

VITAE AND PUBLICATIONS LIST

Robert W. Hutkins
University of Nebraska
Department of Food Science and Technology
258 Food Industry Complex
Lincoln, Nebraska 68588-6205
402-472-2820 rhutkins1@unl.edu

EDUCATION

Ph.D. in Food Microbiology, 1984, University of Minnesota.

M.S. in Food Science, 1980, University of Missouri.

B.S. in Food Science, 1979, University of Missouri.

PROFESSIONAL EXPERIENCE

1987 - Present: Professor, Department of Food Science and Technology, University of Nebraska-Lincoln.

1986 - 1987: Research Scientist, Sanofi Bio Ingredients, Inc., Waukesha, Wisconsin.

1984 - 1986: Post-Doctoral Research Associate, Boston University School of Medicine, Department of Microbiology, Boston, Massachusetts.

RESEARCH INTERESTS

The Hutkins Lab studies bacteria important in fermented foods and in human health. We are particularly interested in understanding: (1) factors affecting persistence and colonization of probiotic bacteria in the gastrointestinal tract; (2) how prebiotics shift the intestinal microbiota and metabolic activities in humans and animals; and (3) how such shifts affect host health. We address these questions using next generation sequencing, metagenomics, and other molecular techniques. Both clinical, *in vivo*, as well as *in vitro* approaches are used. We are also interested in the specific molecular mechanisms and pathways used by probiotic lactic acid bacteria and bifidobacteria to metabolize prebiotic oligosaccharides. Finally, our group has begun to develop application strategies for incorporating prebiotics into foods.

PROFESSIONAL SERVICE ACTIVITIES

Board of Directors, International Scientific Association for Probiotics and Prebiotics

Editorial Board, Academic Press (1997 - Present)

Associate Editor, Microbiology (2001 - 2006)

Editorial Board, Applied and Environmental Microbiology, 1989-1998

Editorial Board, Journal of Food Protection, 1988-2000

Past Chair, Expert Panel on Food Safety and Nutrition, Institute of Food Technologists

Past Chair, Biotechnology Division, Institute of Food Technologists, 2006-2008

Scientific Advisory Board, International Probiotic Association (2006 – 2015)

Scientific Advisory Board, GTC Nutrition (2005 – 2011)

Food Doc Columnist, Lincoln Journal Star (October 2011 - Present)

HONORS AND AWARDS

University of Nebraska Darrell Nelson Award for Excellence in Graduate Advising, 2013
Institute of Food Technologist Fellow, 2010
Khem Shahani Professorship, 2005 - Present
American Society for Microbiology Waksman Foundation Lecturer, 2002 - 2004
University of Nebraska Holling Award for Teaching Excellence, 2001
University of Nebraska Junior Faculty Recognition for Excellence in Research, 1995
University of Nebraska Teaching Council Recognition Award (Multiple years)

PUBLICATIONS (since 2006)

- Makarova, K., A. Slesarev, Y. Wolf, A. Sorokin, B. Mirkin, E. Koonin, A. Pavlov, N. Pavlova, V. Karamychev, N. Polouchine, V. Shakhova, I. Grigoriev, Y. Lou, D. Rohksar, S. Lucas, K. Huang, D. M. Goodstein, T. Hawkins, V. Plengvidhya, D. Welker, J. Hughes, Y. Goh, A. Benson, K. Baldwin, J.-H. Lee, I. Díaz-Muniz, B. Dosti, V. Smeianov, W. Wechter, R. Barabote, G. Lorca, E. Altermann, R. Barrangou, B. Ganesan, Y. Xie, H. Rawsthorne, D. Tamir, C. Parker, F. Breidt, J. Broadbent, R. **Hutkins**, D. O'Sullivan, et al., 2006. Comparative genomics of the lactic acid bacteria. Proc. Natl. Acad. Sci. U.S.A. 103:15611-15616.
- Goh, Y.J., C. Zhang, A.K. Benson, V. Schlegel, J.-H. Lee, and R.W. **Hutkins**. 2006. Identification of a putative operon involved in fructooligosaccharide utilization by *Lactobacillus paracasei*. Appl. Environ. Microbiol. 72:7518-7530.
- Shoaf, K., G.L. Mulvey, G.D. Armstrong, and R.W. **Hutkins**. 2006. Prebiotic galactooligosaccharides reduce adherence of Enteropathogenic *Escherichia coli* to tissue culture cells. Infect. Immun. 74:6920-6928.
- Huebner, J., R.L. Wehling, and R.W. **Hutkins**. 2007. Functional activity of commercial prebiotics. Int. Dairy J. 17:770-775.
- Goh, Y.J., J.-H. Lee, and R.W. **Hutkins**. 2007. Functional analysis of the fructooligosaccharide utilization operon in *Lactobacillus paracasei* 1195. Appl. Environ. Microbiol. 73:5716-5724.
- Huebner, J., R.L. Wehling, A. Parkhurst, and R.W. **Hutkins**. 2008. Effect of processing conditions on the prebiotic activity of commercial prebiotics. Int. Dairy J. 18:287-293.
- Shoaf- Sweeney, K., and R.W. **Hutkins**. 2009. Adherence, anti-adherence, and oligosaccharides: preventing pathogens from sticking to the host. Advances in Food and Nutrition Research 55:101-161.
- Davis, L., I. Martinez, J. Walter, and R. **Hutkins**. 2010. A dose dependent impact of prebiotic galactooligosaccharides on the intestinal microbiota of healthy adults. Int. J. Food Microbiol. 144:285-292.
- Quintero, M.I., M.X. Maldonado, M.E. Perez, R. Jimenez, T. Fangman, J. Rupnow, A. Wittke, M. Russell, and R. **Hutkins**. 2011. Adherence Inhibition of *Cronobacter sakazakii* to intestinal epithelial cells by prebiotic oligosaccharides. Curr. Microbiol. 62:1448-1454.
- Goh, Y.G., C. Goin, S. O'Flaherty, E. Altermann, and R. **Hutkins**. 2011. Specialized adaptation of a lactic acid bacterium to the milk environment: the comparative genomics of *Streptococcus thermophilus* LMD-9. Microb. Cell Fact. 10:S22.

