Life Sciences Industry Characteristics, Economic Impacts, and Possibilities

City of Novato

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Prepared by Marin Economic Forum

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2013 Marin County BioScience Industry Highlights

- **Companies:** Marin County is home to over 200 life-sciences companies; with a population of only 255,000 people, Marin County has more life-sciences businesses than any other county in California per capita.
- **Revenues:** Marin County's biomedical companies will generate total, estimated annual revenue of $783 million in 2013, up from $731 million in 2012 and $689 million in 2011. These businesses, given Marin County's size, generate almost all of their income from exports (sales outside Marin County). BioMarin (ticker: BMRN) was approximately $500.7 million in 2012 in product revenue from their SEC filings for year-end 2012.
- **Employment:** Marin County employs over 1,700 people in life-sciences businesses, mainly in biopharmaceuticals, instruments and diagnostics, and research institutions. Sonoma County, Marin's neighbor to the north, has most of its life-sciences employees in medical device businesses.
- **Employment Trends:** Total life-sciences jobs in Marin County have grown since 2001 from approximately 727 positions to over 1,700. Recent expansions at the Buck Institute for Aging Research and at BioMarin, as well as other, smaller pharmaceutical companies in Novato suggest employment growth.
- **Employment by geographic cluster:** The large number of employees are Novato and San Rafael; there are approximately 700 and 900 employees in San Rafael and Novato respectively, and other 100 employees or more throughout other parts of Marin County (Sausalito, Mill Valley, Corte Madera are other geographic locations).
- **Wages:** Marin County's life-sciences companies paid employees an approximate total of $248 million in 2012. The average annual wage for the industry across Marin County in 2012 was approximately $60,500 for medical labs to $198,000 for pharmaceutical research staff.
- **Grant Funding:** Marin County based researchers were awarded $10.6 million in National Institute of Health grants in 2012, most coming from the Buck Institute for Aging Research. Marin County
- **Business Size:** Marin County has predominantly smaller businesses generally, and 94 percent of life-sciences businesses in Marin County are less than 25 employees.
- **Educated Work Force:** Marin County has a population where over 51 percent of the population over 18 years of age has at least a bachelor's degree, and has similar proportions of graduate degrees to San Francisco County. Novato, where many of the life-sciences employees are concentrated, has 44 percent of its residents with a bachelor's degree or more.

Executive Summary

There are opportunities for new bioscience businesses in Novato and Marin, and also some challenges. It is important to recognize that the life sciences sector is an umbrella over many industries. Marin County provides a home to research facilities, educated labor, firms currently operating in life-sciences industries, and is also part of the Bay Area, which has global bioscience connections. This report uses the Bay Area, San Mateo County specifically from the Bay Area overall, and San Diego County as contexts for California's life-sciences clusters, but also looks briefly at other national examples to suggest other areas of possible competition. Employment is rising throughout the Bay Area life-sciences clusters and in Marin since 2010, and growing in trend since 2001.

Patent, grant and venture capital data suggest that research and development, investment and expansion of life sciences slowed a bit in 2012 for California and the Bay Area overall. Life-sciences industries are regional, drawing workers and ideas across the Bay Area. To draw businesses toward Marin County and the City of Novato, a four-county partnership has begun. The North Bay Bio/Life Science Alliance includes Sonoma, Marin, Napa, and Solano counties; these counties all have life-sciences businesses operating currently, but Marin County has some unique assets within this four-county partnership.

The Buck Institute is a place where grant and foundation funding share risk, a unique asset of Novato. Novato has a cluster of life-sciences businesses in place, firms such as BioMarin, Ultragenyx and Raptor Pharmaceuticals. The normal chain of financing is that local research draws in grant funding to finance initial R&D toward product development and not rely solely on venture or loan funding to move research from idea to marketplace.

Commercial real estate data and trends create more challenges, and suggest that the greater Bay Area has vacant space to fulfill demand for many businesses, especially to the south and east of San Francisco. Marin County has a small amount of industrial space available and more to offer in terms of Class A and B office space. Demand for space, created by marketing and business attraction through the North Bay Bio/Life Science Alliance, may convert currently used space to life-science occupancy because these firms pay larger rents than current occupants.

Regional connections are apparent when looking at national case studies. Examples such as western Philadelphia and west Boston show the possibilities of repurposing office properties to fit the needs of biosciences absent demand from other industries for specifically Class B space. If properties were to be repurposed, it would likely be after a business identifies a property and a specific repurposing need. The proactive conversion of current Class A and B space may not be as important as having flexibility in converting industrial/flex space at a later date once new businesses operating in offices are ready to begin clinical trials or manufacturing. To remain globally competitive, funding needs to be approved at the federal level to support life-sciences research and California voters may be asked to approve state-level funding or agencies to help support the growth of life-sciences research and ultimately businesses. Grant funding acts as primary financing and an attractor to venture capital investors to further fund research once grants are used.

The best bet for Marin County is to initially utilize current office space vacancies as where new businesses should locate. This implies more of an emphasis on firms in either research or design phases rather than in production. Any attraction, retention or expansion strategy needs to focus on businesses that need administrative space and space without the need for lab work. The possibilities of repurposing and tenant improvement flexibility should be known before advertised. It is also possible, by partnering with local landlords and commercial real estate professionals, to find space that is currently occupied and displace otherwise lower-paying tenants for new and growing life-sciences businesses. Further, the Buck Center acts like a university-like environment for scientists in new firms, a unique asset that Marin County holds that the other counties in the Alliance do not have. Marin County

could become the center of a regional bio/life sciences industry expansion radiating from Novato to the north and east.

There are economic impacts on Novato and Marin County by growing life-sciences businesses in Novato. The following summarize this study's estimates of the effects:

- An expansion of life-sciences businesses expands Novato's economy overall.
    - For every 100 new workers in life sciences, another 88 workers are supported in industries across Novato annually;
    - At 200 new workers, there is support for another 182 workers annually;
    - At 300 new workers, another 203 workers are supported beyond the 300 jobs annually.
- As these new businesses came to Novato, business incomes would be made throughout the city, and tax revenue would be generated:
    - When there are 300 new workers, over $95 million of new business incomes would generated throughout Novato annually;
    - These businesses, their employees and other workers and households throughout Novato would generate $4.03 million in state and local revenue.
- The Buck Center's construction effort would support 308 jobs for Novato during construction;
    - Over $49 million of business revenue would be injected into Novato's economy during this time;
    - Over $1.84 million in state and local taxes would also be generated, some of which would be in the form of new property taxes which would remain after construction.
- Once the Buck Center's new space was occupied, there is estimated to be another
    - 287 jobs supported, including new firms at the Buck Center, annually;
    - $47 million of new businesses revenues generated throughout Novato annually;
    - $2.02 million in new state and local tax revenue generated annually; and
    - Building residential units on the same footprint as this commercial expansion would lead to smaller economic impacts for the City of Novato.

Novato is a place of opportunity for life-sciences businesses. The national Biotechnology Industry Organization (bio.org) recently published a study with the following list to describe characteristics of life-sciences locations that form clusters of businesses. The list below could be viewed as a checklist for Novato to consider in terms of next steps and where the public policy needs are:

Characteristic	**Novato Has This**	**Novato Could Develop**	**Challenge for Novato**
Local government & private sectors committed to building base of science R&D and supportive infrastructure;		●	●
Academic and industrial researchers committed to translating discoveries into application and moving them forward to commercialization;	●		
Highly skilled workers and a deep talent pool of both researchers and entrepreneurs;	●		
Public and private sources of risk capital;	●	●	●
Affordable space and facilities equipped to house bioscience companies;		●	●
Support networking and cluster development	●	●	
Favorable financial incentives and tax policies.		●	●

Recommendations

There are five recommendations that Novato and Marin County should consider in terms of a life sciences cluster expansion from the data in this study and Table 8 above:

1. **Utilize the regional connections forming between Marin, Sonoma, Napa, and Solano counties.**
    a. Novato should recognize that life sciences businesses are regional based on local universities and research facilities providing outreach to other areas;
    b. The Bio-Life Sciences Alliance can use each area to leverage local workforce investment act and other state and federal dollars to attract life-sciences businesses; and
    c. The North Bay region has a mix of life-sciences businesses, housing and proximity to the greater Bay Area to provide more options for workers and still remain connected to the core Bay Area clusters in life sciences;
2. **Identify properties, through partnerships with local commercial real estate professionals, that can be repurposed for scientific and research use as an expansion of laboratory environments;**
    a. Form a team of local professionals that provide these data and keep Novato ahead of any deals for space that were initially earmarked for life-sciences businesses;
    b. Join CoStar, or ask a local commercial RE firm for a donated membership;
3. **Identify commercial, educational or non-profit partnerships that can be fostered to provide a pipeline for more life-sciences businesses;**
    a. Be sure the Buck Institute and Dominican and a group of local firms otherwise identify their grant-seeking activities and their venture-capital deals;
    b. These awards and deals becomes stories to tell as to why Marin County is a good place to do business, but these stories must come from the biosciences industry;
4. **Consider diversity in attraction to reduce perceived competition over labor from other life-sciences businesses already in Marin County;**
    a. Be politically savvy in including the biosciences businesses and recognize the current cluster may perceive more labor competition and cost than the positive community effects of expansion;
5. **Advertise any and all financial institutions or venture funding sources in Marin County or the North Bay that are willing to partner with new businesses in life sciences;**
    a. Need to find the local venture firms and also invite venture firms from the Bay Area to Marin County on a regular basis to view new businesses and to link up with grant-seeking scientists and organizations to begin the financing chain;
    b. Link with BayBio and the Bay Area Council to attract a national and international audience for more financial investment.

Life Sciences Industry Characteristics, Economic Impacts, and Possibilities
Novato, California

Introduction

Novato and Marin County have life-sciences firms in operation and Novato may be a great place to both attract and expand such businesses. There are some challenges to both Novato and Marin County being a place for new and growing businesses in life sciences. The life-sciences industry is an umbrella over a large number of other industries. It is a global business, driven by multinational corporations that make investments worldwide to find new ideas and talent. Biological science that helps sustain life in humans, other animals and plants is the foundation. Research and development firms exist alongside of pharmaceutical and medical device manufacturing companies in the North Bay. The greater Bay Area, including San Francisco, Santa Clara, San Mateo, Alameda, Contra Costa, Solano, Napa, Sonoma, and Marin counties, is one of the major life-sciences areas in the world. The depth and breadth of businesses, employees, research, and possibilities gives Marin County target markets and possibilities to combine local and regional assets into economic development, growth and some niche as a place for these types of firms.

In the Bay Area, an organization called BayBio (www.baybio.org) acts like an industry trade association for life-sciences firms. BayBio generally describes the industry sectors in life sciences as based on the following types of businesses:

- Biomaterials and Bioprocesses;
- Medical Therapeutics;
- Agricultural Biotechnology;
- Animal health and nutrition; and
- Nutraceuticals.

This study is about the opportunities and challenges in supporting the growth of life-sciences business in Marin County, competitive advantages and disadvantages, and the effects of growth on other parts of Novato and Marin County overall. The complementary assets are mainly in commercial real estate and labor markets, but also in political and social capital in terms of flexibility of commercial space zoned for other purposes. Competition for businesses and labor in life sciences also reveals opportunities and challenges in expanding or drawing in businesses. Competition is global, but California has unique areas in this industry that are likely candidates for business attraction and also migration of

labor.

The first section of this study looks at research and funding trends and logic. Grant funding acts like seed capital for larger investors, including venture capital firms. The next section looks at currently available commercial space, recent labor demography, and possible regional partnerships help frame how Marin County can be more competitive for specific types of life-sciences businesses. The North Bay Bio/Life Sciences Alliance is such a partnership and important in reducing regional competition and enhancing cooperation as global competition strengthens. The next section compares employment, establishments, and demographic data compared and contrasted Marin County's history; the next section looks at the economic impacts of these businesses and how other businesses are affected by the growth of biotechnology, biological research and other businesses in the life sciences continuum. The final section looks at the possibilities in Novato and Marin County for growth and attraction, providing recommendations as to how Novato can pursue and support growth of these businesses given the context within this report.

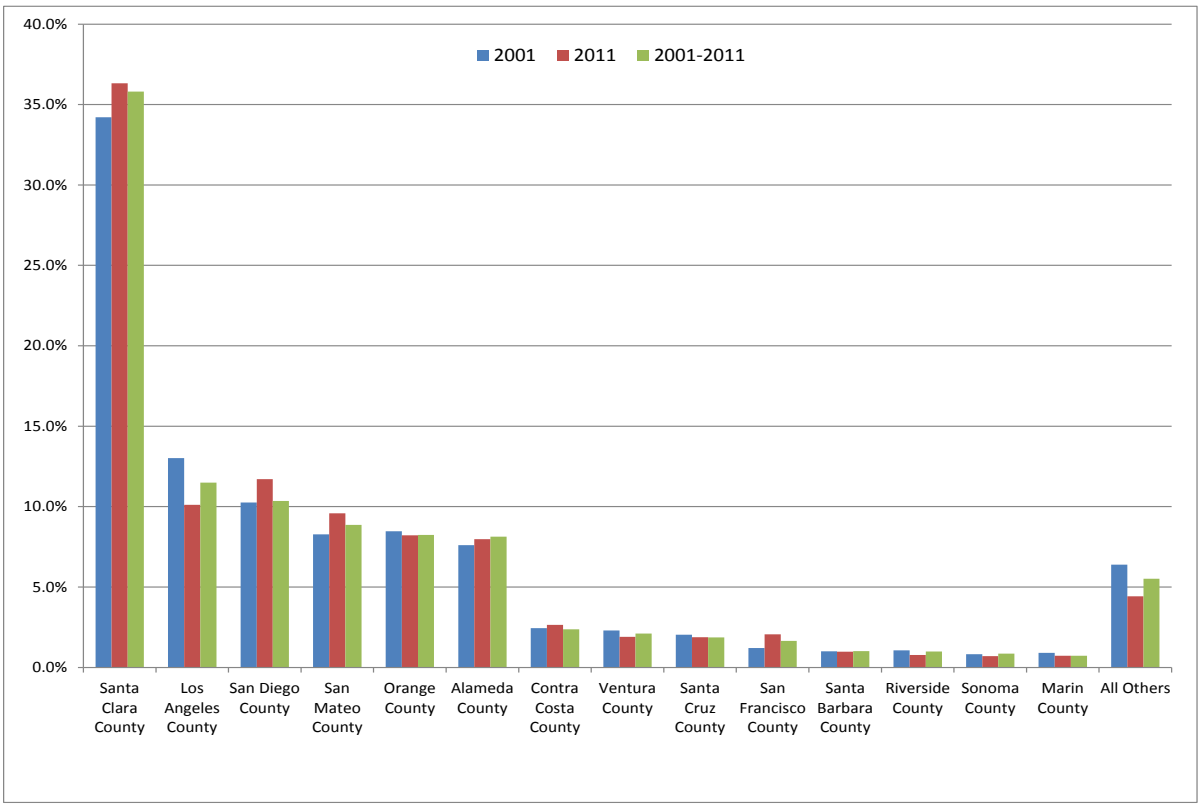
Patents, Grant Funding and Venture Capital

The preferred pattern of investment, according to the Biotechnology Industry Organization in Washington, D.C. (bio.org), is that public grant and non-profit foundation funding, which leads to commercial science applications, attracts private-sector funding to grow the new science into a new business.

