New insight regarding mode of action of brown rot decay of modified wood based on DNA and gene expression studies

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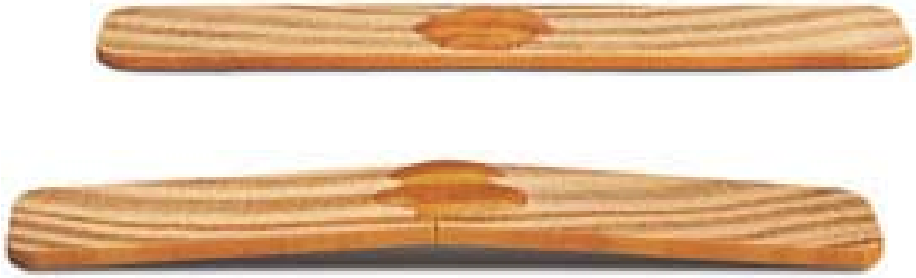
Alfredsen, Ringman, Pilgård & Fossdal, ECWM7, Lisbon March 1012, 2014



Aim

- review the work performed regarding DNA quantification and gene expression studies of brown rot decay related to modified wood

Method development

Holzforschung, Vol. 59, pp. 568–573, 2005 • Copyright © by Walter de Gruyter • Berlin • New York. DOI 10.1515/HF.2005.093

Comparison of quantitative real-time PCR, chitin and ergosterol assays for monitoring colonization of *Trametes versicolor* in birch wood

Morten Eikenes*, Ari M. Hietala, Gry Alfredsen, Carl Gunnar Fossdal and Halvor Solheim

Holzforschung, Vol. 65, pp. 889–895, 2011 • Copyright © by Walter de Gruyter • Berlin • Boston. DOI 10.1515/HF.2011.079

qPCR as a tool to study basidiomycete colonization in wooden field stakes

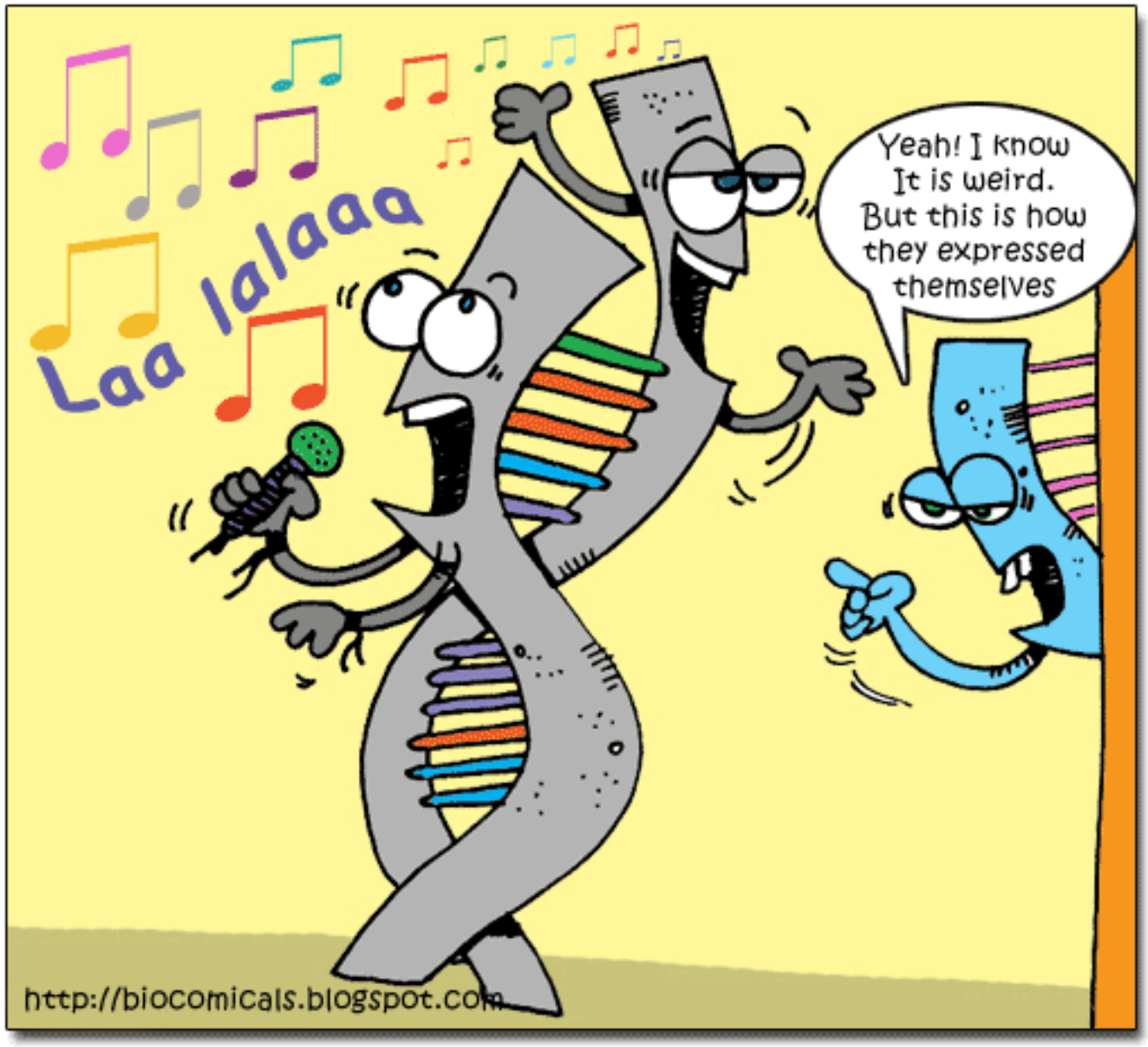
Annica Pilgård[1,*], Gry Alfredsen[2], Charlotte G. Björdal[3], Carl Gunnar Fossdal[2] and Isabella Børja[2]

