Flad

HELPING DELIVER TOMORROW'S MEDICINE TODAY

PHARMA & BIOMANUFACTURING EXPERTISE

CONTENTS

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WHO
WE ARE

FIRM AND EXPERTISE

95+
years of experience in planning and architecture

320+
dedicated staff to serve our clients

10
offices nationwide

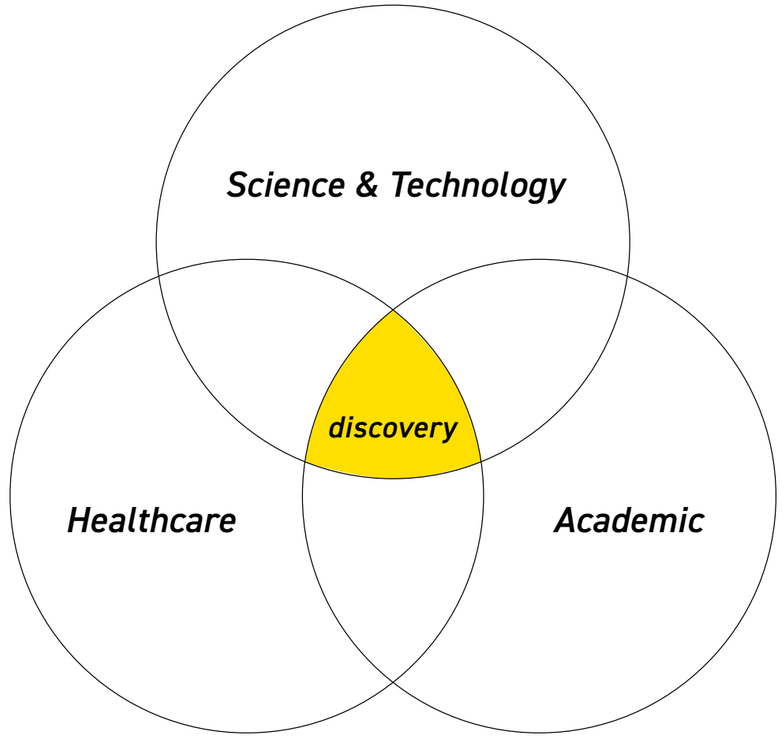
we create environments that enhance human potential®

Atlanta, GA · Boston, MA · Gainesville, FL · Madison, WI · New York, NY
Raleigh, NC · San Diego, CA · San Francisco, CA · Seattle, WA · Tampa, FL

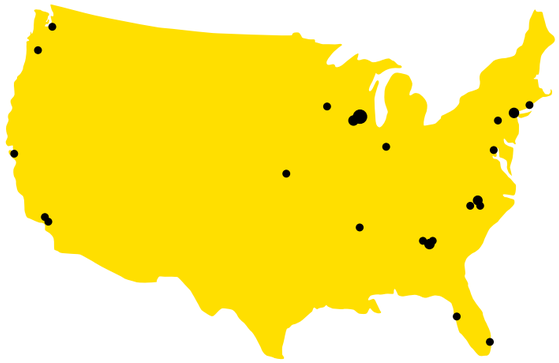
30+
planners: laboratories, healthcare

350+
design awards

- Strategic and Master Planning
- Programming and Campus Planning
- Academic, Research and Medical Planning
- Site Planning and Landscape Architecture
- Architectural Design
- Structural Engineering
- Interior Design