Patents in life sciences generally fall under specific patent classes by composition or use. Because some patents may be sought as a foundational step in life-sciences products, the patents may start outside life sciences. Figure 1 shows the overall patent activity in California counties since 2001. Marin County ranks about 14th in terms of total patents and in the top two or three counties in California in terms of patents per capita for counties with more than 250,000 people.

In terms of life sciences patents, specific areas of California are in national and global competition for ideas and commercial projects. In Figures A10 through A12 in the Appendix, the San Francisco, San Diego and Sonoma County metropolitan statistical area (MSA) data on life-sciences patents are shown. The patterns in Figures A10 through A12 show that since 2001 (the inner ring), the three areas have seen some slowness since to 2001 to 2011 (the outer ring) in terms of the proportion of patent activity in life sciences; San Diego has the most movement mainly in medical device design, which corroborates its standing as one of the leading life sciences areas in California and the United States.

Figure 1: Patent Activity overall in California Counties: 2001, 2011 and 2001-11



Source: US Patent and Trademark Office (USPTO): www.uspto.gov

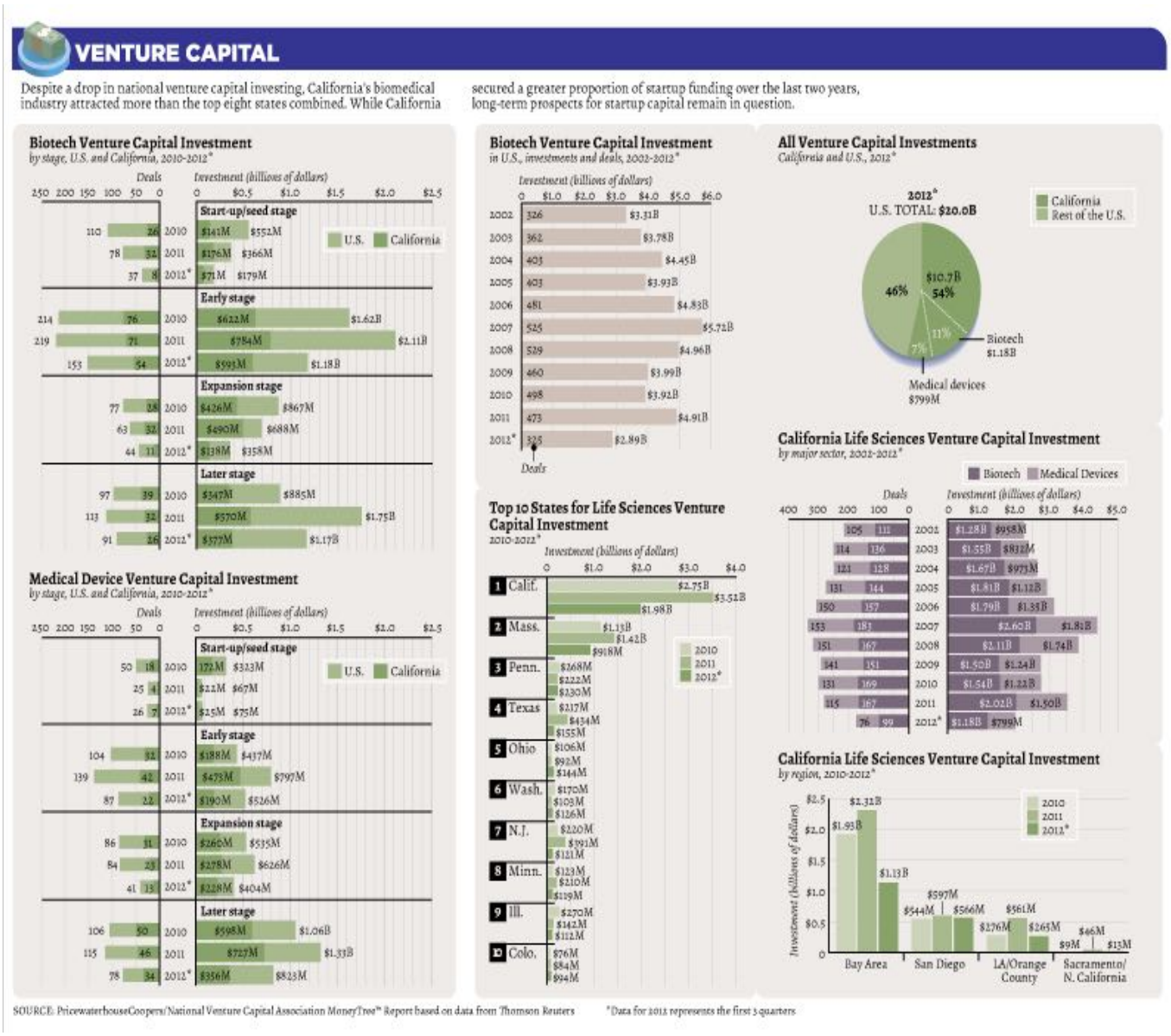
Marin County data is available for all patents, but the data are not available yet for specific types of patents. Medical device expansion has taken place in all three areas; this is especially true in Sonoma County, mainly through Medtronic and spinoffs. Since 2005, Marin County generates between $10 and $15 million in National Institute of Health (NIH) grant-funding, most of which goes to researchers are the Buck Institute for Aging Research. Grant funding can generate interest from venture funding, where grant funding acts as a way for venture funds to share risk with governmental agencies on research becoming commercialized.

In a recent report, a description of the funding cycle preferences makes it clear that life-sciences businesses grow or migrate to locations that link grant or non-profit foundation funding to venture funding and thus share risk among funding sources.[1] The Buck Institute receives grant funding, as does Dominican University of California. As a comparison, the University of California, Davis received $180 million in National Institute of Health (NIH) funding in fiscal year 2012-13 across 37 departments and institutes; the Buck Institute has received $13.6 million, $9.6 million and $10.4 million over the last three

[1] See http://www.bio.org/sites/default/files/State-Leg-Best-Practices_0.pdf

years (2011-13). The Buck Institute also received a $20.5 million grant from the California Stem Cell Research Foundation in 2008 to build a facility dedicated to such research; the facility was finalized in 2012. The data in Figure 2 provide different perspectives on the current focus of venture capital activity. Between 2010 and quarter 3 2012, more focus has been on funding early stage and later stage businesses rather than start-ups. It is likely that there were start-ups in the mid-2000s that are now maturing and have moved through the pipeline. What is intriguing is that there has not been more seed and start-up funding in the last three years given the financial market returns over that same period.

Figure 2: Venture capital summary, Recent History (through 2012 Q3)
US markets and Life Sciences Sub-industries



Source: Accessed at http://www.californiabiomedreport.com/venture-capital/

Local government can also act as a funding source indirectly, but due to the loss of redevelopment dollars, it is difficult to expect cities and counties to provide direct investments. For example, the City of Novato may consider providing reduced taxes, fees or costs to incoming businesses (such as what happens in San Francisco in its biosciences enterprise zone) or providing tenant improvement and zoning flexibility with faster speeds and lower costs when a life-sciences business wants to locate within the city. Such partnerships provide cost reductions to entice new businesses. As with other life-sciences sectors, Novato's greatest and perhaps only major draw will be the Buck and access to grant & foundation funded research. Further, the North Bay Life/Bio Science Alliance provides opportunities for cost sharing in terms of business attraction and expansion strategies and marketing; much like local workforce investment boards, the Alliance allows for group applications for grant funding and other foundation sources to support a regional bioscience cluster.

How Novato Can Use These Data and Ideas

For Novato looking forward, there are three considerations:

1. Venture capital seeking new opportunities outside the core Bay Area clusters may see the Buck Center and Novato as a place where grant and foundation funding are naturally drawn and share risk with investors on new life-sciences businesses;
2. Because Novato already has a cluster of businesses in place, the likelihood that new research and ideas would draw funding is relatively high versus other areas (Napa, Solano west of Vacaville, Sonoma) were fewer firms currently exist or there is not a research institute in place to facilitate innovation (as the Buck Institute and the pharmaceutical companies in Novato provide versus other parts of Marin County). This makes a regional alliance that much more important in sharing ideas, funding, and partnering on grants to support new bioscience business growth; and
3. The key is to facilitate partnerships between research that can be marketed from the Buck Institute and local firms that can provide infrastructure for new products.

Also, the Bioscience Industry Organization[2] (bio.org) in Washington, D.C. identified several factors that can enhance an area's ability to gain access to grant, venture and other types of funding and financial investments:

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[2] Ibid.

- Local government and private sectors committed to building a robust base of high-quality science and technology R&D and supportive infrastructure;
- Academic and industrial researchers committed to translating discoveries into application and moving them forward to commercialization;
- Highly skilled workers and a deep talent pool of both researchers and entrepreneurs;
- Public and private sources of risk capital;
- Affordable lab space and facilities equipped to house biopharmaceutical companies;
- Mechanisms that support networking and cluster development; and
- Favorable financial incentives and tax policies.

Novato and Marin County should consider the Bioscience Industry Organization's list above as a checklist in terms of how biosciences firms may view these areas as potential locations, especially if they intend to seek grant or venture funding once in Marin County.

Commercial Space

There is inventory of light industrial space in San Rafael and Novato that could be repurposed or current tenants displaced if higher-paying tenants were to come to Marin County. There are also sites for light-industrial development like the former Birkenstock Campus and within the Hamilton area of Novato. As of Quarter 3, 2013, CoStar[3] provides the following inventory data for Marin County in industrial/warehouse space:

- Total industrial and warehouse inventory for Marin is 7,946,561 square feet (sf) – Vacancy is 327,667 sf (4.12%)
    - Costar categorizes industrial space as Flex and Warehouse.
    - Flex Inventory is 2,896,239 sf – Vacancy is 176,445 sf (6.09%)
    - Warehouse Inventory is 4,073,022 sf – Vacancy is 3.71%
- Some lab activities are being carried out in both industrial and office buildings in the county.
    - There are 236,560 sf in eight buildings in Bel Marin Keys that Costar classifies as R&D.
    - Several currently have none lab tenants; there are eight buildings with 236,560sf. They are all 100% leased.
    - In addition, there is space at the Buck Institute.

[3] See www.costar.com; data shown here furnished by Cornish-Cary NFK Commercial Realty

- In Bayview Business Park in San Rafael, the building vacated by Tissue Banks International (28,689sf) is all available.
    - Those buildings good be good R&D buildings but currently house various uses.
    - There are eight buildings totaling 225,276sf with a current vacancy, including Tissue Banks (2597 Kerner Blvd in San Rafael), of 52,368sf. (23.2 percent vacant).

In the Bay Area overall, Cassidy-Turley Commercial tracks R&D space in San Mateo County, East Bay Oakland, East Bay Pleasanton.[4] These four markets are the dominant places for life-sciences and physical sciences research and development space. What these data suggest is that space on the R&D side of the market is relative plentiful and inexpensive in these areas. As of 2013, quarter 3, the following data existed for these three markets:

- San Mateo: vacancy rate of 11.8 percent, $2.28/sf; proximity to Stanford University.
- East Bay Oakland: vacancy rate of 19.4 percent, $0.89/sf; and proximity to UC Berkeley
- East Bay Pleasanton: vacancy rate of 8.6 percent, $0.93/sf. proximity to Sandia and UC Davis partnership with local Innovation Hub (iHub) there.

The City of Novato Economic Development Department reports that Novato contains approximately 3.4 million square feet of office space, with a vacancy rate of 18 percent as of October 2013. This rate represents a drop from a high of 21 percent one year prior, and remains in line with countywide trends. Vacancies have been slowly decreasing over the last 12 months from 14 to 13 percent.

Marin County submarkets closer to San Francisco (South Marin) are showing an increase in vacancies from 10 percent to 12 percent over the last twelve months but these areas have higher lease rates than Novato. Central Marin, encompassing Corte Madera, Greenbrae, and Larkspur, has a 7 percent vacancy rate and an average asking rate of $3.58/square-foot, the largest office lease rates in Marin County. Proximity to the ferry building in Larkspur and the ferry terminal in Sausalito (though the office space in Sausalito is much smaller than central Marin by comparison) drives lease rates up, lower vacancies, and better utilization possibilities. In many cases, one tenant leaving South or Central Marin can increase vacancy rapidly, and overall space is becoming less plentiful since 2012.

The Novato office market is organized around five main subareas: Hamilton Landing, Bel Marin

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[4] See http://www.ctbt.com/Web/Research.aspx?CategoryName=Quarterly+Reports&Header=Market+Snapshots

Keys, Rowland Plaza, Central Novato and Northern Novato. Some of these may be strong placement opportunities for new firms in life sciences that do not need lab space immediately or may be able to use shared lab space:

- Hamilton Landing: Mainly Class B space, possible repurposing with amount of available space;
- Bel Marin Keys: Mix of industrial and office, proximity to other labs and R&D space;
- Rowland Plaza: Mainly office space, relatively high vacancy, proximity to other firms;
- Central Novato: Mainly office space, close to other amenities and the Buck Center; and
- Northern Novato: Major portion of available Class A and B space here, very close to Buck Center and Sonoma County.

Novato's industrial market is small and has low vacancy. There are approximately 1.1 million square feet of industrial space with a vacancy rate of 4 percent and 1.5 million square feet of flex and specialty space with a vacancy rate of 7 percent. Lease rates average approximately $1.30/square foot for industrial space and $1.20/square foot for flex space. The amount of this space that is either ready for scientific activity or could be converted is relative large over time when considering the potential displacement of lower-rent tenants for higher-rent scientific business occupants.[5]

How Novato Can Use These Trends

The North Bay Bio/Life Science Alliance provides information to each county about commercial space trends, and also what new or growing businesses are looking for commercial space. Cooperating on business attraction and retention reduces the possibility of losing home-grown or attracted businesses to other regions because the Alliance can work to find firms space that suits their needs. The data above suggest that the greater Bay Area has space to market for life-sciences firms and would be very competitive. Given the small amount of available space in Marin County currently available, if properties were to be repurposed, it would likely be after a business identifies a property and a specific repurposing need. The conversion of current Class A and B space may not be as important as flexibility in converting industrial/flex space at a later date once new businesses operating in offices are ready to begin clinical trials or manufacturing. The Buck Institute for Aging Research (Buck) is considering a second expansion of research space to house aspiring scientists and businesses that intend to use Buck's assets (space, labs, scientific community, staff, regulatory clearances on animal testing) and occupy commercial space. However, this space is limited.

