plant, US Patent Application, submitted.
9. Alcohol acyltransferase and a transgenic cell, tissue, and organism comprising same, US Patent Application, submitted.
10. Uridine diphosphate-glycosyltransferase and a transgenic cell, tissue, and organism comprising same, US Patent Application, submitted.

PUBLICATIONS

Published in peer-reviewed journals

1. Sonawane PD, **Jozwiak A**, Barbole R, Panda S, Abebie B, Kazachkova Y, Gharat SA, Ramot O, Unger T, Wizler G, Meir S, Rogachev I, Doron-Faigenboim A, Petreikov M, Schaffer A, Giri AP, Scherf T, Aharoni A. 2-oxoglutarate-dependent dioxygenases drive expansion of steroidal alkaloid structural diversity in the genus *Solanum*. *New Phytol.* 2022 Mar 3. doi: 10.1111/nph.18064. Epub ahead of print. PMID: 35238413.
2. Panda S, **Jozwiak A**, Sonawane PD, Szymanski J, Kazachkova Y, Vainer A, Vasuki Kilambi H, Almekias-Siegl E, Dikaya V, Bocobza S, Shohat H, Meir S, Wizler G, Giri AP, Schuurink R, Weiss D, Yasuor H, Kamble A, Aharoni A. Steroidal alkaloids defence metabolism and plant growth are modulated by the joint action of gibberellin and jasmonate signalling. *New Phytol.* 2022 Feb;233(3):1220-1237. doi: 10.1111/nph.17845. Epub 2021 Dec 3.
3. Baczewska-Dąbrowska, A.H., Dmuchowski, W., Gozdowski, D., Gworek, B., **Jozwiak A**, Swiezewska, E., Dabrowski, P., Suwara, I. The importance of prenol lipids in mitigating salt stress in the leaves of *Tilia × euchlora* trees. *Trees* (2021). <https://doi.org/10.1007/s00468-021-02214-8>
4. Cai J, **Jozwiak A**, Holoidovsky L, Meijler M.M, Meir S, Rogachev I, Aharoni A. Glycosylation of N-Hydroxy-Pipecolic Acid Equilibrates between Systemic Acquired Resistance Response and Plant Growth. *Molecular Plant.* (2021) 14(3), DOI:<https://doi.org/10.1016/j.molp.2020.12.018>
5. **Jozwiak A**, Sonawane PD, Panda S, et al. Plant terpenoid metabolism co-opts a component of the cell wall biosynthesis machinery. *Nat Chem Biol.* (2020);16(7):740-748.
6. Sonawane PD, **Jozwiak A**, Panda S, Aharoni A. 'Hijacking' core metabolism: a new panache for the evolution of steroidal glycoalkaloids structural diversity. *Curr Opin Plant Biol.* (2020); 55:118-128.
7. Dmuchowski W, Baczewska-Dąbrowska A, Gozdowski D, Brągoszewska P, Gworek B, Suwara I, Chojnacki T, **Jozwiak A**, Swiezewska E. 2021. Effect of salt stress in urban conditions on two *Acer* species with different sensitivity. *PeerJ* 9:e10577
8. Dmuchowski, W., Brągoszewska, P., Gozdowski, D. Baczewska-Dabrowska A, Chojnacki T, **Jozwiak A**, Swiezewska E, Suwara E, Gworek B. Strategies of urban trees for mitigating salt stress: a case study of eight plant species. *Trees* (2020). <https://doi.org/10.1007/s00468-020-02044-0>
9. Korenblum E, Dong Y, Szymanski J, Panda S, **Jozwiak A**, Massalha H, Meir S, Rogachev I, Aharoni A. Rhizosphere Microbiome Mediates Systemic Root Metabolite Exudation by Root-to-Root Signaling. *Proc Natl Acad Sci USA* (2020) 18;117(7):3874-3883.
10. Cárdenas P.D, Sonawane P.D, Heinig U, **Jozwiak A**, et al. Pathways to defense metabolites and evading fruit bitterness in genus *Solanum* evolved through 2-oxoglutarate-dependent dioxygenases. *Nat Commun* (2019) 10: 5169.
11. Gryz E, Perlińska-Lenart U, Gawarecka K, **Jozwiak A**, et al. Poly-Saturated Dolichols from Filamentous Fungi Modulate Activity of Dolichol-Dependent Glycosyltransferase and Physical Properties of Membranes. *Int J Mol Sci.* (2019); 20(12):3043.
12. **Jozwiak A**, Gutkowska M, Gawarecka K, Surmacz L, Buczkowska A, Lichocka M, Nowakowska J, Swiezewska E. PolyPrenol Reductase 2 deficiency is lethal in *Arabidopsis* due to male sterility. *Plant Cell* (2015) 27: 3336-3353.
13. **Jozwiak A**, Lipko A, Kania M, Danikiewicz W, Surmacz L, Witek A, Wojcik J, Zdanowski K, Paczkowski C, Chojnacki T, Poznanski J, Swiezewska E. Modelling of dolichol mass spectra isotopic envelopes as a tool to monitor isoprenoid biosynthesis. *Plant Physiology* (2017) 174(2): 857-874.
14. Dmuchowski W, Brągoszewska P, Gozdowski D, Baczewska-Dabrowska A, Chojnacki T, **Jozwiak A**, Swiezewska E, Gworek B, Suwara I. Strategy of *Ginkgo biloba* L. in the mitigation of salt stress in the urban environment. *Urban Forestry & Urban Greening* (2019) 38: 223-231.
15. Milewska-Hendel A, Baczewska A.H, Sala K, Dmuchowski W, Brągoszewska P, Gozdowski D, **Jozwiak A**, Chojnacki T, Swiezewska E, Kurczynska E. Quantitative and qualitative characteristics of cell wall components and prenol lipids in the leaves of *Tilia x euchlora* trees growing under salt stress. *PLOS ONE* (2017) 12(2): e0172682.
16. Baczewska A. H, Dmuchowski W, **Jozwiak A**, Gozdowski D, Brągoszewska P, Dąbrowski P, Swiezewska E. Effect of salt stress on prenol lipids in the leaves of *Tilia 'Euchlora'*. *Dendrobiology* (2014) 72: 177-186.
17. **Jozwiak A**, Brzozowski R, Bujnowski Z, Chojnacki T, Swiezewska E. Application of Supercritical CO₂ for extraction of polyisoprenoid alcohols and their esters from plant tissues. *J. Lipid Res.* (2013) 54: 2023 – 2028.

