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## Kort præsentation

Jeg arbejder på at finde de grundlæggende mekanismer mellem fysiske egenskaber for træ og biomaterialer. Vand i materialets cellevægge har en afgørende rolle for stort set alle egenskaber, og mit fokus er at forstå baggrunden for dette, herunder hvordan kemiske ændringer i cellevæggene indvirker på interaktionen mellem vand og træ.

## CV

### Uddannelse

2011: ph.D., Danmarks Tekniske Universitet  
2007: Civilingeniør, cand.polyt., Danmarks Tekniske Universitet

### Ansættelser

2019- : Lektor, Københavns Universitet, Institut for Geovidenskab og Naturforvaltning  
2015-2019: Postdoc, Københavns Universitet, Institut for Geovidenskab og Naturforvaltning  
2013-2015: Postdoc, ETH Zürich, Institut für Baustoffe og EMPA, Abteilung Angewandte Holzforschung  
2013: Adjunkt, Danmarks Tekniske Universitet, Institut for Byggeri  
2011-2013: Konsulent R&D, Teknologisk Institut  
2008-2011: ErhvervsPhD-kandidat, Teknologisk Institut

### Videnskabelige medlemskaber

2015- : Medlem af *Marie Curie Alumni Association*  
2013-2015: Medlem af styregruppen, COST Action FP1303 *Performance of biobased building materials*  
2010-2013: Medlem af styregruppen, COST Action FP0904 *Thermo-hydro-mechanical wood behaviour and processing*  
2009-2012: Medlem af arbejdsgruppe, COST Action FP0802 *Experimental and computational micro-characterization techniques in wood mechanics*

### Ansvarsposter

2021- : Videnskabelig bedømmer af forskningsansøgninger for det europæiske *Forest Value* program, EU, for *NWO Dutch Research Council*, Holland, samt for *Czech Science Foundation GCAR*, Tjekkiet  
2020- : Videnskabelig bedømmer af forskningsansøgninger for *Vinnova*, Sverige  
2019- : Videnskabelig bedømmer af forskningsansøgninger for *National Science Centre*, Polen og *Academy of Finland*  
2019: Gæsterektor for specialnummer af tidsskriftet *Forests*  
2017- : Medlem af Editorial Board ved tidsskriftet *Wood Materials Science and Engineering*  
2017- : National koordinator for Danmark i *Northern European Network for Wood Science and Engineering*  
2017- : Medformand for National Support Group of Denmark, *Forest-based Sector Technology Platform*, EU  
2017-2018: Gæsterektor for specialnummer af tidsskriftet *International Wood Products Journal*  
2017: Hovedarrangør for konferencen *13<sup>th</sup> Annual Meeting of the Northern European Network for Wood Science and Engineering (WSE2017)* ved Københavns Universitet

2012- : Videnskabelig reviewer for en række ISI-tidsskrifter inkl. *Acta Biomaterialia*, *Cellulose, International Biodeterioration & Biodegradation*, *Journal of Materials Science*, *Polymer Degradation and Stability*, *Proceedings of the Royal Society A*, m.fl.

2010-2011: Bestyrelsesmedlem i *ErhvervsPhD-foreningen*

2007-2011: Bestyrelsesmedlem og bestyrelsessekretær i *Dansk Selskab for Materialeprøvning og -forskning* (DSM), Ingeniørforeningen i Danmark (IDA)

## Videnskabelige publikationer

Fredriksson, M, Digaitis, R, Engqvist, J & Thybring, EE 2024, 'Effect of targeted acetylation on wood–water interactions at high moisture states', *Cellulose*, bind 31, s. 869–885. <https://doi.org/10.1007/s10570-023-05678-8>

Thybring, EE & Fredriksson, M 2024, 'How accurate are automated sorption balances? An analysis of errors in wood moisture content from uncertainties in the conditioning environment', *Drying Technology*, bind 42, nr. 2, s. 372-379. <https://doi.org/10.1080/07373937.2023.2294021>

