

maroon biotech

FOOD PRESERVATION TECHNOLOGY





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Maroon's Synthetic Chaperone Technology



Figure 1: (a) Side lit photograph of sherbet after ten freeze (-20 °C) /thaw cycles which shows large ice crystals. (b) Sherbet containing Maroon's purified copolymer surfactants after same treatment showing much finer ice crystals.

Maroon Biotech Corp is a biotechnology company targeting immedicate molecular regeneration technology for repair of biomaterials on the *molecular* scale. The company is focused on addressing the needs of a new market space created by newly developed capabilities to restore structural integrity of biomaterials using biocompatible amphiphilic copolymer surfactants. These copolymer surfactants mimic the function of natural chaperones in their ability to control local water structure, disaggregated denatured proteins, catalyze refolding of proteins and restore structural integrity of phospholipid membranes. The applications broadly range across stabilizing manufactured proteins, food preservation, tissue engineering and therapy for traumatic injuries.

Maroon brings novel and widely validated technology in the form of synthetic chaperones, pharmaceutical development expertise, as well as biophysical science capability in molecular spectroscopy and imaging. The combination uniquely positions Maroon to address several fundamental but unmet needs. Maroon technology permits enhancing tolerance of food to destructive processes such as fluctuations in storage temperature, environmental hydration and microbial contamination which is key to addressing some of the basic food access and nutrition problems facing mankind today.

Maroon's molecular regeneration technology has been proven to be effective in disaggregating and refolding proteins in protein crowded solution using multiblock copolymers that are approved for human use by the U.S. FDA. Maroon's approach is to focus on the deterministic interactions between water and macromolecular biopolymers. By altering water structure, the melting temperature and unfolding/refolding kinetics are shifted. While this can be accomplished in several ways, what is unique about Maroon's approach is the capability of selectively altering the conformation of denatured proteins while not altering the conformation and function of normal proteins.

Food quality is dependent on both composition and molecular structure. Maroon's technology permits development of food specific biocompatible copolymers that will enhance tolerance to denaturants such

Molecular Imaging Technology

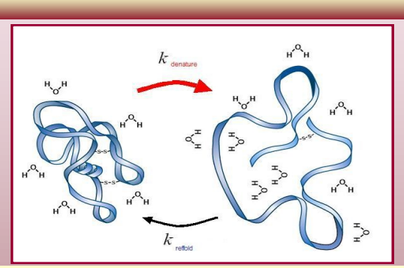
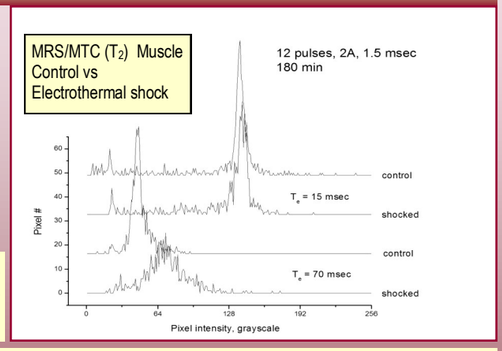


Figure 2: Changes in biomolecular structure and hydration leads to shifts in water structure and water compartment volumes (above) which can be monitored by spectroscopic imaging (right).



► Effective surfactant chaperone action depends on specific structural compatibilities between denatured/aggregated protein and the surfactant;

► Efficient surfactant chaperone mixture development requires real-time spectroscopic imaging of both solvent and biopolymer. This is a core competent of Maroon Biotech;

► Maroon Biotech's labs has capability to develop specific copolymers mixtures for food preservation and

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Food Applications

Maroon envisions a plan of rapidly developing and commercializing surfactant chaperones for food products that can help proteins refold and control water activity and result in restoring the structure and viability to disrupted cells. Surfactant chaperones mimic behaviors exhibited by naturally occurring stress proteins that protect living systems after injury. The safety of certain synthetic surfactants that act as molecular chaperones has been proven over time. Maroon's preservation techniques are being developed to satisfy current demands of economic preservation and consumer satisfaction in nutritional and sensory aspects, convenience and environmental safety. Our research in food preservation will enable the development of innovative food products and process innovations that will extend the shelf life. Maroon's technology will make a major contribution to the well-being and welfare of consumers all over the world.

Maroon's Technology on Food Products will provide:

- Enhanced food quality
- Enhance food storage
- Extend range for food delivery
- Reduce bacterial invasion

Sustenance:

- Taste
- Basic nutrition
- Price

Some of the future research directions on Maroon's technology on food applications focus on new and effective food-based strategies to optimize immune function and mental performance and healthy gastro-intestinal tract for improved well-being and resistance to diseases.



