



When Bob Ward co-founded PTG in 1989, there was a medical device crisis looming. Suppliers of materials used to make medical devices (i.e., 'biomaterials') were alarmed by massive class action lawsuits. These suits, which were primarily related to bodily injury from temporomandibular (TMJ) and breast implants, convinced material suppliers to pull out of the medical market. This left medical device manufacturers high and dry: Where would they get the specialized biomaterials necessary to make their artificial hearts, pacemakers and intraaortic balloons?

## Unshackling Device Makers

### 'FULL SERVICE' STRATEGY SETS PTG APART IN THE BIOMATERIALS INDUSTRY

Polymer Technology Group (PTG) is unique in the biomaterials sector of the medical device industry: It has expert staff *and* state-of-the-art facilities for synthesis, characterization, processing, regulatory support *and manufacturing* of new polymer products and device components. The Company's vertically integrated research-through-development approach permits the entire process to be performed *within one organization*, from invention to market launch.

### CHEMISTRY PRODIGY WITH ENTREPRENEURIAL INSTINCTS

"After I begged them a lot, my parents gave me my first chemistry set in the fourth grade when I was barely 10 years old. Within weeks my bedroom was a working chemistry lab," Ward recalls. "I had a card table and shelves loaded with every kind of chemical I could get my hands on. I had a paper route, and I used to make household products for sale to my paper-route customers. I would tuck home-made advertisements into the newspapers I delivered for the 'new and improved' products I developed and made. One was ant powder that was safe for humans. (It had chocolate and plaster of Paris in it.) Because my chemistry set didn't include the plastics module described in the manual, I developed an instant fascination with polymers. Later, after graduate school courses in polymer chemistry and an ACS Short Course, I decided to make a career of it. I have no idea where my interest in chemistry comes from. My father was a truck salesman, and my mother is a psychiatric social worker. Two of my uncles, one a dentist and the other a doctor, encouraged me."

### 'RIGHT PLACE, RIGHT TIME' JUMPSTARTS BIOMATERIALS PIONEER

"I got engaged to be married after I graduated in 1971 from UMass Lowell (then 'Lowell Tech') with a degree in chemical engineering," says Ward. "But I didn't have a job and 1971 was a real low point for engineering employment. My soon-to-be father-in-law worked at defense contractor Avco Everett Research Lab. He was getting nervous about my employment prospects, so he got me an interview at Avco. They were looking for a chemical engineer for a small medical research group they had started. (Just as the wedding money ran out, I got the job.) At Avco we made the very first biomaterial, Avcothane-51™, a silicone-urethane polymer, for cardiovascular applications such as intraaortic balloons, VADs and artificial hearts. Before Avcothane, many of the polymers used in medical devices were developed first for industrial applications and then adopted as biomaterials 'as is' by device manufacturers. Some of these materials degraded *in vivo*, causing device failure. Others were too weak or caused blood to clot on contact. Avcothane was a big improvement in strength, biostability and 'blood compatibility.' There's no doubt I started in the right place at the right time."

### SAVVY BUSINESSMAN SPINS OUT LIFE SCIENCE INCUBATOR: 'EMERGENCE'

"We have this great capacity to prototype materials-intensive devices, prove feasibility and submit patent applications to add value *before* we seek outside investors in the new companies we create," Ward explains. "Creating Emergence, our life science incubator, is one way for us to have liquidity without having the parent company, PTG, go public. Emergence has unlimited potential." ■



Robert S. ("Bob") Ward  
Co-Founder and CEO

**B**OB WARD, co-founder and CEO of the Polymer Technology Group (PTG), was presented with the "2006 Excellence in Surface Science Award" by the Surfaces in Biomaterials Foundation, an acknowledgement of his lifetime of contributions to the field of surface sciences in the development of biomedical polyurethane for cardiovascular and other applications; a career that spans the early days of the intraaortic balloon pumps and ventricular assist devices to modern-day spinal implants. He has made a significant impact on the field of medical devices, as exemplified by the introduction of *Biospan*®, *Bionate*®, and *Elasthane*™ as high-quality, well-defined replacement biomaterials at a crucial time when legal pressures led to the complete absence of these materials from the marketplace. His contributions continue today with development of the highly novel *Surface Modifying End Group* technology, allowing device manufacturers to specify particular surface interfacial chemistries while retaining the desirable bulk properties of polyurethanes. These achievements by Bob Ward continue to advance the science and engineering of biomaterials interface.