

Curriculum Vitae

Svein Jarle Horn
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Date of Birth: 28 October 1970

Citizenship: Norwegian

Education

- 1996-2000 PhD (Dr. ing.) in Environmental Biotechnology. Title: *Bioenergy from Brown seaweeds*.
Norwegian University of Science and Technology (NTNU), Trondheim.
- 1995-1996 MSc in Biotechnology, thesis work. Title: *Ammonium removal from waste water by combining nitrification to nitrite and anaerobic ammonium oxidation*.
Technical University of Delft, The Netherlands.
- 1991-1995 MSc education (siv. ing.).
The Technical University of Norway (NTH), Trondheim.

Employment

- 2009-present Senior scientist in Seaweed Energy Solutions AS; Processing of seaweed to bioethanol and biogas.
- 2005-present Senior researcher in the group of Vincent Eijsink. Research on chitin/chitinases, cellulose disrupting proteins, enzymatic hydrolysis of barley and BSG. From 2007 mainly work with enzymatic hydrolysis of steam-exploded lignocellulose for bioethanol production. Also some activity related to biogas production.
- 2002-2005 Post. Doc. in the group of Vincent Eijsink. Involved in research on chitinases and fish waste hydrolysis. Norwegian University Life Sciences (UMB), Dep. of Chemistry, Biotechnology and Food Science.
- 1996 Worked as process engineer at Kværner Water Systems, Sandefjord, Norway. This included running a pilot plant for an activated sludge process (HCR).

Additional

Languages: Norwegian, Swedish, Danish, English: Fluent. German, Dutch: Basic

Awards: 1st place for “outstanding work and communication” made at the 16th International Seaweed Symposium held in the Philippines in 1998 (Reference [4]).

Sensor: Department of biotechnology, NTNU.

Referee: Process Biochemistry

Journal of Industrial Microbiology and Biotechnology

Journal of Applied Phycology

Publications (peer-reviewed journals)

- [1] Jetten, M.S.M., Horn, S.J., van Loosdrecht, M.C.M., 1997, Towards a more sustainable municipal wastewater treatment system. *Water Science and Technology*, **35**(9), 171-180.
- [2] Moen, E., Horn, S., Ostgaard, K., 1997, Biological degradation of *Ascophyllum nodosum*. *Journal of Applied Phycology*, **9**(4), 347-357.
- [3] Moen, E., Horn, S., Ostgaard, K., 1997, Alginate degradation during anaerobic digestion of *Laminaria hyperborea* stipes. *Journal of Applied Phycology*, **9**(2), 157-166.
- [4] Horn, S.J., Moen, E., Ostgaard, K., 1999, Direct determination of alginate content in brown algae by near infra-red (NIR) spectroscopy. *Journal of Applied Phycology*, **11**(1), 9-13.
- [5] Horn, S.J., Aasen, I.M., Ostgaard, K., 2000, Ethanol production from seaweed extract. *Journal of Industrial Microbiology & Biotechnology*, **25**(5), 249-254.
- [6] Horn, S.J., Aasen, I.M., Ostgaard, K., 2000, Production of ethanol from mannitol by *Zymobacter palmae*. *Journal of Industrial Microbiology & Biotechnology*, **24**(1), 51-57.
- [7] Horn, S.J., Ostgaard, K., 2001, Alginate lyase activity and acidogenesis during fermentation of *Laminaria hyperborea*. *Journal of Applied Phycology*, **13**(2), 143-152.
- [8] Horn, S.J., Eijsink, V.G.H., 2004, A reliable reducing end assay for chito-oligosaccharides. *Carbohydrate Polymers*, **56**(1), 35-39.
- [9] Aspmo, S.I., Horn, S.J., Eijsink, V.G.H., 2005, Enzymatic hydrolysis of Atlantic cod (*Gadus morhua* L.) viscera. *Process Biochemistry*, **40**(5), 1957-1966.
- [10] Hoell, I.A., Klemsdal, S.S., Vaaje-Kolstad, G., Horn, S.J., Eijsink, V.G., 2005, Overexpression and characterization of a novel chitinase from *Trichoderma atroviride* strain P1. *Biochim Biophys Acta*, **1748**(2), 180-90.
- [11] Sikorski, P., Stokke, B.T., Sorbotten, A., Varum, K.M., Horn, S.J., Eijsink, V.G., 2005, Development and application of a model for chitosan hydrolysis by a family 18 chitinase. *Biopolymers*, **77**(5), 273-85.
- [12] Sorbotten, A., Horn, S.J., Eijsink, V.G., Varum, K.M., 2005, Degradation of chitosans with chitinase B from *Serratia marcescens*. Production of chito-oligosaccharides and insight into enzyme processivity. *Febs J*, **272**(2), 538-49.
- [13] Aspmo, S.I., Horn, S.J., Eijsink, V.G.H., 2005, Use of hydrolysates from Atlantic cod (*Gadus morhua* L.) viscera as complex nitrogen source for lactic acid bacteria. *FEMS Microbiology Letters*, **248**(1), 65-68.
- [14] Aspmo, S.I., Horn, S.J., Eijsink, V.G.H., 2005, Hydrolysates from Atlantic cod (*Gadus morhua* L.) viscera as components of microbial growth media. *Process Biochemistry*, **40**(12), 3714-3722.
- [15] Horn, S.J., Aspmo, S.I., Eijsink, V.G.H., 2005, Growth of *Lactobacillus plantarum* in media containing hydrolysates of fish viscera. *Journal of Applied Microbiology*, **99**(5), 1082-1089
- [16] Vaaje-Kolstad, G., Horn, S.J., van Aalten, D.M.F., Synstad, B., Eijsink, V.G.H., 2005, The non-catalytic chitin-binding protein CBP21 from *Serratia marcescens* is essential for chitin degradation. *Journal of Biological Chemistry*, **280** (31), 28492-28497.
- [17] Horn, S.J., Sørli, M., Vaaje-Kolstad, G., Norberg, A.L., Synstad, B., Vårum, K.M., Eijsink, V.G.H., 2006, Comparative studies of chitinases A, B and C from *Serratia marcescens*. *Biocatalysis and Biotransformation*, **24** (1/2), 39-53.
- [18] Horn, S.J., Sørbotten, A., Synstad, B., Sikorski, P., Sørli, M., Vårum, K.M., Eijsink, V.G.H., 2006, Endo/exo mechanism and processivity of three family 18 chitinases that make up the chitinolytic machinery of *Serratia marcescens*. *Febs Journal*, **273**, 491-503.