Davis, L., I. Martinez, J. Walter, C. Goin, and R. **Hutkins**. 2011. Barcoded pyrosequencing reveals that consumption of galactooligosaccharides results in a highly specific bifidogenic response in humans. *PLoS One* 6(9):e25200.

Ebersbach, T., J.B. Andersen, A. Bergström, R.W. **Hutkins**, and T.R. Licht. 2012. Xylooligosaccharides inhibit pathogen adhesion to enterocytes *in vitro*. *Res. Microbiol.* 163:22-27.

Brooks, J.C., B. Martinez, J. Stratton, A. Bianchini, R. Krokstrom, and R. **Hutkins**. 2012. Survey of raw milk cheeses for microbiological quality and prevalence of foodborne pathogens. *Food Microbiol.* 31:154-158.

Frese, S.A., R.W. **Hutkins**, and J. Walter. 2012. Comparison of the colonization ability of autochthonous and allochthonous strains of lactobacilli in the human gastrointestinal tract. *Adv. Microbiol.* 2:399-409.

Maldonado, M., T. Fangman, A.F. Pinto, J.H. Rupnow, and R.W. **Hutkins**. 2013. Inhibition of lectin adherence to tissue culture cells by prebiotic carbohydrates. *Adv. Biosci. Biotechnol.* 4:67-74.

Quintero, M., B. Aam, J. Rupnow, M. Sørli, V. Eijsink, and R.W. **Hutkins**. 2013. Adherence inhibition of enteropathogenic *Escherichia coli* by chitooligosaccharides with specific degrees of acetylation and polymerization. *J. Ag. Food Chem.* 61:2748-2754.

Hartzell, A.L., M.X. Maldonado, R.W. **Hutkins**, and D.J. Rose. 2013. Synthesis and *in vitro* digestion and fermentation of acylated inulin. *Bioactive Carbohydrates and Dietary Fibre.* 1:81-88.

Degner, B.M., K.M. Olson, D.J. Rose, V. Schlegel, R.W. **Hutkins**, and D.J. McClements. 2013. Influence of freezing rate variation on the microstructure and physicochemical properties of food emulsions. *J. Food Eng.* 119:244-253.

Hartzell, A.L., M.X. Maldonado, R.W. **Hutkins**, and D.J. Rose. 2013. In vitro digestion and fermentation of 5-formyl-aminosalicylate-inulin: a potential prodrug of 5-aminosalicylic acid. *Bioactive Carbohydrates and Dietary Fibre.* 2:8-14.

Blatchford, P., Ansell, J., de Godoy, M.R.C., Fahey, G., Garcia-Mazcorro, J.F., Gibson, G.R., Goh, Y.J., Hotchkiss, A.T., **Hutkins**, R., LaCroix, C., Rastall, R.A., Reimer, R., Schoterman, M., Van Sinderen, D., Venema, K., Whelan, K. 2014. Prebiotic mechanisms, functions and applications. *Int. J. Probiotics Prebiotics.* 8:109-132.

Degner, B.M., K.M. Olson, D.J. Rose, V. Schlegel, R.W. **Hutkins**, and D.J. McClements. 2014. Factors influencing the freeze-thaw stability of emulsion-based foods. *Comp. Rev. Food Sci. Food Safety.* 13:98-113.

Yang, J., M.X. Maldonado, R.W. **Hutkins**, and D.J. Rose. 2014. Production and *in vitro* fermentation of soluble, non-digestible, feruloylated oligo- and polysaccharides from maize and wheat brans. *J. Ag. Food Chem.* 62:159-166.

