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Bioscience and Economic Development: The Grand Rapids ‘Medical Mile’

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Michigan Street hill in Grand Rapids, Michigan has been dubbed the ‘Medical Mile’ because of the recent developments related to medical research and health care at this location. The impact of this growth is sure to change the face of Grand Rapids, but it is not clear how it will impact the economic situation there. Many other cities around the country and around the globe are putting investment into the bioscience, biotechnology, or life sciences sectoral strategy hoping that it will have a profound effect on their economic vitality. In this paper, I explore theoretical and practical perspectives on the crucial components that create a thriving bioscience cluster. After examining the broader international and national trends of success, this paper evaluates the collective impact of the biosciences on the Grand Rapids area through an assessment of the opportunities and constraints involved in the process. This paper was originally submitted in a Masters level Economic Development course, but it is being further developed as the Grand Rapids “Medical Mile” unfolds as one of Michigan’s primary economic drivers. The most recent draft was submitted in April 2008 in the Public Management Seminar course required for completion of a Masters degree in Public Administration with an emphasis in Health Administration. It expands on the conditions and infrastructure of the Grand Rapids economic development strategy through the lens of the economic philosophy of “Wikinomics.” It delves into the changes that have occurred over the past year and examines what lies ahead.

INTRODUCTION

The life sciences, or biosciences, have become the focus of many cities’ efforts to jumpstart their economies. In the article entitled, “Cities and States Clamor to be Bio Town, U.S.A.” Pollack (2002) draws attention to the trend: “Cities and states across the United States are committing billions of dollars to become centers of the biotechnology industry, just as they once tried to attract computer and microchip companies to emulate Silicon Valley. The pioneers of the movement using life science as an economic development tool have been the Boston and San Francisco areas, who began in the 1970’s, while Seattle and Raleigh-Durham, North Carolina, New York, Philadelphia, Washington-Baltimore, and Los Angeles have also been leading close behind” (Pollack, 2002, p. 1).

It becomes evident that “bio” has become the new buzzword for local economies in the United States and abroad: “The Netherlands has its Bio-Delta; Switzerland has the BioAlps near Geneva and Basel’s BioValley; Singapore claims to be “the Biopolis of Asia;” and even Saudi Arabia is laying plans for Jeddah BioCity” (Pollack, 2002, p.1). Is there enough evidence to support such concerted endeavors, or are cities setting themselves up for failure? In a 2001 survey by Battelle for the Biotechnology Industry Organization, 41 states claimed that they were investing in life sciences (Pollack, 2002, p.1). Is life science a sectoral strategy? What exactly is a biotech cluster? What are the critical elements that advance a successful life sciences center? Should there be hope for a significant return on investment in such projects?

This paper begins by defining the biosciences and discussing their emergence as a sectoral strategy in economic development. It then evaluates several cities in the United States that have attempted to create and cultivate a life sciences center in order to better understand these endeavors and to gain an understanding of what it takes to create a thriving life sciences hub. It continues with a literature review that integrates both theory and case studies from several different locations in the United States and abroad. The ultimate goal of this paper is to highlight the most important components that drive successful biotechnology clusters and to assess Grand Rapids’ opportunities and constraints in developing its life sciences corridor. Collaborative approaches will be explored in the context of the efforts of Michigan and Grand Rapids in the life sciences. News headlines from 2007-2008 will be compiled to determine the status of the Grand Rapids Medical Mile’s development. Finally, this paper assesses the available data on Grand Rapids job growth and innovative capacity in order to create the building blocks for a longitudinal assessment of Grand Rapids’ successes and failures.

The Biosciences/Life Sciences

What are the biosciences? According to Battelle, a nonprofit research institution that administered a survey on the subject in 2001, they are:

A diverse group of industries and activities with a common link—they apply knowledge of the way in which plants, animals, and humans function. The sector spans different markets and includes

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manufacturing, services, and research activities. By definition, the biosciences are a unique industry cluster and are constantly changing to incorporate the latest research and scientific discoveries. (“Growing the nation’s”, 2006, p. 1)

The following table presents several examples of bioscience investments being pursued globally.

Figure 1. A Sample of Biotech/life Sciences Parks Being Planned or Developed Around the World

<i>Name</i>	<i>Location</i>	<i>Investment</i>
East River Science Park	New York City, NY, USA	\$700 million
Beijing Bioengineering and Pharmaceutical Industrial Base	Beijing, China	\$241.5 million
Medipark	Brno, Czech Republic	\$200 million
Thailand Science Park	Klong Luang, Thailand	\$175 million
International Biotech Park	Hinjewadi, India	\$140 million
Life Science and Biotech Center of Excellence	Astana, Kazakhstan	\$50 million
DuBiotech	Dubai, United Arab Emirates	Data unavailable

(Rinaldi, 2006, p. 133)

Biosciences as a Sectoral Strategy

The biosciences have become what seems to be a popular economic development sectoral strategy in the United States and abroad. What makes a bioscience cluster a sectoral strategy? While the biosciences encompass a diverse selection of industries, as mentioned above, the bioscience strategy is a sectoral one because its focus is to cultivate an environment for a particular industry—the biotech/life sciences. While the term sectoral strategy is somewhat difficult to define given its many interpretations, sectoral strategies are all efforts to stimulate economic development in a particular area by fueling a particular sector or group of sub-sectors/industries that, when functioning together, create a hub of vitality.

