Carlsberg Research Laboratory
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CARLSBERG LABORATORIUM

BERETNING FOR ÅRET 2015

TIL CARLSBERG LABORATORIUM ER KNYTTET FØLGENDE VIDENSKABELIGE MEDARBEJDERE OG PHD-STUDERENDE:

Birgitte Skadhauge, VP Group Research, er forskningsdirektør for Carlsberg Laboratorium.

Råmaterialer

Professor Geoff Fincher
Science Manager Dr. Ilka Braumann
Science Manager Dr. Jesper Harholt
Science Manager Dr. Pai Rosager Pedas
Seniorforsker Dr. Anita Jansson Mathiesen
Dr. Malene Dinesen
Dr. Jonatan Fangel
Dr. Christine Finnie
Dr. Andreas Hansson
Dr. Lea Møller Jensen
Dr. Stinus Lindgreen
Dr. Lucia Marri
Dr. Christian Poulsen
Dr. José Cuesta Seijo
Dr. Alexander Striebeck
M.Sc. Katarzyna Krucewicz

Ingredienser

Professor Birger Lindberg Møller
Dr. Renil Manat
Dr. Fen Qin
Dr. Gen Li

Gærbiologi

Professor Jürgen Wendland
Science Manager Dr. Marta Hanna Miks-Krajnik
Seniorforsker Dr. Claes Gjermansen
Dr. Claudia Kempf
Dr. Klaus Lengeler
Dr. Davide Ravasio

Dr. Gemma Buron Moles
Dr. Morten Thrane Nielsen
Ph.d.-studerende Klara Junker

Carlsberg Laboratorium er en del af Carlsberg Group Research.

FØLGENDE ARBEJDER ER PUBLICERET INDTIL UDGANGEN AF 2015:

Beeren, S.R., Christensen, C.E., Tanaka, H., Jensen, M.G., Donaldson, I. and Hindsgaul, O. (2015) Direct study of fluorescently-labelled barley β-glucan fate in an in vitro human colon digestion model. Carbohydrate Polymers, 115, 88-92.

Beeren, S.R. and Meier, S. (2015) Supramolecular chemical shift reagents inducing conformational transitions: NMR analysis of carbohydrate homooligomer mixtures. Chemical Communications, 51, 3073-3076.

Bertram, N., Laursen, T., Barker, R., Bavishi, K., Moller, B.L. and Cardenas, M. (2015) Nanodisc Films for Membrane Protein Studies by Neutron Reflection: Effect of the Protein Scaffold Choice. Langmuir, 31, 8386-8391.

Bojstrup, M., Marri, L., Lok, F. and Hindsgaul, O. (2015) A Chromogenic Assay Suitable for High-Throughput Determination of Limit Dextrinase Activity in Barley Malt Extracts. Journal of Agricultural and Food Chemistry, 63, 10873-10878.

Clausen, M., Kannangara, R.M., Olsen, C.E., Blomstedt, C.K., Gleadow, R.M., Jorgensen, K., Bak, S., Motawie, M.S. and Moller, B.L. (2015) The bifurcation of the cyanogenic glucoside and glucosinolate biosynthetic pathways. Plant Journal, 84, 558-573.

Dockter, C. and Hansson, M. (2015) Improving barley culm robustness for secured crop yield in a changing climate. Journal of Experimental Botany, 66, 3499-3509.

Frederiksen, R.F., Yoshimura, Y., Storgaard, B.G., Paspaliari, D.K., Petersen, B.O., Chen, K., Larsen, T., Duus, J.O., Ingmer, H., Bovin, N.V. et al. (2015) A Diverse Range of Bacterial and Eukaryotic Chitinases Hydrolyzes the LacNAc (Galβ1-4GlcNAc) and LacdiNAc (GalNAcβ1-4GlcNAc) Motifs Found on Vertebrate and Insect Cells. Journal of Biological Chemistry, 290, 5354-5366.

Gallage, N.J. and Moller, B.L. (2015) Vanillin-Bioconversion and Bioengineering of the Most Popular Plant Flavor and Its De Novo Biosynthesis in the Vanilla Orchid. Molecular Plant, 8, 40-57.

Hald, H., Wu, B.Q., Bouakaz, L. and Meldal, M. (2015) A single-vector EYFP reporter gene assay for G protein-coupled receptors. Analytical Biochemistry, 476, 40-44.

Lai, D., Picmanova, M., Abou Hachem, M., Motawia, M.S., Olsen, C.E., Moller, B.L., Rook, F. and Takos, A.M. (2015) Lotus japonicus flowers are defended by a cyanogenic β-

glucosidase with highly restricted expression to essential reproductive organs. Plant Molecular Biology, 89, 21-34.

Laursen, T., Moller, B.L. and Bassard, J.E. (2015) Plasticity of specialized metabolism as mediated by dynamic metabolons. Trends in Plant Science, 20, 20-32.