Quintero, M.I., A. Wittke, and R. **Hutkins**. 2014. Adherence inhibition of *Cronobacter sakazakii* to intestinal epithelial cells by lactoferrin. *Curr. Microbiol.* 69:574-579.

Rattanaprasert, M., S. Roos, J. Walter and R.W. **Hutkins**. 2014. Quantitative evaluation of synbiotic strategies to improve persistence and metabolic activity of *Lactobacillus reuteri* DSM 17938 in the human gastrointestinal tract. *J. Functional Foods* 10:85-94.

Maldonado-Gomez, M.X., H. Lee, D. Barile, M. Lu, and R.W. **Hutkins**. 2015. Adherence inhibition of enteric pathogens to epithelial cells by bovine colostrum fractions. *Int. Dairy J.* 40:24-32.

Duar, R.M., P.T. Ang, M. Hoffman, R. Wehling, R. **Hutkins**, and V. Schlegel. 2015. Processing effects on four prebiotic carbohydrates supplemented in an extruded cereal and a low pH drink. *Cogent Food & Agriculture* 1: 1013782.

Krumbeck, J.A., M.X. Maldonado-Gomez, I. Martínez, S.A. Frese, T.E. Burkey, K. Rasineni, A.E. Ramer-Tait, E.N. Harris, R.W. **Hutkins**, and J. Walter. 2015. *In vivo* selection to identify bacterial strains with enhanced ecological performance in synbiotic applications. *Appl. Environ. Microbiol.* 81:2445-2465.

Ramirez-Hernandez, A., J. Rupnow, and R.W. **Hutkins**. 2015. Reduction by mannan oligosaccharides and a high molecular weight component of cranberry extract of adherence to HEp-2 cells by *Campylobacter jejuni* and *Campylobacter coli*. *J. Food Prot.* 78:1496–1505.

Hutkins, R.W., J.A. Krumbeck, L.B. Bindels, P.D. Cani, G. Fahey, Jr., Y.J. Goh, B. Hamaker, E.C. Martens, D.A. Mills, R.A. Rastal, E. Vaughan, and M.E. Sanders. 2016. Prebiotics: why definitions matter. *Curr. Opin. Biotechnol.* 37:1–7.

Krumbeck, J.A. N.L. Marsteller, S.A. Frese, D.A. Peterson, A.E. Ramer-Tait, R.W. **Hutkins**, and J. Walter. 2016. Characterization of the ecological role of genes mediating acid resistance in *Lactobacillus reuteri* during colonization of the gastrointestinal tract. *Environ. Microbiol.* DOI: 10.1111/1462-2920.13108.

Krumbeck, J.A., M.X. Maldonado-Gomez, A.E. Ramer-Tait, and R.W. **Hutkins**. 2016. Prebiotics and synbiotics - dietary strategies for improving gut health. *Curr. Opin. Gastroenterol.* 32:110-119.

Maldonado-Gomez, M.X., I. Martínez, F. Bottacini, A. O’Callaghan, M. Ventura, D. van Sinderen, B. Hillmann, P. Vangay, D. Knights, R.W. **Hutkins**, and J. Walter. 2016. Stable engraftment of *Bifidobacterium longum* AH1206 in the human gastrointestinal tract depends on individualized features of the resident microbiome. *Cell Host Microbe.* 20:515–526.

Marco, M.L., D. Heeney, S. Binda, C.J. Cifelli, P.D. Cotter, B. Foligné, M. Gänzle, R. Kort, G. Pasin, A. Pihlanto, E.J. Smid, and R. **Hutkins**. 2017. Health benefits of fermented foods: microbiota and beyond. *Curr. Opin. Biotechnol.* 44:94-102.

Ivens, K., J. Baumert, R. **Hutkins**, and S. Taylor. 2017. Effect of proteolysis during Cheddar cheese aging on the detection of milk protein residues by ELISA. *J. Dairy Sci.* 100: 1629–1639.

Gibson, G.R., R. **Hutkins**, M.E. Sanders, S.L. Prescott, R.A. Reimer, S.J. Salminen, K. Scott, C. Stanton, K.S. Swanson, P.D. Cani, K. Verbeke, and G. Reid. 2017. Expert consensus document: The International Scientific Association for Probiotics and Prebiotics (ISAPP) consensus statement on the definition and scope of prebiotics. *Nat. Rev. Gastroenterol. Hepatol.* 14:491-502.

Books and Book Chapters (Since 2006):

Hutkins, R.W. 2006. *Microbiology and Technology of Fermented Foods*, 473 p. Blackwell-IFT Press, Ames, Iowa.

Hutkins, R.W. 2011. *Dairy Starter Cultures*. In *Encyclopedia of Biotechnology in Agriculture and Food* (D. Heldman, ed.). Marcel Dekker, Inc. New York.

Goh, J., and R.W. **Hutkins**. 2014. *Streptococcus thermophilus*. In *Encyclopedia of Food Microbiology*. Second edition. 554–559.