



Biomedical Technology Alliance Executive Summary

What is the BTA? The Biomedical Technology Alliance (BTA) is an organization that was formed to build collaborative bridges that increase academic research capacity in Southeastern Wisconsin and throughout the IQ corridor. Through partnership with the State of Wisconsin and the federal government and with the support of academic, community, business and government leaders, the BTA is taking important steps toward the goal of **increasing collaborative research in the Milwaukee Region**.

Regional and State Benefits: Fostering research collaboration will have significant benefits for the Milwaukee region and the State of Wisconsin. The BTA is complementary, not competitive to similar initiatives in Madison and will serve as an important pillar of the IQ corridor in Milwaukee. The benefits include:

- **A stronger economy in the Milwaukee Region.** The potential impact of greater collaboration fostered by the BTA could be in the hundreds of millions of dollars. Research helps to strengthen and diversify the economy of the Milwaukee region. According to a recent report by the Wisconsin Technology Council, 36 high-paying jobs are created for every \$1 million in R&D spending, and academic institutions in the region already account for over \$100 million in annual research funding. Economic impact projections for a similar program between Mayo Clinic and the University of Minnesota, which received a 5-year \$70 million state commitment, shows a \$290 million in overall new impact annually to the state of Minnesota by 2010.
- **More jobs and higher wages.** Data from other States shows that the economic activity generated by the collaboration could result in as many as 4,000 net new direct and indirect jobs.
- **Broader tax base.** Wisconsinites enjoy the level of service they receive from the government; however, the costs of those services have exceeded the means to pay for them. Growing Southeastern Wisconsin is the only way to share the burden of the taxes to pay for the service we all come to know and expect.
- **Keeping our best and brightest at home – stop the brain drain.** Wisconsin must foster a culture that rewards risk-taking and encourages entrepreneurship, especially when it comes to new high-tech business start-ups. The BTA seeks to foster the kinds of businesses that ultimately provide the high paying jobs which are desperately needed to keep our best and brightest people working in Wisconsin.
- **Leveraging federal grants.** The BTA will help researchers gain access to federal research funds, bringing new money to the region. More and more, the National Institute of Health and other federal funding programs are supporting interdisciplinary and inter-institutional research teams, because those teams have proven more effective in producing valuable scientific results and innovations. However, researchers must first establish proven interdisciplinary teams and have preliminary data that demonstrates the merit of their proposals to realistically access these federal funds. Collaborative programs will make researchers more competitive for federal grants, and seed money for promising areas will help provide preliminary data that is critical for winning major federal research funds.
- **Offering companies access to research.** The BTA will help companies innovate and succeed in the global market place by connecting both existing and new companies to research. These successful companies will also help to fund future research innovations in the region.
- **Spin-off more companies.** Academic R&D spending and researchers are the key catalysts for starting new technology companies. The Milwaukee region has already shown its ability to spin out companies is among the best in the nation based on spin out companies per research dollar.

How is the BTA organized? The BTA established a steering committee to guide the initial efforts of the alliance. The steering committee is made up of academic, government, business and community leaders, and is co-chaired by Dr. William Hendee, President of the MCW Research Foundation and Cory Nettles, attorney with Quarles and Brady, LLP, and former Secretary of Commerce for the State of Wisconsin. The steering committee includes two subcommittees: the finance subcommittee, chaired by Tom Hefty; and the scientific subcommittee chaired by William Hendee.