Lerche, M.H., Jensen, P.R., Karlsson, M. and Meier, S. (2015) NMR Insights into the Inner Workings of Living Cells. Analytical Chemistry, 87, 119-132.

Møller B.L., Skadhauge B. Byg for fremtiden på Carlsberg Laboratorium. Carlsbergfondet Årsskrift 2015.

Moller, M.S., Vester-Christensen, M.B., Jensen, J.M., Abou Hachem, M., Henriksen, A. and Svensson, B. (2015) Crystal Structure of Barley Limit Dextrinase-Limit Dextrinase Inhibitor (LD-LDI) Complex Reveals Insights into Mechanism and Diversity of Cereal Type Inhibitors. Journal of Biological Chemistry, 290, 12614-12629.

Moller, M.S., Windahl, M.S., Sim, L., Bojstrup, M., Abou Hachem, M., Hindsgaul, O., Palcic, M., Svensson, B. and Henriksen, A. (2015) Oligosaccharide and Substrate Binding in the Starch Debranching Enzyme Barley Limit Dextrinase. Journal of Molecular Biology, 427, 1263-1277.

Neilson, E.H., Edwards, A.M., Blomstedt, C.K., Berger, B., Moller, B.L. and Gleadow, R.M. (2015) Utilization of a high-throughput shoot imaging system to examine the dynamic phenotypic responses of a C-4 cereal crop plant to nitrogen and water deficiency over time. Journal of Experimental Botany, 66, 1817-1832.

Niero, M., Manat, R., Møller, B.L., Olsen, S.I. Challenges and opportunities in using Life Cycle Assessment and Cradle to Cradle® for biodegradable bio-based polymers: a review. Proceedings. LCA for "Feeding the planet and energy for life," Stresa; Expo 2015 Milano, Italy. October 6-8, 2015.

Pentzold, S., Zagrobelny, M., Bjarnholt, N., Kroymann, J., Vogel, H., Olsen, C.E., Moller, B.L. and Bak, S. (2015) Metabolism, excretion and avoidance of cyanogenic glucosides in insects with different feeding specialisations. Insect Biochemistry and Molecular Biology, 66, 119-128.

Petersen, B.O., Motawie, M.S., Moller, B.L., Hindsgaul, O. and Meier, S. (2015) NMR characterization of chemically synthesized branched alpha-dextrin model compounds. Carbohydrate Research, 403, 149-156.

Picmanova, M., Neilson, E.H., Motawia, M.S., Olsen, C.E., Agerbirk, N., Gray, C.J., Flitsch, S., Meier, S., Silvestro, D., Jorgensen, K. et al. (2015) A recycling pathway for cyanogenic glycosides evidenced by the comparative metabolic profiling in three cyanogenic plant species. Biochemical Journal, 469, 375-389.

Skryhan, K., Cuesta-Seijo, J.A., Nielsen, M.M., Marri, L., Mellor, S.B., Glaring, M.A., Jensen, P.E., Palcic, M.M. and Blennow, A. (2015) The Role of Cysteine Residues in Redox Regulation and Protein Stability of Arabidopsis thaliana Starch Synthase 1. PLOS ONE, 10.

Sorndech, W., Meier, S., Jansson, A.M., Sagnelli, D., Hindsgaul, O., Tongta, S. and Blennow, A. (2015) Synergistic amylomaltase and branching enzyme catalysis to suppress cassava starch digestibility. Carbohydrate Polymers, 132, 409-418.

Wagner, G.K., Pesnot, T., Palcic, M.M. and Jorgensen, R. (2015) Novel UDP-GaINAc Derivative Structures Provide Insight into the Donor Specificity of Human Blood Group Glycosyltransferase. Journal of Biological Chemistry, 290, 31162-31172.

Walther, A., Ravasio, D., Qin, F., Wendland, J. and Meier, S. (2015) Development of brewing science in (and since) the late 19th century: Molecular profiles of 110-130 year old beers. Food Chemistry, 183, 227-234.

Wang, S., Cuesta-Seijo, J.A., Striebeck, A., Lafont, D., Palcic, M.M. and Vidal, S. (2015) Design of Glycosyltransferase Inhibitors: Serine Analogues as Pyrophosphate Surrogates? ChemPlusChem, 80, 1525-1532.

Wasserstrom, L., Lengeler, K., Walther, A. and Wendland, J. (2015) Developmental Growth Control Exerted via the Protein A Kinase Tpk2 in Ashbya gossypii. Eukaryotic Cell, 14, 593-601.

Zakhrabekova, S., Dockter, C., Ahmann, K., Braumann, I., Gough, S.P., Wendt, T., Lundqvist, U., Mascher, M., Stein, N. and Hansson, M. (2015) Genetic linkage facilitates cloning of Ert-m regulating plant architecture in barley and identified a strong candidate of Ant1 involved in anthocyanin biosynthesis. Plant Molecular Biology, 88, 609-626.