Many times, sectoral strategies begin as public/private partnerships but usually one intermediary organization facilitates the sectoral strategy process. This organization can vary from a city or state government entity to a chamber of commerce, a community-based or nonprofit organization, to a university or community college (Fitzgerald & Green Leigh, p. 41). Many times the leader of the development partners with other public, private, and nonprofit organizations. Fitzgerald and Green Leigh (2002) explain that sectoral strategies among the nonprofit and foundation community “mean strategies that focus on creating employment opportunities for low income people” in a sector, focusing primarily on workforce development and augmenting the capacity of existing organizations (p. 44). These strategies would fall under what Fitzgerald and Green Leigh coin “Type 1” strategies, those that “target existing industries in an economy and take measures to improve their productivity and create conditions for their growth” (p.40). The biosciences sectoral strategy can be described as what the authors describe as a “Type 2” sectoral strategy because it usually focuses on drawing in new growth, stimulating the creation of new biotech spin-offs, and focuses on high-paying, high-skilled jobs related to life sciences (p. 40). These “Type 2” strategies are many times initiated by city and state governments simply because not all community organizations have the resources to spearhead the attraction of high tech industries to the area. Governments can use resources such as land as well as tactics such as tax increment financing and networking capabilities to ease the process (p. 44-45). Fitzgerald and Green Leigh recognize that these “Type 2” strategies, through their focus on high-skills, high-paying jobs leave a need for job creation on all skill and pay levels, specifically to open opportunities for low-wage, low-skill workers that are placed at a disadvantage. Referencing their case study of New Haven, Connecticut, the authors underscore the importance of the development of workforce development strategies such as skills training for entry-level jobs, something that New Haven will have to deal with considering their 19.5% poverty rate, which is higher than the state and national averages of 8.3% and 11.8% (p. 64-65). Despite the success of New Haven’s biotech cluster, the city may have to compensate by supporting the population that does not benefit from the growth. “Type 2” strategies can have unintended negative consequences by reinforcing the separation between the rich and the poor.

Theory and Practice

Philip Cooke (2002), University of Wales, U.K., who has written extensively on the subject of biotechnology clusters, presents a theoretical and practical study about biotech clusters in the article, “Biotechnology Clusters as Regional Innovation Systems.” He first explains the significance of the “knowledge” economies in the global economy and then expands on biotechnology clusters in particular and the components that allow them to form and sustain themselves. He further illustrates his theories through the presentation of flourishing biotechnology clusters in Germany, Cambridge, Massachusetts, and Cambridge, U.K.

In explaining the multifaceted process involved in translating cluster development into tangible economic development success, he makes the following point: “to transfer science from the laboratory to the market involves complex interactive chains among scientists, entrepreneurs, and various intermediaries” (p. 8). He argues that regional economic systems have an advantage by explaining the features that commonly arise in tandem with their success, including but not limited to: agglomeration economies, institutional learning, associative governance, proximity capital, and interactive innovation (p. 10). According to Cooke (2002), these components are not all necessary for a cluster development to form, but contribute greatly to their capacity to flourish in an increasingly competitive global environment. He describes agglomeration economies as those with a ‘concentration of producers that support suppliers of specialized inputs,’ proximity being something that allows for the lessening of transaction costs between firms. Institutional learning involved the creation of norms and ‘rules of the game’ between firms, a sort of shared organizational framework, something that he extended to describe the broader trend occurring globally. Associative governance refers to the cooperative relationship between governments in a region as well as the ability for governments to ‘let go,’ or allow private entities to assume the role of a regional power player: Examples would include the role of a chamber of commerce or a business association. Proximity capital refers to infrastructure in place that provides the necessary means to integrate elements needed to create a product or to provide a service: “The existence of appropriate communication links such as road, rail, airport, and telecommunications services is crucially important in proximity to industrial agglomerations” (p. 11). The final component he describes is interactive innovation, a product of the interaction between the so-called ‘triple helix’ of organizations: industry, government, and universities. A possible addition would be the nonprofit sector, an increasingly powerful player in economic development activity (p. 12). Grand Rapids, in particular, has what may be called a “quadruple-helix” model, because of its philanthropic assets—non-profit organizations and foundations. Philanthropy has fueled much of the life sciences development—without these organizations, a piece of the puzzle would be missing.

Cooke (2002) holds that cluster development facilitates productivity, innovation, and new business formation if it is done in a particular way, and succeeds in creating the particular environment with fertile ground for a growing and thriving hub. The following chart (Figure 1) shows Cooke’s criteria for a regional innovation system that is more likely to succeed as opposed to one that is likely to fail. The overwhelming theme presented here is cohesion and synergy—these are components that Cooke finds to be crucial predictors of a booming regional innovation system or biotech center. These factors must be integrated into spending, policy strategy, as well as the relationships between university and industry. They must also be extended to the organizational culture of organizations (firms) and the broader context of organizational cooperation across sectors—be they public, private, or nonprofit organizations.

The areas that will be less likely to succeed are those that lack the essential connecting forces between people, ideas, capital, funding, skills, technology, etc. This leads one to ask the following question: What should be included as a recipe for an economically viable bioscience cluster? One of the key components that is prevalent in much of the literature regarding bioscience cluster development success is the cultivation of an environment that invigorates learning and innovation. Walcott (2002) includes the following statement in the article, “Analyzing an Innovative Environment: San Diego as a Bioscience Beachhead,” which explores the development of San Diego, California as a bioscience hub:

Five factors are crucial for the development of a bioscience cluster: an outstanding research university with relevant specialty, a local entrepreneurial culture, strong advocacy leadership, available risk financing, and appropriate real estate (p.99).

Walcott (2002) cites several other factors that contribute to the development of a thriving bioscience cluster, including a culture that allows for the possibility of failure, dynamic leadership and networking capability. San Diego was able to cultivate its bioscience cluster through taking advantage of these elements (p.111).

Figure 2. Conditions for Higher and Lower Regional Innovation Systems Potential

<i>Higher Potential</i>	<i>Lower Potential</i>
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Infrastructural level

Autonomous taxing and spending
Regional private finance
Policy influence on infrastructure
Regional university-industry strategy

Decentralized spending
National financial organization
Limited influence on infrastructure
Piece meal innovation projects

Super structural level

Institutional dimension

Cooperative Culture
Interactive Learning
Associative Consensus

Competitive culture
Individualistic
Institutional dissension

Organizational dimension (firms)

Harmonious labor relations
Worker mentoring
Externalization
Interactive Innovation

Antagonistic labor relations
Self-acquired skills
Internalization
Stand alone R & D

Organizational dimension (policy)

Inclusive
Monitoring
Consultative
Networking

Exclusive
Reactin
Authoritative
Hierarchical

(Cooke, 2002, p. 15)

In an article in the *Journal of Commercial Biotechnology* examining the role of research institutions in Massachusetts, Nelsen (2005) notes the importance of educational institutions:

The Boston/Cambridge area of Massachusetts has an unusually large concentration of world-class research institutions—universities and research hospitals—funded in large part by the US federal government, and particularly the National Institutes of health (NIH), to perform basic discovery research in biology and biomedicine. These include, among others, the Massachusetts Institute of Technology, the Whitehead Institute, Harvard University, Massachusetts General Hospital, Boston University and many others. Together, Massachusetts research institutions received over US \$2.1 billion in NIH research grants in fiscal year 2003, approximately 10 percent of the national total. From this research comes much of the ‘feedstock’ for new biotech companies: new discoveries, intellectual property, knowledgeable scientific advisors for new companies and importantly, well-trained scientists to staff the new companies. (Nelsen, 2005, p. 331)