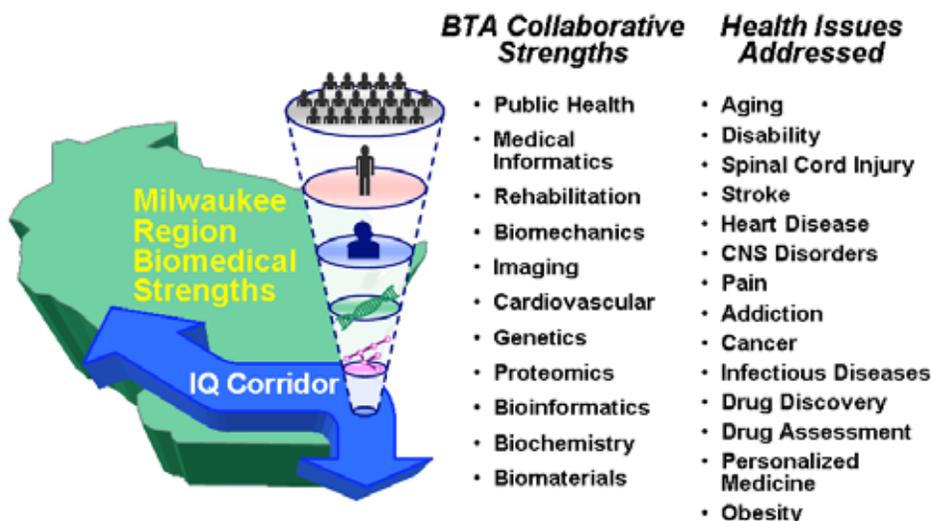
The BTA was founded in 2004 by academic research institutions in the Milwaukee region – Marquette University, Medical College of Wisconsin, Milwaukee School of Engineering, UW-Milwaukee and UW-Parkside – along with the TechStar Foundation. It received its start when TechStar (a Milwaukee-based collaboration among the founding institutions that emphasizes research commercialization) received a federal earmark that provided funds to begin organizing the alliance. The TechStar foundation board, consisting of representatives from each of the founding academic institutions, oversaw these initial efforts that included a series of collaborative seminars highlighting the region’s biomedical strengths.

Strategic Plan: The BTA seeks to foster research collaboration by creating awareness, incentives and infrastructure. The long-term vision for development includes the establishment of a new campus of shared facilities and funds to seed early collaborative research.

- **Awareness.** The BTA has been organizing a series of collaborative conferences that highlight the Milwaukee region’s significant strengths in biomedical technology. These events have drawn together clinicians, researchers and business people as well as government and community leaders, and have grown to include over 200 participants. The programs have included Wisconsin Governor Jim Doyle, Milwaukee Mayor Tom Barrett, as well as leaders of the founding academic institutions.
- **Incentives.** Modeled on the successes of other states such as Minnesota, the BTA is seeking to provide incentives that will push researchers to build collaborative teams that reach across academic institutions and include industry. The State of Wisconsin recently committed \$500,000 in matching funds that will be used to foster this sort of collaborative research that includes multiple institutions.
- **Infrastructure.** The BTA is also working to provide infrastructure that allows researchers to work collaboratively. In the near term, the academic institutions have been creating inter-institutional agreements to make it easier to assemble collaborative teams. In the long term, the BTA seeks to build a campus of shared resources where researchers from multiple institutions can share facilities and equipment. The BTA also supports other initiatives such as a community institutional review board (IRB) that could streamline the process of gaining approval to perform clinical trials at the various clinical sites in the region.

What are the region’s Biotechnology strengths? A significant portion of the biomedical technology research and development done in the region is done collaboratively – between institutions and with industry. The regional strengths of the BTA include public health, biomedical informatics, rehabilitation, biomechanics, biomedical imaging, cardio-pulmonary, genetics, proteomics and biochemistry. These strengths are used to address a wide range of health issues as illustrated in the accompanying Figure.

Academic Collaborations. The academic institutions in the Milwaukee Region are the founding members of the Biomedical Technology Alliance. These institutions include Marquette University, Medical College of Wisconsin, Milwaukee School of Engineering, University of Wisconsin-Milwaukee and University of Wisconsin-Parkside. These institutions are the core of much of the collaborative research done regionally. In many cases, research centers at the institutions act as the collaborative bridges that bring together the resources of multiple institutions to address specific health issues.



Industry Collaborations. In addition to the academic institutions, industry plays a critical role in biomedical research in the Milwaukee region. In many cases, that research is done collaboratively with academic institutions. Local industries also represent a significant opportunity for greater collaboration. Increasing the awareness of the research capabilities that exist in the academic institutions can lead to greater collaborations between industry and academia.