[5] City of Novato, 2013 Existing Conditions report forthcoming.

Where Novato and Marin County otherwise are competitive is office space; by advertising flexibility on tenant improvements and repurposing space as needed, new and expanding business may be attracted to move office locations and use other assets identified in this study (local labor force, research workers, proximity to the Bay Area otherwise) where office space would be an initial need. The conversion of current low-rent tenant to new businesses is also a possibility.

Considering Competition and Locations of Other Life Sciences Clusters

Solano County has the largest life-sciences footprint within the Alliance counties, but that footprint lies at Solano's eastern border; Genentech locating a campus in Vacaville were due to incentives to locate there in terms of land use and improvements; the proximity to UC Davis, the regional labor force in Solano, Yolo and Sacramento counties, and the logistics along the I-80 corridor added indirect incentives. Logistics and proximity to a major research institution (or set of them) seem to be major factors in life-sciences clustering in other, national examples.

Major Locations outside California[6]

In 2011, California accounted for about 14 percent of science and engineering jobs nationwide. Locations outside California present competition in the race to hire highly-skilled science, technology, engineering, and mathematics (STEM) trained workers. Indeed, for many years, a number of other states have engaged in economic development to expand life-sciences businesses locally. Efforts include specific attraction strategies (such as targeting university research in New York City to transfer to commercial facilities in the greater New York area) to providing direct grant financing. Metropolitan areas in the United States considered to be major life-sciences areas generally have three major characteristics:

1. Large governmental presence and ties to government grants;
2. Large educational presence and community partnerships to foster entrepreneurism in these industries as born from university science, professors, and students; and
3. Large metropolitan areas for access to workers and capital.

Research environments exist throughout the United States where research-focused educational institutions, normally called "Research 1" institutions, find partnerships with local industries or are themselves generating new businesses. In most cases, there are educational facilities close to or in

[6] See http://lifesciencespace.com/files/JLL_Global_LifeSciencesClusterReport.pdf for more.

explicit partnerships with the local businesses. While this is not overwhelming evidence of a need to have both a major metropolitan area and research–based educational facilities close, it seems to help. This underscores two themes of this study: (1) the presence of the Buck Institute in Novato as a Research 1 type facility attracts and expands businesses in Marin County; and (2) the partnerships are regional other places, which highlights the importance of the North Bay Bio/Life Sciences Alliance to Novato's efforts to grow this industry cluster.

Boston, MA

Boston is one of the major biosciences areas in the United States (San Diego, the Bay Area and the Raleigh-Durham area (aka the "Research Triangle") are the other major places to engage in biosciences) in terms of consistent focus of venture capital and also employment opportunities. Cambridge, MA alone has over 7.5 million square feet of lab space. Harvard and MIT are academic incubators in terms labor and new research ideas. Private research institutions also drive new business activity, or feed into available space also acting like incubation. In 2012 and 2013, commercial rents have risen to the point of moving businesses into suburban areas around Boston.

For the most part, cities and towns west of Boston have been places where non-science support businesses operate (accounting, legal, patent support, etc.). Because commercial rents are less expensive in suburban areas to the west that can be accessed by mass-transit lines and highways, the expansion is forecasted to continue. **In many of these markets, the strategy has been to take Class B space and repurpose it to fit the needs of the life-sciences businesses that are seeking expansion out of the greater Boston/Cambridge area.**

Raleigh-Durham, NC

The Research Triangle has long been a place where frontier technology businesses are born and expand due to the research capabilities and synergies of the University of North Carolina, Duke University, Wake Forest University, North Carolina State University, and others. This area has taken advantage of relatively low real-estate and labor prices to expand in terms of generics development, crop and animal science innovation, and also biological organism testing and stem cell research. In contrast to the Boston/Cambridge clusters and to those in California, the movement in the Research Triangle is much more about smaller businesses and providing continuous incubation space for university-driven research seeking funding beyond grants. Agricultural technology is growing in the area, including Bayer CropScience. Pharmaceutical business growth is also taking place. Merck also has

an expanding footprint in the region.

Philadelphia, PA

Much like Boston/Cambridge and the Research Triangle, activity in the Philadelphia metro area feeds of life-sciences research coming from the many universities that populate the Philadelphia/Camden, NJ area. There are over 1,200 life-sciences companies in the greater Philadelphia area. Venture and conventional funding that exists in New York can access this market easily, and real estate prices are not as fast growing as in the Boston area. Philadelphia has attracted the largest amount of life-sciences venture funding in the last 10 years, over 61 percent of the deals. There are 25 medical schools and over 100 universities and colleges in the metro area, which generates labor and research across the entire ecosystem of life-sciences. There may be as many as 432,000 people employed in life-sciences related businesses in the metro area, over 15 percent of regional employment.

Novartis has recently gone into partnership with the University of Pennsylvania (Penn) for research and licensing, ostensibly to create a pipeline of research to commercialization from Penn to Novartis.[7] Along Route 202, which is to the northwest of downtown Philadelphia, there has been an expansion of pharmaceutical companies. Logistics and academic clustering are considered the reasons behind this expansion. There are also roadway and infrastructure improvements specific to this industry's support going into the roadways along Route 202 in Pennsylvania.

Additional areas in the US and outside of California include:

- Washington, DC;
- New Jersey and New York City;
- Minneapolis/St. Paul, MN;
- Seattle, WA; and
- Westchester/New Haven, CT

Once the businesses come to the local area, another major attraction is the economic benefits that come to the local community. The next section explores those benefits, using and expansion of the Buck Center as new commercial space built and suited for life-sciences businesses.

[7] Novartis is also located in Vacaville, CA.

How Novato Can Use these Data and Stories

These examples suggest that being outside a major metropolitan area, where there is a critical mass of either bioscience research coming from universities or equity-funded science through corporations or both, the development of a life-sciences cluster would be difficult. However, a cluster already exists in microform in Marin County because of its proximity and connections to the greater Bay Area. A challenge is to advertise the scientific community that exists in Marin County as a smaller version of, educational and research institute resources to develop a Research 1 like atmosphere, new ideas from Bay Area researchers will begin to look north and west. As suggested above, much of this depends on the flow of grant and foundation funding to an area, which then attracts other funding sources.

The main reason for national and global comparisons is to look for similar situations that become good stories to tell. Two specific case examples Marin County should consider is west Philadelphia or west Boston. Marin County is on the northern edge of a global center for life sciences and has available space, a relatively educated community and work force, high quality of life, and businesses that are direct and indirect links to life sciences throughout the region. These selling points need to be front and center in any attraction strategy. The North Bay is a suburban region outside the more urbanized Bay Area counties. Given other examples in the United States, it is logical that an expansion toward the Buck institute and UC Davis as idea engines makes Marin and Solano counties points of expansion. The North Bay Bio/Life Sciences Alliance is a partnership to facilitate such movements.

Markets and Contexts: Data and Comparisons

A large obstacle in tracking changes in the life-sciences industry is deciding what types of business represent the industry. A large amount of life-sciences employment and firms are considered "manufacturers" because a business is set up to be a vertically-integrated pipeline from research and development (R&D) to product development, sales and distribution. This is like other scientific firms that ultimately take ideas and create products from them; while the lag times in life-sciences research are generally longer than internet or communications product development, the mechanics and needs of the businesses can be seen is similar.

Table 1 provides the North American industrial Classification System (NAICS) codes for specific industries that are in life sciences. In the manufacturing industries, research and development is

assumed to happen within those firms for the purpose of generating product ideas that are then manufactured. Within these industries, workers are sourced throughout the world to come to the Bay Area.

Employment

In 2013 Quarter 1, there were approximately 110,000 Bay Area workers in life sciences as it is defined in this report. This is approximately 20 percent of California's life-sciences workers. Historically, this employment has been heavily concentrated in Santa Clara County. Since 1990, however, employment in this sector in Santa Clara County has declined by 30 percent, with offsetting increases in Alameda and San Mateo counties. Employment in Alameda and San Mateo counties has increased by about 150 percent since 1990. Throughout the Bay Area, this industry's employment increased by just over 20 percent from 1990 through 2013.

Table 1: NAICS Codes for Life Sciences Employment and Establishments

Industry	NAICS Codes
Medicinal and Botanical Manufacturing	325411
Pharmaceutical Preparation Manufacturing	325412
In-Vitro Diagnostic Substance Manufacturing	325413
Biological Product (except Diagnostic) Manufacturing	325414
Electromedical and Electrotherapeutic Apparatus Manufacturing	334510
Analytical Laboratory Instrument Manufacturing	334516
Irradiation Apparatus Manufacturing	334517
Laboratory Apparatus and Furniture Manufacturing	339111
Surgical and Medical Instrument Manufacturing	339112
Surgical Appliance and Supplies Manufacturing	339113
Dental Equipment and Supplies Manufacturing	339114
Ophthalmic Goods Manufacturing	339115
Dental Laboratories	339116
R&D in Biotechnology	541711
R&D in the Physical, Engineering, and Life Sciences (except Biotechnology)	541712
Medical Laboratories	621511
Diagnostic Imaging Centers	621512

Source: Bureau of Labor Statistics (ww.bls.gov)

There was a peak in employment in 2000, with significant declines following the 2001 recession; the level of employment in 2013 represents a current, high-water mark in life sciences. Marin County employment in Marin County has more than tripled since 2000 to just over 1,700 employees in 2013

quarter 1 according to California EDD. Table 2 represents life-sciences employment, based on the NAICS codes listed above, from 2001 to 2013.

It is important to note that anecdotal evidence suggests that the local biotech and biosciences firms that exist in Marin County may not want an expansion of businesses locally. The claim is that a more competitive labor market will make it more difficult to find qualified workers and also bid up wages. From a strategic standpoint, early involvement of current leaders in biotechnology would be a politically savvy move to avoid confusion or resistance.

Demographics

An important aspect of understanding life-sciences businesses is the type of worker that represents the "core" employee. We tend to think that workers in technology-based companies are generally younger, have some education beyond high school, and are attracted to urban areas for lifestyle reasons. Life sciences businesses tend to attract older, more educated workers on average. Marin County, which has an older demography and a more educated populace than many other counties in the Bay Area, fits those conditions on an initial look.

Table 2: Employment in Life Sciences Businesses, 1990 – 2013 (Q1), Bay Area Counties

Year	Bay Area	Alameda	Contra Costa	Marin	Napa	San Francisco	San Mateo	Santa Clara	Solano	Sonoma
2001	112,651	17,141	3,689	727	257	1,637	18,640	58,073	1,462	11,025
2002	105,755	18,083	3,473	796	164	1,559	20,073	52,723	136	8,748
2003	101,021	17,823	4,182	836	452	1,920	19,035	48,073	1,628	7,072
2004	95,306	17,855	5,609	869	177	1,880	13,873	46,418	1,836	6,789
2005	93,191	17,913	5,088	922	306	1,521	14,553	45,484	2,007	5,397
2006	92,667	18,804	5,086	1,020	314	2,105	14,744	43,593	2,076	4,925
2007	77,725	20,689	5,010	977	173	2,027	16,149	26,096	2,288	4,316
2008	102,230	25,148	4,502	1,077	236	2,044	16,933	45,443	2,188	4,659
2009	95,545	24,445	4,261	1,157	287	1,952	14,727	42,369	2,151	4,196
2010	95,305	25,182	5,051	1,343	312	2,121	14,426	40,760	2,313	3,797
2011	96,638	26,500	4,559	1,456	334	2,915	12,825	41,892	1,984	4,173
2012	110,809	27,119	4,882	1,590	131	3,692	24,472	41,947	2,922	4,054
2013	110,337	26,893	4,453	1,703	131	3,575	25,628	40,981	2,926	4,047

Sources: EDD (www.edd.ca.gov) and BLS (www.bls.gov)

The Appendix provides data referred to throughout this section. Figures A1 through A3 show worker ages are generally older, regardless of marketplace. Workers in life sciences tend to be older than in other industries, an aspect that has increased over time. The age aspect, however, is merely an artifact of the educational profile of workers in the sector. In the Bay Area as a whole, 45.5 percent of

workers have a bachelor's degree or higher. In life-sciences businesses, 65.1 percent have at least a bachelor's degree, with 31.5 percent having a graduate degree, as compared with just 17.4 percent of the broader Bay Area economy. Figures A4 through A6 show these data.

Earnings of workers in life sciences also tend to be higher than in the rest of the economy; almost $27,000 higher on average across the Bay Area. In San Mateo, the wage gap between life sciences and other businesses is larger than the Bay Area overall; there is a smaller gap in San Diego. This gap has widened significantly since 1999; wages in the sector are nearly 50 percent higher on average today, while they were just 34 percent higher in 1999. Wages in life sciences are higher, regardless of the education level of the worker. The earnings profiles rises as workers become more educated. The growth of wages is more rapid in life sciences than overall jobs, but is likely to follow other industries where scientific education is paid a premium.

In terms of educational pipeline, there are higher education institutions in Marin County, but their scope is somewhat limited for life sciences. College of Marin is a likely candidate to provide training and coursework to lab technicians, lab assistants, and other clinical staff as needed for life-sciences businesses. Dominican has coursework in biology and Dominican has historic agreements with the Buck Institute in terms of placing interns and new graduates in some technical positions. Sonoma State University has biology programs at both the undergraduate and graduate levels. None of these institutions have a wide variety of graduate degrees, research taking place in academic settings, or equipment that would be seen as immediate partnership possibilities with new businesses.

Table 3: Educational Attainment in Life Sciences Workers by Geography, 2011

Educational Level	Bay Area LS	Marin All	Bay Area All
Less than High School	2.6	8.4	10.3
High school graduate	10.0	12.3	16.8
Some college, but less than 1 year	4.0	4.3	5.0
One or more years of college, no degree	14.6	14.7	16.2
Associate's degree	8.4	6.3	7.6
Bachelor's degree	**32.1**	**31.7**	**26.7**
Master's degree	**13.0**	**13.9**	**11.6**
Professional school degree	**3.3**	**5.6**	**3.2**
Doctorate degree	**11.9**	**2.7**	**2.6**

Source: American Community Survey, 5-year average, Calculations by MEF

Table 3 provides a way to compare Marin County educational levels to the Bay Area in terms of overall workers and of those in life sciences. Notice that the education profile of Marin County moves in sync with the Bay Area's life-sciences profile until the more advanced degrees, but outpaces the overall

Bay Area in more-educated categories. These data suggest Marin County may be attractive to life-sciences firms because of a relatively educated workforce.