Fitzgerald & Green Leigh (2002) underscore the crucial component of the active presence and involvement of research institutions as well:

Biotechnology, like high-tech industries, has location needs that preclude its locating in many places. A major research university is at the core of all biotechnology clusters and is a necessary, but not sufficient need. Once this requirement is met, state and local economic development policy can facilitate the expansion of biotechnology clusters in many ways. (p. 54)

Whether or not localities have all or some of the components that Cooke (2002) and Walcott (2005) describe as qualities that make a place more likely to succeed in biotechnology or life science development, the sector continues to grow and appears to be having positive benefits for communities. The Battelle nonprofit research group published the following findings in their report in 2006:

Total employment in the biosciences in the United States reached 1.2 million in 2004 (the latest year for which data are currently available), with bioscience workers found in all 50 states, the District of Columbia, and Puerto Rico...The nation's 1.2 million bioscience jobs generated an additional 5.8 million jobs in the economy, resulting in a total employment impact of 7 million jobs.... The average annual wage of bioscience workers in the United States was \$65,775 in 2004, more than \$26,000 greater than the average private sector annual wage...The bioscience industries as a whole are extremely profitable... Metropolitan areas of all sizes are heavily engaged in bioscience activities. While the five largest bioscience metro areas account for anywhere from 20 percent to nearly 40 percent of the total national employment in one particular sub-sector, these bioscience activities are widespread, with hundreds of metropolitan areas throughout the United States having some commercial or research involvement in the biosciences. In fact, 193 of the nation's 361 metropolitan statistical areas have a specialization in at least one of the four biosciences sectors. ("Bioscience," p. 2-5)

The international, national, and local economic structure is certainly changing at a rapid pace, and collaborative structure and ideology is becoming ever more common as the economic system goes through a powerful metamorphosis. In the revolutionary book, Wikinomics: How Mass Collaboration Changes Everything," written by Tapscott & Williams (2006), a new economic theory is born. The authors explain how this new economic framework is emerging, one that embraces the collaboration and synergy that are provided by the tools of innovative technology such as open source software, which embraces the connectivity of the internet to allow people to share knowledge and resources. They describe that:

These changes, among others, are ushering us toward a world where knowledge, power, and productive capability will be more dispersed than at any time in our history—a world where value creation will be fast, fluid, and persistently disruptive. A world where only the connected will survive. A power shift is underway, and a tough new business rule is emerging: Harness the new collaboration or perish. Those who fail to grasp this will find themselves ever more isolated—cut off from the networks that are sharing, adapting, and updating knowledge to create value. (Tapscott & Williams, 2006, p. 12)

Similar to Phillip Cooke, the authors claim that collaboration leads to gains in productivity and profit. Both Wikinomics and the "Triple-helix" that these authors describe are happening whether the critics like it or not. The case of Grand Rapids, Michigan is proving just that. In the following section, the evolution of the Grand Rapids Medical Mile will be examined through a review of the events and developments that have occurred from April 2007 to April 2008. It will take a closer look at the collaborative structures that are emerging; it will break down the data on job growth and job projection, and it will examine how companies have been created and are growing.

The evidence shows that the city of Grand Rapids is changing rapidly in tandem with the global economy. It is not evident, however, whether or not the environment will allow for a true "quadruple-helix" collaborative structure to be embraced by all. As the authors of Wikinomics claim, it is a given that change will occur, but it is not a given that cities, companies, organizations, and individuals will adapt accordingly. This sentiment is highlighted by the following paragraph:

Now, to great chagrin, industrial-era titans are learning that the real revolution is just getting started. Except this time the competition is no longer their arch industry rivals; it's the uber-connected, amorphous mass of self-organized individuals that is gripping their economic needs firmly in one hand, and their economic destinies in the other. "We the People" is no longer just a political expression, a hopeful ode to the power of the masses; it is also an apt description of how ordinary people, as employees, consumers, community members, and taxpayers now have the power to innovate and to create value on the global stage....Companies can reach beyond their walls to sow the seeds of innovation and harvest a bountiful crop. Indeed, firms that cultivate nimble, trust-based relationships with external collaborators are positioned to form vibrant business ecosystems that create value more effectively than hierarchically organized businesses.....But the new participation will also cause great upheaval, dislocation, and danger for societies, corporations, and individuals that fail to keep up with relentless change. (Tapscott & Williams, 2006, p. 14-15)

Can Grand Rapids harness the potential to create a regional innovation system, a successful, booming life sciences corridor? While it is difficult and impossible to predict exactly the overall impact that the life sciences will have on the Grand Rapids area, it is helpful to evaluate and assess the collective developments, efforts and relationships

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being formed to attempt to envision how these changes will affect the Grand Rapids community and to track them as they develop further.

Opportunities and Constraints for the Grand Rapids Life Sciences Corridor



Photo: Emily Vander Woude, April 23, 2008

The Michigan Economic Development Corporation (MEDC) has invested in the 21st Century Jobs Fund, an initiative that is attempting to use tobacco revenue to invest in four target sectors, one of them being the life sciences. MEDC has also created the Smart Zone program that uses tax increment financing to particular areas where biosciences are being pursued. “Biotech Connect,” a part of this effort, seeks to provide entrepreneurs with the needed support to start up their bioscience businesses (“Bioscience” p. 1-2). The Smart Zone provides incentives for business start ups.



Photo: Emily Vander Woude, April 23, 2008

In assessing the opportunities that Grand Rapids has for success, it is evident that Grand Rapids has several components that were noted earlier as prerequisites or predictors for success. Grand Rapids has a strong base of philanthropy, from the Van Andel Institute to the Helen Devos Children’s Medical Tower, to St. Mary’s Hauenstein Center, to the GVSU Cook-Devos Health Center—the big names that have provided the funds are major players in the life science corridor’s development.