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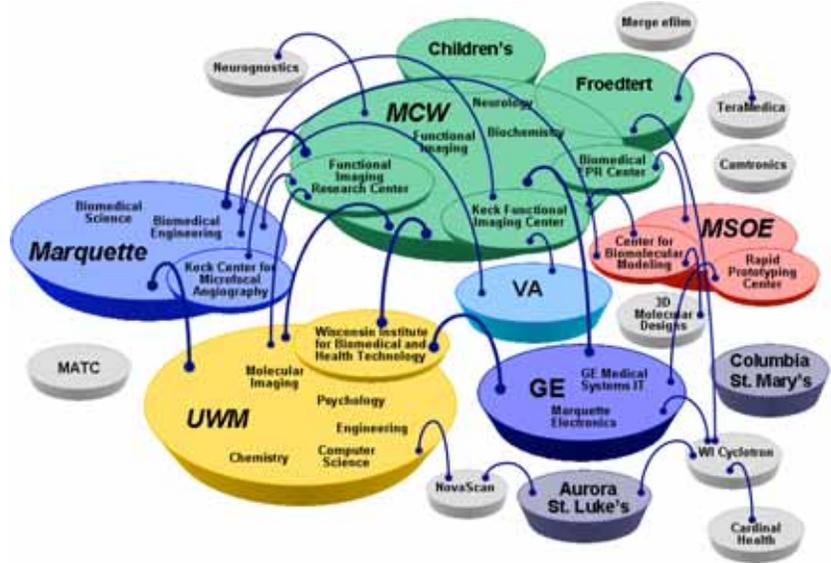
Clinical Populations. Another critical element of biomedical research in the Milwaukee region is the clinical population. Access to clinicians and patient populations is critical to biomedical research. Involvement of practicing clinicians is essential to development of new technologies to ensure that these new technologies address real clinical needs (the “clinical pull”). Access to patient populations is essential for the validation of new technologies. There is a significant opportunity to involve public health organizations in the region more closely with the biomedical technology development process to help identify patients appropriate for clinical trials.

Biomedical Imaging. Research in biomedical imaging spans a range of technologies that includes MRI, CT, PET, nuclear medicine, molecular imaging and functional MRI (fMRI). The health issues addressed by research in biomedical imaging include: Alzheimer’s, Parkinson’s, ADHD, Multiple Sclerosis, Pain, Cancer, Cardiopulmonary, Renal, Osteoporosis, Addiction.

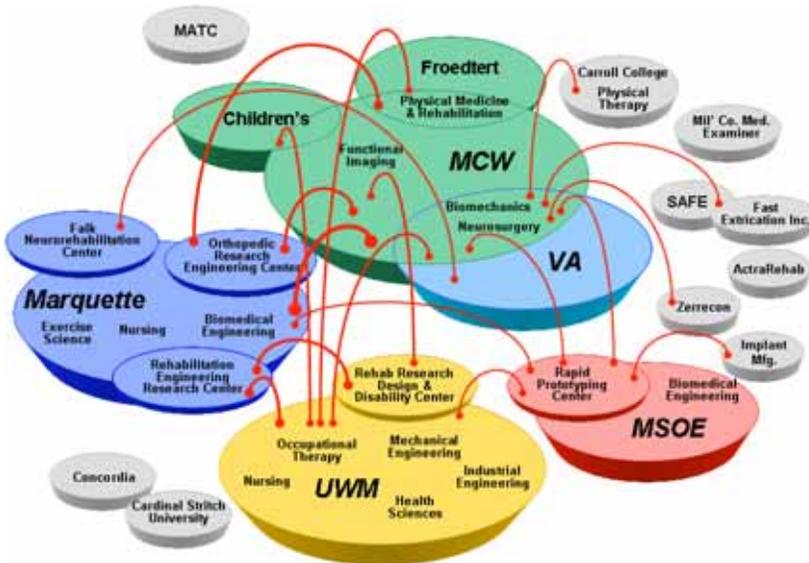
GE Medical Systems is a major industry player in this area. Collaborations that have been identified with GE include the clinical evaluation of new imaging technologies. GE may also represent a significant opportunity for new research-based collaborations with the academic institutions.

Functional imaging is an important area of strength with two centers dedicated to functional imaging – the Functional Imaging Research Center (FIRC)

Biomedical Imaging Collaborations



Rehabilitation and Biomechanics Collaborations



and the Keck Functional Imaging Center. Other research centers involved in biomedical imaging include the Keck Center for Microfocal Angiography at Marquette and the newly formed Wisconsin Institute for Biomedical Health Technology. These centers draw on core departmental strengths at Marquette, MCW and UWM that include biomedical engineering, biochemistry, engineering and computer science.

Rehabilitation and Biomechanics.

Rehabilitation and biomechanics addresses the body’s muscular, skeletal and neurological systems. Health issues addressed by researchers working in this area include: Stroke, Spinal Injury, Aging, Disability, Access, Assistive Technology, Spasticity, Amputee rehabilitation, Walking & gait analysis, Neurorehabilitation, Cerebral Palsy and ALS.