Establishments

Marin County's employment in life sciences has doubled in the last 10 years.[8] A significant proportion of this employment and growth has taken place in Novato, with a recent, partial migration of BioMarin to San Rafael. Larger biosciences employers are located in Novato. This starts with the Buck Institute and BioMarin. Other important employers include Biosearch Technologies, Raptor Pharmaceutical, and Borsting Laboratories. Other significant employers in Marin include Genetics Savings and Clone in Sausalito and Orthogene in Greenbrae.

The Buck Institute and BioMarin are the largest life sciences orgs in Marin County. The Buck Institute for Research on Aging was the first research facility in the county to respond to the Institute of Medicine's call for the establishments of at least 10 Centers of Excellence to undertake the study of aging. Having opened its doors in September of 1999, the Institute has a solid track record research designed to further the mission of extending "healthspan", the healthy years of life.

Based on a $1.5 million investment from Glyko Biomedical Ltd, BioMarin opened its doors in early 1997. The company's mission was to develop therapies for numerous diseases and conditions and burn and wound care. In 2005, BioMarin released Naglazyme, its first independently developed and commercialized drug therapy. Since then it has developed numerous other drug therapies and had total revenue of $500.7 million, with more than 1,000 employees worldwide.

There are a wide variety of smaller organizations in Marin County and Novato that work in similar fields. Prior to 2000, there was a steady level of such companies of around 50 per year with employment of 5 or less. Beginning in 2001, this number grew to around 100, where it remained from 2004 through 2009. These companies include Raptor Pharmaceutical, Inc., which produces adrenal pharmaceutical preparations and Hunter Laboratories, a growing bioreference laboratory. Ultragenyx, a spinoff pharmaceutical firm based on scientists originally from BioMarin, has also steadily grown in Novato.

In 2004, BayBio and other biotech organizations around the state produced a major report entitled the California Life Sciences Action Plan. This report indicated that roughly 40% of the life sciences companies globally were located in California. Although it is surely the case that this number has declined over the last ten years, it indicates the strength of the industry in California. In 2010, this

[8] See data in Table 2.

strength is particularly pronounced in Los Angeles and San Diego Counties, with nearly 40% of California's 11,600 life sciences companies located in one of those two counties. The Bay Area is home to just over a quarter of the state's life sciences companies (Table 4).

Table 4: Life Sciences Presence in the Bay Area

County	# Firms	Share of California Life Sciences Firms	Number of Payroll Business Overall, 2010
Santa Clara	930	8.0	53,286
Alameda	625	5.4	53,275
San Mateo	470	4.0	23,202
San Francisco	382	3.3	51,914
Contra Costa	334	2.9	28,661
Marin	**206**	**1.8**	**10,063**
Sonoma	131	1.1	17,919
Solano	67	0.6	9,430
Napa	42	0.4	4,865
Bay Area	**3,187**	**27.3**	**252,615**

Source: National Employment Time Series (NETS), 2010

Within the North Bay, Marin County has more firms and a larger proportion of the state's businesses than any other county and this holds in terms of proportion of total businesses across the entire Bay Area. With most of the industry outside of the Bay Area, there is significant competition for appropriately skilled labor. Major employers - in life sciences in California - are listed in Table 5. These include major pharmaceutical companies (Genentech and Baxter), medical device producers (Medtronic), and research organizations (SRI Int'l). These companies are all in significant competition with each other for high skilled local labor as well as labor imported from out of the region.

Business establishments in the life sciences tend to be larger than in the rest of the economy. For all types of businesses, even if self-employed workers (consultants) were removed from the data, of which there are far fewer in life sciences than in other sectors of the economy, nearly half of all business establishments in California have just one or two employees beyond the owner. In life sciences, only 18 percent of establishments are this small. About 15 percent of life sciences companies have more than 25 employees, while this is true of fewer than 6 percent of all establishments. The small business profile fits Marin County well in terms of attraction and expansion.

Establishments in Marin County and Novato specifically tend to be in this mid-range category of between 3 and 25 employees. While establishments of this size tend to employ just 30 percent of all

workers and just 18 percent of Bay Area life sciences workers, they employ 55 percent of all life sciences workers in Marin County. Table 6 provides a perspective on the size of these businesses by county.

Table 5: Major Life Sciences Employers, Major Metro Areas in California

Bay Area	Los Angeles	San Diego
Genentech	Medtronic Minimed	SAIC
Perclose, Inc.	Baxter Healthcare	Pfizer
SRI Int'l	Pacesetter, Inc.	Applied Biotech
Medtronic	Leiner Health Products	Sirio Pharma
Alza Corp	Medsep Corp	Burnham Inst.
Abbott Labs	Grifols Biologicals	Novartis Inst.

Source: NETS

Table 6: Proportion of Life Sciences Businesses by County and Employee Size

	Employee Size Range					
County	<2 workers	3-25	26-100	101-250	251-1,000	1,001 +
Alameda	15.4	65.5	14.1	3.4	1.5	0.2
Contra Costa	24.7	63.5	8.6	0.4	2.7	0.0
Marin	**17.5**	**77.9**	**3.9**	**0.6**	**0.0**	**0.0**
San Francisco	20.6	74.7	3.2	1.1	0.4	0.0
San Mateo	14.1	66.6	13.5	4.5	0.5	0.8
Santa Clara	17.5	65.1	11.8	3.8	1.9	0.0
Bay Area	18.1	67.1	10.4	2.9	1.3	0.2
All of CA	**20.0**	**68.8**	**7.9**	**2.2**	**1.0**	**0.2**

Source: NETS (2010) and Calculations by MEF

How Novato Can Use These Trends

Life sciences employment is rising throughout the Bay Area and in Marin since 2010. Growth in the Bay Area outside Marin drives wages and commercial space lease prices higher. Demographically, Novato has 44.5 percent of its residents with a bachelor's degree or better, and 15.8 percent with a graduate degree.[9] Hence, Novato, like Marin County otherwise, is relatively well-educated as a potential workforce for this industry.

Novato has a budding life-sciences cluster and businesses in this sector (BioMarin, Ultragenyx, and Raptor), alongside of a research institute (Buck Institute) that seeks out grant and foundation dollars annually. Local research can draw in grant funding to finance initial R&D toward product development

[9] New American Community Survey data have come out for Novato to match the data available for Marin County. See factfinder2.census.gov for more information.

and not rely solely on venture or loan funding to move research from idea to marketplace. The clustering of firms provides a university-like community in generating new ideas and partnering on research, grant writing, and space use.

One of the key challenges for Novato and Marin County is maintain these clusters as the current firms grow and potentially look to outside Marin County for funding and acquisition. However, Novato has the characteristics that match the basic life sciences demography, firms, and employment levels to market Novato as a place of growth for this industry. The regional connections among Sonoma, Napa, Solano, and Marin counties become more important as these clusters grow and competition for housing workers, finding funding partners, and finding commercial space grows.

Economic Impacts of Life Sciences Workers in Novato

To perform an economic impact analysis, we need some assumptions and initial data. We assume the Buck Center is a place that combines many of the attributes discussed above, right in Novato: a research institute with commercial space suited for life-sciences businesses, proximity to an educated workforce and to larger clusters and investment pools in the Bay Area.

The output data identify supply chain connections for this industry and what exists in Novato and what does not. There are some assumptions made for this report as the inputs into the economic impact process:

1. For the next three years, there will be growth of 100 jobs per year in life science industries in Novato;
    a. The cumulative growth will be 100 new workers in 2014, 200 in 2015, and 300 additional jobs in life sciences by 2016 in Novato;
2. The Buck Institute for Aging Research intends to build another 65,000 sq feet of space for new and existing life-sciences firms;
    a. This will provide an infusion of construction revenues for local firms and other, associated tradespeople and contractors;
3. The estimated cost of construction will be approximately $35 million which will have economic impacts for one year during construction and then give way to impacts from operations once occupied by new life-science firms; and
    a. The expectation is that there will be approximately 150 additional workers in 2016 at the Buck Center, beyond what is operating currently and also beyond the additional 300 workers above;

b. These firms at the Buck Center add to the life science clustering in Marin County.

The Economic Impact Process and Results

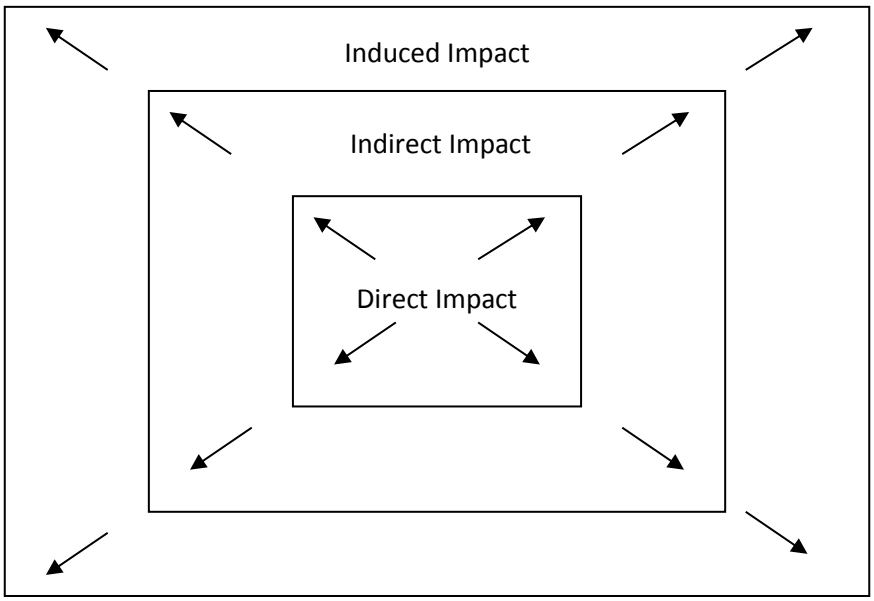
Using these assumptions, the economic impact analyses provide ways to see the breadth of effects on the City of Novato. The economic impacts come in three categories and each has three stages of effects. The three categories are new business revenues, supported jobs (as full-time equivalent positions) and new state and local tax revenues. The community impacts are connected to both new state and local tax revenues used for community purposes, but there are also social benefits in terms of larger, local education connections to biotechnology and life sciences work, job opportunities, and expanded scientific space.

The three stages of economic effects are direct, indirect and induced; the sum of these three stages generates a "multiplier" effect on the local economy. Figure 3 shows a way to consider this multiplier idea, where the direct impacts generate the indirect and induced effects as the new incomes spread throughout the life sciences supply chain here in Novato and also throughout the region. The local area is defined as Novato, California here; some of these effects will spill over onto the remainder of Marin County through new tax revenues, use of local businesses, and the indirect and induced effects.

The following subsections provide data for the economic impacts from three phases of expansion for life-sciences firms in Novato. The first is the natural growth of this cluster outside the Buck Center; the second is the construction effort of the Buck Institute to expand its capacity to provide space to new life-sciences businesses; and the third is the operations of the expanded space at the Buck Institute through new and existing firms that come from outside Novato into this space and bring with it revenues and employment. These impacts expand the indirect and induced spending throughout the city of Novato.

Tables A10 through A25 in the Appendix provide more detailed information about the economic impacts. Table 7 provides a summary of the overall impacts. These tables provide estimates of new business revenues, new supported jobs, and new state and local taxes. New business revenues are annual sales revenues made from selling goods and services by new or expanding businesses in Marin County. The figures in Table 7 and Tables A10 through A25 are total sales revenues across the direct (new biotech firms), indirect (new employee purchases and new vendor revenue from growing life-sciences sector purchases) and induced incomes (additional demand throughout the county economy). These estimates are based on the sum of new or growing biotech firms that would come to or grow within Marin County.

Figure 3: Economic Impact Concept



The supported jobs represent new, overall employees that are new workers in life-sciences (direct) or elsewhere in the county economy based on the new business income growth (indirect and induced). State and local taxes are new, annual tax receipts that originate in Marin County from the new business incomes and employees mentioned above and summarized in Table 7. Table A10 and A25 provide more details about the type of taxes involved and the industries affected by new life-sciences businesses and workers.

The increase in life-sciences jobs in Novato affects the city economy in many ways. Part of those effects come from a construction effort at the Buck Institute for Aging Research; the Buck Institute has an ability to become a place where new life-sciences firms can conduct research and development, incubate new commercial products, and potentially expand to the point of generating revenue and growing new jobs and product lines as applicable. The assumption is that by 2016 there will be 300 new jobs in Novato across life sciences and outside the Buck Institute; the Buck Institute will be operating an expanded space and will also have that space fully occupied by 2016. Much of the effort to increase life sciences in Novato will depend on marketing why these firms should come to Novato to operate. The clustering idea and effects only work when there is the ability for scientific firms to convert the local area into a “campus” of sorts for interaction and labor market use.

Table 7 also includes square foot estimates for new commercial space demand. Some of the

new commercial space demand will be in the form of lab and R&D space; other jobs will demand office and retail spaces. Table 7 assumes that each job in life sciences that is primarily R&D based will demand 500 square feet of space. Jobs that both support those jobs and are the result of indirect and induced impacts, as discussed above, will demand 300 square feet per job. Retail jobs may be as high as 600 square feet per worker depending on the type of retail. As Table 7 shows, by expanding life-sciences in Novato by 100 jobs per year for three years, there would be approximately 321,000 new square feet of commercial space to house the new businesses and the subsequent growth on the rest of Novato's economy. Details on this space demand are in the Appendix, Table A25. These estimates provide a way to prepare for new jobs coming to Marin County. If the estimated space exists, then reducing vacancies in existing space will take place or some new construction may occur (most likely in lab and R&D space at Buck or beyond in Marin County).

There are data provided in the Appendix for comparing building residential units instead of additional commercial space at the Buck Institute. Building and occupying 350 new housing units implies there would be 350 new households. For these estimates, each household would be assumed to have a median income equal to the latest estimate from the Census Bureau's American Community Survey (ACS) data for Novato of $79,664 (average between 2008 and 2012). After savings and taxes of an assumed 35 percent are taken from this figure, the median household would be estimated to spend $51,781 of goods and services. For 350 new households, there would be new, annual business revenues for Novato of $13.98 million. There would also be 88.5 jobs supported by these new households and over $1.2 million in state and local taxes, where $587,000 of these new tax receipts would stay in Novato. This assumes that all the new households are new to Novato; if not, Novato residents simply moving from one home to another in Novato would have little net change in spending, short of new rental income for the property owner.

