

Introduction



Skill Standards are an outcome of concerns expressed by key industries that they will not be able to remain competitive in global markets if the U.S. cannot provide sufficient quantities of qualified, skilled workers. These key industries, in conjunction with federal and state governments, are providing funding to develop voluntary skill standards to meet the critical need for trained workers. The standards identify what people must know and be able to do to qualify for beginning and middle level jobs. This information, generated through strong collaboration between industry and educators, provides a sound starting point for the development of training programs that will prepare people for employment and career advancement and meet the country's need for knowledgeable, highly-skilled workers. Industry-based skill standards can help ensure that more people, particularly those who have been underserved by our education system, are prepared for high-wage jobs requiring highly skilled workers. This project proposes the development of regional industry-based skill standards within the Biotechnology/Biomedical industry. These standards will be implemented in an integrated articulation model among the partners of this consortium of schools and colleges.

Industry and Education Perspectives

*Ruth Scott, President
Washington Biotechnology &
Biomedical Association (WBBA)*

“Washington State is recognized internationally as one of the premiere bioscience centers in the world. Our industry can only sustain that position if we are able to hire a trained and talented workforce. As Washington’s 160+ companies continue to move from early stages of discovery and development to manufacturing and marketing, the demand for skilled workers will only increase.

The Washington Biotechnology & Biomedical Association (WBBA) enthusiastically supports the efforts of the community colleges, the education community, and industry representatives involved in the skill standards project. In the long term, their work will contribute to the skilled labor force necessary for the continued success of Washington’s biosciences sector.”

*Dr. Holly Moore, Interim President
Shoreline Community College*

“Our nation has become increasingly aware of the critical need to raise both the academic achievement levels and the work skills of people graduating from our schools. The creation of industry ‘driven’ skill standards is the first but profound step in moving this agenda forward. This Biotechnology/Biomedical Skill Standards Project is an excellent example of education and industry collaborating to meet a critical shortage of skilled workers in this vital industry. Projects such as this ensure that students are prepared for the biotechnology/biomedical occupations with the skill sets required by industry.

Continuous collaboration between education and industry is the key to the region’s economic viability.”

*Derald Lo, Human Resources Generalist
Cell Therapeutics, Inc.*

“The Biotechnology pharmaceutical industry is one of the fastest growing technology sectors both in the Puget Sound region and nationally. In addition, rapid advancement of both technology and scientific breakthroughs has changed the fashion in which companies in this industry operate. This environment creates a need for properly trained and educated employees. It is crucial for the biotechnology pharmaceutical industry to partner with higher education in order to meet the challenges of hiring qualified people who are able to help companies innovate and compete well into the 21st Century.”

*Caralee Cheney, Ph.D.
Faculty
Biotechnology Lab Specialist Program
Shoreline Community College*

“This Biotechnology/Biomedical Skill Standards Project is timely for Shoreline’s program. It gives more broad-based and detailed input from industry in areas that are currently strongly represented in our program—research and development—as well as areas that we are considering addressing in more depth: manufacturing, regulations, and clinical trials. The skill standards will be useful in that they are clear, practical, and complete. We will use these to take an overall look at our curriculum and assessment to determine if we are developing the skills as strongly as possible through the course of our program.

We will also work with representatives from local high schools and four-year schools to consider the development of these skills in the more long-term transition of the student from high school to community college to four-year institutions. We will consider the potential of articulations to formalize these transitions.”

*Mary F. Burnett, Ed.D., Associate Dean
Biotechnology Program
Science & Math Division
Seattle Central Community College*

“Seattle Central Community College Biotechnology Program faculty and staff support the partnership of high schools, community colleges and employers who have collaborated to produce the industry skill standards for Puget Sound educators and employers. Our future work is to design competency-based curriculum identified by this project and also promote new articulation models for the students of Washington State.”