The VA and Froedtert represent important clinical sites for research in rehabilitation and biomechanics.

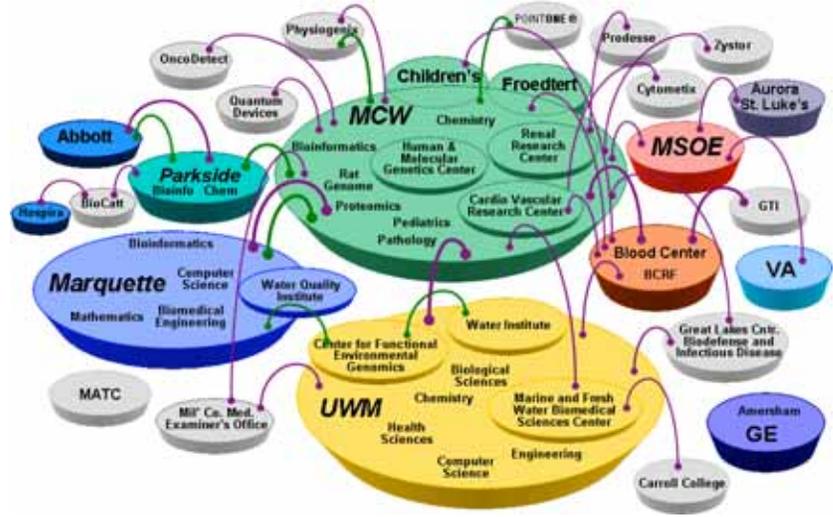
MCW’s resources in this area include the Physical Medicine and Rehabilitation Department located at Froedtert and biomechanics and neurosurgery capabilities centered at the VA. At Marquette, the Biomedical Engineering department and three rehab-related centers – the Orthopedic Research Engineering Center (OREC), the Rehabilitation Engineering Research Center (RERC) and the Falk Neurorehabilitation Center – are the basis for significant collaborative research. UW-Milwaukee’s resources include the Rehabilitation Research and Design Center (R2D2) as well as strengths in Nursing, Occupational Therapy, Health Sciences, and Mechanical and Industrial Engineering. The Rapid Prototyping Center (RPC) at MSOE is an important resource that is used in a variety of collaborations.

Genetics and Proteomics. Resources in genetics, proteomics and bioinformatics play an important role in the Milwaukee region’s capabilities in drug discovery. There is an opportunity to more closely link these resources with biochemistry research in the area and public health for a unified drug discovery and assessment capability. Key areas addressed by research in genetics, proteomics and bioinformatics include: Drug Discovery, Animal Models, Rat Genome and Personalized Medicine.

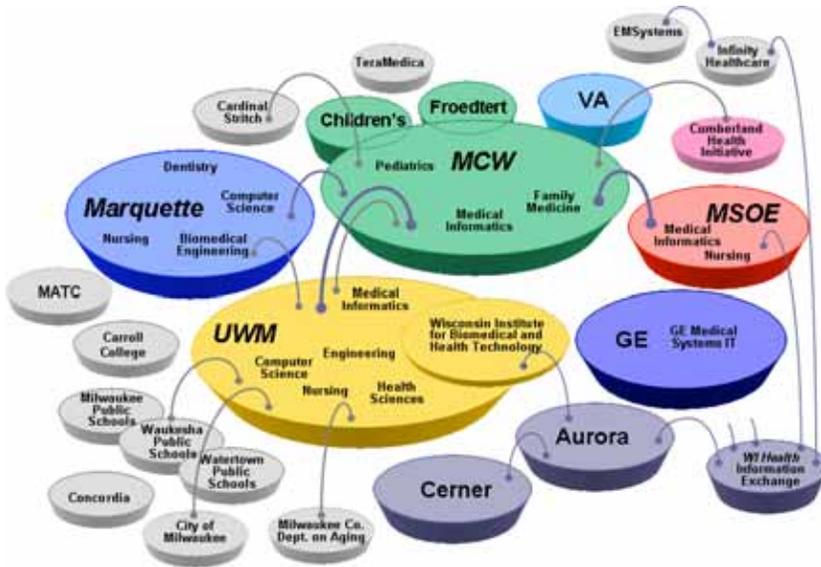
Biochemistry. Key areas addressed by researchers working in this area include: Infectious disease, Drug Development, Diagnostics, Cancer, Proteins, Blood, Renal, Cell Biology , Transplant Cardiovascular, Heart attack, Diagnostics

Medical Informatics. Medical informatics is an area of growing importance to the health care system and a growing resource in the Milwaukee region. Education rather than fundamental research is a primary focus of the regional academic institutions in the area of medical informatics. There are a growing number of small companies working in the area as well as large companies such as GE Medical Systems that are commercializing products in this area. Emphasis in medical

Genetics, Proteomics and Biochemistry Collaborations



Public Health and Medical Informatics Collaborations



informatics includes: Electronic Medical Records, Standards, Education and Patient Safety.