Comparing these figures to the Buck Institute expansion (Appendix tables A23 through A25) to create space for 150 more workers in life sciences, the Buck expansion of commercial space provides more estimated business revenue annually, supports more jobs in Novato, and generates about $183,000 more in annual tax receipts than 350 new households would for Novato. In terms of a straight economic comparison, the expansion of specific commercial space for new bioscience businesses has more bang for buck.

How Novato Can Use These Data

As with other economic impact analyses, the direct impacts of growing life sciences businesses

affect both the new businesses vendors and suppliers as well has employees that spend on their households with wages earned. The indirect and induced effects and the industries affected provide a planning tool for Novato in terms of support industries for new life-sciences businesses, their employees, and employees that may also be residents of Novato. For example, if 100 new workers come to Novato in bioscience research, Tables A10 through A12 describe the effects of Novato today. Most of these effects are on professional and personal services, including health care, finance and retail. However, and more important, is what is not there.

Table 7: Summary Economic Impacts, Incremental Benefits

Expansion	2014	2015	2016 and Ongoing
New and Supported Jobs			
100 New Life-Science Workers	188.6	188.6	188.6
200 New Life-Science Workers		182.7	182.7
300 New Life-Science Workers			203.3
Buck Institute Construction		306.8	
Buck Institute New Occupancy			287.3
Totals	**188.6**	**678.1**	**861.9**
Commercial Space Demand (Sq feet)	**76,580**	**76,580**	**168,160**
New Business Revenues			
100 New Life-Science Workers	$30,672,400	$30,672,400	$30,672,400
200 New Life-Science Workers		$28,665,900	$28,665,900
300 New Life-Science Workers			$35,790,400
Buck Institute Construction		$49,363,900	
Buck Institute New Occupancy			$47,564,300
Totals	**$30,672,400**	**$108,702,200**	**$142,693,000**
New State and Local Taxes			
100 New Life-Science Workers	$1,301,800	$1,301,800	$1,301,800
200 New Life-Science Workers		$1,216,600	$1,216,600
300 New Life-Science Workers			$1,519,100
Buck Institute Construction		$1,854,100	
Buck Institute New Occupancy			$2,018,600
Totals	**$1,301,800**	**$4,372,500**	**$6,056,100**

In Table 7, each year's increase in workers increases commercial space use, business revenues for life-sciences businesses and many others, and supports the growth of quality jobs. By 2016, 300 workers may have come to Marin County as additional workers in this cluster. It is also important to recognize that the economic benefits to not end at the county borders. Sonoma, Napa and Solano counties may also benefit from growth in Marin County by housing workers, providing financing options,

and also experiencing growth in life-sciences businesses and workers as the cluster becomes regional. The North Bay Bio/Life-Science Alliance cooperates to utilize university connections, available and flexible space and financing, to maximize the potential of expanding this cluster in Novato and Marin County.

If bioscience research firms need equipment, laboratory supplies, specific waste disposal services, and other direct support needs, these industries should be developed parallel to bioscience firms. Combining the economic impact data with commercial real estate data also provides a way of estimating the commercial space needs for both the bioscience employer and those businesses that expand because of the new employer. Further, building residential units instead of scientifically-focused commercial space would have fewer economic impacts when comparing new residents to new workers and businesses on the same parcels.

Conclusions and Recommendations

As with any economic development effort focused on a specific industry, attracting and growing life-sciences businesses in Novato implies advertising assets Novato can offer such businesses. The life sciences industry starts with biological science and research, moving new ideas through clinical trials, regulatory environments, and other paths to markets. Once ready for market, manufacturing space and workers may be needed. Financial investors will want to share risk with business owners, foundation and government research grants; it is important that the availability of such funding is present for new businesses to grow and expand. Commercial space may be demanded in a broad mix of needs, from office to industrial, where demand will depend on the stage new or expanding businesses are in with respect to new ideas going to market.

Novato has many of these assets, as does Marin County overall versus other parts of the North Bay. Areas where life sciences have formed business clusters have common characteristics. The commercial space challenge is a particularly tricky one as local real estate professionals suggest there is little space available as either current laboratory space, industrial space, or expandable through a series of tenant improvements to become such a space. R&D-focused businesses may need a mix of lab space and office, and Novato should plan for both.

In terms of attracting and expanding new and current businesses in these industries, Novato and Marin County would need to identify space that could be used specifically as both R&D and industrial space for laboratory tests, prototypes and perhaps manufacturing. The economic impacts should be attractive to local policy makers in providing flexibility to land use, possible economic incentives to

locate in Marin County (specifically Novato) or other parts of the North Bay. The economic impacts tell a story about what other industries would grow and need to be supported as a life-sciences cluster was formed and expanded.

The Bioscience Industry Organization (bio.org) in Washington, D.C. identified several factors that can enhance an area's ability to gain access to grant, venture and other types of funding and financial investments. Novato is a place of opportunity for life-sciences businesses.

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Appendix I

Tables and Figures on All Industries in Selected Counties of California

Table A1: Age of Workers in Life Sciences Businesses, 2011

Age Range	Bay Area	San Mateo	San Diego
17-25	6.7	5.6	9.0
26-35	23.1	27.3	26.0
36-45	29.6	35.6	27.2
46-55	25.6	21.4	24.4
56-65	15.1	10.1	13.4
All Ages	100	100	100
Number of Workers	**146,417**	**27,566**	**64,026**

Source: American Community Survey, 5-year average, factfinder2.census.gov, Calculations by MEF

Table A2: Age of Workers from Census 2000, Life Sciences Businesses

Age Range	Bay Area	San Mateo	San Diego
17-25	8.4	11.1	10.3
26-35	27.0	25.9	29.6
36-45	32.1	29.1	30.9
46-55	23.5	22.2	19.6
56-65	9.1	11.8	9.6
All Ages	100	100	100
Number of Workers	**106,685**	**67,703**	**41,928**

Source: Census 2000, 5-year average, factfinder2.census.gov, Calculations by MEF

Table A3: Age of All Workers, 2011

Age Range	Bay Area	San Mateo	San Diego
17-25	12.7	11.4	18.5
26-35	23.2	23.5	23.6
36-45	24.5	25.7	22.3
46-55	23.1	22.8	21.2
56-65	16.6	16.6	14.4
All Ages	100	100	100
Number of Workers	**3,478,437**	**354,844**	**1,443,153**

Source: American Community Survey, 5-year average, factfinder2.census.gov, Calculations by MEF

Table A4: Age of All Workers from Census 2000

Age Range	Bay Area	San Mateo	San Diego
17-25	14.4	16.1	19.5
26-35	25.6	26.2	24.9
36-45	27.4	27.1	26.5
46-55	21.3	19.4	18.9
56-65	11.3	11.2	10.1
All Ages	100.0	100.0	100.0
Number of Workers	**3,411,308**	**3,993,727**	**1,290,388**

Source: Census 2000, 5-year average, factfinder2.census.gov, Calculations by MEF

Table A5: Educational Attainment in Life Sciences Workers by Geography, 2011

Educational Level	Bay Area	San Mateo	San Diego
Less than High School	1.9	1.1	2.6
High school graduate	8.7	5.1	10
Some college, but less than 1 year	3.6	2.4	4
No degree, some college	12.2	8.5	14.6
Associate's degree	8.5	6.3	8.4
Bachelor's degree	33.6	36.7	32.1
Master's degree	16	18.9	13
Professional school degree	3.6	3.3	3.3
Doctorate degree	11.9	17.7	11.9
Number of Workers	**146,417**	**27,566**	**64,026**

Source: American Community Survey, 5-year average, factfinder2.census.gov, Calculations by MEF

Table A6: Educational Attainment in Life Sciences Workers by Geography, 1999

Educational Level	Bay Area	San Mateo	San Diego
Less than High School	4.7	10.2	5
High school graduate	9.1	13.5	10
Some college, but less than 1 year	4.9	5.5	5.4
No degree, some college	14.2	16.4	16.5
Associate's degree	8	8.3	7.4
Bachelor's degree	31.4	26.9	30.1
Master's degree	14.5	11.4	11.4
Professional school degree	2.8	2.7	2.6
Doctorate degree	10.3	5.1	11.6
Number of Workers	**106,685**	**67,703**	**41,928**

Source: Census 2000, factfinder2.census.gov, Calculations by MEF

Table A7: Annual Earnings by Educational Attainment in Life Sciences Workers by Geography, 2011

Educational Level	Bay Area	San Mateo	San Diego
Less than High School	$38,585.40	$47,990.70	$27,624.70
High school graduate	45,021.00	60,520.60	35,921.30
Some college, but less than 1 year	54,922.10	54,352.70	49,037.40
One or more years of college, no degree	59,258.60	68,156.10	46,289.30
Associate's degree	59,889.20	64,791.80	55,748.20
Bachelor's degree	88,673.50	96,082.20	78,259.80
Master's degree	122,247.60	147,543.30	112,916.80
Professional school degree	172,926.40	223,575.90	161,492.20
Doctorate degree	137,225.60	167,051.70	120,131.80
All Educational Levels	**$90,896.20**	**$114,869.50**	**$77,240.50**

Source: American Community Survey, 5-year average, factfinder2.census.gov, Calculations by MEF

Table A8: Annual Earnings by Educational Attainment in Life Sciences Workers by Geography, 1999

Educational Level	Bay Area	San Mateo	San Diego
Less than High School	$27,280.90	$21,901.30	$20,135.70
High school graduate	32,207.00	30,311.60	28,264.40
Some college, but less than 1 year	38,880.00	34,567.50	37,284.60
One or more years of college, no degree	43,067.70	34,437.20	32,367.80
Associate's degree	48,776.90	38,227.20	35,553.00
Bachelor's degree	61,427.60	51,935.90	49,700.90
Master's degree	85,886.20	74,472.40	75,601.90
Professional school degree	103,641.30	82,740.60	95,217.00
Doctorate degree	99,093.30	83,601.40	81,062.70
All Educational Levels	**$61,070.00**	**$45,979.80**	**$49,261.00**

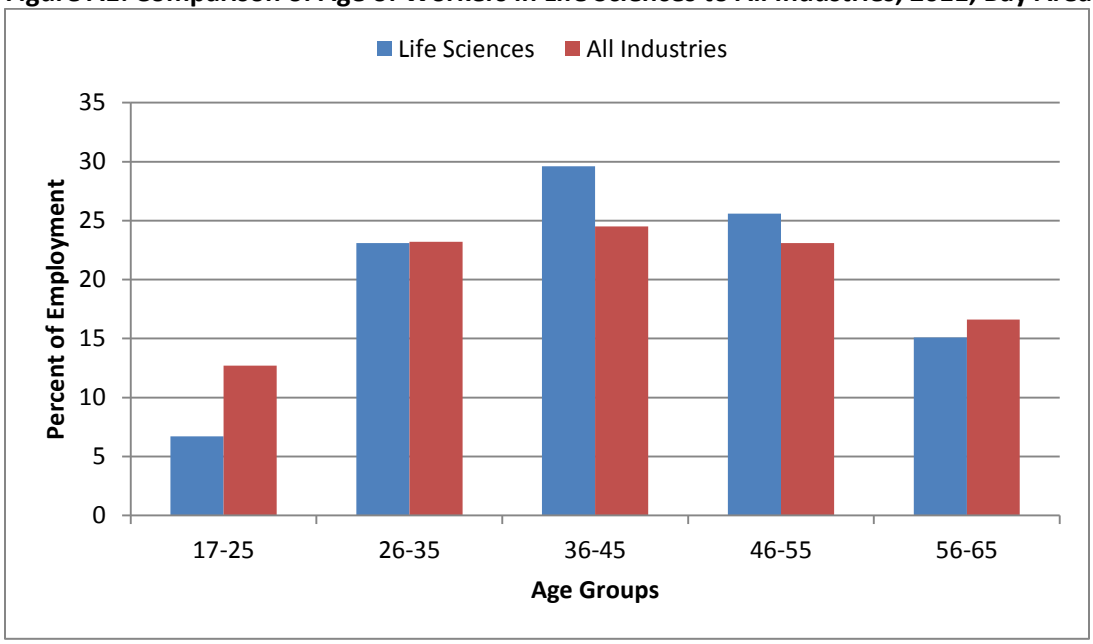
Source: Census 2000, factfinder2.census.gov, Calculations by MEF

Table A9: Occupations in Life Sciences Businesses, Percent of Total Industry Employment, Census 2000

	Shares of Total Employment in Life Sciences		
Occupations	Bay Area	San Mateo	San Diego
Management	17.6	14.3	14.3
Life, Physical, and Social Science	16.4	6.8	21.2
Production	12.5	15.6	10.8
Office and Administrative Support	11.5	17	15.9
Architecture and Engineering	10.6	8.7	7.2
Computer and mathematical occupations	7.3	5.2	4.6
Healthcare Occupations (Technical)	7	11.9	8.1
Business and Financial Operations	5.4	4.3	5.5
Sales and Related	2.5	3.2	2.6
Healthcare Support	2.2	4.3	2.5
Installation, Maintenance, and Repair	1.5	1.6	1.7
Arts, Entertainment, Sports, and Media	1.2	1.3	1.2
Transportation and Material Moving	1	2.5	1.2
Community and Social Service	0.7	1	0.7
Education, Training, and Library	0.5	0.4	0.3
Building and Grounds Maintenance	0.5	0.3	0.5
Legal	0.4	0.2	0.4
Construction and Extraction	0.4	0.4	0.2
Protective Service	0.3	0.2	0.4
Personal Care and Service	0.2	0.9	0.5
Food Preparation and Serving Related	0.1	0.1	0.3

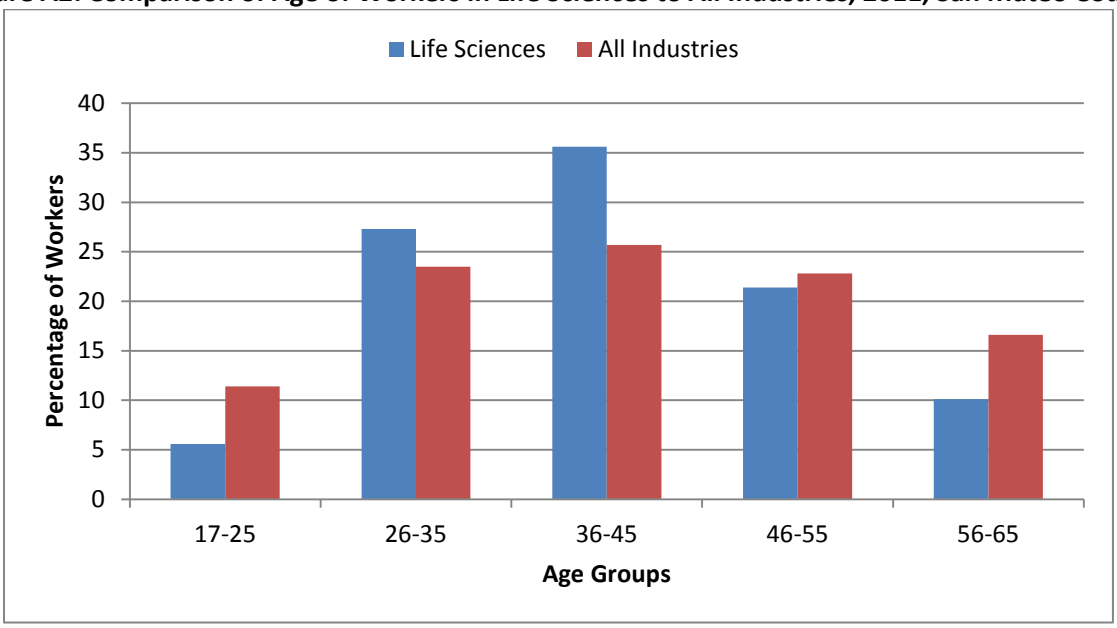
Source: Census 2000, factfinder2.census.gov, Calculations by MEF