The private funding sources give Grand Rapids an advantage over other areas. Many localities simply do not have the generous philanthropic resource that Grand Rapids is fortunate to possess. The local philanthropic funds have spurred the rapid growth of projects that may have been hindered by the lack of state and local funding available. A project like Van Andel Institute would not have been possible without extensive private capital. As mentioned before, many cities cannot engage in the trial and error involved in the life sciences sectoral strategy. Grand Rapids has been fortunate enough to gain the cushion provided by philanthropic revenue and *can* afford to take such risks.

The nonprofit organization The Right Place has been also been a leader in economic development efforts. In their most recent annual report (2006), *The Right Place* notes the more than one billion dollars in life science investment that is happening in Grand Rapids as well as the “manufacturers throughout the area that continue to leverage their expertise in sophisticated metals, plastics and medical device manufacturing to develop new market opportunities” (“Right Place,” 2006, p. 9). The report continues to describe the Innovation WORKS program that was initiated by the Right Place in 2006. This program is a regional collaborative effort between The Right Place, Lakeshore Advantage, an economic development organization serving the Holland, Zeeland, and Saugatuck, Michigan areas, and Grand Rapids Community College created to build the necessary foundation for commercialization among firms. The project is funded by part of a 15 million dollar grant from the U.S. Department of Labor, one of the 12 West Michigan Strategic Alliance’s (WMSA) WIRED (Workforce Innovations in Regional Economic Development) West Michigan efforts to revitalize the economic base through workforce development, economic

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development strategy, and education (“Right Place,” 2006, p.9). The Right Place report further describes the Innovation WORKS program expanding on its regional cooperative efforts toward commercial and societal benefit:

Targeted to advanced manufacturing as well as emerging industries, Innovation WORKS will not only expand the infrastructure for start-up businesses and improve the competitiveness of area firms; it will also raise the region’s profile as an innovative, attractive business location. Its four components include: A region-wide Commercialization Infrastructure that will organize current and future resources to accelerate the commercialization of intellectual property in Michigan, a regional Design Council to increase the supply and use of industrial and other design skills in area companies, a series of Innovation Forums featuring world-class thinkers on innovation strategies to educate and help area firms adopt new practices, and an Innovative Curriculum of learning programs to help the skills needed to support innovation strategies, systems, and practices. (p. 9)

The Right Place has been involved in many integrating economic development strategies such as this one that focus on regional rather than competitive strategies. It appears that initiatives such as this project are attempting to foster the kind of learning environment that Cooke (2002) describes as a crucial component to regional innovation system success and survival.

The Grand Rapids/ Kent County Smart Zone is another effort that has been developed for economic development purposes by the City of Grand Rapids, Grand Rapids Community College, Grand Valley State University, The Right Place Program and the Van Andel Institute (VAI). In “Smart Zones and technology-based economic development: technology-led economic development in Michigan and other mid-western states,” Johnson & Singh (2003) describe the Grand Rapids Smart Zone below:

This zone seeks to stimulate the growth of technology-based businesses and jobs in the Grand Rapids area. It will build upon the singular strength of the VAI, a sustained rebirth of downtown Grand Rapids, and the regional institutions of higher education. The zone will also support the growing needs of the new life sciences enterprises developed through the establishment of a life sciences development center, to include a full-service incubation center. (p. 1)

Critics of the Smart Zone argue that it would reinforce socioeconomic inequality by benefiting a highly skilled workforce and leaving out people with lower skills and less education. Not only will it do this, but because it is a tax increment financing zone, it would not extend the taxes to the areas that are in dire need of tax revenue such as the failing Grand Rapids Public School system. While there are those who boast about the money coming into the city with the Helen Devos Children’s Hospital at \$250 million, the Van Andel new construction (\$165 million), St. Mary’s Hauenstein Center (\$60 million), the slated MSU medical school—it is hard to decipher who will be the direct beneficiaries of the profits. Will there be significant positive externalities to justify the use of the Smart Zone tax incentives? Those who argue that the overall life sciences efforts are worth it underscore the importance of an innovative organization such as the Van Andel Institute:

The Van Andel Institute is an important asset in making Grand Rapids more attractive to life-sciences companies...The Van Andel Institute is different from other Life-Sciences facilities, in that it does not serve a local clientele but draws new money into the area in the form of research grants to find treatments for cancer, Parkinson’s and other diseases. Discoveries by the institute’s scientists could attract new business from pharmaceutical and medical device companies. (Shellenbarger, 2007, p. A1)

The West Michigan Science and Technology Initiative (WMSTI) is housed in Grand Valley State University’s Cook-Devos Center for Health Sciences. It is a partnership that was formed in 2003 between The Right Place, Van Andel Research Institute, Grand Valley State University, the City of Grand Rapids, and Grand Rapids Community College and has recently drawn in Spectrum Health, Saint Mary’s, Mary Free Bed Rehabilitation Hospital, and the Grand Angels. The partnership was formed to “bring together the product development tools, amenities, and community assets an innovator, entrepreneur, or small business needs to make their ideas a business reality. WMSTI also caters to client needs by offering incubator/accelerator amenities through the Product Development Center located in the Cook-Devos building” (“WMSTI”, 2007).



Photo: Emily Vander Woude, April 23, 2007

In an article about the Michigan Department of Transportation's plan to widen 'key sections of vital city streets,' a total investment of \$400 million that will include \$3.75 million of reconstruction on Michigan Street, Guy (2006) explains the debate that arose over whether or not this would have a positive or negative impact on the city of Grand Rapids. Those in favor of less travel time on the highways and major city roads are proponents, while those that believe mass transit is where the state should be investing its money are discouraged by the plans. Some argue that the overwhelming focus on automobile transit ignores the need to facilitate other important modes of transit such as walking, biking, bus, or street car—citing major metropolitan areas where this is the norm (p. 1-3). For now, it seems that Grand Rapids will continue to be an auto-centered environment, something that may be to its detriment in attracting and retaining high-skills labor. Michigan State University's plan to come to Grand Rapids is a major asset of the Medical Mile and may override the detraction of the widened road:

The Grand Rapids building that will become the new home of the MSU College of Human Medicine will be named "The Secchia Center," in recognition of a gift from alumnus Ambassador Peter F. Secchia that will total \$20 million toward the \$40 million in private support required to complete the project. The Secchia Center will include research and teaching laboratories, classrooms, offices and student areas. Michigan State's College of Human Medicine is slated to enroll its first class of 100 first-year students in Grand Rapids in 2010, when the new facility opens, and second-year students will begin study there in 2008 in a leased facility. Once the program is at full capacity, enrollment in Grand Rapids will exceed 400 students. ("Secchia", 2007)

MichBio , as an affiliate of Biotechnology Industry Organization, BIO, which represents biotechnology companies across America and in 33 other nations, is:

a non-profit, statewide trade association, headquartered in Ann Arbor, MI. Formed in 1993 as the Michigan Biosciences Industry Association, MichBio's mission is to drive life sciences industry growth in Michigan by

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providing its members with: networking & educational opportunities, legislative & business advocacy & public awareness efforts, a hub for life sciences information and comments, and power buying resources. Its members are life sciences companies, academic and research institutions, bioscience service providers, and related organizations. (Michbio, 2008)

As part of its efforts, MichBio created an online directory of all of the life science companies in Michigan. Following is a table that displays the companies, universities, and other organizations that engage in activity related to life sciences in Grand Rapids, Michigan. See Figure 3.

