Massachusetts Life Sciences Industry
Entry Level Employment Demand Report
2013

Developed For and With Funding From:

Massachusetts Community Colleges Workforce Development Transformation Agenda

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Massachusetts Life Sciences Industry
Entry Level Employment Demand
Report (2013)

The content of this report is based on industry input collected via the Massachusetts Life Sciences Education Consortium’s (MLSEC) Employment Demand Survey and interviews conducted under the auspices of the North Shore Workforce Investment Board.

Introduction

MassBio and MassBioEd are working every day to ensure that the biotechnology and life sciences industry in Massachusetts has access to the best-prepared life sciences workforce in the world.

Massachusetts’ outstanding public education system and exceptional institutions of higher education have enabled the record-shattering growth and development of this industry over the past decades. This has been thanks to a robust dialog between industry professionals, researchers, health care professionals, college faculty, and administrators all with a mutual commitment to excellence in STEM education.

Despite this exceptional record of success, there are concerns regarding a perceived mismatch between the skills, knowledge and workplace expectations of graduates and certificate recipients and the performance needs of the workplace. Industry leaders express concern at not being able to fill entry-level positions and educators worry that recent graduates will be unable to locate internships and permanent placements.

MassBio and MassBioEd established the Massachusetts Life Sciences Education Consortium (MLSEC) to facilitate ongoing dialogue between the industry and higher education in Massachusetts. Higher education relies on industry input to accurately anticipate the kinds of skilled employees needed today and in the coming years. The community colleges in Massachusetts have been a significant focus of this work. Beginning in 2009, MassBioEd facilitated a collaborative effort by staff and faculty of community colleges to develop competencies that would be infused in all community college biotech programs. During 2012 and 2013, we have continued
our work with the Massachusetts community colleges with support from the Boston Foundation and through their Department of Labor-funded initiative, the Massachusetts Community College and Workforce Development Transformation Agenda. Through this initiative, the community colleges are working to build accelerated programs that meet employer need in key industry sectors, including biotechnology.

The Massachusetts community colleges commissioned this report to expand their understanding of current needs and opportunities in biotechnology. Industry leaders were engaged in the development of the survey following a meeting convened by MassBio and MassBioEd at the request of Congressman Ed Markey to discuss unfilled industry workforce needs and unfulfilled preparation expectations. Over 40 individuals representing industry, academia and the public sector came together in August 2012. As a result of the dialog that day, it quickly became apparent that more data was required to accurately identify the scope and depth of the worker shortfall and the specific skill sets needed by industry to be added to higher education curricula.

To move the work forward, we created two standing committees composed of industry personnel. A call went out for volunteers to serve as members of an Employment Demand Committee and a Program Standards Committee. Both have contributed to the development of the survey and this analysis. Committees included members from the following companies: Acceleron, Alkermes, Athena Diagnostics, Biogen Idec, Biomedical Search Consultants, Ipsen, Nitto Denko, Cubist, Lab Support, Lonza, Organogenesis Perkin Elmer, Pfizer, Propel Careers, Shire, Stratacuity, and Thermo Fisher.
Survey Overview

Developed by the MassBioEd Foundation with the guidance of the members of two MLSEC Standing Committees, the survey was designed to gather data regarding the persistent questions regarding industry’s workforce needs and practices.

It asked 13 questions that were intended to be easily and quickly answered. The committee believed that the size and focus of the company would be variables in its workforce needs and hiring approach. The survey asked each company to self-identify a primary focus (Biotechnology, Pharma, Diagnostics, CRO, CMO, Medical Device, Supplier, Analytical Instrumentation, and Academic/Hospital). Companies were also grouped according to reported numbers of employees as: Small (up to 24 employees), Medium (25 to 249 employees), Large (250 to 999 employees) and Major (1000 or more employees).

Questions focused on the current distribution of the existing workforce, anticipated need for new employees both within the next 12 months and the next three years. Other questions sought to determine the degree preparation preferences for various positions. The survey also wished to ascertain the preferred means for recruitment and selection of future employees.