Figure A1: Comparison of Age of Workers in Life Sciences to All Industries, 2011, Bay Area



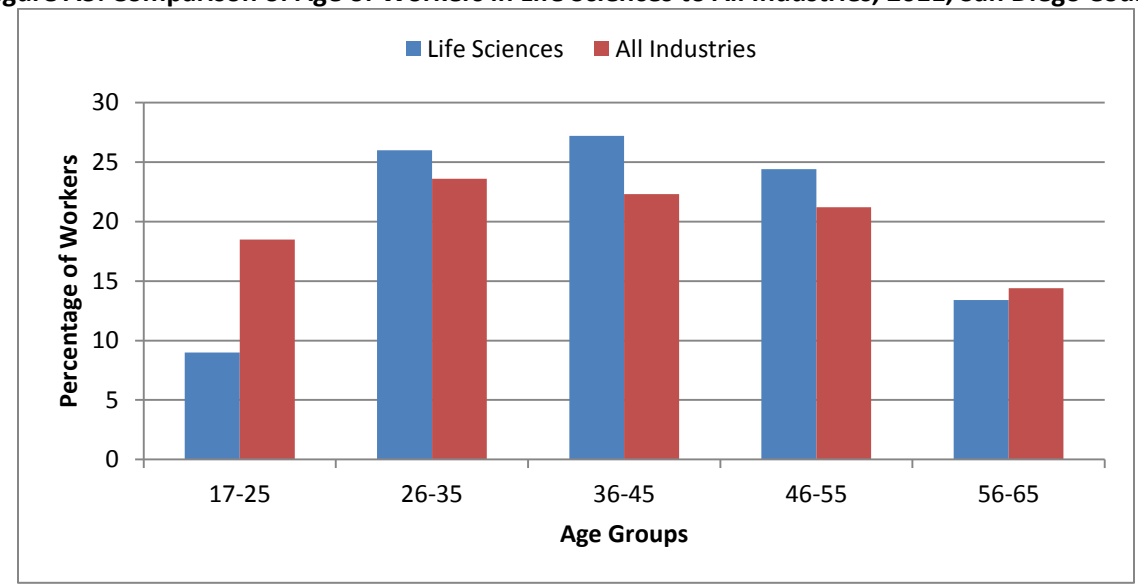
Source: American Community Survey, 5-year average, Calculations by MEF

Figure A2: Comparison of Age of Workers in Life Sciences to All Industries, 2011, San Mateo County



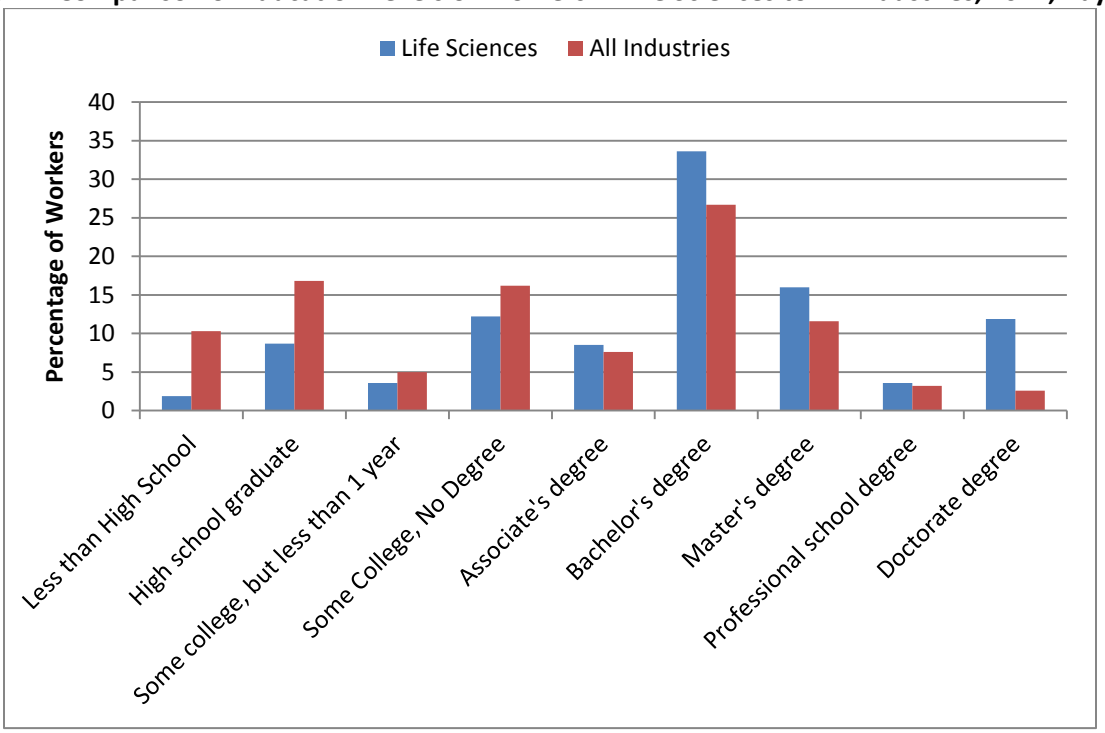
Source: American Community Survey, 5-year average, Calculations by MEF

Figure A3: Comparison of Age of Workers in Life Sciences to All Industries, 2011, San Diego County



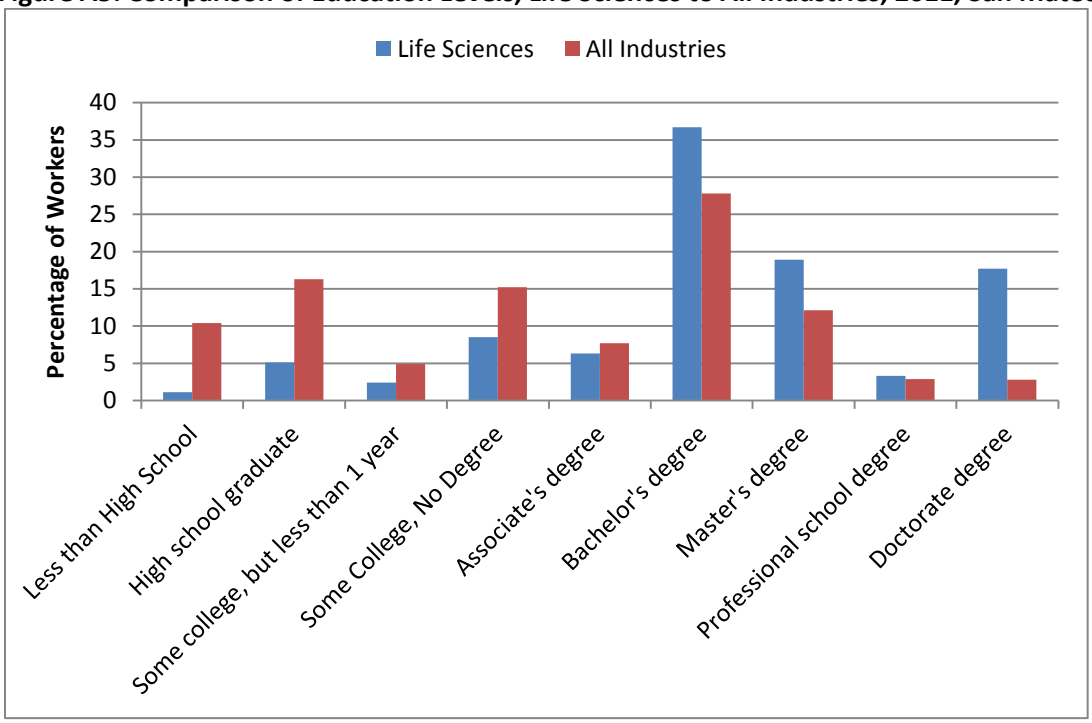
Source: American Community Survey, 5-year average, Calculations by MEF

Figure A4: Comparison of Education Levels of Workers in Life Sciences to All Industries, 2011, Bay Area



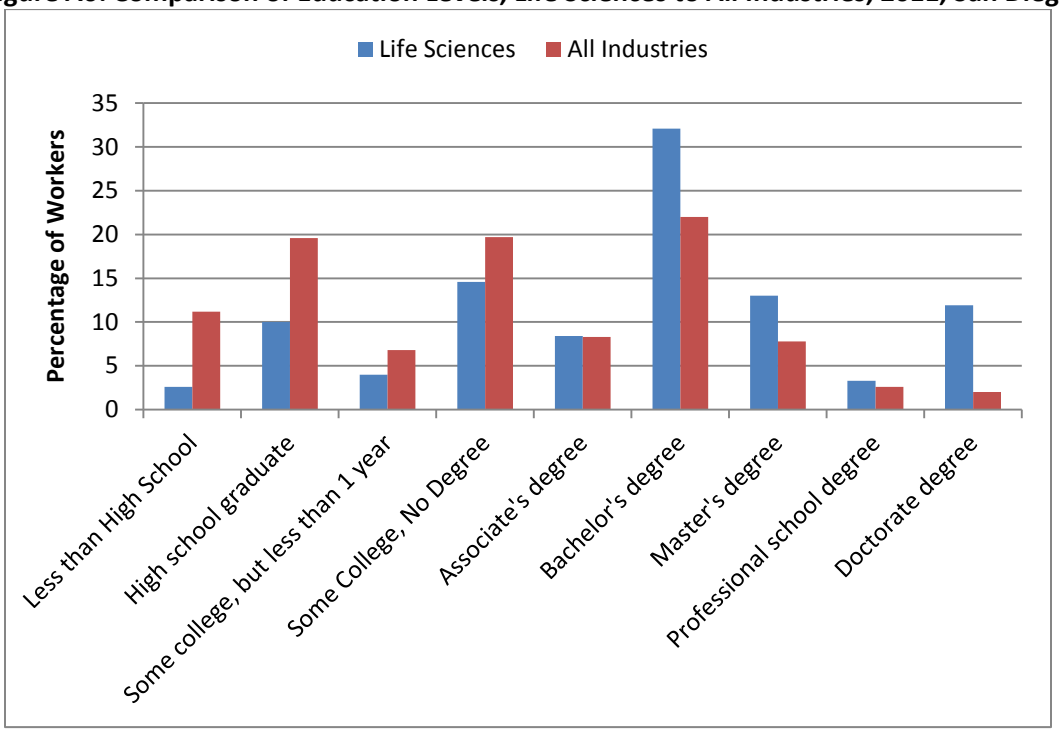
Source: American Community Survey, 5-year average, Calculations by MEF

Figure A5: Comparison of Education Levels, Life Sciences to All Industries, 2011, San Mateo



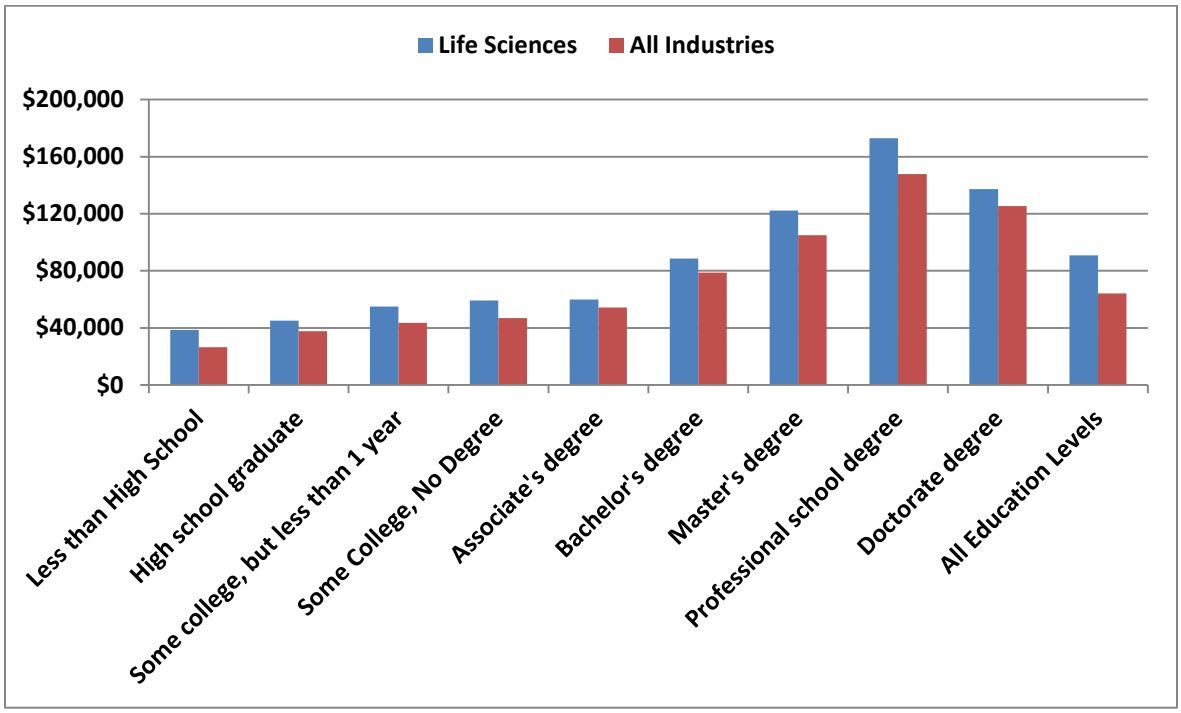
Source: American Community Survey, 5-year average, Calculations by MEF

Figure A6: Comparison of Education Levels, Life Sciences to All Industries, 2011, San Diego