DE GRUYTER DOI 10.1515/hf-2012-0157 — Holzforschung 2014; 68(1): 123–131

Ari M. Hietala*, Emil Stefańczyk, Nina Elisabeth Nagy, Carl Gunnar Fossdal and Gry Alfredsen

Influence of wood durability on the suppressive effect of increased temperature on wood decay by the brown-rot fungus *Postia placenta*

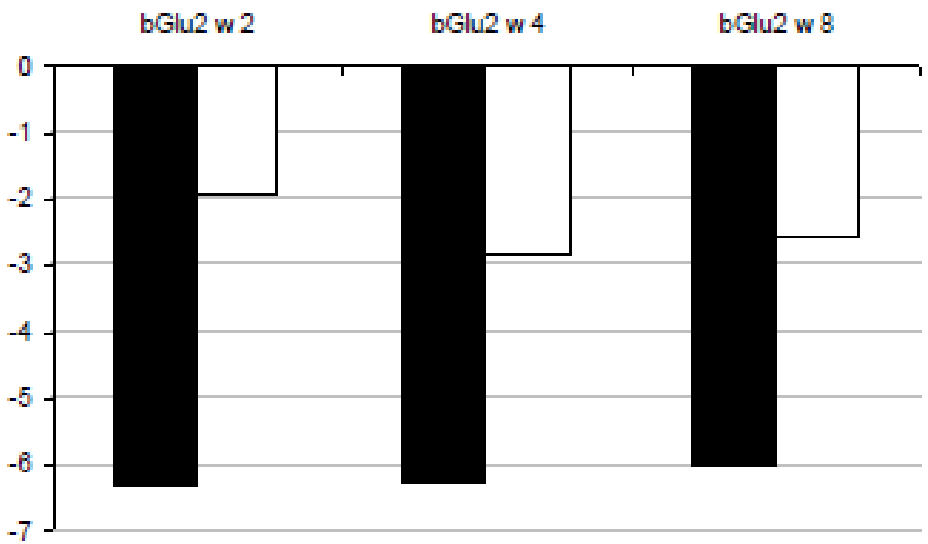
Fungal DNA and gene expression studies



Postia placenta gene expression during growth in furfurylated wood

Alfredsen and Fossdal (2010), IRG/WP 10-10734

- ✓ Genes involved in oxidative degradation: furfurylated ≥ untreated
- ✓ Genes involved in enzymatic degradation: furfurylated ≤ untreated
- ✓ Wood moisture content : Pine > FA