The survey, created using Survey Monkey, was distributed via Constant Contact to the either human resource professionals or other senior representatives of 450 MassBio life science member companies. As a result of repeated outreach efforts, a total of 49 companies completed the survey. This response surpassed the sampling goal of including at least 10% of the life science member companies of MassBio. Guarantees of anonymity and individualized reports were provided to participants.

Simultaneous to the MLSEC survey effort, the North Shore Workforce Investment Board (WIB) initiated an interview process to measure the extent and needs of the life science in their district. They hired several consultants with prior life science career experience to interview company executives regarding workforce needs. MassBioEd is appreciative of their willingness to share data accumulated through this effort.

Findings

The MLSEC Survey respondents included companies that self-identified as primarily focused on Biotechnology (30), Pharma (5), CRO (8), CMO (1), Diagnostics (3), Medical Device (1), and Supplier (1). There were no survey respondents from the Analytical Instrumentation or Academic / Hospital Lab categories.
The North Shore WIB’s Interviews took place with companies identified as Biotechnology (2), CRO (2), Diagnostics (3), Medical Device (9), and Research Product and Instrumentation (15).

Table 1 (below) provides an overview of the distribution of the companies contributing to this database organized by primary focus of activity and number of employees. Data has been compiled for this report from a total of 80 life science companies employing a total workforce of 18,128. This represents 23% of the Commonwealth’s life science industry sector workforce of 80,000. Representatives from 49 companies completed the surveys and 31 company representatives participated in individual (face to face) interviews. The participating companies align with the distribution of MassBio company membership.

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>Small (&lt;25)</th>
<th>Medium (25-249)</th>
<th>Large (250-750)</th>
<th>Major (&gt;750)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biotechnology</td>
<td>10</td>
<td>13</td>
<td>5</td>
<td>4</td>
<td>32</td>
</tr>
<tr>
<td>Pharma</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>CRO/CMO</td>
<td>3</td>
<td>7</td>
<td></td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Diagnostics</td>
<td>4</td>
<td>2</td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Medical Device</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>Research products &amp; Lab Instrumentation</td>
<td>10</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>Supplier</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

*Survey and interview data*

The survey sought to identify the distribution of current industry employees by work area. The findings confirm much of what has previously been written about the Massachusetts life science sector. As shown in Chart 1, the aggregated survey data reveals the dominance of employment in Research and Development at 42%.
Manufacturing and Production workers account for 18% and Information Technology for 10% of the workforce. Process Development followed up at 5%, with Quality, Finance, and Sales all at 4%.

**Chart 1: Distribution of employees by work area**

<table>
<thead>
<tr>
<th>Work Area</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>R&amp;D</td>
<td>42%</td>
</tr>
<tr>
<td>Manuf. &amp; Prod.</td>
<td>18%</td>
</tr>
<tr>
<td>Other</td>
<td>7%</td>
</tr>
<tr>
<td>General Sales and Admin.</td>
<td>2%</td>
</tr>
<tr>
<td>Marketing</td>
<td>4%</td>
</tr>
<tr>
<td>Information Technology</td>
<td>10%</td>
</tr>
<tr>
<td>Legal</td>
<td>2%</td>
</tr>
<tr>
<td>Human Resources</td>
<td>2%</td>
</tr>
<tr>
<td>Quality</td>
<td>4%</td>
</tr>
<tr>
<td>Finance</td>
<td>4%</td>
</tr>
<tr>
<td>Process Development</td>
<td>5%</td>
</tr>
<tr>
<td>Other</td>
<td>7%</td>
</tr>
</tbody>
</table>

**Survey data**

**Current employees’ education attainment at time of hire**

The survey was interested in measuring how academic degree attainment was a factor in the hiring practices of companies. The survey requested the company to estimate the percentage of employees hired with an associate degree or a baccalaureate degree at the time of hire in each of the following ten major work area categories:

- Finance
- General Administrative
- Human Resources
- Information Technology
- Legal
- Manufacturing and Production
- Process Development
- Quality
- Research and Development
- Sales and Marketing
This proved to be difficult data to locate for many companies since it is not routinely maintained in their employee database. Nevertheless, many of the responding companies worked hard to provide us with the following information.