[19] Sikorski, P., Sørbotten, A., Horn, S.J., Eijsink, V.G.H., Vårum, K.M., 2006, *Serratia marcescens* chitinases with “tunnel-shaped” substrate-binding grooves show endo-activity and different degrees of processivity during enzymatic hydrolysis of chitosan, *Biochemistry*, **45**, 9566-9574.

[20] Horn, S.J., Sikorski, P., Cederkvist, J.B., Vaaje-Kolstad, G., Sørlie, M., Synstad, B., Vriend, G., Vårum, K.M., Eijsink, V.G.H., 2006, Costs and benefits of processivity in enzymatic degradation of recalcitrant polysaccharides. *PNAS*, **103** (48), 18089-18094.

[21] Horn, S.J., Aspmo, S.I., Eijsink, V.G.H., 2007, Evaluation of different cod viscera fractions and their seasonal variation used in a growth medium for lactic acid bacteria. *Enzyme and Microbial Technology*, **40**, 1328-1334.

[22] Krokeide, I.M., Synstad, B., Gåseidnes, S., Horn, S.J., Eijsink, V.G.H., Sørlie, M., 2007, Natural Substrate Assay for Chitinases Using High Performance Liquid Chromatography: A Comparison with Existing Assays. *Analytical biochemistry*, **363**, 128-134.

[23] Synstad, B., Vaaje-Kolstad, G., Cederkvist, F.H., Saua, S.F., Horn, S.J., Eijsink, V.G.H., Sørlie, M., 2008, Natural Expression and characterization of endochitinase C from *Serratia marcescens* B JL200 and its purification by a one-step general chitinase purification method. *Bioscience, Biotechnology, and Biochemistry*. **72** (3), 715-723.

[24] Treimo, J.R., Eijsink, V.G.H., Horn, S.J., 2008, Enzymatic solubilization of proteins in brewer's spent grain. *J. Agric. Food Chem.*, **56** (13), 5359-5365.

[25] Eijsink, V.G.H., Vaaje-Kolstad, G., Vårum, K. M., Horn, S.J., 2008, Towards new enzymes for biofuels: lessons from chitinase research. *Trends in Biotechnology*, **26** (5), 228-235.

[26] Treimo, J., Westereng, B., Horn, S.J., Forssell, P., Robertson, J., Faulds, C., Waldron, K., Buchert, J., Eijsink, V.G.H., 2009, Enzymatic solubilization of brewers' spent grain by combined action of carbohydrases and peptidases. *J. Agric. Food Chem.*, **57**, 3316-3324.