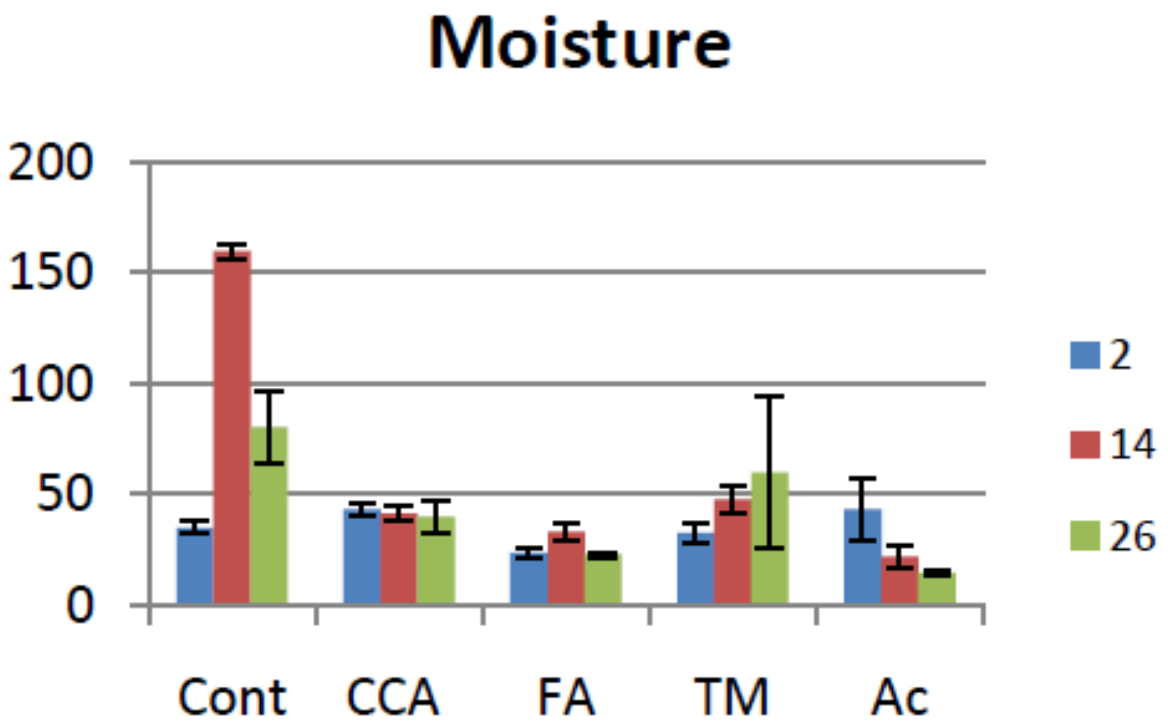


bGlu2

Molecular investigation of *Postia placenta* growing in modified wood

Schmöllerl *et al.* (2011), IRG/WP 11-10756

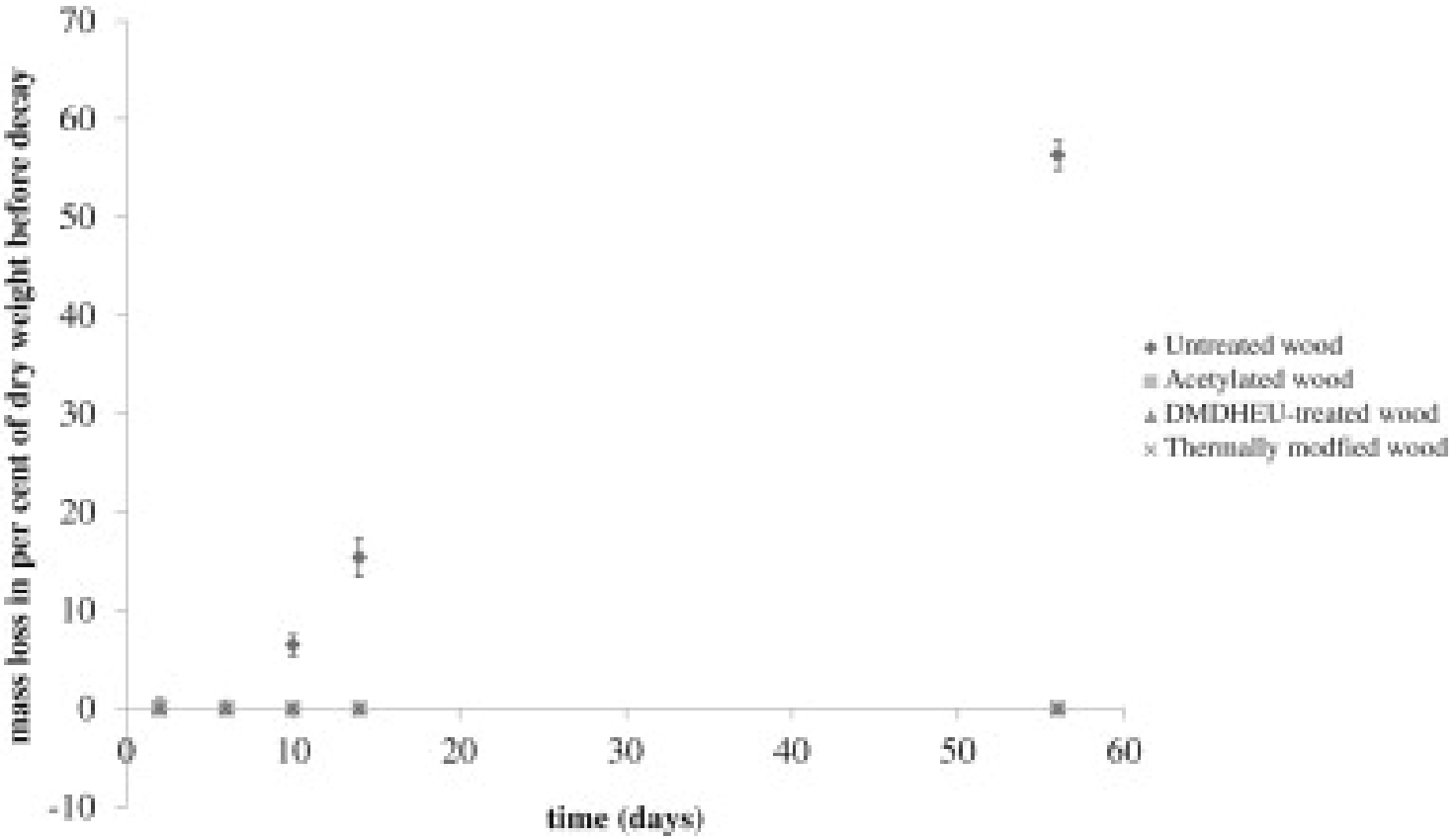
- ✓ DNA and gene expression measured even when no mass loss
- ✓ Genes involved in oxidative degradation: modified ≥ untreated
- ✓ Wood moisture content : Pine > modified wood