18. **Jozwiak A**, Ples M, Skorupinska-Tudek K, Kania M, Dydak M, Danikiewicz W, Swiezewska E. Sugar availability modulates polyisoprenoid and phytosterol profiles in *Arabidopsis thaliana* hairy root culture. *Biochimica et Biophysica Acta Molecular and Cell Biology of Lipids* (2013) 1831: 438–447.
19. Segatto M, Manduca A, Lecis C, Rosso P, **Jozwiak A**, Swiezewska E, Morena S, Trezza V, Pallottini V. Simvastatin treatment highlights a new role for the isoprenoid/cholesterol biosynthetic pathway in the modulation of emotional reactivity and cognitive performance in rats. *Neuropsychopharmacology* (2014) 39: 841-854.
20. Trapani L, Segatto M, **Jozwiak A**, Swiezewska E, Pallottini V. HMG CoA reductase inhibition by Simvastatin gets rat β -Myosin Heavy Chain disappeared: a statin paradox. *Open Journal of Molecular and Integrative Physiology*. (2013) 3:1-5.
21. Lefeber DJ, Brouwer AP, Morava E, Riemersma M, Schuurs-Hoeijmakers JH, Absmanner B, Verrijp K, Akker WM, Huijben K, Steenbergen G, Reeuwijk J, **Jozwiak A**, Zucker N, Lorber A, Lammens M, Knopf C, Bokhoven H, Grünwald S, Lehle L, Kapusta L, Mandel H, Wevers RA. Autosomal recessive dilated cardiomyopathy due to DOLK mutations results from abnormal dystroglycan O-mannosylation, *PLoS Genet*. (2011) 7: e1002427.
22. Trapani L, Melli L, Segatto M, Trezza V, Campolongo P, **Jozwiak A**, Swiezewska E, Pucillo LP, Moreno S, Fanelli F, Linari M, Pallottini V, Effects of MHC plasticity induced by HMGCoA-reductase inhibition on skeletal muscle functions, *FASEB J*. (2011) 25: 4037-47.
23. Zhang J, Angala SK, Pramanik PK, Li K, Crick DC, Liav A, **Jozwiak A**, Swiezewska E, Jackson M, Chatterjee D. Reconstitution of functional mycobacterial arabinosyltransferase AftC proteoliposome and assessment of decaprenylphosphorylarabinose analogues as arabinofuranosyl donors, *ACS Chem Biol*. (2011) 6: 819-28.
24. Gajjar D, **Jozwiak A**, Swiezewska E, Alapure B, Parmar T, Johar K, Vasavada AR. Quantification of dolichol in the human lens with different types of cataracts, *Mol Vis*. (2009) 15: 1573-9.
25. Czarnocki S, Wojtasiewicz K, **Jozwiak A**, Maurin J, Czarnocki Z, Drabowicz J. Enantioselective synthesis of (+)-tryptargine and (+)-crispine E, *Tetrahedron* (2008) 64: 3176.