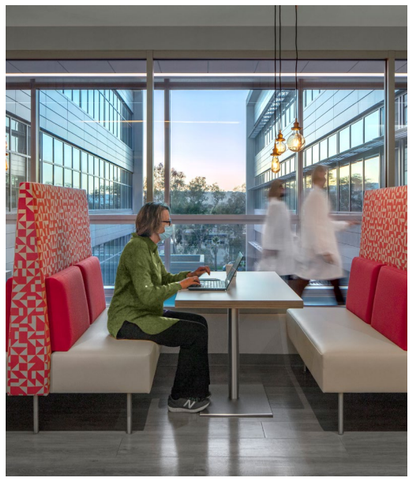
PHARMA & BIOMANUFACTURING PROJECTS

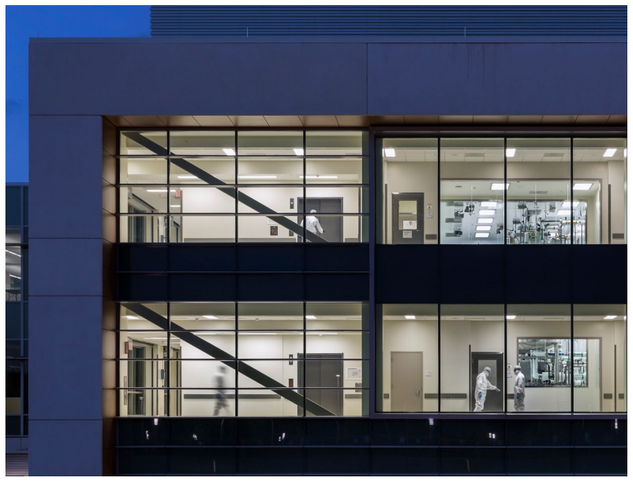


CLIENT // PROJECT	SF	PROJECT COMPONENTS												
		Injectables	Cell Processing // Gene Manufacture	Small Molecule Manufacture	BSL-2 and -3 // Cleanrooms	Quality Control Labs	Raw Material Processing	Equipment Sterilization	Offices	Conferencing // Amenities	Fill Finish // GMP Warehousing	Cell Banking	Fit-Up // Existing Facility	Greenfield // Brownfield Site
Allergan (now AbbVie) // Biologics Development Center Conceptual Design	145,000		●	●	●	●	●	●	●	●	●	●		●
CSL Sequiris // Quality Control Lab and Administrative Facility	112,000					●			●	●				●
Confidential Client 20802 // Admin and Quality Control Lab	125,000				●	●			●	●				●
Confidential Client 23563 // Manufacturing Complex	115,000					●			●	●				●
Exact Sciences // Sample Processing and Production Lab	114,700					●					●		●	
Fujifilm Cellular Dynamics // Cell Manufacturing Pilot Facility	28,000	●	●		●	●	●	●	●	●	●	●	●	
Fujifilm Cellular Dynamics // cGMP Manufacturing & Life Sciences Facility Concept Study	135,000	●	●		●	●	●	●	●	●	●	●		●
Genentech // Fill Finish Facility	295,000	●	●	●		●	●	●	●	●	●			●
Confidential Client 13445 // Potent Compound Facility	26,000			●	●			●					●	
Georgia Institute of Technology // Marcus Cell Characterization & Manufacturing Facility	5,200	●	●		●			●	●	●	●	●	●	
H. Lee Moffitt Cancer Center & Research Institute // cGMP Cell Therapies Facility	6,800	●	●		●	●	●	●	●	●	●	●		●
Confidential Client 24964 // Quality Assurance and Administration Building	177,000					●			●	●				●
Confidential Client 19677 // East Coast Quality Control Lab Renovation	106,000					●			●	●	●		●	
Confidential Client 20491 // Administrative and QC Lab Core and Shell	125,000					●			●	●				●
Illumina // Enzyme Manufacturing Facility	133,000		●		●	●		●	●	●	●			●
Johns Hopkins University // Center for Translational Molecular Imaging	4,100	●	●		●	●	●	●	●			●		

CLIENT // PROJECT	SF	PROJECT COMPONENTS												
		Injectables	Cell Processing // Gene Manufacture	Small Molecule Manufacture	BSL-2 and -3 // Cleanrooms	Quality Control Labs	Raw Material Processing	Equipment Sterilization	Offices	Conferencing // Amenities	Fill Finish // GMP Warehousing	Cell Banking	Fit-Up // Existing Facility	Greenfield // Brownfield Site
Mayo Clinic Laboratories // Center of Regenerative Medicine Biomanufacturing Development Facility	18,000	●	●		●	●	●	●	●	●		●	●	
Confidential Client 20373 // cGMP Cell and Gene Manufacturing Facility	21,000		●		●	●	●	●	●	●	●		●	
Confidential Client 27077 // Manufacturing Technology Center	260,000			●	●	●	●	●	●	●	●		●	
Promega // Chappelle Manufacturing Center	159,200			●		●	●	●	●	●	●		●	●
Regeneron Pharmaceuticals, Inc. // Biopharmaceutical Campus Master Plan	900,000	●	●		●	●		●	●	●	●	●	●	●
Regeneron Pharmaceuticals, Inc. // Preclinical Manufacturing and Process Development Building	Confidential	●	●		●	●		●	●	●		●		●
Seattle Children's Research Institute // Building Cure	55,000	●	●		●	●	●	●	●	●	●	●		●
Scientific Protein Labs // GMP Manufacturing Facility	33,000	●	●		●	●	●	●	●	●	●			●
St. Jude Children's Research Hospital // cGMP Facility	65,300	●	●		●	●	●	●			●	●	●	●
Takeda Pharmaceuticals // Project Diamond	128,500	●			●			●	●	●	●		●	
Takeda Pharmaceuticals // Georgia Manufacturing Facility	1,100,000	●			●	●	●	●	●	●	●			●
Takeda Pharmaceuticals // Quality Assurance & Quality Control Lab	16,000				●	●			●	●				●
University of Wisconsin // Waisman Center Biomanufacturing	60,000	●	●		●	●	●	●	●	●			●	
USDA // National Bio & Agro-Defense Facility, Biotechnology Development Module	20,600	●	●	●	●	●	●	●	●	●	●	●	●	●

