



J. Vincent Edwards Receives the Olney Medal

J. Vincent Edwards is recognized with the AATCC Olney Medal Award for his substantial work in the design and implementation of cotton for acute and chronic wound care.

Edwards graduated Summa cum Laude with a BA in chemistry from the University of Louisville in 1976 and a PhD in Bio-Organic Chemistry in 1984. After graduating, he went to work with the Southern Regional Research Center (SRRC) Agricultural Research Service (ARS), United States Department of Agriculture (USDA) as a research chemist, researching the structure and synthesis of proteins and peptides. In 1987, he joined Merrell Dow Pharmaceuticals as a senior associate scientist. In 1994, he joined GeneMedicine Inc. as a senior scientist and in 1997, Edwards returned to the SRRC-ARS-USDA as a Research Chemist, Lead Scientist.

Achievements

For almost 25 years, Edwards' research in the areas of cotton, hygiene, and wound healing has led to significant understanding and treatment of infection and pain caused by chronic wounds. Research that he began in 1997 led to the development of a protease-inhibitor,

cotton-based wound dressing that served as a model in wound dressing development. At the center of the pathology is human neutrophil elastase (HNE), which is perhaps the most destructive protease in the body.

Edwards was able to develop controlled release protease inhibitors useful as a treatment modality for chronic wounds. He was the first to demonstrate the kinetic profile, dose response, and fiber release properties of an HNE fiber-inhibitor dressing formulation applied to human chronic wound fluid. He led a team of wound healing scientists and physicians to evaluate elastase inhibition of the modified wound dressings. His findings would assist the more than 5 million people who suffer from chronic wounds. The first paper he wrote on this research was the main subject of discussion at a Gordon Conference on Tissue Repair & Regeneration in June 1999 and played a role in wound care companies developing protease sequestrant dressings.

While working on cotton wound dressings, Edwards recognized a need for cotton materials that were designed and prepared for selective healthcare and hygiene functions. Beginning in 1999, Edwards researched and developed biomedical and hygienic cotton products. He did this by using synthesized peptide, protein, carbohydrate, and lipid analogs of cellulose. Then, he demonstrated the design, preparation, and activity of immobilized enzymes and peptides on cotton fibers. From this, he developed an algino-cellulose, skin-lipid-textile technology that would improve the cotton dressing properties of adsorption, gelling, ease of application, and lipid transfer.

In 2002, Edwards' work with wound dressing led to the creation of Smart Cotton wound dressings and point-of-care diagnostics. Up to this point, improvements in chronic and hemostatic wound dressings were empirical and little was known about molecular design of functionally active dressings. Edwards designed and prepared cellulose analogs of small peptides, monosaccharides, and derivatized cellulose on cotton fabrics to demonstrate selective binding of elastase and hemostatic activity. He showed how these analogs of cotton bind elastase and promote hemostasis in a charge-dependent manner. He designed and synthesized nanocellulose biosensors with sensitive elastase detection and then demonstrated *in situ* potential. Due to the promising activity of the modified cotton wound dressings in reducing elastase activity, an outside technology company was funded for a phase II NIH SBIR grant in 2004 to conduct clinical trials and manufacture the dressing for chronic wound patients. Three major international wound dressing companies expressed an interest in

licensing the protease sequestrant dressings and cited successfully repeating the published experiments in their laboratories. Two European companies expressed an interest in the elastase sensor, cited as a promising, point-of-care diagnostic for protease detection.

Edwards also continued to develop, test, and manufacture trials of cotton wound dressings. He developed and tested marketable cotton chronic and hemostatic wound dressings and two prototypes. One dressing was effective at clinical treatment of chronic wounds, removing harmful proteases, while a second one promoted rapid blood clotting. The phosphorylated cotton dressing was FDA approved for chronic wound patients in 2006 and is licensed in the US for use in negative pressure chronic wound therapy. In a similar manner, he developed a hemostatic dressing. These wound dressings are the first type of protease-modulating dressing delineated molecular mechanism of action intervening in chronic wound pathology.

Edwards has published extensively, with more than 100 peer-reviewed and other papers, proceedings, and presentations. He has edited and contributed to several books. Edwards and his co-workers have been issued nine US patents.

Edwards organized nine American Chemical Society (ACS) Cellulose and Renewable Materials Symposia between 1999 and 2016. During this time, two symposia (2001, 2006) resulted in edited books and one of them, the ACS Symposium Series 792 book, *Bioactive Fibers and Polymers* (2001) received record sales. Another symposium led to a special issue of the journal, *Cellulose* (2012).

Professional Organization Affiliations

Edwards has been a very active member of the American Chemical Society, Cellulose and Renewable Materials Division, where he served as chair from 2007 through 2008. He served as program chair from 2005 through 2006, awards chair from 1999 through 2004, and nominations chair in 2013. He also served on the poster committee of the Wound Healing Society in 2003 and 2013.

Honors & Recognition

Edwards was recognized by the SRRRC with the Early Career Scientist Award in 1986 and the Outstanding Contributor to EEO in 1987. Also, in 1987, he was awarded a fellowship by the Office of Economic and Cooperative Development, Department of Organic Chemistry, Stockholm University, Stockholm, Sweden to perform glycopeptide research. In 1990, he was recognized with the Marion Merrill Dow Inc. Bicentennial Inventor Award.

Edwards received the Employee of the Year Award for Technology Transfer Adoption, from the SRRRC in 2001, 2005, and 2014 and the Excellent Paper Award for “Performance of Bioactive Molecules on Cotton and Other Textiles” in 2006.

He was recognized as Outstanding Scientist at the SRRRC in 2008 and Division Fellow of Cellulose and Renewable Materials Division from the American Chemical Society (ACS) in 2013. He received the SRRRC Mid-South Technology Transfer Award for “The Development of Greige Cotton Nonwoven Fabrics for Disposable Diapers” in 2014, and the Federal Laboratory Consortium Southeast Region, Excellence in Technology Transfer Award for “Greige Cotton Nonwoven Fabrics for Disposable Diapers” also in 2014.

Edwards received the SRRRC award for National Technology Transfer for “Cotton Battlefield Dressing Technology” in 2019. Edwards was recognized with the 2020 Secretary Honor Award given by Secretary of Agriculture Sonny Perdue. In 2020, he also earned a place in the President’s Gears of Government Hall of Winners, USDA, for developing “a nonwoven cotton gauze that is 33% lighter and 63% more absorbent than standard gauzes made of bleached processed cotton. Edwards’ product also triggers blood clotting more quickly, sheds fewer fibers, and releases small amounts of hydrogen peroxide to help mobilize wound-healing cells at the injury site.”

The Olney Medal

Established in 1944 in honor of Louis Atwell Olney, the founder and first president of AATCC, the Olney Medal recognizes outstanding achievement in textile or polymer chemistry or other fields of chemistry of major importance to textile science. The award consists of a gold medal, a scroll, and an honorarium.

Presentation of the medal each year is a highlight of AATCC’s annual conference. This year, the conference, AATCC Textile Discovery Summit, will be held at the Sheraton Imperial Hotel, Durham, NC, USA, from November 16-18, 2021. The Association will present the Olney Medal at the Awards Luncheon on November 18, 2021.

Edwards will deliver the traditional Olney Medal Address on November 18 at 8:15 a.m.

The title of his address is “A Road Less Traveled: Cotton-Based Approaches to Wound Healing.”

For a complete list of our esteemed past award recipients: www.aatcc.org/olney