

海外特別講演

Todd R. Klaenhammer

Distinguished University Professor & William Neal Reynolds Distinguished Professor of Food Science, Microbiology, and Genetics

**Education / Training**

INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
University of Minnesota, Minneapolis, MN	BS	1973	Microbiology
University of Minnesota, St. Paul, MN	MS	1975	Food Science/Biochem.
University of Minnesota, St. Paul, MN	PhD	1978	Food Science/Genetics

Research Interests:

Microbiology and genomics of lactic acid bacteria and their bacteriophages important in food and industrial fermentations. Functional genomics of probiotic organisms used for delivery of biotherapeutics.

Training Record

M.S. (21); Ph.D. (22; 2 current),

Academic and Professional Appointments

Assistant, Associate, and Full Professor, Departments of Food Science & Microbiology, 1978-1992
 NCSU Alumni Distinguished Professor, 1993 & 1994
 Director of the Southeast Dairy Foods Research Center, 1993-2014
 William Neal Reynolds Distinguished Professor, College of Agriculture and Life Sciences, 1992-present
 Distinguished University Professor, 2002-present

Selected Professional Activities

2000 IFT Task Force on Food Biotechnology: Expert Panel
 2000-2004 Chief Science Advisor, Einstein Institute for Science, Health and the Courts and NIEHS, In Food/Agricultural Biotechnology
 2003-2006 National Academy of Sciences, Committee on Scientific Programs
 2003-2007 German/US Frontiers of Science, Co-Chairman, National Academy of Sciences
 2009-2015 Co-chief editor for the Annual Reviews of Food Science and Technology

Selected Awards and Honors

Samuel Cate Prescott Research Award. Institute of Food Technologists, 1989
 Alumni University Research Award. North Carolina State Univ. Alumni Association, 1990
 Dairy Research Foundation Award. American Dairy Science Association, 1990
 Borden Award. American Dairy Science Association, 1996
 Research and Development Award Institute of Food Technologists, 1998
 Fellow in Institute of Food Technologists 2000, American Academy of Microbiology, 2001
 Outstanding Achievement Award of the University of Minnesota, June 7, 2001
 Elected member in the National Academy of Sciences, May 1, 2001.
 William C. Frazier Memorial Award. University of Wisconsin, Madison. May 29, 2002
 William C. Haines Dairy Science Research Award, 2006
 Alexander Quarles Holladay Medal of Excellence, North Carolina State University, 2007
 Nicolas Appert Award, Institute of Food Technology, 2007
 Oliver Max Gardner Award, the University of North Carolina System, May 8, 2009
 Fellow, American Association for the Advancement of Science, 2009
 Eli Metchnikoff Award in Biotechnology, International Dairy Federation, 2010
 Harris Award for contributions to the field of Food Science, Ohio State University, March 2012

Publications and Citations

See Todd R. Klaenhammer—Google Scholar

Genomic views of prebiotic and probiotic mechanisms that impact health

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Lactic acid bacteria (LAB) and bifidobacteria are associated with various plant, animal and human niches and play a key role in the production of fermented foods and beverages, with some species also exerting probiotic properties. Explosive genome sequencing of numerous LAB and probiotic species in recent years has revealed a path of evolution toward specialized habitats that are nutritionally rich, such as milk and the gastrointestinal tract. During this process, the group underwent a dramatic reduction in genome size, decay of biosynthetic pathways and loss of non-essential genes, but concurrently acquired key gene sets promoting survival in these adapted environments. This presentation will examine the genomic relationships and distinctions of probiotic microbes. Genomic analyses have identified genetic determinants implicated in the survival and beneficial activities of probiotic lactobacilli and bifidobacteria. Exploitation of new genetic tools has allowed confirmation of important gene groups that direct prebiotic utilization, acid tolerance, bile tolerance, and production of cell surface components that are responsible for direct interactions with the intestinal mucosa and immune responsive cells. These features are critical to the metabolic, bioprocessing and health-related activities of probiotic species.