All of the companies that responded to this question, regardless of focus or size, hire baccalaureate degree holders and above. Further, as can be seen below in Table 2, many companies, regardless of foci or size, hire at the associate level as well. The smaller the company the less likely it will have hired an associate degree holder. This is especially true of start-ups.

**Table 2: Percent of Surveyed Companies that hire AS/AS degree holders**

<table>
<thead>
<tr>
<th></th>
<th>Small (&lt;25)</th>
<th>Medium (25-249)</th>
<th>Large (250-750)</th>
<th>Major (&gt;750)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biotech</td>
<td>11%</td>
<td>50%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Pharma</td>
<td>0%</td>
<td>50%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>CRO/CMO</td>
<td>50%</td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnostics</td>
<td>0%</td>
<td>50%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Device</td>
<td></td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplier</td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
</tr>
</tbody>
</table>

*Survey data*

Since the focus of this survey is on entry-level positions attained by associate or baccalaureate degree holders, the survey asked companies for approximate percentages of individuals who were hired with either an associate or a baccalaureate in each of the work areas. Respondents had the option to choose between estimates of “less than 10%”, “10-24%”, “25-49%”, “50-75%” or “greater than 75%”. Although many companies reported hiring at the associate degree level, the preponderance of them did so at a rate of “less than 10%” of their employees in any of the ten work area categories. In contrast, they frequently reported hiring employees with a bachelor’s degree at the “greater than 75%” level. Chart 2 provides dramatic evidence of this data. Note the high degree of frequency of “less than 10%” for those hired with an AA or AS degree. Note the even greater frequency of “greater than 75%” for those hired with a BA or BS degree.
The North Shore WIB interviewers asked about degree preparation at each of the companies interviewed. Of the 31 interviewed companies only seven stated that they hired at the associate degree level. Many specified that they only hired at the Baccalaureate or above. The preference for the baccalaureate is dominant among the life science companies sampled by the survey as well as among those interviewed.

**Projected Hiring: Next 12 Months**

In projecting hiring over the next 12-month period, the survey asked respondents to estimate the number of hires in 21 job titles elected for their universality across the industry. They are often (but not always) considered entry-level positions. In addition to estimating the total hires in each job title, the respondents were also asked to estimate the distribution of those new hires among associate and bachelor degree holders. The preference for the baccalaureate is pronounced. This was true even in job titles for which there are well-established associate degree programs and/or certificates with respected track records in place. This includes positions, such as IT Applications Technicians, Administrative Assistants, and Manufacturing Operators, Laboratory Technicians, Animal Technician, and Glass Washer.
Table 3: Anticipated hires in next 12 months for selected job titles

