



Good Food, Good Life

Nestlé and UC Santa Barbara Researchers Uncover the Physics of Self-Aggregating Molecules in Foods

Lausanne, SWITZERLAND 6 November 2007 – Scientists from the Nestlé Research Center (NRC), Lausanne, Switzerland in collaboration with researchers from the Materials Research Laboratory, University of California, Santa Barbara (UCSB), U.S., have developed a model to explain the behaviour of self-aggregating molecules in food. The full contribution is available in the November edition of [Physical Review Letters](#).

A vital element of the physics of food structure is the interaction of lipids and water. This determines the texture as well the transport of flavours and nutrients in foods. Unravelling the mechanism of interactions between lipid and water molecules will help scientists understand the physical properties of complex functional food structures, to subsequently create foods with optimal stability and delivery of nutrients, active ingredients, flavours and aromas.

Nestlé and UCSB researchers examined the molecular interactions of molecules in lipid-water mixtures. The scientists developed a thermodynamic model to quantitatively predict the self-assembly of lipid-water molecules into ordered structures. Prior to the current study, no quantitative theoretical framework had been established to fully interpret the structural changes that occur in lipid-water interfaces under varying conditions.

“This discovery allows us to grasp complex food systems, providing new food science insights for enhancing the physical and functional attributes of food such as flavour, texture and nutrient delivery,” said Prof. Raffaele Mezzenga, Nestlé Research Center scientist.

Glenn Fredrickson, a professor of chemical engineering and Associate Director of the Materials Research Laboratory at UCSB, added, “It was exciting for UCSB chemical engineering graduate student Won bo Lee and I to participate in this collaboration and apply our theoretical tools to solve a real-world problem in food science.”

Article Reference:

Lee WB, Mezzenga R, Fredrickson GH. Anomalous Phase Sequences in Lyotropic Liquid Crystals. *Physical Review Letters*. 2007: 99(18).

About the Nestlé Research Center

Established in 1987, the Nestlé Research Center (NRC), Lausanne, Switzerland, is one of the world's leading research institutions in food, nutrition and life sciences. With a diverse staff of leading researchers from a broad range of scientific competencies, NRC possesses a unique blend of talent and expertise. Knowledge on nutrition and health, food science, food/consumer interaction and food quality and safety are combined at the Nestlé Research Center to help develop Good Food as a source of Good Health throughout life. Learn more about the Nestlé Research Center at www.research.nestle.com.



Good Food, Good Life

About the College of Engineering at UC Santa Barbara

The College of Engineering at UC Santa Barbara is a global leader in bioengineering, chemical and computational engineering, materials science, nanotechnology and physics. UCSB boasts five Nobel Laureates (four in sciences and engineering) and one winner of the prestigious international Millennium Technology Award. Its students, professors and staff thrive in a uniquely-successful interdisciplinary and entrepreneurial culture and UCSB research is among the most highly cited in the world. The Materials Research Laboratory (MRL), funded by the National Science Foundation (USA), is one of the premier international centers for materials research. Learn more about the MRL at mrl.ucsb.edu.