Figure 3. MichBio Directory of Grand Rapids (MSA) Life Sciences Organizations

<i>Directory of Life Sciences Organizations</i>	
<i>Company/Organization</i>	<i>Category</i>
ATEK Medical Manufacturing	Contract Manufacturing/Production
Avalon Laboratories, Inc	General
Bio-Chem Environmental Analytical Laboratories	General
Cascade Life Solutions	General
ClinXus	Research Institute
Core Technology Alliance	Research Institute
Corium International, Inc.	Biopharmaceutical
Elkins Innovations, Inc .	Prosthetics/Orthotics
Gerontology Network	General
Grand Rapids Community College	University
Grand River Aseptic Pharmaceutical Packaging, Inc	Pharmaceutical
Grand Valley State University	University
Haviland Enterprises	Contract Manufacturing/Production
Hopen Therapeutics	General
Medbio, Inc	Contract Manufacturing/Production
Medtronic	General
Michigan Antibody Technology Center	General
Michigan Instruments	General
Michigan Medical PC	General
Optical Supply	General
Surge Medical Solutions	General
Van Andel Research Institute	General
Vital Concepts, Inc.	General
West Michigan Regional Laboratory	Healthcare & Technology

This may not be an all-inclusive list—as the economy is constantly evolving, it will be of crucial importance to continue to follow these organizations and their relationships to one another to get the full picture of the Grand Rapids life sciences sector’s development.



Photo: Emily Vander Woude, April 23, 2008

A non-published data file from the Community Research Institute at the Johnson Center for Philanthropy at Grand Valley State University provides data on the number of employable graduates in the life sciences field. The methodology used is as follows: Data was downloaded from the Bureau of Labor Statistics on job growth projections for the Grand Rapids Metropolitan Statistical Area (MSA). Jobs that had less than 25% growth and jobs with less than 100 jobs added over the term (not annually) are excluded. The Standard Occupational Occupation codes are compared with the Bureau of Labor Statistic codes. The major group occupations, nonspecific occupations are also excluded. For remaining occupations, the titles are compared to the Integrated Postsecondary Education Data System (IPEDS) fields of study to find the best fit. It is noted that some occupations do not have an IPEDS field of study because there is no relevant college coursework. Finally, projected annual openings for each opening are compared with the respective degree/certificate completions and the lesser of the two figurines is the Employable Graduates number (the number of people who could possibly fill the projected positions available). Figure 4 shows the Employable Graduates in the health field:

Figure 4. Grand Rapids (MSA) Employable Graduates in Health Field

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<i>Occupational Projections with >24% and 100 Jobs Growth 2004- 2014</i>			<i>Local County Completions</i>				<i>Employable Graduates</i>		
<i>SOC</i>	<i>Occupational Title</i>	<i>Annual Average Openings</i>	<i>Major</i>	<i>2003-2004</i>	<i>2004- 2005</i>	<i>2005- 2006</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>
291071	Physician Assistants	14	Physician Assistant	27	28	26	14	14	14
291111	Registered Nurses	358	Nursing/Registered Nurse (RN, ASN, BSN, MSN)	269	361	348	269	358	348
291123	Physical Therapists	18	Physical Therapy/Therapist	47	47	46	18	18	18
292021	Dental Hygienists	27	Dental Hygiene/Hygienist	25	30	31	25	27	27
292071	Medical Records/Health Info Technicians	24	Health Information/Medical Records Technology/Technician	130	33	29	24	24	24
311011	Home Health Aides	75	Home Health Aide/Home Attendant	0	0	0	0	0	0
319091	Dental Assistants	80	Dental Assisting/Assistant	113	258	107	80	80	80
319092	Medical Assistants	92	Medical/Clinical Assistant	485	990	510	92	92	92

(Community Research Institute, 2008)

Since 2007, the headlines regarding job growth, profit-making, and collaborative activities have regularly surfaced in the Grand Rapids media circuit. Rapid Growth is a weekly e-magazine and web site “devoted to showcasing the positive and sustained transformation of the greater Grand Rapids region” (Rapid Growth, 2008). Reviewing Rapid Growth headlines in the past year provides an overview of the recent developments related to health care and life sciences in Grand Rapids. While other local media outlets such as the Grand Rapids Press and the television networks cover these stories, Rapid Growth interviews the specific organizations regarding their economic development activities more thoroughly. Appendix A displays the highlights of the past year from the Rapid Growth e-newsletter in their weekly headlines. This compiled list provides a snapshot of the developments of the Medical Mile – jobs gained, discoveries made, new programs, etc.

CONCLUSION

Michigan Street is blossoming into a hub of economic activity and a topic of discussion for Grand Rapids residents, leaders, and entrepreneurs. Since April 2007, many developments have ensued and many relationships have been forged. This is clearly reflected in the news headlines found in Appendix A. Collectively, the health care developments—philanthropic, governmental, private, and on the university level—have rapidly changed the face of Grand Rapids and continue to do so. Will Grand Rapids manage to sustain its life sciences cluster? Further analysis and longitudinal data on demographics and employment changes will be required to determine what is to be the ultimate impact of the Grand Rapids Medical Mile. At this time; however, it is evident that Grand Rapids managed to create a “quadruple-helix” in the collaboration between its universities, public, private, and nonprofit organizations—creating an ever-changing “Medical Mile” on Michigan Street. What other cities can learn from Grand Rapids: It is possible to find synergy between organizations and individuals which results in massive profit that extends beyond monetary gain to give birth to new and innovative discoveries—despite the critic’s belief to the contrary.



