

Contract Manufacturing

Indiana's manufacturing expertise translates across the board to the health and life science industries. Whether a client is working to bring a new pharmaceutical or biopharmaceutical to market or developing and testing a medical device, contract and outsource service providers can help every step along the way.

- **Devices**
 - Contract services may include: development of plastic or metal parts, software development, machining or tooling, prototyping, design & engineering, sales & distribution, regulatory and patent guidance
 - Many existing companies may have competencies that can be used to manufacture medical/surgical instrumentation and devices.
- **Pharmaceuticals/Biopharmaceuticals**
 - Contract services may include: discovery, analysis, formulation, scale up manufacturing, clinical research, regulatory and patent guidance, modeling, logistics and cold chain storage.
 - BioCrossroadsLINX program - BioCrossroadsLINX advances Indiana's drug development sector and facilitates connections with the biotechnology and pharmaceutical industries. Home to more than 40 contract drug development companies and their 6,000 employees, Indiana's technology, resources and spirit make it a premier drug development and manufacturing center in the U.S. These contract service providers support the growing outsourcing needs of the pharmaceutical and biotechnology industries. This program provides a web-based service to identify service providers in Indiana.

Regional Strategy Recommendations

As a result of our investigation and based upon the assets recognized within the study area, we would like to offer the following growth strategy recommendations for the region:

Business Attraction and Growth

**Disclaimer – Company inclusion on this list in no way constitutes an endorsement, representation of interest or future business intent, or existence of a relationship with the Indiana Health Industry Forum, it's consultants or affiliates.*

- Build upon the strong production base and skill sets available within the community to encourage expansion and to attract new manufacturing and research investments in the following areas:
 - **Pharmaceuticals:** Central Indiana is home to largest concentration of pharmaceutical companies in the State of Indiana and is recognized as being one of the major life sciences clusters in the United States. Eli Lilly's substantial presence in the region combined with companies such as Dow Agro Sciences and Baxter Healthcare to the south, the deep educational infrastructure, and the area's familiarity with the entire value chain of pharmaceutical production should poise the region for attraction of global-scale life science investments. Through Eli Lilly's insulin production operations, the workforce's is extremely familiar with large-scale fermentation processes translating extremely well into the growth trend toward biologic production of drug substances. Through its industry and university infrastructure, the area has significant research capacities particularly in the fields of cancer research, diabetes treatment, and neurosciences; however, other than nurturing of start-ups, due to competition with other US drug-discover markets, the region may be best served by focusing recruitment efforts on development (scale-up), bulk production, secondary manufacturing (fill/finish), and distribution investments. Specific recruitment opportunities could include domestic (US) biotech companies looking to establish their initial scale-up or bulk production facilities, contract bulk, biologically-based (cell culture, microbial) drug substance manufacturers, or contract secondary manufacturers, particularly of sterile products. The area also appears well positioned for the recruitment of companies producing drug intermediates or reagents.
 - Some companies in this field are:
 - Johnson & Johnson
 - Pfizer
 - Novartis

- Bristol Myers Squibb
 - Merck
 - Eli Lilly
 - Lonza
 - Boehringer Ingelheim
 - Amgen
 - Genentech
- Some important trade shows for this industry are:
 - Biotechnology Industry Organization (BIO)
 - BIO-Europe
 - INTERPHEX Asia
 - INTERPHEX
 - Industry Publications:

<ul style="list-style-type: none"> • BioWorld Today • BioPharm International • Innovations in Pharmaceutical Technology 	<ul style="list-style-type: none"> • Pharmaceutical Technology • Pharmaceutical Technology Europe • Contract Pharma
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- **Vaccines** – As with the previous recommendation, the target of vaccine research and production is based largely around the existing educational and training assets available in the region combined with the region’s deep industry presence. Vaccine development and manufacturing, particularly the growth of microbial or cell-based production, is a strong candidate for the State of Indiana due to its experience with large scale fermentation operations and due to the fact that the US government is the primary customer for vaccines. Specific vaccine products that could prove to be attractive targets include flu vaccines, treatments for childhood diseases, and precautions against biologic warfare.
 - Some leading companies in this field are:
 - GlaxoSmithKline
 - Sanofi Pasteur
 - Wyeth
 - Novartis
 - Some important trade shows for this industry are:
 - Biotechnology Industry Organization (BIO)
 - BIO-Europe
 - INTERPHEX
 - INTERPHEX Asia
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 - Industry Publications:

<ul style="list-style-type: none"> • BioWorld Today • BioPharm International • Innovations in Pharmaceutical Technology 	<ul style="list-style-type: none"> • Pharmaceutical Technology • Pharmaceutical Technology Europe • Contract Pharma
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 - **Electronic medical / research laboratory and testing equipment** – The recommendation is based upon the strong engineering and life sciences educational and training programs available within the region. The crossover of these disciplines allows for targeting of research and production of new technologies for the analysis of drug candidates, their efficacy in cell structures, analysis of their geometries, etc.
 - Some leading companies in this field are:
 - Applied Biosystems
 - Agilent Technologies
 - Thermo Fisher Scientific
 - Waters Corporation