[27] Zakariassen, H., Aam, B.B., Horn, S.J., Vårum, K.M., Sørlie, M., Eijsink, V.G.H., 2009, Aromatic residues in the catalytic center of Chitinase A from *Serratia marcescens* affect processivity, enzyme activity and biomass-converting efficiency. *Journal of Biological Chemistry*, **284**, 10610-10617.

[28] Horn, S.J., Eijsink, V.G.H., 2010, Enzymatic hydrolysis of steam exploded hardwood using short processing times. *Bioscience, Biotechnology, and Biochemistry*, **74** (6), 1157-1163.

[29] Vaaje-Kolstad, G., Westereng, B., Horn, S.J., Liu, Z., Zhai, H., Sørlie, M., and Eijsink, V.G.H., 2010, An Oxidative Enzyme Boosting the Enzymatic Conversion of Recalcitrant Polysaccharides. *Science*, **330** (6001), 219-222.

[30] Horn, S.J., Nguyen, Q.D., Westereng, B., Nilsen, P., Eijsink, V.G.H., 2011, Optimization of steam explosion of wheat straw for enzymatic hydrolysis and ethanol fermentation, *submitted*

[31] Blomqvist, J., South, E., Tiukova, L., Haddad, Momeni, M.H., Hansson, H., Ståhlberg, J., Horn, S.J., Schnürer, J., Passoth, V., 2011, Fermentation of lignocellulosic hydrolysate by the alternative industrial ethanol yeast *Dekkera bruxellensis*, *Letters in Applied Microbiology*, **53** (1), 73-78.

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[35] Treimo, J., Westereng, B., Horn, S.J., Forssell, P., Robertson, J., Faulds, C., Waldron, K., Buchert, J., Eijsink, V.G.H., 2011, Comparison of enzymatic hydrolyzability of proteins and polysaccharides in brewers` spent grain from different European breweries. *Manuscript*.

Books/Book Chapters

Horn, S.J., 2009, Seaweed Biofuels: Production of Biogas and Bioethanol from Brown Macroalgae. VDM Verlag. ISBN 978-3-639-15307-1.

Horn, S.J., 2011, A tetra transition away from fossil fuels. In: The changing environment for human security: New agendas for research, policy, and action. Eds. O'Brien, K., Sygna, L. And Wolf, J. In press.

Other publications

Aasen, IM og Horn, SJ (1998) Etanolproduksjon fra marine makroalger. Ekstraksjon og fermentering av laminaran og mannitol. STF66 F98019. (Ethanol production from marine macroalgae. Extraction and fermentation of laminaran and mannitol).

Aasen, IM og Horn, SJ (1999) Etanolproduksjon fra marine makroalger. Rapport nr 3: Fermentering med *Pichia angophorae* og *Zymobacter palmae*. STF66 F99058. (Ethanol production from marine macroalgae. Fermentation with *Pichia angophorae* and *Zymobacter palmae*).

Svein Horn og Vincent Eijsink, 2007, Det koster å være prosessiv, *NBS Nytt*, 1, 31-33. (Article about enzymatic processivity published in the newsletter of the Norwegian Biochemical Society).

Odd Inge Forsberg og Svein Jarle Horn, 2007, En norsk integral politikk, *Visjon nr. 5* (Article analyzing Norwegian politics using Ken Wilber's integral theory).

Erling Thuen , Odd Magne Harstad , Torstein H. Garmo , Harald Volden , Øystein Holand , Svein Jarle Horn , Vincent Eijsink , John Morken , Petter Heyerdahl , Hanne Sjølie , Birger Solberg , Lars Bakken , Trine Aulstad Sogn , Tormod Briseid , Arne Grønlund , Simen Gjølshjøl , Bjørn Langerud , Nicholas Clarke, Hans Fredrik Hoen (red), Erik Trømborg (red), Anders Nielsen (red), 2007, Klimagasser og bioenergi fra landbruket - kunnskapsstatus og forskningsbehov. UMB rapport. (Greenhouse gases and bioenergy from the agricultural sector – Knowledge status and research needs).

Svein Jarle Horn. 2008, Et nytt kulturtrinn, *Visjon nr. 5* (A new stage of cultural development).

Svein Jarle Horn. 2009, Ken Wilbers Integral Spiritualitet, *Visjon nr. 2* (Ken Wilber's Integral Spirituality).