Zelinka, SL, Glass, SV, Lazarcik, EQD, Thybring, EE, Altgen, M, Rautkari, L, Curling, S, Cao, J, Wang, Y, Künniger, T, Nyström, G, Dreimol, CH, Burgert, I, Uyup, MKA, Khadiran, T, Roper, MG, Broom, DP, Schwarzkopf, M, Yudhanto, A, Subah, M, Lubineau, G, Fredriksson, M, Strojecki, M, Olek, W, Majka, J, Pedersen, NB, Burnett, DJ, Garcia, AR, Verdonck, E, Dreisbach, F, Waguespack, L, Schott, J, Esteban, LG, Garcia-Iruela, A, Colinart, T, Rémond, R, Mazian, B, Perre, P, Emmerich, L & Li, L 2024, 'Interlaboratory study of the operational stability of automated sorption balances', *Adsorption*. <https://doi.org/10.1007/s10450-024-00472-9>

Ponzecchi, A, Alfredsen, G, Fredriksson, M, Thybring, EE & Thygesen, LG 2024, 'Localization and characterisation of brown rot in two types of acetylated wood', *Cellulose*, bind 31, s. 1875–1890. <https://doi.org/10.1007/s10570-023-05680-0>

Fredriksson, M, Rüggeberg, M, Nord-Larsen, T, Beck, G & Thybring, EE 2023, 'Water sorption in wood cell walls—data exploration of the influential physicochemical characteristics', *Cellulose*, bind 30, s. 1857-1871. <https://doi.org/10.1007/s10570-022-04973-0>

Thybring, EE & Fredriksson, M 2023, Wood and Moisture. i P Niemz, A Teischinger & D Sandberg (red), *Springer Handbook of Wood Science and Technology*. 1 udg, Springer, Cham, Springer Handbooks, s. 355-397. [https://doi.org/10.1007/978-3-030-81315-4\\_7](https://doi.org/10.1007/978-3-030-81315-4_7)

De Ligne, LC, Van Acker, J, Baetens, JM, Omar, S, De Baets, B, Thygesen, LG, Van Den Bulcke, J & Thybring, EE 2022, 'Moisture dynamics of wood-based panels and wood fibre insulation materials', *Frontiers in Plant Science*, bind 13, 951175. <https://doi.org/10.3389/fpls.2022.951175>

Thybring, EE, Thygesen, LG, Alfredsen, G & Fredriksson, M 2022, 'Editorial: Wood decomposition: Mechanisms and prevention strategies', *Frontiers in Plant Science*, bind 13, 1081131. <https://doi.org/10.3389/fpls.2022.1081131>

Ponzecchi, A, Thybring, EE, Digaitis, R, Fredriksson, M, Piqueras Solsona, S & Thygesen, LG 2022, 'Raman micro-spectroscopy of two types of acetylated Norway spruce wood at controlled relative humidity', *Frontiers in Plant Science*, bind 13, 986578. <https://doi.org/10.3389/fpls.2022.986578>

Zelinka, SL, Altgen, M, Emmerich, L, Guigo, N, Keplinger, T, Kymäläinen, M, Thybring, EE & Thygesen, LG 2022, 'Review of Wood Modification and Wood Functionalization Technologies', *Forests*, bind 13, nr. 7, 1004. <https://doi.org/10.3390/f13071004>

Thybring, EE, Fredriksson, M, Zelinka, SL & Glass, SV 2022, 'Water in Wood: A Review of Current Understanding and Knowledge Gaps', *Forests*, bind 13, nr. 12, 2051. <https://doi.org/10.3390/f13122051>

Thybring, EE, Boardman, CR, Zelinka, SL & Glass, SV 2021, 'Common sorption isotherm models are not physically valid for water in wood', *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, bind 627, 127214. <https://doi.org/10.1016/j.colsurfa.2021.127214>

Kim, I, Thybring, EE, Karlsson, O, Jones, D, Mantanis, GI & Sandberg, D 2021, 'Characterisation of moisture in Scots pine (*Pinus sylvestris* L.) sapwood modified with maleic anhydride and sodium hypophosphite', *Forests*, bind 12, nr. 10, 1333. <https://doi.org/10.3390/f12101333>

Digaitis, R, Thybring, EE, Thygesen, LG & Fredriksson, M 2021, 'Targeted acetylation of wood: a tool for tuning wood-water interactions', *Cellulose*, bind 28, nr. 12, s. 8009-8025. <https://doi.org/10.1007/s10570-021-04033-z>

Gundersen, P, Thybring, EE, Nord-Larsen, T, Vesterdal, L, Nadelhoffer, KJ & Johannsen, VK 2021, 'Old-growth forest carbon sinks overestimated', *Nature*, bind 591, nr. 7851, s. E21-E23. <https://doi.org/10.1038/s41586-021-03266-z>