- Some important trade shows for this industry are:
 - Biotechnology Industry Organization (BIO)
 - BIO-Europe
 - INTERPHEX
 - INTERPHEX Asia
 - Forum Labo
- Industry Publications:
 - BioWorld Today
 - BioPharm International
 - Innovations in Pharmaceutical Technology
 - Pharmaceutical Technology
 - Pharmaceutical Technology Europe
 - Contract Pharma
- **Medical devices** – The recommendation is based upon the strong engineering skills and the specialty production assets available in the region. As stated previously, opportunities appear to exist to expand research and development for medical devices statewide, particularly through partnerships with companies in the Warsaw cluster.
 - Some leading companies in this field are:
 - DePuy Orthopaedics
 - Smith & Nephew
 - Biomet
 - Zimmer Holdings
 - Boston Scientific
 - Some important trade shows for this industry are:
 - Medical Device & Manufacturing East
 - FIME International Medical Expo
 - Industry Publications:
 - IEEE Engineering in Medicine and Biology Magazine
 - Medical Device & Diagnostic Industry
 - Medical Product Manufacturing News
 - Medical Device Technology
- Build upon the assets (clinical trials, universities, lab technician and nursing programs) within the community to encourage expansion and to attract new investments by contract research organizations. The recommendation is drawn from the region's health care, clinical trial, educational and transportation strengths. Contract research organizations (CRO's) assist drug companies with the process of moving drug candidates from development to market. Those CROs primarily focused upon the management and execution of clinical trials appears to be a particularly strong target.

Entrepreneurial Growth & Innovation

- Continue to build upon the strong business incubation programs available within the region. The recommendation is based upon the current assets available through Indiana University. Next steps include development of graduation space for current tenants of the business incubators in the area.

Entrepreneurial Growth: Hospitals

- **Hospitals as an Idea Generator**

In many instances hospitals are among the largest employers in a county but often overlooked as a source of innovation and technology resources. Whether or not a hospital is conducting clinical research on the premises, doctors and nurses may have ideas for new products or have created techniques to solve common problems.

- Develop good working relationships with individual hospitals and work to be seen as a source of encouragement and guidance for people exploring ideas.
- Be familiar with areas of clinical research in your area (see map)
- Be familiar with centers of excellence

- **Tech Transfer & Innovation**

While some hospitals have excellent technology transfer mechanisms to encourage staff to explore opportunities as a means to encourage professional growth, others may not consider their facilities as fertile ground. High tech equipment and procedures can be found in many rural hospitals, especially as hospitals compete for patients by advertising the latest and greatest equipment, staff, and facilities.

- Have a referral network to local hospitals for companies that may want to explore the adoptability of their new medical device. Early feedback from authoritative sources can help refine a product and make it more likely to succeed on the market. (This one is probably a stretch – Woody?)

- **Be aware of the dynamics of the hospital business model.**

Collaboration between providers is unlikely (again, competing for patients), unless they are in separate patient markets. For-profit and not-for-profit hospitals are affected by insurance reimbursement policies. Opportunities to decrease costs and increase staff efficiency are in high demand. Many hospitals are exploring implementing quality systems.

- Check with IHIF for referrals to hospitals with innovative programs
- IHIF ED Network
- Refer to IHIF for industry specific service provider information and other business development resources.

- **Attracting Talent**

As with the rest of the life science industry, extreme competition exists. Attracting and keeping medical talent is key to the success of local healthcare providers.

- Be familiar with new equipment purchases. The opportunity to work with current technologies is attractive to doctors and may help to encourage their relocation to more rural areas.
- Quality of life is a high motivator for attracting doctors and their spouses. Many times a spouse will be as educated as the candidate that is looking in your area.
- Develop a local spousal employment referral network
- Assess local intellectual capital – promote number of Ph.D, M.D. and Master's level degreed professionals.
- Continue to focus upon education and training support for health care delivery professionals within the region. The demographic trends of the US and the State of Indiana is driving the need for medical professionals, from orthopedic surgeons to home health care workers. The existing educational and training resources available within the area make this a clearly identified target for the area.

Additional Regional Strategies

- Continue to build upon the strong university research available within the region seeking to build additional partnerships across other portions of the state to encourage expanded life sciences research within the area. The recommendation is formed due to the strength of the research currently underway at the institutions of higher education in the region and is based upon existing synergies between Purdue and the Indiana University.
- Seek opportunities to capitalize on the region's strategic location in the central Midwest building upon the area's transportation assets. Given the area's has a natural geographic advantage, the area's interstate and overnight freight capabilities, and the current depth of the biologistics cluster including cold storage

capabilities, distribution targets should remain a strong expansion and recruitment target. Also, the area's recent successful recruitment of the Medco's mail-order pharmacy proves the market can target and support specialty distribution / pharmaceutical operations.

- The market has a stated lack of available laboratory space for start-up and emergent biotech research operations. Additional market studies are probably required to fully assess the demand for and current utilization of these facilities, but given the studies' outcomes and determination of the requirements, partnerships with private developers or real estate investment trusts could then be formed to bring them online.
- Continue to seek opportunities to collaborate and market the region's assets jointly with other portions of the state. The Central Indiana area can benefit greatly from joining in marketing and promotion efforts with the rest of the state by highlighting the critical mass of life science resources available, the area's geographic location within these assets, and through cost sharing with the other regions.

Summary

The Indiana Health Industry Forum's Statewide Asset Mapping and Strategic Planning project is the first of its type in the state. The regional analysis and recommendations developed through this process are just a starting point. IHIF will be available to assist local communities in adding to the asset map, further developing strategies and creating successful implementation plans for these strategies.

For more information on this project or regarding IHIF's programs, please visit www.ihif.org.