<table>
<thead>
<tr>
<th>Position Title</th>
<th>BA/BS</th>
<th>AA/AS</th>
<th>Unspecified</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admin. Assist</td>
<td>30</td>
<td>26</td>
<td>2</td>
<td>58</td>
</tr>
<tr>
<td>Animal Tech</td>
<td>6</td>
<td>13</td>
<td>0</td>
<td>19</td>
</tr>
<tr>
<td>Clinical Research Admin.</td>
<td>39</td>
<td>5</td>
<td>2</td>
<td>46</td>
</tr>
<tr>
<td>Document Control</td>
<td>27</td>
<td>3</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>Facilities Tech</td>
<td>3</td>
<td>9</td>
<td>5</td>
<td>17</td>
</tr>
<tr>
<td>Glass Washer</td>
<td>9</td>
<td>8</td>
<td>6</td>
<td>23</td>
</tr>
<tr>
<td>IT App. Tech</td>
<td>30</td>
<td>4</td>
<td>4</td>
<td>38</td>
</tr>
<tr>
<td>IT Help Desk Tech.</td>
<td>22</td>
<td>7</td>
<td>4</td>
<td>33</td>
</tr>
<tr>
<td>Laboratory Tech.</td>
<td>28</td>
<td>9</td>
<td>9</td>
<td>46</td>
</tr>
<tr>
<td>Manufac. Operator</td>
<td>22</td>
<td>22</td>
<td>4</td>
<td>48</td>
</tr>
<tr>
<td>Manufac. Tech.</td>
<td>11</td>
<td>4</td>
<td>11</td>
<td>26</td>
</tr>
<tr>
<td>Mat. Mgr.</td>
<td>10</td>
<td>3</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>Mechanic</td>
<td>2</td>
<td>3</td>
<td>13</td>
<td>18</td>
</tr>
<tr>
<td>QA Auditor</td>
<td>32</td>
<td>6</td>
<td>0</td>
<td>38</td>
</tr>
<tr>
<td>QC Engineer</td>
<td>5</td>
<td>0</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>QC Tech.</td>
<td>15</td>
<td>3</td>
<td>8</td>
<td>26</td>
</tr>
<tr>
<td>Research Assist.</td>
<td>21</td>
<td>9</td>
<td>4</td>
<td>34</td>
</tr>
<tr>
<td>Research Assoc.</td>
<td>83</td>
<td>2</td>
<td>3</td>
<td>88</td>
</tr>
<tr>
<td>Research Scientist</td>
<td>89</td>
<td>0</td>
<td>21</td>
<td>110</td>
</tr>
<tr>
<td>Valid. Engineer</td>
<td>9</td>
<td>3</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Valid. Tech.</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>504</strong></td>
<td><strong>139</strong></td>
<td><strong>108</strong></td>
<td><strong>751</strong></td>
</tr>
</tbody>
</table>

Survey data

The anticipated hiring over the next 12 months totaled 751. This represents an annual 4% growth rate. The respondents indicated that they would seek to fill 504 positions with a bachelor degree holder and 139 with an associate degree holder. The distribution overall favors the baccalaureate degree 67% over the associate degree 18%. See Chart 3.
Although there are a number of fields in which the projected hiring offers opportunity to the associate degree candidate, it is outpaced in each position title by the baccalaureate degree. This dramatic preference can be seen vividly in Chart 4 below.

The only positions that demonstrate an associate degree preference are Animal Technician, Mechanic, and Facilities Technician. See Chart 5.
Survey data

Projected Hiring: Next 3 years

The survey asked respondents to estimate employment growth over the next three years in the major work areas of the industry. The total hiring over the three year period was estimated at 1,377 new hires. This represents an annual 2.5% growth rate per year significantly lower than the 12-month estimated 4% rate of growth. This inconsistency may be related to a general reluctance to predict beyond the next year. It also may be attributable to asking for data in broader work area categories.

The WIB Interviewers found a similar variance in hiring projections. The three year hiring projection was for 233 new hires. Of these, they projected 158 new hires would be made in the next 12 months. The nature of projection is tricky at best and there may be an intrinsic reluctance to do so beyond the upcoming year.

The survey indicated that major hiring will take place in:
- Sales and Marketing (347)
- Research and Development (258)
- Manufacturing and Production (167)
- Process Development (119)
- Quality (107)
- Information Technology (104)
Chart 6: Projected hiring over the next three years

Survey data

The rate of workforce growth as indicated by the projected three year hiring provides an interesting view of the industry. Small companies project a greater rate of growth than the larger ones. Nevertheless, a greater number of the planned hires will occur at large and major companies. See Table 5 below.

Table 5: Rate of growth over three years by company focus and size

<table>
<thead>
<tr>
<th>Size of company</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
<th>Major</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Biotech # of current employees</td>
<td>105</td>
<td>638</td>
<td>1864</td>
<td>8014</td>
</tr>
<tr>
<td>Planned hires</td>
<td>69</td>
<td>96</td>
<td>160</td>
<td>680</td>
</tr>
<tr>
<td>Growth rate</td>
<td>66%</td>
<td>15%</td>
<td>9%</td>
<td>8%</td>
</tr>
<tr>
<td>Total CRO/CMO # of employees</td>
<td>16</td>
<td>568</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planned hires</td>
<td>15</td>
<td>59</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth rate</td>
<td>94%</td>
<td>10%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Diagnostic # of employees</td>
<td>10</td>
<td>83</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Planned hires</td>
<td>22</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Growth rate</td>
<td>220%</td>
<td>19%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Pharma # of employees</td>
<td>10</td>
<td></td>
<td>2372</td>
<td></td>
</tr>
<tr>
<td>Planned hires</td>
<td>1</td>
<td></td>
<td>244</td>
<td></td>
</tr>
<tr>
<td>Growth rate</td>
<td>10%</td>
<td></td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