Photo: Emily Vander Woude, April 23, 2008

APPENDIX A

Rapid Growth News Headlines for Grand Rapids (MSA)

Rapid Growth News Headlines 2007-2008

<i>Date</i>	<i>Headline</i>	<i>Highlights</i>
26-Apr-07	WMSTI leverages over \$23M for life sciences startups, pursues patents	In the last five years, the West Michigan Science and Technology Initiative (WMSTI) has helped life sciences start-ups procure more than \$20 million in investment, some \$3 million in grants, and helped one business license their first product with a \$13-billion-dollar corporation.
3-May-07	GR medical manufacturer expects to create 15 jobs	The silicone tubes Rose Technologies makes are components for catheters. The company's manufacturing method revolutionized the product and launched their business. Now, nine years later, they make 200 different medical components for finished goods manufacturers like ATEK Medical Manufacturing and Medtronic, they have 25 employees, and posted 2006 sales just under \$2 million.
3-May-07	\$6M venture moves GR into molecular medicine	A \$6 million joint venture between Spectrum Health and the Van Andel Institute will offer cutting-edge molecular medicine capabilities. The Center for Molecular Medicine (CMM) will aid in early diagnosis and improved treatments for cancers, heart disease, mental illness, and other complex diseases.
10-May-07	GR molecular drug testing in top 10 percent	Out of about 350 molecular medicine centers in the country, Grand Rapids' Center for Molecular Medicine is in the leading ten percent to offer genetic testing that determines a patient's compatibility and non-compatibility with certain prescription drugs.
10-May-07	Life-changing prosthetic hand could garner \$20M annually	Today, hand and arm amputees have just three options when it comes to prosthetics: one that is merely cosmetic, one that opens and closes by mechanically controlling a harness, and one that opens and closes by way of sensors glued on the skin over certain muscles. The first has no practical function, and the others have limited functions that are difficult to master. Elkins Innovations, Inc., 301 Michigan NE, is about to change all that. A new prosthetic hand the company is developing will control an unprecedented eight functions: wrist flexion (up and down), thumb movement (in and out), and individual movement of each finger.
10-May-07	W MI 1.4M patient population gains early access to advanced medicine	West Michigan's 1.4 million healthcare patient population is expected to benefit from advanced medical treatments sooner than the general population. ClinXus, a partnership of several West Michigan medical facilities—among them are the Van Andel Institute, Spectrum Health, Saint Mary's Health Care, and the Jasper Clinic—expects to bring cutting edge treatments to some patients seven to eight years sooner than they would normally be able to receive them if they lived somewhere else.
21-Jun-07	Suburban GR company relocates downtown, brings 75 employees	ProCare Systems Corporation is a medical practice management corporation with a nice office near Centerpointe Mall. But the business needs room to grow, so it's heading downtown and bringing 75 employees along.

28-Jun-07	As medical industry booms, GR packaging firm plans to hire 60	To say that Grand Rapids-based Praxis is in growth mode is an understatement. The company quadrupled its annual sales in the past two years, hired 115 workers this year alone, and now plans to add some 60 more by year's end. Praxis is a contract packaging company that began in the late 1980s offering packaging and point of purchase displays for over the counter drug manufacturers. The company recently expanded its services to include packaging for prescription pharmaceuticals, which has become its fastest growing market.
12-Jul-07	State considers \$8M fund to finance life sciences startups	In an effort to retain life sciences technicians who lost their jobs when Pfizer downsized in Holland, Kalamazoo, and Ann Arbor, the state has proposed a pool of \$8 million from the 21st Century Jobs Fund to entice those workers to stay in Michigan and develop their own life sciences companies. The money is part of a \$12 million allocation for a Pfizer retention initiative.
12-Jul-07	From GR to Detroit, lure life sciences entrepreneurs	A consortium of 21 laboratories across the Michigan life sciences corridor are available to entrepreneurs to research, test, develop, and even package clinical products. The Core Technology Alliance (CTA), which is housed at the Van Andel Institute in downtown Grand Rapids, is making it easier for life sciences startups to make their product without building an expensive laboratory many can't afford.
19-Jul-07	Medical manufacturers team up to capture potential \$500M in sales	Seven West Michigan medical device manufacturers recently formed a coalition, West Michigan Medical Device Consortium (WMMDC), to encourage collaboration, help leverage individual strengths, and grow their businesses. The West Michigan Science and Technology Initiative (WMSTI), part of Grand Valley State University, is putting together the strategic plan and helping the consortium get off the ground.
26-Jul-07	Van Andel Institute researchers step closer to drug for prostate cancer	Scientific Investigator Dr. Cindy Miranti and her team at the Van Andel Research Institute have taken a major step forward on their quest to develop a drug to treat prostate cancer.
26-Jul-07	Medbio hires 5, will add 4 more jobs by year's end	"Astounding" might be the word Chris Williams, president of Grand Rapids-based Medbio, would use when describing his company's growth this year. Williams expects 2007 sales to exceed a 100 percent increase when compared to the company's 2006 performance, approaching some \$4 million by the end of the year. And if that isn't astounding enough, Williams is predicting 20 percent to 40 percent growth in '08 and '09.
2-Aug-07	Educational leadership initiative gets \$2.3M for math and science training	With high-tech jobs, life sciences careers, and medical device manufacturing and engineering on the rise, the success of Michigan's knowledge economy is dependent on the availability of qualified science and mathematics professionals. GVSU, the University of Michigan and University of Michigan-Dearborn, Saginaw Valley State University, and the Michigan Mathematics and Science Center Network joined forces with targeted high-needs schools statewide and college and university math and science experts to form the collaborative. Funding comes from a \$2.3 million two-year grant from the Michigan Department of Education, with the possibility of renewable grants of \$4.5 million.
2-Aug-07	GR's Surge Medical on track for 40 percent growth and more employees	The leaders at Surge Medical in Grand Rapids still consider the two-year-old medical device manufacturer a start-up. But since acquiring a product line 12 months ago, the company has been on an upward climb on the sales charts.