Thybring, EE & Fredriksson, M 2021, 'Wood modification as a tool to understand moisture in wood', *Forests*, bind 12, nr. 3, 372. <https://doi.org/10.3390/f12030372>

Digaitis, R, Thybring, EE & Thygesen, LG 2021, 'Investigating the role of mechanics in lignocellulosic biomass degradation during hydrolysis: Part II', *Biotechnology Progress*, bind 37, nr. 1, e3083. <https://doi.org/10.1002/btpr.3083>

Fredriksson, M, Thybring, EE & Zelinka, SL 2021, 'Artifacts in electrical measurements on wood caused by non-uniform moisture distributions', *Holzforschung*, bind 75, nr. 6, s. 517-525. <https://doi.org/10.1515/hf-2020-0138>

Glass, SV, Zelinka, SL & Thybring, EE 2021, 'Exponential decay analysis: a flexible, robust, data-driven methodology for analyzing sorption kinetic data', *Cellulose*, bind 28, s. 153-174. <https://doi.org/10.1007/s10570-020-03552-5>

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Yang, T, Thybring, EE, Fredriksson, M, Ma, E, Cao, J, Digaitis, R & Thygesen, LG 2020, 'Effects of changes in biopolymer composition on moisture in acetylated wood', *Forests*, bind 11, nr. 7, 719. <https://doi.org/10.3390/f11070719>

Zelinka, SL, Glass, SV & Thybring, EE 2020, 'Evaluation of previous measurements of water vapor sorption in wood at multiple temperatures', *Wood Science and Technology*, bind 54, nr. 4, s. 769-786. <https://doi.org/10.1007/s00226-020-01195-0>

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Thybring, EE, Glass, SV & Zelinka, SL 2019, 'Kinetics of Water Vapor Sorption in Wood Cell Walls: State of the Art and Research Needs', *Forests*, bind 10, nr. 8, 704. <https://doi.org/10.3390/f10080704>

- Digaitis, R, Thybring, EE & Thygesen, LG 2019, 'Investigating the role of mechanics in lignocellulosic biomass degradation during hydrolysis', *Biotechnology Progress*, bind 35, nr. 2, e2754. <https://doi.org/10.1002/btpr.2754>
- Thybring, EE, Boardman, CR, Glass, SV & Zelinka, SL 2019, 'The parallel exponential kinetics model is unfit to characterize moisture sorption kinetics in cellulosic materials', *Cellulose*, bind 26, nr. 2, s. 723-735. <https://doi.org/10.1007/s10570-018-2134-3>
- Beck, G, Thybring, EE & Thygesen, LG 2018, 'Brown-rot fungal degradation and de-acetylation of acetylated wood', *International Biodeterioration and Biodegradation*, bind 135, s. 62-70. <https://doi.org/10.1016/j.ibiod.2018.09.009>
- Fredriksson, M & Thybring, EE 2018, 'Scanning or desorption isotherms? Characterising sorption hysteresis of wood', *Cellulose*, bind 25, nr. 8, s. 4477-4485. <https://doi.org/10.1007/s10570-018-1898-9>
- Zelinka, SL, Bourne, KJ, Glass, SV, Boardman, CR, Lorenz, L & Thybring, EE 2018, 'Apparatus for gravimetric measurement of moisture sorption isotherms for 1-100 g samples in parallel', *Wood and Fiber Science*, bind 50, nr. 3, s. 244-253. <<https://wfs.swst.org/index.php/wfs/article/view/2691>>
- Beck, G, Thybring, EE, Thygesen, LG & Hill, C 2018, 'Characterization of moisture in acetylated and propionylated radiata pine using low-field nuclear magnetic resonance (LFNMR) relaxometry', *Holzforschung*, bind 72, nr. 3, s. 225-233. <https://doi.org/10.1515/hf-2017-0072>
- Thybring, EE, Kymäläinen, M & Rautkari, L 2018, 'Experimental techniques for characterising water in wood covering the range from dry to fully water-saturated', *Wood Science and Technology*, bind 52, nr. 2, s. 297-329. <https://doi.org/10.1007/s00226-017-0977-7>
- Thybring, EE, Kymäläinen, M & Rautkari, L 2018, 'Moisture in modified wood and its relevance for fungal decay', *iForest*, bind 11, s. 418-422. <https://doi.org/10.3832/ifor2406-011>
- Zelinka, SL, Glass, SV & Thybring, EE 2018, 'Myth versus reality: Do parabolic sorption isotherm models reflect actual wood-water thermodynamics?', *Wood Science and Technology*, bind 52, nr. 6, s. 1701-1706. <https://doi.org/10.1007/s00226-018-1035-9>
- Glass, SV, Boardman, CR, Thybring, EE & Zelinka, SL 2018, 'Quantifying and reducing errors in equilibrium moisture content measurements with dynamic vapor sorption (DVS) experiments', *Wood Science and Technology*, bind 52, nr. 4, s. 909-927. <https://doi.org/10.1007/s00226-018-1007-0>
- Tarmian, A, Burgert, I & Thybring, EE 2017, 'Hydroxyl accessibility in wood by deuterium exchange and ATR-FTIR spectroscopy: methodological uncertainties', *Wood Science and Technology*, bind 51, nr. 4, s. 845-853. <https://doi.org/10.1007/s00226-017-0922-9>
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- Digaitis, R, Thybring, EE, Kunniger, T & Thygesen, LG 2017, 'Synergistic effects of enzymatic decomposition and mechanical stress in wood degradation', *Wood Science and Technology*, bind 51, nr. 5, s. 1067-1080. <https://doi.org/10.1007/s00226-017-0939-0>
- Thybring, EE 2017, 'Water relations in untreated and modified wood under brown-rot and white-rot decay', *International Biodeterioration & Biodegradation*, bind 118, s. 134-142. <https://doi.org/10.1016/j.ibiod.2017.01.034>
- Zelinka, SL, Ringman, R, Pilgard, A, Thybring, EE, Jakes, JE & Richter, K 2016, 'The role of chemical transport in the brown-rot decay resistance of modified wood', *International Wood Products Journal*, bind 7, nr. 2, s. 66-70. <https://doi.org/10.1080/20426445.2016.1161867>