Survey data
An interesting picture emerges when we examine the projected three year hiring by company focus. Below are charts presenting the hiring data in this way.

Chart 7 provides detail for the average hiring within the companies self identified as biotechnology focused. One of the Biotechnology companies indicated that it is projecting to hire 100 new employees in Sales and Marketing in each of the next three years. This one piece of data can be seen to influence the distribution heavily. Changes in workforce, due to a new product, or a decision to manufacture “in-state” or not, will have significant impact on the workforce demand picture. The general level of activity and growth across the biotechnology focus area averages in the range of 5-10 new hires per year per company.

![Chart 7: Average Projected Biotechnology Focused Hiring in the Next Three Years](chart.png)

Survey data
In the chart below showing Pharma’s projected growth, there is a distinctly different average pattern with emphases on Research and Development and Information Technology.

**Chart 8: Average Projected Pharma Focused Hiring in the Next Three Years**

- Information Technology
- Research and Development
- Quality
- Process Development
- Manufacturing and Production
- Sales and Marketing
- Human Resources
- Finance
- General Administrative
- Legal
- Other

*Survey data*
In Chart 9 below, the projected hiring in CRO focused companies again demonstrates the variability within sectors. The emphases within the CRO focused companies is on Research and Development and Process Development. These two eclipse other areas of hiring demand.

**Chart 9: Average Projected CRO Focused Hiring in the Next Three Years**

- Research and Development
- Process Development
- General Administrative
- Sales and Marketing
- Information Technology
- Finance
- Legal
- Human Resources
- Quality
- Manufacturing and Production
- Other

*Survey data*
In Chart 10 below, the projected hiring of CMO (limited generalizability due to only one respondent) there are predictable emphases on Manufacturing & Production and Quality.

**Survey data**
Then in Chart 11 (one diagnostic focused company responded) the hiring focus projected over the next three years is on Manufacturing & Production and Sales & Marketing.

**Chart 11: Average Projected Diagnostics Focused Hiring in the Next Three Years**

Survey data
The Bachelor Degree Preference Challenged

In both public pronouncements and in the collected data regarding hiring projections, there is an expressed preference for hiring the baccalaureate degree holder. At its extreme, company spokespersons state that they do not hire at the associate level. When this is examined aside the reported description of the current workforce and the long-standing placement records of community college based biotechnology programs, a confused picture emerges. There is a substantial track record of hiring at the associate degree level that is well documented but there is at the same time a frequently asserted preference to hire at the baccalaureate level.

The survey sought to clarify this confusion or at least begin to explore and illuminate it. The survey asked two questions related to 21 entry-level job titles. In the first instance, the survey asked about planned hiring. In the second instance, the survey asked respondents to indicate their company’s preference for degree preparation for the 21 entry-level positions. When asked about hiring projections regarding these 21 job titles the respondents demonstrated a marked leaning toward the bachelor degree. See Table 3 (page 9).

In the second instance, examining the preference for academic preparation, a number of the positions emerge favoring the associate degree. Table 6 has been sorted by the positions most frequently identifying the associate degree as the preferred preparation. It shows a preference for the associate degree as preparation for Clinical Research Associate, Laboratory Technician, Document Control, Facilities Technician, Manufacturing Operator and Quality Control Technician.