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16-Aug-07	West Michigan's life sciences industry sixth largest in the nation, and growing	The region is the sixth largest biopharmaceuticals cluster in the US, with a recent investment of over \$1 billion in life science endeavors. In addition, there are over 850 clinical trials currently open in West Michigan.
23-Aug-07	Spectrum Health among first in MI to offer alternative hip replacement procedure	In May 2006, the FDA approved the Birmingham Hip Resurfacing (BHR) implant and procedure for use in the US. In September, Dr. Thomas Malvitz, M.D. was in Birmingham, England training under the doctor who created the implant and surgical technique. Since then, Dr. Malvitz, chair of Spectrum Health's Orthopedic Department and a physician with Orthopedic Associates of Grand Rapids, has performed 25 BHR implant procedures.
23-Aug-07	Center for Molecular Medicine pioneers test to protect nursing infants	This week, the Grand Rapids-based Center for Molecular Medicine (CMM) announced it is the only lab in the Midwest with the capability to test nursing mothers for codeine risks that can cause morphine overdoses in nursing infants. When codeine is metabolized, it becomes morphine. People with a variation in a liver enzyme called CYP2D6 may change the codeine to morphine more quickly and completely.
30-Aug-07	VARI Graduate School welcomes first two students	Last week, the new Van Andel Institute Graduate School (VAIGS) accepted its first two students with a convocation signaling the beginning of the academic year. The VAIGS received an independent charter from the State of Michigan to confer advanced degrees in biomedical research of various human diseases.
30-Aug-07	Collaborative life sciences initiatives blaze trails to new businesses, jobs	<p>Collaboration between business competitors is unheard of in most parts of the country. But in West Michigan, it's becoming the norm, especially in the life sciences industry. One example is the West Michigan Science and Technology Initiative (WMSTI), which was established by the State of Michigan in 2002 as a life sciences incubator to help entrepreneurs and innovators get their products and discoveries to market. "We've got competitors working together for the greater good of the community, and that's what West Michigan is built on," says Kim Bode, marketing director. "That sets us apart." Bode cites a number of joint efforts across the region that are primed to spur economic development throughout the gamut of life sciences technologies:</p> <ul style="list-style-type: none"> * The Right Place, Inc. and Southwest Michigan First are working together to attract and retain businesses. * ClinXus, a clinical research alliance, is attracting pharmaceutical companies to do clinical research. * The Core Technology Alliance connects core efficiencies between companies to drive drug development through the pipeline faster. * West Michigan Medical Device Consortium is a group of manufacturers working together to leverage core competencies and create awareness of the region's manufacturing expertise. * Biotech Commercialization Project sets up innovation committees to get healthcare workers' biotech inventions to market.
30-Aug-07	VARI scientists closer to finding leukemia gene	Researchers at Grand Rapids-based Van Andel Research Institute may have pinpointed the gene that causes myeloproliferative disease (MPD) and myelodysplastic syndrome (MDS), two bone marrow cancers formerly known as pre-leukemia. The discovery could be a major step in helping physicians determine if a patient has the potential to develop acute leukemia.

20-Sep-07	VAI honors two renowned researchers for cancer prevention discoveries	Last week the Van Andel Institute (VAI) honored two renowned researchers who were instrumental in investigating human papillomavirus (HPV) and its links to cervical cancer with the Daniel Nathans Memorial Award. The VAI's Board of Scientific Advisors presents the award each year for far-reaching contributions in biomedical and cancer research that have a significant benefit to public health.
20-Sep-07	Women's Health Center could bring 50 new jobs to downtown Grand Rapids	Construction of the five-story, 110,000-square-foot Women's Health Center at Union and Michigan Streets in Grand Rapids is well underway and 70 percent of the space already is pre-leased. Even with 30,000 square feet still available, developer Michael Garrett expects the businesses and health practices already on board will generate approximately 50 new jobs.
18-Oct-07	Michigan firm launches two cutting-edge life science companies at MichBio	Two new companies, Michigan Virtual BioPharma Company, LLC, and Michigan Virtual Medical Device Company, LLC, were launched Tuesday by the Michigan Life Science Network (MLSN), a group working to elevate the state's 650 biotech companies and medical device manufacturers as leaders of life science innovation and production in the global marketplace. The new companies create two new separate networks that get life science products to market faster, more efficiently, and for less money than traditional practice. Both networks use Crowdsourcing, a web based tool that enables each company to fill in their piece of the collaboration puzzle whether it be research, clinical trials, or manufacturing capabilities. From there, a virtual company is created that leverages the strengths of each individual business.
25-Oct-07	West Michigan company launches two virtual life science ventures, seven jobs	Of the 650 estimated biotech and medical device businesses in Michigan, 313 of them want in on creating two virtual companies to elevate the state as a leader of life science innovation and production in the global marketplace. The response came after an announcement made last week at MichBio, Michigan's largest gathering of life science experts, educators, and investors. Michigan Life Science Network (MLSN) announced its intent to create Michigan Virtual BioPharma Company, LLC, and Michigan Virtual Medical Device Company. By leveraging each company's capabilities—research, legal services, manufacturing, or others—and connecting them with the capabilities of other biotech companies, the virtual companies will get life science products to market faster, more efficiently, and for less money than traditional methods.
8-Nov-07	State announces initiative to retain Pfizer's life science resources	In an effort to retain the human talent and scientific equipment left in the wake of Pfizer's downsizing of workforce and facilities, Michigan Governor Jennifer Granholm announced last week that the Michigan Strategic Fund (MSF) board has appointed Zeeland-based Lakeshore Advantage, an economic development corporation, as one of four EDCs to make loan recommendations for the \$8-plus million Company Formation and Growth Fund. The MSF created the fund to finance opportunities to accelerate company growth and create new businesses that establish biotech or life science-related jobs for former Pfizer employees, or use technologies and high-tech equipment connected with Pfizer's closed facilities in Holland, Kalamazoo, Plymouth Township, and Portage.
15-Nov-07	Van Andel Institute awarded \$400K for groundbreaking breast cancer research	Concept Award grants from the US Department of Defense Breast Cancer Research Program (BCRP) are difficult to land. Yet three researchers at the Van Andel Institute received grants totaling over \$400,000 to help fund their groundbreaking breast cancer investigations.