Effect of wood modification on gene expression during incipient *Postia placenta* decay

Ringman *et al.* (2014) Int. Biodeterior. Biodegrad (in press)

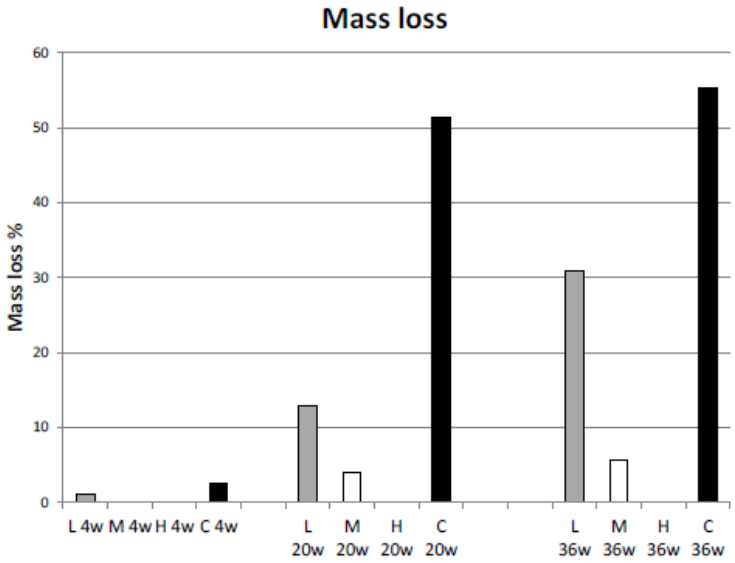
- ✓ Gene expression measured even when no mass loss
- ✓ Genes involved in oxidative degradation: modified ≥ untreated
- ✓ Genes involved in enzymatic degradation: modified ≤ untreated