There are distinctly mixed perceptions about the nature and quality of the associate degree holder and the content of the preparation. This provides opportunity for further research, and enhanced communication. Chart 12 shows the distribution of preparation preference.
Table 6: Company preferred degree preparation for selected entry-level positions

<table>
<thead>
<tr>
<th>Position</th>
<th>Diploma</th>
<th>Associate</th>
<th>Bachelor</th>
<th>Graduate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Research Associate</td>
<td>3</td>
<td>22</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Laboratory Technician</td>
<td>3</td>
<td>10</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Document Control</td>
<td>1</td>
<td>9</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>Facilities Technician</td>
<td>5</td>
<td>8</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Manufacturing Operator</td>
<td>3</td>
<td>8</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Quality Control Technician</td>
<td>2</td>
<td>8</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Animal Technician</td>
<td>2</td>
<td>7</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Manufacturing Technician</td>
<td>3</td>
<td>5</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Research Assistant</td>
<td></td>
<td>5</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Validation Technician</td>
<td>1</td>
<td>5</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Administrative Assistant</td>
<td>2</td>
<td>4</td>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>IT Applications</td>
<td>1</td>
<td>3</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>IT Help Desk</td>
<td>1</td>
<td>3</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Mechanic</td>
<td>9</td>
<td>3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Glass Washer</td>
<td>9</td>
<td>1</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Quality Control Engineer</td>
<td></td>
<td>1</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>Materials Technician</td>
<td>1</td>
<td>10</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Quality Assurance Auditor</td>
<td></td>
<td>12</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Research Associate</td>
<td>18</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Validation Engineer</td>
<td></td>
<td>3</td>
<td>17</td>
<td></td>
</tr>
</tbody>
</table>

*Survey data*
Survey data

Challenges in seeking new employees

The survey and interviewers both asked respondents to identify the position titles they found most difficult to fill. The rationale for this question was to seek possible areas where demand was outpacing supply of new talent. The complete list of each reported position that companies found difficult to fill can be found in appendix A. The positions cross a broad range of roles with several being reported repeatedly.

The most frequently mentioned areas were “Clinical roles”, “Engineers” with various specializations, “Scientists” with specific skills, “Research roles”, “Data or IT roles, “Quality” roles, "Regulatory” roles and “Sales”.

Skill preference for entry level candidates

Both the survey and the interviewers were interested in learning about the skill deficits companies were encountering with entry-level candidates (new employees). The respondents identify a broad range of technical and soft skills. They also emphasize the need for experience, real world hands on and practical knowledge.

The entire list of desired skills can be found in Appendix B
What are your preferred ways of locating new entry-level talent?

The survey also sought to provide information to assist industry talent acquisition staff and college faculty and placement personnel. In the highly competitive world of life sciences, the associate degree holder is generally competing with the bachelor degree holder. Knowing what means of recruitment is preferred by the company is informative.

It is no surprise given conversations with industry leaders and human resource professionals that the industry values experience above all else. In order to assure themselves that the new hire is a good risk, the route most often chosen is via the staffing agencies. Next most frequently relied upon is familiarity with a proven training program and then based on prior first-hand experience with the candidate as an intern or coop and then second-hand as someone known to a current employee. Programs in ongoing relationship and geared to specific company needs are a valued source of new help. The known quality program becomes a trusted resource for filling new positions. The track record matters.

Chart 13: Preferred approach to hiring at the AA/AS level

Survey data
The survey also asked for the kinds of services they utilized when seeking new entry-level employees. Job boards, staffing agencies, college placement offices and MassBio are mainstays of their process to locate new staff. At lesser levels companies may use industry boards, employee referral and word of mouth. Although social media is growing in awareness, it is still not a regular part of their recruitment efforts.

**Chart 14: Means to locate potential employees**

![Chart 14: Means to locate potential employees](image)

**Survey data**

**Summary of Principle Findings**

The life science sector continued to outperform other industry sectors by exhibiting dramatic growth from 2002-2008 and moderate growth over the past four years.

There is bias within the industry in Massachusetts for the bachelor degree. This preference is expressed even in positions that are aligned with the preparation afforded by the community college.