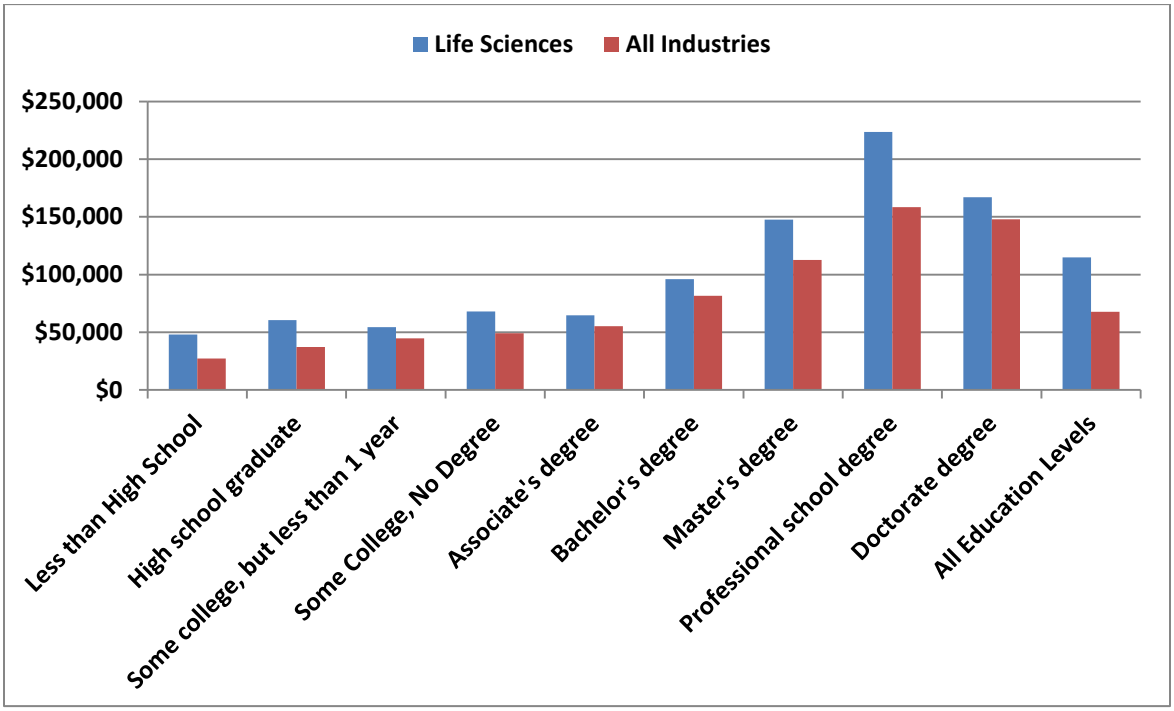
Source: American Community Survey, 5-year average, Calculations by MEF

Figure A7: Wages by Education Levels, Life Sciences to All Industries, 2011, Bay Area



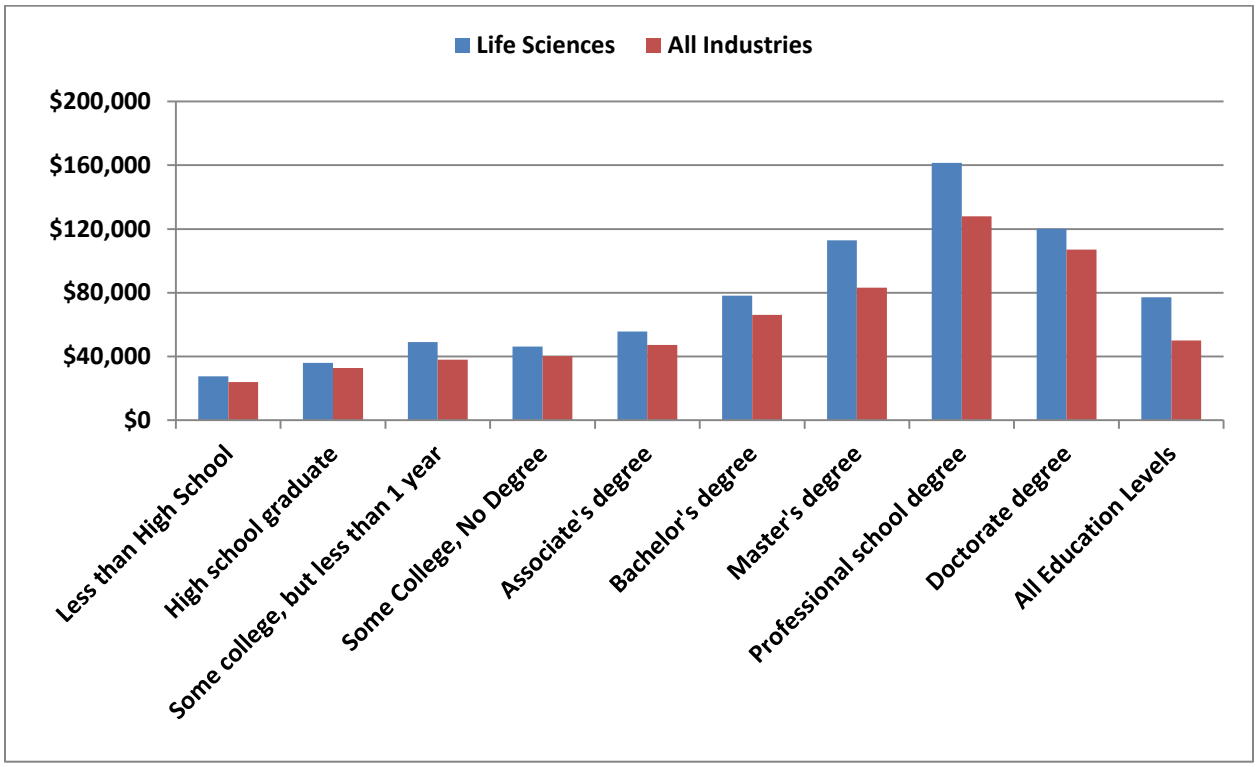
Source: American Community Survey, 5-year avg., Calculations by MEF

Figure A8: Comparison of Education Levels, Life Sciences to All Industries, 2011, San Mateo



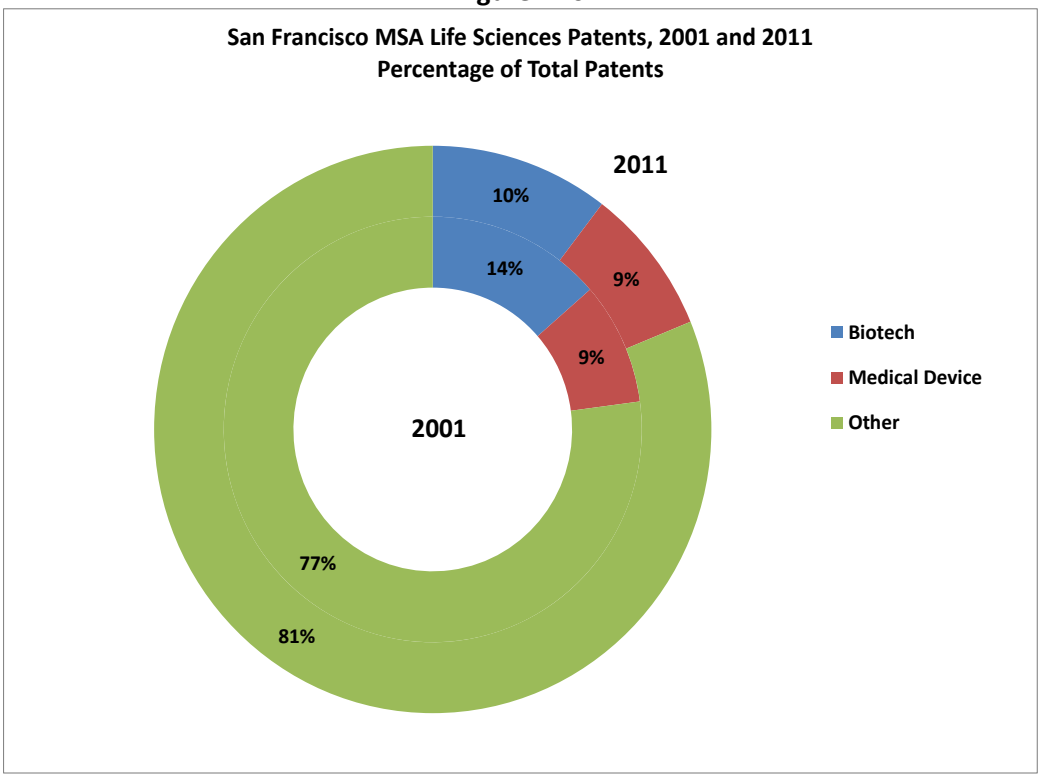
Source: American Community Survey, 5-year average, Calculations by MEF

Figure A9: Comparison of Education Levels, Life Sciences to All Industries, 2011, San Diego



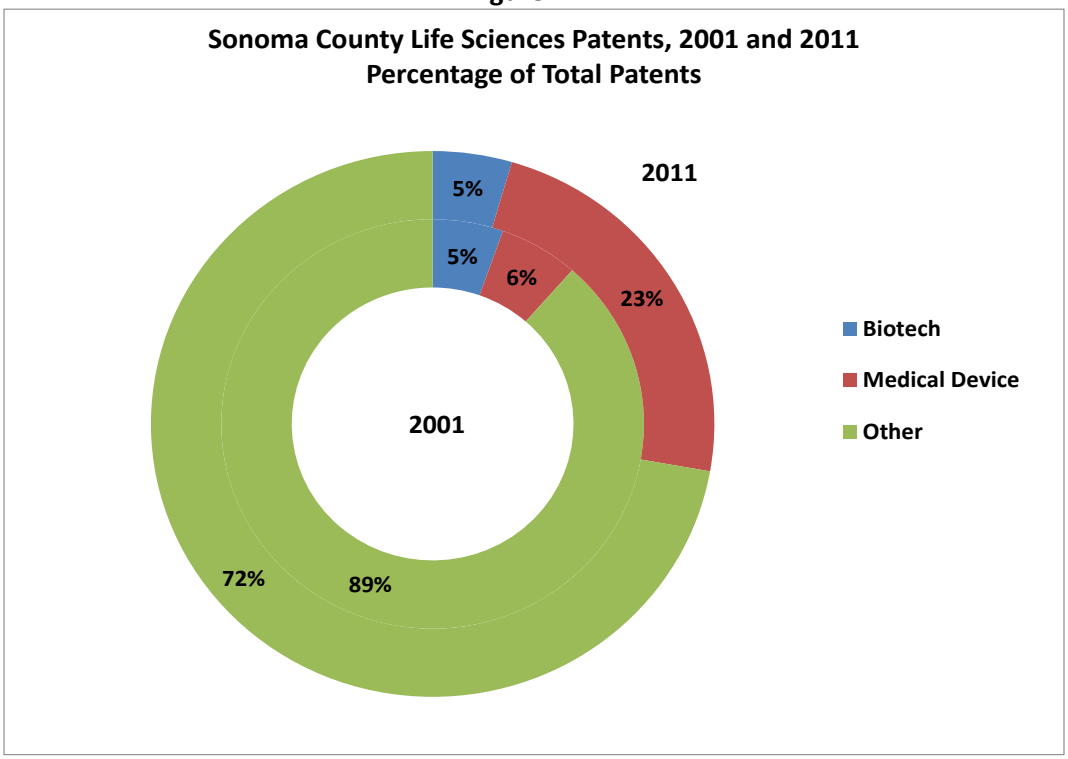
Source: American Community Survey, 5-year average, Calculations by MEF

Figure A10



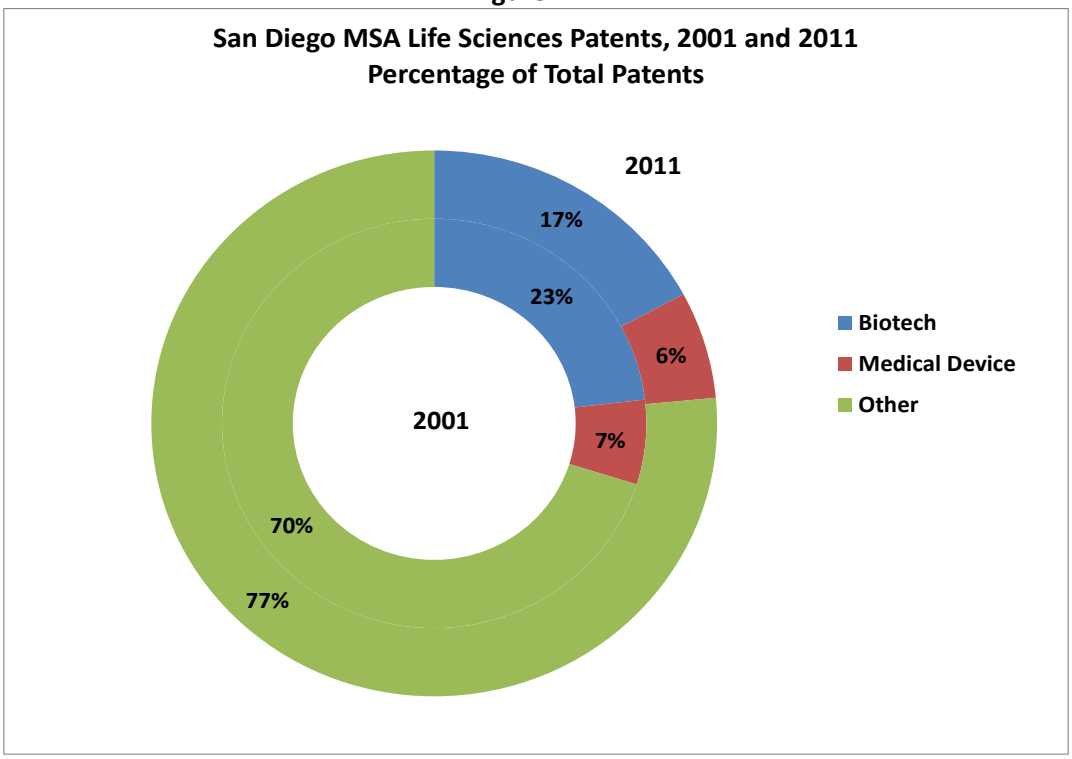
Source: US Patent and Trademark Office (USPTO): www.uspto.gov

Figure A11



Source: US Patent and Trademark Office (USPTO): www.uspto.gov

Figure A12



Source: US Patent and Trademark Office (USPTO): www.uspto.gov

Life-Sciences Cluster Expansion, 100 new jobs (2014)