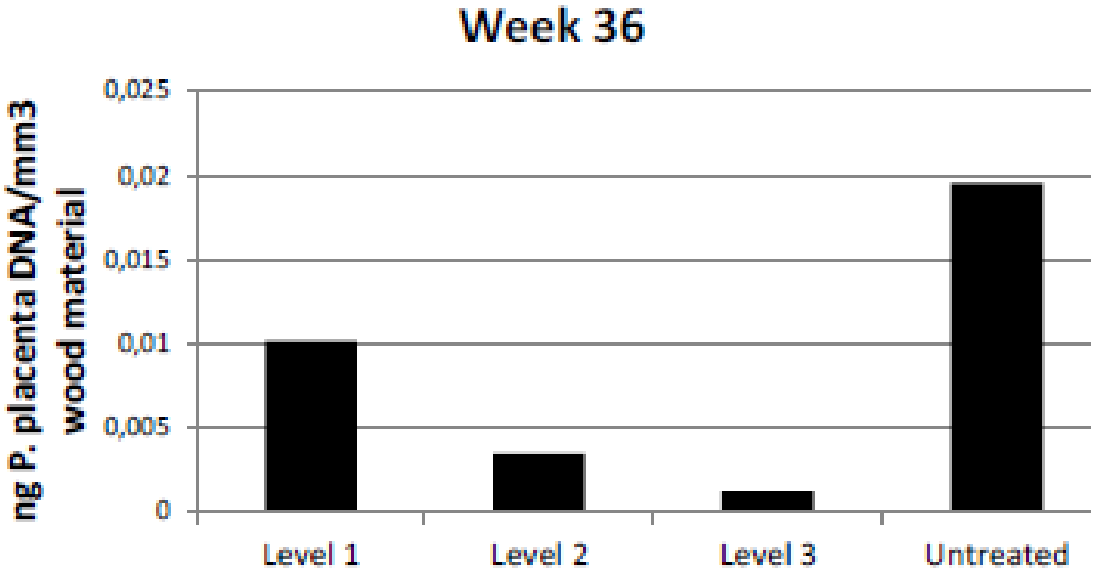


The effects of acetylation level on the growth of *Postia placenta* over 36 weeks

Pilgård *et al.* (2012), IRG/WP 12-40589

- ✓ DNA and gene expression measured even when no mass loss
- ✓ Genes involved in oxidative degradation: acetylated ≥ untreated
- ✓ Wood moisture content : Pine > acetylated