Thybring, EE 2014, 'Explaining the heat capacity of wood constituents by molecular vibrations', *Journal of Materials Science*, bind 49, nr. 3, s. 1317-1327. <https://doi.org/10.1007/s10853-013-7815-6>

Thygesen, LG, Thybring, EE, Johansen, KS & Felby, C 2014, 'The Mechanisms of Plant Cell Wall Deconstruction during Enzymatic Hydrolysis', *P L o S One*, bind 9, nr. 9, s. 1-4. <https://doi.org/10.1371/journal.pone.0108313>

Thybring, EE 2013, 'The decay resistance of modified wood influenced by moisture exclusion and swelling reduction', *International Biodeterioration and Biodegradation*, bind 82, s. 87-95. <https://doi.org/10.1016/j.ibiod.2013.02.004>

Engelund, ET, Thygesen, LG, Svensson, S & Hill, CAS 2013, 'A critical discussion of the physics of wood-water interactions', *Wood Science and Technology*, bind 47, nr. 1, s. 141-161. <https://doi.org/10.1007/s00226-012-0514-7>

Engelund, ET & Salmén, L 2012, 'Tensile creep and recovery of Norway spruce influenced by temperature and moisture', *Holzforschung*, bind 66, nr. 8, s. 959-965. <https://doi.org/10.1515/hf-2011-0172>

Hoffmeyer, P, Engelund, ET & Thygesen, LG 2011, 'Equilibrium moisture content (EMC) in Norway spruce during the first and second desorptions', *Holzforschung*, bind 65, nr. 6, s. 875-882. <https://doi.org/10.1515/HF.2011.112>

Engelund, ET & Svensson, S 2011, 'Modelling time-dependent mechanical behaviour of softwood using deformation kinetics', *Holzforschung*, bind 65, nr. 2, s. 231-237. <https://doi.org/10.1515/hf.2011.011>

Thygesen, LG, Engelund, ET & Hoffmeyer, P 2010, 'Water sorption in wood and modified wood at high values of relative humidity. Part I: Results for untreated, acetylated, and furfurylated Norway spruce', *Holzforschung*, bind 64, s. 315-323. <https://doi.org/10.1515/hf.2010.044>

Engelund, ET, Thygesen, LG & Hoffmeyer, P 2010, 'Water sorption in wood and modified wood at high values of relative humidity. Part 2: Appendix. Theoretical assessment of the amount of capillary water in wood microvoids', *Holzforschung*, bind 64, nr. 3, s. 325-330. <https://doi.org/10.1515/hf.2010.061>