Vander Woude/Bioscience and Economic Development

29-Nov-07	Grand Rapids lab among first to offer highly specialized breast cancer test	Illustrating Grand Rapids' evolution as an epicenter for advanced health care, the Center for Molecular Medicine (CMM) announced last week that it is the only lab in Michigan to offer a test that identifies and counts circulating tumor cells (CTCs) in the bloodstream of patients with stage IV, or metastatic, breast cancer.
10-Jan-08	\$500K infant incubator revolutionizes preemie healthcare in West Michigan	Helen DeVos Children's Hospital added a revolutionary new medical device to its neonatal intensive care unit (NICU), providing cutting-edge technological capabilities for the detection of brain injuries or abnormalities in even the smallest babies. Only ten units are in operation in the United States.
10-Jan-08	MSU, St. Mary's lure new medical talent to Grand Rapids	Saint Mary's Health Care and the MSU College of Human Medicine have appointed their first leader of a newly created neurological services initiative. Christopher C. Glisson, DO, MS is the new medical director of Saint Mary's Health Care's innovative new neuro-ophthalmology program, and he will be the MSU medical school's assistant professor of neurology and ophthalmology. The Hauenstein Neurosciences Center currently under construction at St. Mary's will be completed in 2009 and will offer Dr. Glisson and his scientific team opportunities to delve into and help develop emerging neuro-ophthalmologic techniques, with a focus on those related to multiple sclerosis and neuro-degenerative diseases.
17-Jan-08	Growth at Spectrum Health spurs 500 clinical healthcare positions by year's end	By the end of 2008, Spectrum Health expects to create and fill 500 full-time-equivalent clinical healthcare positions. While most of those jobs will be system-wide, Spectrum has earmarked some for its state-of-the-art Lemmen-Holton Cancer Pavilion, slated to open on June 30.
24-Jan-08	Saint Mary's adding 3 radiologists to expanded nuclear medicine department	Next September, the new PET scanner and nuclear medicine addition at Saint Mary's Health Care in Grand Rapids will be up and running. And so will three new radiology technologist jobs the hospital expects to create to handle the increased number of patients.
31-Jan-08	Two Grand Rapids hospitals pioneer treatment to help kids with cerebral palsy	A neurosurgery never before available in West Michigan—limited exposure selective dorsal rhizotomy—offers children suffering from spasticity the chance to walk easier. A partnership between Helen DeVos Children's Hospital (HDVCH) and Mary Free Bed Rehabilitation Hospital furthers the cause by offering a comprehensive physical therapy program for pediatric patients undergoing the surgery.
31-Jan-08	Growing Center for Molecular Medicine develops 3 key knowledge jobs	In existence since late 2006, The Center for Molecular Medicine (CMM) already has added three experienced medical technologists to handle the influx of molecular research. Their expertise spans a range of medical specialties, including molecular and cell biology, biotechnology, molecular biology, and clinical laboratory science.

7-Feb-08	New women's health research lab taking shape on Medical Mile	<p>Another medical milestone was laid last week in Grand Rapids with the announcement of a collaborative effort culminating in a cutting-edge laboratory dedicated to the research of women's health issues. The lab is a joint effort of GVSU, Michigan State University's College of Human Medicine, the West Michigan Science & Technology Initiative, and Spectrum Health. One year ago, the three institutions signed an agreement to collaborate on future research and academic projects by sharing resources and talent.</p> <p>By mid-February, workers will begin establishing the lab on the fifth floor of the GVSU Cook-DeVos Center for Health Sciences. The lab will address a broad range of research on women's health issues by a team of researchers led by Dr. Richard E. Leach, the MSU College of Human Medicine chair for obstetrics, gynecology, and reproductive biology. Researchers will have dedicated wet lab space as well as the use of existing WMSTI space already outfitted with 100 pieces of lab equipment.</p>
14-Feb-08	With 150 job openings, Perrigo aims to attract skilled workers back to West Michigan	<p>Perrigo Company has gotten plenty creative in its quest to attract highly skilled pharmaceutical workers to fill approximately 40 positions at its Allegan plant, and many of the workers it is talking with are former Pfizer employees from all over West Michigan. Perrigo has an additional 110 non-pharmaceutical jobs to fill due to the company's fast-paced growth driven by new product offerings and the acquisition of Galpharm, a pharmaceutical company in the U.K.</p>
14-Feb-08	WIRED moves West Michigan into next phase of transition to the Digital Age	<p>On February 1, the workgroups in the Workforce Innovation in Regional Economic Development (WIRED) initiative moved into their next phase of spurring West Michigan toward establishing a reputable knowledge economy workforce.</p> <p>WIRED West Michigan launched 12 workgroups, or 'innovations,' to spur the transformation of the regional economy from a manufacturing base to one organized more directly around technology, creativity, and knowledge. The initiative is funded by a \$15 million federal grant that runs out on February 1, 2009.</p>
28-Feb-08	Grand Rapids business leader creates online networking tool for small businesses	<p>On March 31, Grand Rapids businesswoman Donna Wilson will launch an innovative virtual business community that helps cash-strapped, schedule-tight small business owners generate market exposure, land new clients, and boost their bottom line – all through online networking and referrals. Wilson's management consulting firm I-Core Networks and Milync Digital Design created the new virtual business community, MyCitySources.com. The site provides a variety of tools to help members reach their target market and other members who can refer them to potential clients.</p>
6-Mar-08	Center for Molecular Medicine pioneers prostate cancer test	<p>A new FDA-approved blood test, the CellSearch System, can aid in the treatment of metastatic prostate cancer, and the Grand Rapids-based Center for Molecular Medicine (CMM) is one of the first labs in the country to offer it, illustrating the city's ongoing rise a hub for medical research and innovation.</p>
6-Mar-08	VAI researchers discover method to slow kidney cancer growth	<p>It turns out that LEPIMAT, a lethal toxin that causes anthrax, actually slows the growth of a common human kidney cancer called clear cell renal cell carcinoma. That is what researchers at Van Andel Research Institute (VARI) recently discovered while testing the toxin on mice.</p>

20-Mar-08	Saint Mary's steadily builds talented staff for new neurological center	Last week, Saint Mary's Health Care announced the appointment of Deborah F. Gelinas, MD, as director of clinical neuroscience research. Dr. Gelinas specializes in ALS and will head up research at the new ALS Clinic at Mary Free Bed Rehabilitation Hospital. She fills only one of nine top medical positions created by the development of Saint Mary's Hauenstein Center, scheduled to open in January 2009. Five of those positions are still open. The 14,000-square-foot Hauenstein Center will be West Michigan's premier location for the diagnosis and treatment of neurological disorders and injuries.
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Johnson Wood (2007-2008)

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