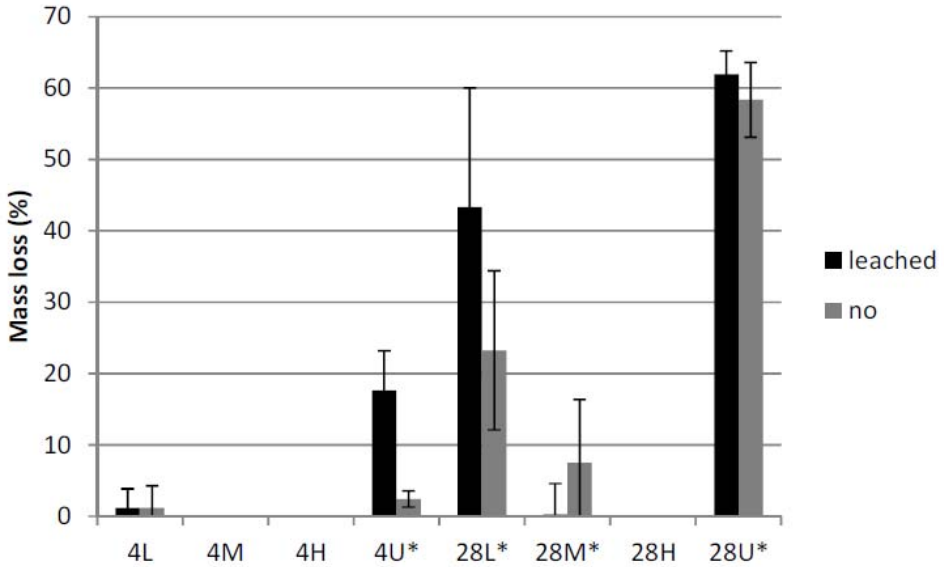


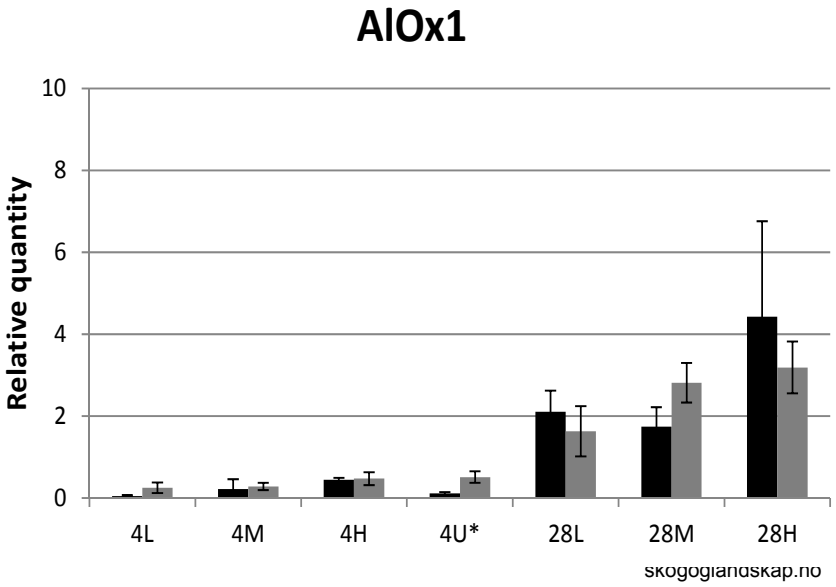


Postia placenta decay of acetic anhydride modified wood – effect of leaching

Alfredsen and Pilgård (2014), Wood Material Science & Engineering, in press

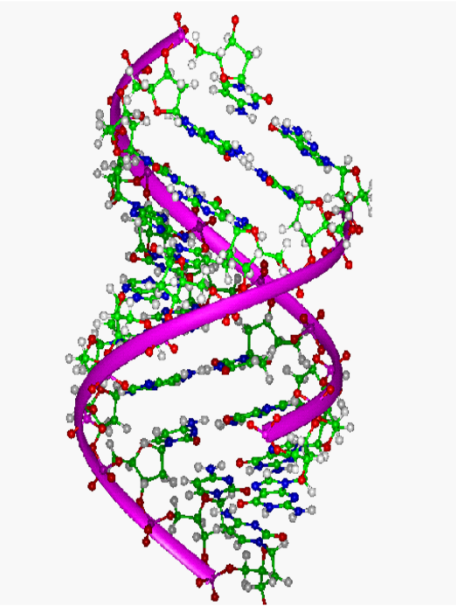
- ✓ DNA and gene expression measured even when no mass loss
- ✓ Genes involved in oxidative degradation: acetylated ≥ untreated
- ✓ Wood moisture content : Pine > acetylated wood
- ✓ The high acetylation level expressed higher levels of genes involved in oxidative degradation at week 28 compared to untreated wood at 4 weeks even if no mass loss was detected.





Conclusion


The Future
NEXT EXIT



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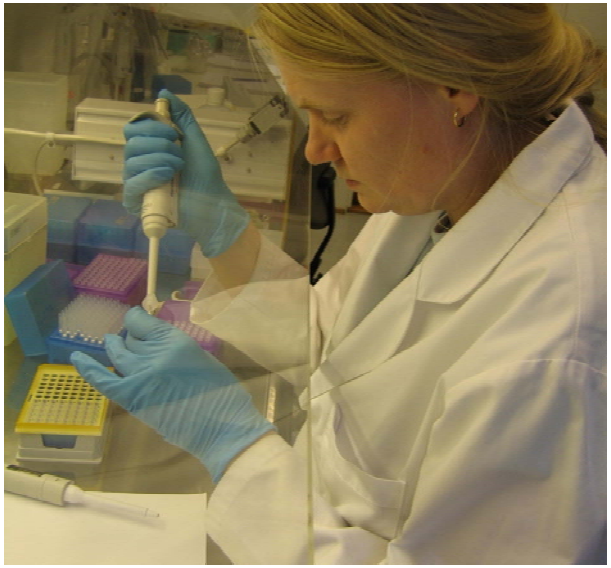

Knowledge for environment and innovation

Thanks for your attention!

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