Executive Summary



The demand for skilled workers is growing in every industry sector. In the Biotechnology/Biomedical industry this is especially true, with biosciences companies within the state projected to directly employ more than 27,000 by 2005, and with indirect employment exceeding 67,500, an increase of 100% in five years. Of the (approximately) 160 biotechnology and medical device companies in Washington, around 44% were formed in the last five years, with new company formation continuing at a steady pace. The majority of companies are focused on research and development of therapeutic products, diagnostics, plant, agriculture and animal, informatics, contract manufacturing, and genetic testing. Companies with core businesses such as these require highly skilled employees with strong problem solving, creative thinking, and scientific skills.

Biotechnology/biomedical companies are deeply concerned over the shortage of workers with the skills needed to keep pace with technology. At the same time, the workforce is severely challenged by corporate downsizing and relocation, and the need to keep pace with technology. The education, training, and information available to most workers are often insufficient to deal with technology-driven changes in the workplace.

To help respond to the gap between the demand for workers with specific skills and the availability of workers with those skills, the Washington State Board for Community and Technical Colleges (SBCTC) sponsored this project through Shoreline Community College to develop skill standards for the Biotechnology/Biomedical industry. This project was conducted in accordance with SBCTC guidelines for developing skill standards and was provided oversight by a steering committee consisting of representatives from business and education. Industry, labor and education are very committed to the development of assessments and curriculum in Washington State based on these skill standards. In fact, a concurrent project to upgrade assessments and curriculum at the high school and community college level was launched in January 2001, with the results due in the summer of 2001. For additional information and updates, contact Shoreline Community College, Office of Vocational Instruction, or the State Board for Community and Technical Colleges in Olympia.

The State of the Industry

The 21st century has been declared “The Biotechnology Century.” Certainly, this is a time of great excitement and promise. Medical and scientific breakthroughs will change the world in ways we have yet to imagine. Biotechnology affects many aspects of our lives: how we fight and treat diseases; how we eat and provide for our families; and how our economy grows and jobs are created.

The Seattle metropolitan area and Washington state have long been a leading center of technology advancement. The region is now becoming increasingly well known as one of the premiere biosciences centers in the world. This is an industry that thrives due to the state’s world-class research institutions, pervasive entrepreneurial spirit, the region’s rapidly growing financial wealth, and unsurpassed quality of life that makes it one of the most desirable places of all to live, work and play.

The technology foundation of Washington’s biosciences community is the cutting edge research conducted at the University of Washington, Washington State University, Fred Hutchinson Cancer Research Center, and Battelle/Pacific Northwest National Laboratory. More than one-half of the biotechnology and medical device firms in the state are founded on technologies developed at these institutions.

Here are some facts about Washington’s biosciences industry based on 1999 data derived from Info.Resource, Inc., publisher of www.WaBio.com (Washington Biotechnology & Medical Technology Online):

- There are over 160 biotechnology and medical device companies in Washington. Around 44% were formed in the last five years, with new company formation continuing at a steady pace.
- The majority of companies (51%) are focused on research and development of therapeutic products, followed by diagnostics (32%), plant, agriculture and animal (4%), and other, including informatics, contract manufacturing, and genetic testing (13%).
- At the close of 1999, total aggregated biotechnology and medical technology industry employment in the state exceeded 15,000 people, an increase of 12.6% from 1998. Biotechnology employment exceeded 8,100, an increase of 9.6% from the prior year. Medical technology employment exceeded 6,800, an increase of 16.7%. It is estimated that these two sectors combined indirectly employ more than 37,000 people currently in the state of Washington.
- Conservatively, biosciences companies within the state are projected to directly employ more than 27,000 by 2005, with indirect employment exceeding 67,500.
- Washington’s biotechnology and medical technology industry continues to be diverse in size with the top ten largest companies employing 63% of the industry total, while 70% of the companies employ fewer than 50 people.
- The majority of the industry employment is concentrated in the greater Seattle metropolitan area.



Bothell has 24% of the statewide industry total, Redmond 21%, Seattle 42%, with the balance distributed throughout the state.

As we enter the 21st century, we are witnessing the convergence of biotechnology and medical technology with informatics, genomics, proteomics, kinematics, advanced materials, and telemedicine—areas in which companies and research institutions in Washington state excel. This convergence of technology is resulting in the formation of new companies which will position the state at the forefront of new technology research and development well into the new century, nationally, as well as globally.