ISPE – FACILITY OF THE YEAR AWARDS





International Society for Pharmaceutical Engineering (ISPE)

ISPE is the global industry leader in connecting pharmaceutical knowledge to deliver manufacturing and supply chain innovation, operational excellence, and regulatory insights to enhance industry efforts to develop, manufacture and reliably deliver quality medicines to patients. The Facility of the Year Awards is an annual program that recognizes state-of-the-art projects utilizing new, innovative technologies to improve the quality of products, to reduce the cost of producing high-quality medicines, and demonstrate advances in project delivery.

Center for Innovative Drug Research
Confidential Client
Special Recognition Award for Operational Agility: COVID-19 Impact, 2021

Innovation Development Center
Confidential Client
Operational Excellence, 2020

Georgia Manufacturing Facility
Takeda Pharmaceuticals
Honorable Mention, 2019

Quality Control Laboratory
Takeda Pharmaceuticals
Operational Excellence, 2018

Flu Cell Culture Facility
Novartis Vaccines and Diagnostics
Category Winner for Process Innovation and Overall Winner, 2013

AWARDS AND NATIONAL RANKINGS

National Rankings

Building Design+Construction Giants // 2024

2 Laboratory Architecture
5 Science & Technology Architecture

350+
design awards

100 AIA Awards
39 IIDA Awards
8 Lab of the Year Awards
5 ISPE Facility of the Year Awards


EXISTING MALL SPACE
PARKING GARAGE
CLINIC ACCESS
MALL/COMMUNITY ACCESS
EMPLOYEE ACCESS

HOW WE WORK

HOLISTIC BIOMANUFACTURING PLANNING

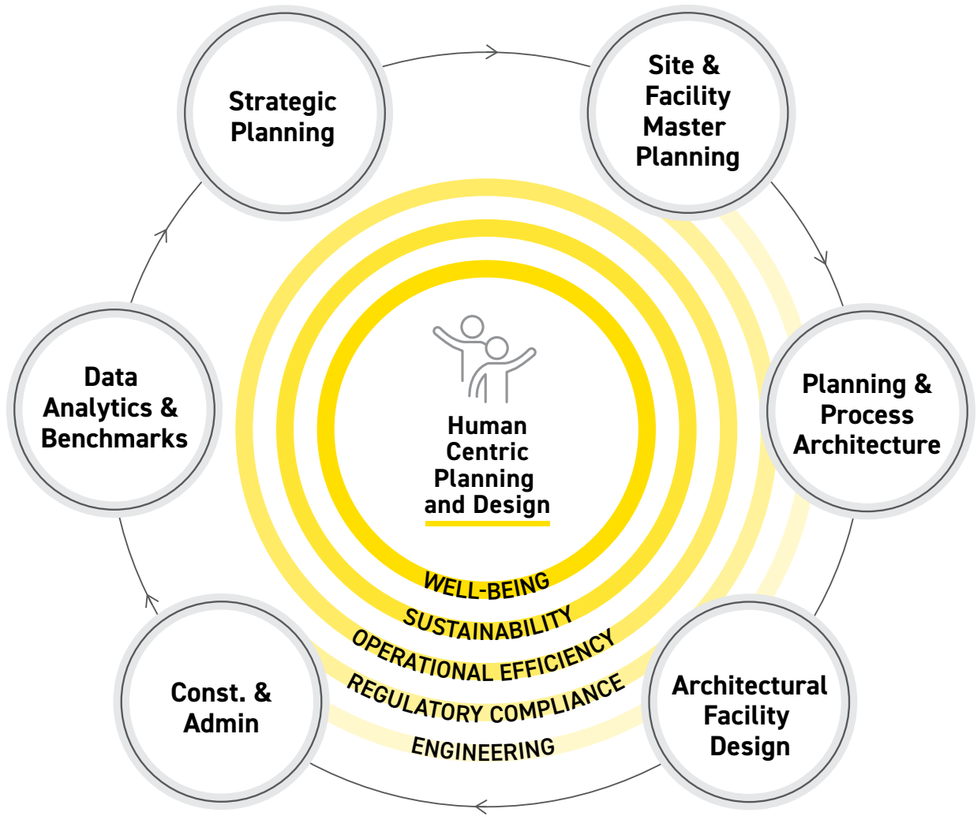
Effective manufacturing facility planning must consider the environment from a human perspective