ABSTRACTS VED KONFERENCER:

Gürdeniz G, Jensen, M.G., Bech, L., Lund, E., Dragsted, L.O. Effect of beer intake on LC-MS plasma and urine profiles. 12th European Nutrition Conference (FENS), Berlin, Germany. October 20-23, 2015.

Harholt, J., Jensen, J.K., Scheller, H.V., Ulvskov, P. Xylan biosynthesis - details of the WHEN question. Gordon Research Conference on Plant Cell Walls, Boston, USA. July 12-17, 2015.

Hebelstrup, K.H., Nielsen, M.M., Carciofi, M., Krucewicz, K., Shaik, S.S., Andreas Blennow, A., Palcic, M.M. Functionality of granule-bound starch synthase from the waxy barley cultivar CDC Alamo. 11th Carbohydrate Bioengineering Meeting, Espoo, Finland. May 10-13, 2015.

Skadhauge, B. Business meets vigilant barley and yeast research. 17th Australian Barley Technical Symposium. September 13-16, 2015.

Skadhauge, B. Malting barley fit for new challenges. 35th European Brewery Convention, Porto, Portugal. May 24-28, 2015.

Villette, C., Didierjean, L., Schaller, H. Brassinosteroid signalling in Barley: A genetic approach. Selection and characterization of semi-dwarf mutants. Poster at 1st general Ecost meeting, IPK, Gatersleben, Germany. June 22-24, 2015.

Wasserstrom, L., Lengeler, K., Walther, A., Wendland, J. Regulation of sporulation in Ashbya gossypii. Fungal Genetics Conference, Asilomar, California, USA. March 17-22, 2015.

PATENTER OG PATENTANSØGNINGER:

Breddam, K., Olsen, O., Skadhauge, B., Lok, F., Knudsen, S., Bech, L.M. Barley for production of flavor-stable beverage. Patent no.: AR049008B1.

Donaldson, I,. Vaag, P. Stable haze for beverages. Publ. no.: WO2015086027.

Douma, A., Doderer, A., Cameron-Mills, V., Skadhauge, B., Bech, L., Schmitt, N., Heistek, J., Van Mechelen, J. Low lipoxygenase 1 barley. Patent no.: CA2433250.

Garde, A., Rype, J-U. An electro-membrane separation system. Patent no.: ZL201280005294.6.

Garde, A., Rype, J-U. Method and system for improved process parameter control of a liquid composition in a reverse electro-enhanced dialysis (REED) system. Patent no.: MX327983; US8961769; US9216387.

Garde, A., Rype, J-U. Process for controlling the pH and level of target ions of a liquid composition. Patent no.: AU2009289737; MX334730; US9156002.

Gojkovic, Z., Vaag, P., Garde, A. Flavour stable beverages. Publ. no.: WO2015/101377.

Knudsen, S., Hambraeus, G., Bech, L. M., Soerensen, S. B., Skadhauge, B., Breddam, K., Olsen, O. Barley and malt-derived beverages with low DMS level. Patent no.: AP3392; JP5774997.

Knudsen, S., Riis, P., Skadhauge, B., Bech, L. M., Olsen, O. Energy saving brewing method. Patent no.: SG185696.

Meldal, M., Renil, M. Cellulose based polymer material. Patent no.: EA02176.

Meldal, M., Renil, M., Vesborg, S. Coating of hydroxylated surfaces by gas phase grafting. Patent no.: AU2009328762; PH1-2011-501236.

Skadhauge, B., Lok, F., Breddam, K., Olsen, O., Bech, L. M., Knudsen, S. Barley with reduced lipoxygenase activity and beverage prepared therefrom. Patent no.: MY-155960-A.

CARLSBERG LABORATORIUM

Regnskab 1. januar 2015 - 31. december 2015 i hovedtal

INDTÆGTER i t.kr.	**2015**	**2014**
Carlsbergfondet	19.000	17.000
Carlsbergfondet ekstraordinær bevilling	2.473	1.104
Carlsbergfondet regulering vedr. tidligere år	602	2.688
EU forskningsprogrammer	1.328	1.794
Øvrige indtægter	1.337	1.634
	24.740	24.220
Carlsberg A/S	3.602	630
	28.342	24.850
Omkostninger		
Gager	16.890	19.067
Laboratoriematerialer og prøver m.m.	8.166	3.363
Anskaffelser og vedligehold m.m.	2.221	1.593
Konferencer, projekter og møder mm.	0	17
Rejser og repræsentation	247	441
Ph.d.-afgift	130	50
Personaleomkostninger (gæster m.m.)	577	132
Øvrige omkostninger	111	187
	28.342	24.850

Hertil kommer indirekte omkostninger på skønsmæssigt 13,0 mio. kr. i 2015 og 12,4 mio. kr. for 2014.