Submitted manuscripts

26. **Jozwiak A**, Sonawane PD, Panda S, Dong Y, Meir S, Rogachev I, Aharoni A. Cellulose Synthase Like G is indispensable for steroidal glycoalkaloid production in tomato.
27. Berman P*, De Haro L*, **Jozwiak A***, Sonawane PD*, Panda S, Dong Y, Cveticanin J, Barbole R, Livne R, Arava S, Scherf T, Shimoni E, Kopitman E, Levin-Zaidman S, Meir S, Rogachev O, Aharoni A. Convergent evolution of the cannabinoids biosynthetic pathway (*authors contributed equally to this work).
28. Gharat A, Sonawane PD, **Jozwiak A**, Barbole R, Rogachev I, Meir S, Giri AP, Aharoni A. The GAME36 acyltransferase is a key enzyme in the biosynthesis of ripe tomato fruit-associated glycoalkaloids.

Manuscripts in preparation

29. **Jozwiak A** et al., Discovery of enzymes involved in the biosynthesis of fucosylated steroidal saponins in *Liriopse*.
30. **Jozwiak A** et al., Structural diversification of steroidal alkaloids in genus *Solanum* stems from evolution of GAME8 activity.
31. **Jozwiak A** et al., Engineering triterpenoid saponin production and evaluation of their environmental function in plants.
32. **Jozwiak A** et al., Metabolomic profiling provides insights into biosynthesis and spatial distribution of limonoids in genus *Citrus*.

PRESENTATIONS

Selected oral presentation:

- Metabolomics 2022; Deciphering the Complex Chemical Space and Biosynthetic Routes of Steroidal Saponins in Monocotyledonous Plants, June 19-23, 2022, Valencia, Spain.
- Plant MetaboPeople; Biosynthesis of triterpenoids in plants – a surprising case of molecular “hijacking”; April 26-27, 2022, Agamon Hula, Israel
- 5th International Conference on Plant Synthetic Biology, Bioengineering and Biotechnology; Complex Metabolic engineering of plant factories – from scientific curiosity to industrial application, November 15-17, 2021, Virtual; Society for Biological Engineering.
- TERPNET 2019 - The 14th International Meeting on Biosynthesis, Function and Synthetic Biology of Isoprenoids; Elucidation of the Triterpenoid Saponin Biosynthetic Pathway in Spinach Provides Novel Insights to Glycosylation and Acylation Reactions, August 26-30, 2019, Halle Saale, Germany
- 15th Annual Conference of the Metabolomics Society, Metabolomics 2019; From MS peak to unambiguous metabolite identification using the WeizMass spectral library and LC-MS-SPE-NMR system, June 23-27, 2019, The Hague
- Leibniz Institute of Plant Genetics and Crop Plant Research; A Novel Glycosyltransferase Activity of Cellulose Synthase-Like Enzyme Enables Engineering of the Low-Calorie Natural Sweetener from Licorice, September 02, 2019, Gatersleben, Germany
- Second Austrian Summit on Natural Products; Discovery Of Saponin Biosynthetic Pathway In Spinach; January 13 - 15, 2019 Seefeld, Austria

SERVICE

Ad hoc reviewer

Metabolites

The Plant Journal

BMC Genomics

Horticulture Research

SCIENTIFIC SOCIETY MEMBERSHIPS

2019 – present	Metabolomics Society
2015 – present	Polish Biochemical Society