Planning for cGMP facilities requires a detailed understanding of the way people and the physical environment interact and how the processes and operations work together to achieve operational goals, regulatory compliance, and staff well-being. For biomanufacturing, effective strategies require both a thorough examination of the specific processes and an understanding of the interdependencies of the human side of manufacturing. With Flad's extensive expertise in the pharmaceutical industry, our clients gain a partner who understands the intricacies of their manufacturing processes while benefiting from our architectural perspective and design expertise.

Recognizing that the focus of cGMP facilities is to prevent contamination, deviations, and errors to ensure products are safe and effective, Flad's early planning efforts consider all aspects of the manufacturing process, including operational efficiency, environmental controls, and equipment integration, helping ensure regulatory compliance. We examine and optimize process flows, including personnel, materials, products, and waste, while also reviewing adjacencies and other Lean operational strategies.

We also believe effective manufacturing facility planning must consider the environment from a human perspective. Process considerations must be balanced and integrated with a myriad of other factors, such as human comfort, sustainable design initiatives, access to daylight and views, connections to nature, available collaboration space, and respite areas.

We believe each project offers opportunities early in the planning process to ensure the project achieves optimal manufacturing processes while also laying the groundwork for architectural solutions that consider health and well-being of the staff. Working directly with our clients and all involved planning disciplines, we tailor efficient and human-centric planning concepts that are in lockstep with the unique demands of the biomanufacturing process.



PUTTING PEOPLE FIRST

Creative thinking and the joys of delivering a solution based on shared values produces powerful results. Every time.

Every project is founded in an understanding that there is an important need and a promise of transformation. We are driven to build a collaborative of people that form a high-performance team, setting the stage for confidence and the belief that we will deliver the right project for long-term success.

Aligning the principal stakeholders with capable professionals who want the best for their institution and are willing to work hard to achieve that is key. We gather principal stakeholders together to focus on purpose, vision, facts, goals, needs, and concepts that define the greater truth for the project, shaping the right design solutions.

A communication plan is equally essential to every project, ensuring stakeholders feel their voice is heard and that they can shape their future. It also helps manage expectations and provides a framework for decision making, conflict resolution, creating an audit trail for the work, and ensuring that the status of the project is shared accurately with everyone on campus over time.

Transforming the scientific workplace to address next generation treatments.

Our clients don't work on small problems. They are tackling challenges that will change people's lives. A new cure for cancer. A breakthrough gene therapy. Advanced medical technologies that stop the spread of disease in its tracks. We're not talking about buildings; we're talking about the people inside them and the meaningful solutions they create for our world's biggest health challenges. This is the inspiration behind our work—it's the passion that drives every plan, every process, and every detail.

Flad is recognized as a global leader in the design of major science and technology facilities. Our practice touches the entire value chain within the pharmaceutical, biotechnology, and consumer products industries including discovery; basic research; scale-up and pilot-scale laboratories; QC laboratories; and full-scale, process-intensive manufacturing facilities. Our design philosophy is highly collaborative, recognizing that the best ideas are derived from a close partnership with our clients. Our legacy of repeat clients and extensive portfolio of specialized experience provides measurable evidence of how strongly we value our culture of outstanding client service.

