In the last half century the modern era of bioengineering has emerged, and with this there has been a technological revolution in health care. In parallel biology has undergone a revolution, and this biological revolution now is demanding an engineering revolution. With this there has been the emergence of a biology-based engineering, i.e. bioengineering, and today in the U.S. alone there are more than 70 bioengineering departments. This revolution, however, is global in nature with exciting developments taking place in Europe and Asia as well. Other more traditional engineering fields also have recognized the importance of the bio world, and the medical device and diagnostics in industry, in addition, is changing due to the convergence of the biological revolution with it, and there will be new biology-based industries. In the future one can foresee there being just as many applications outside of the medical field as within it. Thus, as we move further into the 21st century, the changes in bioengineering will be just as dramatic as those in the last 50 years, and the opportunities for those entering the field will be just as exciting.