Figure 3: Picture taken???Dr. Lee, pls reference.

Malnutrition is found to be a leading killer throughout the world, with undernutrition as the main nutritional problem in the developing world. Drying, salting, smoking are food preservation methods that have declined in industrial world but are in practice in Africa. Poor nutrition, calorie deficiencies, stale food cause nearly one in three people to die or have disabilities according to the World Health Organization. Maroon's inexpensive surfactant chaperone technology can significantly improve the quality of life in these countries by keeping the food freshness over a long period of time.

Maroon Biotech's Patent Position

The concept of molecular repair with surfactant chaperones was developed in Dr. Raphael Lee's laboratory who is the Founder of Maroon Biotech. The University of Chicago holds three issued patients related to this technology which were invented by Dr. Raphael Lee. Some of the patents are: US Patent US 5,470,568 (1995) is a broad enabling patent, covering the fundamental role of P-188 in repairing cell membranes as well as its use in gene transfection and the treatment of radiation injury. The second patent, US 5,605,687 (1997) covers the use of P-188 in treating electrical injury. Another patent is for surfactant therapy for brain and spinal cord injury. This latter patent has issued in several countries and remains pending in the United States.

Another patent has been issued recently on Method of using Amphiphilic Multiblock Copolymers in Food which described the method of processing food to reduce amount of freezer burns or undesirable ice crystal formation, in a manner so as to maintain food freshness over a long period of time, or in a manner so as to prevent protein aggregation over elongated period of time(WO/2008/034082).

Additionally Maroon has active US filings and published foreign patents on the combination of surfactant chaperones with additives that dramatically increase their effectiveness. Several of these filings covers the use of Poloxamer in the treatment of brain and spinal cord injury. Finally the company has a vigorous research program directed towards more potent second generation compounds. As Maroon Biotech continues to refine its synthetic surfactant chaperone technology, it will aggressively seek protection for intellectual property with additional patents.

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Company

Founding and Accolades

The capability of biocompatible copolymer surfactants to repair damaged cell membranes was discovered fifteen years ago by Dr. Raphael C. Lee, Professor of Molecular Medicine and Surgery at the University of Chicago Pritzker School of Medicine. This concept has been widely validated in by scientist from many universities.

Distinguished Management

Adela Cepeda, MBA (Director) Ms. Cepeda is the President of A.C. Advisory, Inc., a leader in municipal financial advisory services with over $45 billion in completed transactions. Ms. Cepeda serves on the board of The Chicago Community Trust, and as a commissioner for the Public Building Commission of Chicago. Ms. Cepeda is an honors graduate of Harvard College and has an MBA from the University of Chicago.

Art Coury Ph.D. (Chairman) Dr. Coury served as a Research Director and Corporate Fellow, Medtronic, Inc. (1976-1993), Vice President, Research and Chief Scientific Officer, Focal, Inc. (1993-2000), and Vice President, Biomaterials Research, Genzyme Corporation (2000-June, 2008). He was President, Society for Biomaterials, USA (1999-2000); President, American Institute for Medical and Biological Engineering (2003-2004) and received the 2007 Innovation and Technology Development Award of the Society for Biomaterials.

Richard B. Egen, MBA. (Director) Mr. Egen is former President and CEO of NephRx Corporation, a biotechnology company focused on acute renal failure. He was most recently Chairman of the Board of Aksys, Ltd. and currently serves on the Board of Directors of Väsamed. Prior to joining NephRx Mr. Egen was Senior Vice President at Baxter International, Inc. and a member of the Senior Management Committee..

Raphael C. Lee, MD, ScD, DSc. (Inventor and Founder) Dr. Lee is Professor of Surgery, Medicine, Anatomy and Organismal Biology at the University of Chicago. He is the primary inventor of Maroon Biotech's technology. Previously, Dr. Lee served on the faculties of Harvard and MIT. He is the recipient of more than 25 scientific awards including a MacArthur Genius Award and the Searle Scholar Award. He is also founder and Chairman, Avocet Polymer Technologies, Inc., a wound healing corporation and Electrokinetic Signal Research, Inc.

Ashley Harris, MS, Executive Director. She received her M.A. in 2005 from the University of Chicago in the Social Sciences. Ms. Harris oversees Maroon's business development, recruitment, investor relations, distribution, contract work, and finances.

Julia H. Cesur , MS, Director of Operations. She is a biomedical engineer and did her thesis on lipid based formulations in biopharmaceutical sciences. Ms. Cesur is managing product development, contract work, and human resources at Maroon Biotech.

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