The industry seeks individuals with a high level of confidence and skill in laboratory techniques for a variety of positions.
Larger companies hire greater number of AA/AS graduates and there is a potential for more hiring under the proper circumstances.

There is a near universal expectation of prior experience even at the entry-level. This is best developed through internship or coop experiences.

Projected hiring patterns indicate current and future need for Administrative and IT functions.

There is a contradiction between the stated preference to hire community college graduates and the numbers of community college graduates hired. This survey data points to a predilection to hire community college graduates but for various reasons the inclination is not fulfilled.

**Recommendations for Future Initiatives**

We believe there is an opportunity for community colleges to increase their graduates’ image and value to life sciences corporations and the following strategies should be initiated:

- Continue to define the life science core competencies of graduates as they relate to specific job functions and skills desired by industry
- Increase the clarity and capacity of productive and efficient academic and career pathways to meet desired core competencies
- Increase relationships and collaboration opportunities between community college faculty/administration and corporate scientist and hiring managers
- Cultivate a systemic approach to increase graduate placements using staffing agencies
- Expand and further develop the college’s corporate outreach in order to raise awareness of community college programs and demonstrate the value of the community college graduate
- Leverage and build upon life sciences industry endorsement of community college programs
- Expand industry awareness of the community college preparation for roles as administrative assistant and information technology positions.
- Increase national presence and collaborations with DOL funded entities and other not-for-profits working to enhance community college graduates relevance with life science corporations
Appendix A

Complete list of responses to “Most difficult positions to fill”

Whenever the same language was used, the numeric notation in brackets indicates the number of times the position was mentioned. Thus Animal Technician (2) indicates that two companies indicated this as a need.

Administrative
Administrators
All hire internationally
Animal Technician (2)
Biostatistician (2)
Chemist (2)
Chemistry /Physics with Bio background
Clinical
Clinical Pharmacologists (2)
Clinical Safety Assistant
Clinical Safety Associate
Clinical Trial Assistants
Clinical Trials Associates
Computational Biologist
Customer Service
Data analyst
Document Control
Engineer, electromechanical
Engineering (software, mechanical, electrical)
Engineers with broad skill set
Engineers with specific experience, controls,
Software electronics, CAD/CAM
Engineers with specific skills
Facilities Technician
Field Application Specialist with prior IVD experience
Generalist for administrative activities
Good interns
IT
IT Quality Assurance,
Lab technician

Laboratory interns
Manufacturing operators
Manufacturing technician (2)
Mechanic
Medical Technologists
Paralegal
Pharmacology Associates
PhD
Plastics extrusion engineers and techs
Product development
QC technician
QA Compliance Specialist
Regulatory Affairs (4)
Research Assistants (because we are looking for more than an average person - someone with more ‘fire in the belly’ to contribute more broadly)
Research Associate (3)
Sales (2)
Sales Procurement Services
Sales with tech skills
SAS Programmer
Scientific, research experience with more understanding of drug development process
Scientist with Specific Skill set (4)
Specialist Design Engineers Programmers
Staffing Assistance
Technical Managers (2)
We don’t have many entry-level positions in our Massachusetts facility.

Survey and interview data
Appendix B

Complete list of responses to “What key skills do you find entry level candidates lack?”

Ability to work independently  
Advanced computer skills  
All applicants seem to require visa sponsorship  
Analytical and synthetic chemistry experience  
Biotech mfg. knowledge  
Broad Science techniques knowledge  
Business/industry experience technical selling  
Communication (3)  
Computer Skills  
Critical thinking, complex problem solving  
Critical thinking, independent, data interpretation, judgment  
Customer service, Design control  
Direct experience unless utilizing internships, Co-Ops, etc.  
Drug development experience  
Engaged, enthusiastic, pro-active  
Experience with commercialized diagnostic development  
Experience, independence  
Exposure & knowledge of GMP/GXP  
Field experience  
Fit with culture  
GMP validation  
Hands-on experience  
Hands-on lab experience  
Hands-on practical experience  
Hands-on exposure through industry internships or applied learning at school  
Immunoassay techniques  
Independence  

Survey and interview data