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Destination 2025 is an initiative of The BioBusiness Alliance of Minnesota in collaboration with Deloitte Consulting LLP to develop a roadmap for the bioscience markets in Minnesota.



The Destination 2025 project examines six markets of the bioscience industry: Animal Health, Food, Medical Device, Biologics and Biopharmaceutical, Renewable Materials, and Renewable Energy.

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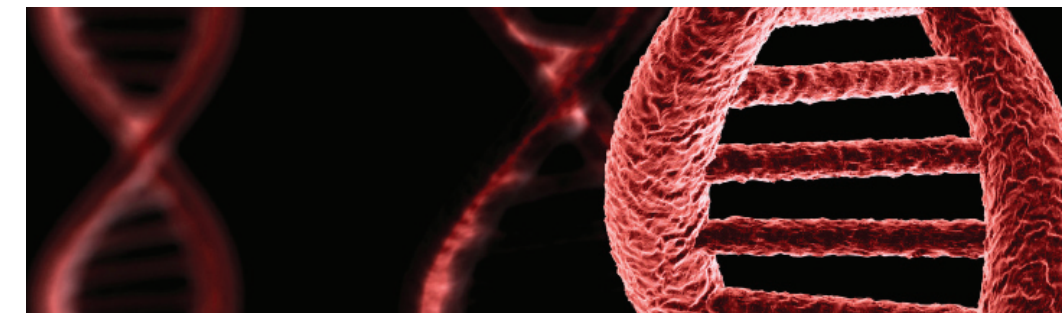
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Destination 2025 Focus on the Future of the Biologic and Biopharmaceutical Industry



We have identified leading trends and technologies that are expected to significantly affect the Biologic and Biopharmaceutical industry globally over the next two decades.

Executive Summary February 2009

Destination 2025 - a collaboration between The BioBusiness Alliance of Minnesota and Deloitte Consulting LLP

Executive summary

The trends and technologies identified, and opportunities in the industry, are likely to realign to different levels of importance over time.

Using the Strategic Flexibility Framework, we performed a scenario-based planning exercise to evaluate a range of different future scenarios. This allowed us to determine which of these trends and technologies are likely to have the greatest impact in the development of the industry.

The review of trends and technologies suggests that opportunities exist to develop new products and solutions. Moreover, existing markets and products may experience flux due to new trends and technologies. Strategies must evolve to benefit from opportunities and threats. Decision makers in academia, government, and industry can use the Strategic Flexibility Framework to develop strategies based on individual constraints and objectives.

Market definition

The biologic and biopharmaceutical market includes drugs or other products that are derived from life forms. Biologics are biology-based products used to prevent, diagnose, treat, or cure disease or other conditions in humans and animals. However, in this paper we focus only on human-related products. As defined by the Food and Drug Administration (FDA), biologics generally include products, such as vaccines, blood and blood components, allergenics, somatic cells, genes, proteins, DNA, tissues, recombinant therapeutic proteins, microorganisms, antibodies, immunoglobins, etc.

In this paper, we expand the definition to include cell therapies, tissue therapies, organ and partial organ technologies and xenotransplantation, which includes the transplantation of animal cells, tissues, and organs into humans. Biopharmaceuticals are produced using biotechnology and are made from proteins, genes, antibodies, nucleic acids, etc. Biopharmaceuticals are often referred to as "large molecule" drugs.

The full white paper on the future of the biologic and biopharmaceutical industry is available for download at www.deloitte.com/us/d2025

Focus on the Future of the Biologic and Biopharmaceutical Industry

Emerging and future trends

The following trends are expected to influence the industry in the next 20 years.

Significant demographic trends are likely to expand the demand for biologic and biopharmaceutical. The growing and graying world population, coupled with economic growth in emerging economies, is expected to increase demand for health care products and services. This may be reinforced by the growth in chronic diseases in both industrialized and emerging economies.

Globalization is changing industry dynamics and is expected to continue. Availability of cost-effective and high-quality medical care at international destinations is driving the trend toward medical tourism. Infectious diseases remain a major cause of death and disability and social and economic upheaval around the world. As global trade and travel proliferate, the potential for pandemic or epidemic influenza, possibly from mutated bird flu or bioterrorism, continues to be a threat. Collectively, these changes are expected to increase demand for technological breakthroughs and new products. The global talent shortage in the life science industry is expected to be exacerbated in the coming years by retirement of baby boomers, and a growing skills gap for specialized knowledge in the field.

Pressures and potential changes in the U.S. health care system are expected to affect patient decision making, and industry demand, supply, and pricing of health care products and services. Patients are becoming increasingly active in the decision making process with their health care providers. Meanwhile, the burden of health care costs on families and businesses continues to grow along with overall health care costs. Pressure to reduce costs is expected to result in reduced hospital stays, increased outpatient and home-based care, and increased reliance on paraprofessionals.

The shift toward prevention over cure is expected to be fueled by development in such areas as pharmacogenetics and biomedical engineering. Even though personalized medicine holds much promise in terms of efficacy and cost-effectiveness, significant economic and technical challenges remain before it can be commercialized successfully on a larger scale.

Convergence across health care products and industry segments is expected to transform the biopharmaceuticals, biologics, and medical device industries. An increasingly lean pharmaceutical pipeline and looming patent expirations have spurred partnerships between the traditional pharmaceutical companies and biotechnology firms. This trend is expected to continue to grow in the future, with increased emphasis on drug research and development, as well as innovative medical breakthroughs. Scientific advances, changing patient demographics, and shifting health care needs are leading the trend of drug-device convergence. The integration of diagnostic capabilities with medical devices that deliver therapy is expected to continue to grow rapidly in the future, and become increasingly cost-effective.

Managing the talent gap is key to industry growth and innovation. The current global talent shortage in the life science industry is expected to be exacerbated in the coming years by retirement of baby boomers and a growing skills gap for specialized knowledge in the field. Life science companies may need to reevaluate current talent development and retention policies, and expand the scope of their search for talent from local to global. Academic medical centers and their collaborations with other research entities and industry are critical in developing new talent.

Next steps

The review of trends and technologies suggests that opportunities exist to develop new products and solutions. Moreover, existing markets and products may experience flux due to new trends and technologies. Strategies must evolve to benefit from opportunities and threats. Decision makers in academia, government, and industry can use the Strategic Flexibility Framework to develop strategies based on individual constraints and objectives.

Emerging and future technologies

Market segment	Representative products based on relevant technologies
Nanobiotechnology	<ul style="list-style-type: none"> • Miniature biosensors • Faster disease diagnostics • Devices for drug delivery • Tumor targeted treatments
Gene-based technologies	<ul style="list-style-type: none"> • Evolutional analysis • Disease treatments • Imaging • Protein microarray • Drug response studies
Personalized medicine	<ul style="list-style-type: none"> • Treatments for chronic diseases • Individual disease diagnostics • Early disease diagnosis and monitoring
Regenerative medicine	<ul style="list-style-type: none"> • Semi-synthetic tissues and organs • Renal assist devices like biohybrid kidney • Transplants • Biological entities for novel applications
Data-based technologies	<ul style="list-style-type: none"> • Biostatistical applications • Computational modeling of data • New drug design and discovery
DNA-based technologies	<ul style="list-style-type: none"> • Vaccines against cancer, hypertension, and diabetes • Genome synthesis and design • New drug development
Convergence of drugs and devices	<ul style="list-style-type: none"> • Artificial implants • Predictive models of cell processes