Table A10: Employment: 100 New Jobs Life Sciences, Full-Time Equivalents

Industry	Direct	Indirect	Induced	Total
Biotech and Life Sciences	100.0	0.4	0.1	100.5
Building Services	0.0	6.9	0.7	7.6
Bars and Restaurants	0.0	1.8	5.1	6.9
Building Maintenance	0.0	3.7	0.2	3.9
Real Estate Agencies	0.0	2.1	1.6	3.7
Employment services	0.0	3.1	0.5	3.6
Consulting services (scientific and marketing)	0.0	2.8	0.3	3.1
Medical and Dental Offices	0.0	0.0	2.8	2.8
Private household operations	0.0	0.0	2.8	2.8
Legal services	0.0	2.0	0.8	2.8
Architectural, engineering, and related services	0.0	2.4	0.1	2.5
Investment Banking	0.0	0.6	1.8	2.4
All Others	0.0	13.9	32.1	46.0
Total	**100.0**	**39.7**	**48.9**	**188.6**

Table A11: New Business Revenues: 100 New Jobs Life Sciences, 2014 dollars

Industry	Direct	Indirect	Induced	Total
Biotech and Life Sciences	$17,884,400	$75,400	$15,800	$17,975,600
Rental Income for Property Owners	0	0	1,344,300	1,344,300
Real estate establishments	0	436,300	346,400	782,700
Building Maintenance	0	605,100	33,800	638,900
Building Services	0	451,600	48,100	499,700
Insurance carriers	0	123,800	357,400	481,200
Bars and Restaurants	0	123,500	346,100	469,600
Legal services	0	325,400	135,900	461,300
Consulting services (scientific and marketing)	0	394,600	41,800	436,400
Medical and Dental Offices	0	0	378,600	378,600
Banks and Credit Unions	0	199,300	161,600	360,900
Misc. Professional Services	0	307,300	13,400	320,700
All Others	0	2,618,600	3,903,900	6,522,500
Total	**$17,884,400**	**$5,660,900**	**$7,127,100**	**$30,672,400**

Table A12: State and Local Tax Impacts: 100 New Jobs Life Sciences, 2014 dollars

State and Local Taxes	Amount
Employment Taxes	$37,900
Sales Taxes - CA	65,777
Sales Taxes - Novato	214,124
Property Taxes - CA	29,778
Property Taxes - Novato	283,022
Personal Income	425,400
Other Taxes and Fees	245,800
Total State and Local taxes	**$1,301,800**

Life Sciences Cluster Expansion, 200 new Jobs (2015)

Table A13: Employment: 200 New Jobs Life Sciences Full-Time Equivalents

Industry	Direct	Indirect	Induced	Total
Biotech and Life Sciences	200.0	0.8	0.2	201.0
Building Services	0.0	13.3	1.4	14.7
Bars and Restaurants	0.0	3.6	10.0	13.6
Building Maintenance	0.0	7.1	0.4	7.5
Real estate establishments	0.0	4.0	3.2	7.2
Employment services	0.0	6.0	0.9	6.9
Consulting services (scientific and marketing)	0.0	5.3	0.6	5.9
Medical and Dental Offices	0.0	0.0	5.5	5.5
Private household operations	0.0	0.0	5.5	5.5
Legal services	0.0	3.8	1.6	5.4
Architectural, engineering, and related services	0.0	4.7	0.3	5.0
Investment Banking	0.0	1.2	3.5	4.7
All Others	0.0	26.9	61.5	88.4
Total	**200.0**	**76.7**	**94.6**	**371.3**

Table A14: New Business Revenues: 200 New Jobs Life Sciences, 2014 dollars

Industry	Direct	Indirect	Induced	Total
Biotech and Life Sciences	$34,598,900	$146,000	$30,600	$34,775,500
Rental Income for Property Owners	0	0	2,600,600	2,600,600
Real estate establishments	0	844,000	670,200	1,514,200
Building Maintenance	0	1,170,700	65,300	1,236,000
Building Services	0	873,700	93,000	966,700
Insurance carriers	0	239,600	691,500	931,100
Bars and Restaurants	0	239,000	669,600	908,600
Legal services	0	629,500	262,900	892,400
Consulting services (scientific and marketing)	0	763,400	80,900	844,300
Medical and Dental Offices	0	0	732,400	732,400
Banks and Credit Unions	0	385,600	312,600	698,200
Misc. Professional Services	0	594,500	26,000	620,500
All Others	0	5,065,400	7,552,400	12,617,800
Total	**$34,598,900**	**$10,951,400**	**$13,788,000**	**$59,338,300**

Table A15: State and Local Tax Impacts: 200 New Jobs Life Sciences
2014 dollars

State and Local Taxes	Amount
Employment Taxes	$73,300
Sales Taxes - CA	127,276
Sales Taxes - Novato	414,324
Property Taxes - CA	57,596
Property Taxes - Novato	547,504
Personal Income	822,800
Other Taxes and Fees	475,600
Total State and Local taxes	**$2,518,400**

Life Sciences Cluster Expansion, 300 new Jobs (2016)

Table A16: Employment: 300 New Jobs Life Sciences, Full-Time Equivalents

Industry	Direct	Indirect	Induced	Total
Biotech and Life Sciences	300.0	1.3	0.3	301.6
Building Services	0.0	21.4	2.3	23.7
Bars and Restaurants	0.0	5.7	16.0	21.7
Building Maintenance	0.0	11.4	0.6	12.0
Real estate establishments	0.0	6.4	5.1	11.5
Employment services	0.0	9.6	1.4	11.0
Consulting services (scientific and marketing)	0.0	8.6	0.9	9.5
Medical and Dental Offices	0.0	0.0	8.8	8.8
Private household operations	0.0	0.0	8.7	8.7
Legal services	0.0	6.1	2.6	8.7
Architectural, engineering, and related services	0.0	7.5	0.4	7.9
Investment Banking	0.0	2.0	5.6	7.6
All Others	0.0	43.0	98.9	141.9
Total	**300.0**	**123.0**	**151.6**	**574.6**

Table A17: New Business Revenues: 300 New Jobs Life Sciences, 2014 dollars

Industry	Direct	Indirect	Induced	Total
Biotech and Life Sciences	$55,467,500	$234,000	$49,100	$55,750,600
Rental Income for Property Owners	0	0	4,169,200	4,169,200
Real estate establishments	0	1,353,000	1,074,500	2,427,500
Building Maintenance	0	1,876,700	104,700	1,981,400
Building Services	0	1,400,600	149,200	1,549,800
Insurance carriers	0	384,100	1,108,500	1,492,600
Bars and Restaurants	0	383,100	1,073,500	1,456,600
Legal services	0	1,009,200	421,400	1,430,600
Consulting services (scientific and marketing)	0	1,223,800	129,800	1,353,600
Medical and Dental Offices	0	0	1,174,200	1,174,200
Banks and Credit Unions	0	618,100	501,100	1,119,200
Misc. Professional Services	0	953,100	41,700	994,800
All Others	0	8,121,100	12,107,500	20,228,600
Total	**$55,467,500**	**$17,556,800**	**$22,104,400**	**$95,128,700**

Table A18: State and Local Tax Impacts: 300 New Jobs Life Sciences
2014 dollars

State and Local Taxes	Amount
Employment Taxes	$117,500
Sales Taxes - CA	204,027
Sales Taxes - Novato	664,173
Property Taxes - CA	92,344
Property Taxes - Novato	877,856
Personal Income	1,319,200
Other Taxes and Fees	762,400
Total State and Local taxes	**$4,037,500**

Table A19: Employment: New Jobs (Construction), Full-Time Equivalents

Industry	Direct	Indirect	Induced	Total
Facility Construction	209.3	0.0	0.0	209.3
Bars and Restaurants	0.0	0.9	7.3	8.2
Architectural, engineering, and related services	0.0	6.9	0.2	7.1
Wholesale trade businesses	0.0	2.6	1.9	4.5
Legal services	0.0	2.9	1.2	4.1
Medical and Dental Offices	0.0	0.0	4.0	4.0
Private household operations	0.0	0.0	3.9	3.9
Real estate establishments	0.0	1.0	2.4	3.4
Investment Banking	0.0	0.4	2.6	3.0
Grocery Stores	0.0	0.0	2.9	2.9
Building Services	0.0	1.5	1.0	2.5
Accounting and Bookkeeping/Tax Prep Services	0.0	1.8	0.5	2.3
All Others	0.0	10.9	40.7	51.6
Total	**209.3**	**28.9**	**68.6**	**306.8**

Table A20: New Business Revenues: Construction, 2014 dollars

Industry	Direct	Indirect	Induced	Total
Facility Construction	$35,000,000	$0	$0	$35,000,000
Rental Income for Property Owners	0	0	1,867,300	1,867,300
Architectural, engineering, and related services	0	831,700	23,400	855,100
Wholesale trade businesses	0	425,200	308,200	733,400
Real estate establishments	0	213,500	500,800	714,300
Legal services	0	475,000	192,300	667,300
Bars and Restaurants	0	57,300	488,000	545,300
Insurance carriers	0	42,200	498,500	540,700
Medical and Dental Offices	0	0	535,700	535,700
Banks and Credit Unions	0	98,100	230,100	328,200
Accounting and Bookkeeping/Tax Prep Services	0	249,000	65,700	314,700
Investment Banking	0	39,800	260,700	300,500
All Others	0	1,920,200	5,041,200	6,961,400
Total	**$35,000,000**	**$4,352,000**	**$10,011,900**	**$49,363,900**

Table A21: State and Local Tax Impacts: Construction, 2014 dollars

State and Local Taxes	Amount
Employment Taxes	$65,700
Sales Taxes - CA	89,653
Sales Taxes - Novato	291,848
Property Taxes - CA	44,632
Property Taxes - Novato	381,868
Personal Income	637,600
Other Taxes and Fees	342,800
Total State and Local taxes	**$1,854,100**

Buck Institute Occupancy and Operation: Expanded Space

Table A22: Employment: 150 New Jobs Life Sciences at Buck Institute, Full-Time Equivalents

Industry	Direct	Indirect	Induced	Total
Biotech and Life Sciences	150.0	0.6	0.1	150.7
Building Services	0.0	10.7	1.1	11.8
Bars and Restaurants	0.0	2.8	8.0	10.8
Building Maintenance	0.0	5.7	0.3	6.0
Real estate establishments	0.0	3.2	2.6	5.8
Employment services	0.0	4.8	0.7	5.5
Consulting services (scientific and marketing)	0.0	4.3	0.5	4.8
Medical and Dental Offices	0.0	0.0	4.4	4.4
Private household operations	0.0	0.0	4.4	4.4
Legal services	0.0	3.1	1.3	4.4
Architectural, engineering, and related services	0.0	3.8	0.2	4.0
Investment Banking	0.0	1.0	2.8	3.8
All Others	0.0	21.5	49.4	70.9
Total	**150.0**	**61.5**	**75.8**	**287.3**

Table A23: New Business Revenues: 150 New Jobs Life Sciences at Buck Institute
2014 dollars

Industry	Direct	Indirect	Induced	Total
Biotech and Life Sciences	$27,733,700	$117,000	$24,500	$27,875,200
Rental Income for Property Owners	0	0	2,084,600	2,084,600
Real estate establishments	0	676,500	537,200	1,213,700
Building Maintenance	0	938,400	52,400	990,800
Building Services	0	700,300	74,600	774,900
Insurance carriers	0	192,000	554,300	746,300
Bars and Restaurants	0	191,500	536,800	728,300
Legal services	0	504,600	210,700	715,300
Consulting services (scientific and marketing)	0	611,900	64,900	676,800
Medical and Dental Offices	0	0	587,100	587,100
Banks and Credit Unions	0	309,100	250,600	559,700
Misc. Professional Services	0	476,500	20,800	497,300
All Others	0	4,060,600	6,053,700	10,114,300
Total	**$27,733,700**	**$8,778,400**	**$11,052,200**	**$47,564,300**

Table A24: State and Local Tax Impacts: 150 New Jobs Life Sciences at Buck Institute
2014 dollars

State and Local Taxes	Amount
Employment Taxes	$58,700
Sales Taxes - CA	102,014
Sales Taxes - Novato	332,087
Property Taxes - CA	46,172
Property Taxes - Novato	438,828
Personal Income	659,600
Other Taxes and Fees	381,200
Total State and Local taxes	**$2,018,600**

Table A25: Estimated Commercial Space Demand Based on Economic Impacts

	Direct Jobs	Indirect	Induced	sf. per job	Space Type	Total Space sf.
2014	100			500	R&D	50,000
2014		39.7		300	Office	11,910
2014			48.9	300	Office	14,670
					Subtotal	**76,580**
2015	100			500	R&D	50,000
2015		39.7		300	Office	11,910
2015			48.9	300	Office	14,670
					Subtotal	**76,580**
2016	100			500	R&D	50,000
2016		39.7		300	Office	11,910
2016			48.9	300	Office	14,670
					Subtotal	**76,580**
Buck Institute 2016	130			500	R&D	65,000
Buck Institute 2016		39.7		300	Office	11,910
Buck Institute 2016			48.9	300	Office	14,670
					Subtotal	**91,580**
					Total	**321,320**

Table A26: Business Revenues and Supported Jobs, 350 Residential Units, 2013 $

Industry	Revenues	Jobs
Rental Income for Property Owners	$2,233,000	-
Wholesale trade businesses	1,007,000	4.1
Real estate agencies	823,500	4.9
Medical and Dental Offices	606,400	4.2
Insurance carriers	538,000	1.2
Bars and Restaurants	521,400	7.7
Construction of new commercial structures	474,100	2.2
State & local govt fees	357,500	7.3
Banks and Credit Unions	327,600	1.1
Private hospitals	319,200	1.8
Construction of new residential structures	277,300	1.6
Grocery Stores	265,400	2.5
Legal services	248,000	1.6
Construction of other new nonresidential structures	247,200	1.2
Check Cashing and Pawn	243,400	0.8
Custom computer programming services	233,900	1.6
E-commerce	230,700	2.5
Building material and garden supply retail	209,700	1.6
Medical labs and outpatient services	187,300	0.9
Investment Banking	176,300	0.9
Telecommunications	175,600	0.3
Department Stores	174,000	2.6
Gasoline stations	155,300	0.3
Clothing Stores	141,100	1.2
Pharmacies	140,400	0.1
Motor vehicle and parts retail	131,300	1.1
All Others	3,537,300	33.3
Totals	**$13,981,900**	**88.5**

Table A27: State and Local tax Estimates, 350 Residential Units at Buck Institute 2013$

Category	Taxes
Employment Taxes	$18,200
Sales Taxes - CA	90,700
Sales Taxes - Novato	295,400
Property Taxes – CA	17,800
Property Taxes - Novato	292,000
Personal Income	254,600
Other Taxes and Fees	233,900
Total State and Local taxes	**$1,202,600**