Public Health. Research in public health is, by its nature, highly collaborative. Key areas of research in this area include: Aging, Education, Quality, Public Health

More work needs to be done to identify and categorize collaborations in the area of public health, because there are significant opportunities to strengthen other core areas by closer ties to public health agencies and clinical populations. A clinical trials consortium aimed at giving researcher access to relevant clinical populations would be a significant advantage to researchers in the area.

What is the long term vision of the BTA? The long term vision of the BTA is to provide a campus of shared resources where researchers can work collaboratively. This campus could provide space for joint colleges, centers for imaging, genetics and rehabilitation research. This campus could also augment the Milwaukee regions wet lab and incubator space and ultimately provide additional research park space for spin out companies.

Research Campus

Informatics & Genomics Center

- Shared computing resources
- Super computing
- Mass spectrometry resources
- Proteomics facility
- Gene sequencing equipment
- Micro array equipment
- Thermal cycling, PCR equipment

Imaging Center

- Shared equipment
- MRI, NMRI scanners
- Joint functional imaging program

Joint Colleges

- School of Health Sciences
- Joint medical informatics program
- UW-M, MCW, Marquette, ...

Research Park

- Spin out companies
- Build to suit

Rehabilitation Center

- Research facilities

Business Incubator

- Office space
- Modular
- Conference rooms
- V.C. turn-around spaces
- Management services

Wet Lab Space

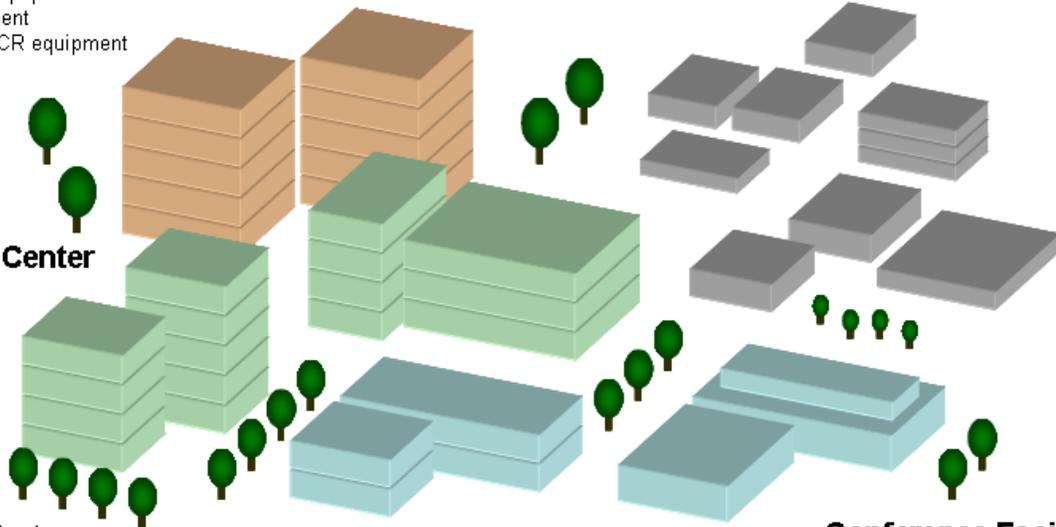
- Wet labs
- Animal facilities

BTA Admin

- Pilot studies administration
- Industry outreach programs
- Academic coordination programs

Conference Facility

- Auditorium (s)
- Meeting rooms
- Coffee shop, informal meeting space



Conclusion

The BTA is an important economic development initiative for the Milwaukee Region and for the state as a whole. It serves as a complement to similar initiatives in Madison. With its mission of collaboration, it will serve as an important hub for the IQ corridor in Milwaukee. Over time, this program will leverage funding from other federal and industry sources.

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