In complex process-intensive environments, Flad's extensive knowledge of cGMP regulatory requirements, process flows, aseptic and sterilized products, and equipment will provide an overall project approach that will address both initial and long-term needs. Throughout this process, Flad works collaboratively with owners and the process engineering team to create and finalize all process design solutions. As process architects and planners, we leverage our experience to ensure the right decisions are made at the onset and to ensure that the facility design supports and aligns with industry regulatory guidance provided by the U.S. FDA and other global regulatory authorities. Our fully integrated systems approach to design will help build a facility that will achieve production performance goals while ensuring the highest and best use of capital investment dollars.

LIVING OUR VALUES

We honor the creative spirit in all things.

We foster an environment of trust, integrity, and respect.

We embrace both individual initiative and collaboration.

We are committed partners to our clients.

In partnership with leading research organizations, universities, healthcare institutions, and science-based companies, we design beautiful, innovative environments that enable our clients to make revolutionary discoveries that have a profound impact on society. We are dedicated to providing exemplary service to our clients. Fostering this collaborative approach allows us to challenge assumptions, solve unique problems, and help our clients achieve their mission through the lens of design. Our environments are an extension of our client's enterprise, celebrating their talent and reinforcing their brand and culture. Our solutions are customized, mission-driven, and transparent – increasing efficiency, productivity, and identity.

SELECT PROJECTS

Takeda Pharmaceuticals,
Georgia Manufacturing Facility

manufacturing plasma-based therapeutics

This state-of-the-art biotech manufacturing campus integrates the technical requirements of both upstream and downstream manufacturing, while providing a work environment focused on the well-being and efficiency of a diverse and highly dedicated workforce with a shared mission: to deliver plasma-based therapies for people affected by rare diseases and other highly specialized conditions.

The design includes cGMP manufacturing units, warehouse and freezer storage, two testing laboratories, a 300-person administration building, and a central commons with a cafeteria, gym, and training rooms. The manufacturing units include plasma fractionation and the production of immunoglobulin and albumin therapies. Licensing and regulatory requirements for the FDA, European Union, and other countries were considered and implemented. These spaces are organized in a linear fashion along a two-level spine, which runs the length of the facility, carrying people and materials above and main utility runs below. The arrangement facilitates flows of personnel, material, samples, and waste while minimizing conflicts with maintenance operations. The entire campus is designed with the flexibility needed to allow for future expansion of each of its components.

Programmatic Components

1,100,000 SF
cGMP Program
Laboratory Program
Scientific Workplace Program
Office / Conference / Amenity

Read More >>
ISPE Article
Embracing the Human Side of Manufacturing


EXIT


FIRE EXTINGUISHER

Seattle Children's Research Institute,
Building Cure

responding to changing research needs

The Flad team has designed a landscape of wet and dry research space that positions this research institute for decades of groundbreaking research. The program outcomes will result in interactive research communities on each floor that respond immediately to agile scientific discoveries and accelerate the delivery of successful cures. Our design fosters rapid cross-pollination throughout the building, connecting these interior communities together to readily respond to changing research needs in the areas of cancer immunotherapy, neuroscience, child health and behavior, and bioethics.

The Therapeutic Cell Production Center (TCPC) incorporates a cGMP suite for cell culture and purification of immunotherapy drug products in clinical trial Phases I and II. Cell production lots are small volumes using state-of-the-art disposable technologies. The suite has ten production rooms and support areas at ISO 7 classification. An adjacent viral vector production suite of two ISO 7 rooms is served by a discrete set of gowning rooms and air handling unit. Quality control labs and production documents areas dedicated to the TCPC area are also located in efficient proximity on the same floor.

Programmatic Components

540,000 SF
cGMP Program
Laboratory Program
Office / Workplace Program

Flad and Aedas co-led this project, with Flad serving as Architect of Record for all scientific workplace and research space; Aedas serving as Architect of Record for the building exterior and interior public space.


Seattle Children's
HOSPITAL • RESEARCH • FOUNDATION


CURE
FACTORY

Confidential Client 13445,
Potent Compound Facility

helping deliver tomorrow’s medicine today

Next-generation research takes place in a third-floor Potent Compound Facility that has been designed with an eye toward humanizing what ordinarily can be a cold and sterile environment. The last unbuilt portion of this Bay Area biotech company’s facility, the top floor shell space was fit out to include GMP clinical manufacturing tableting suites. The project also includes the design and construction of a small GMP formulations scale-up chemistry suite on the first floor of an adjacent building.

Charged with creating a showcase zone for visitors and a functional, restricted zone for employees who spend most of their hours in multilayered protective clothing, the designers conceived a safe and secure laboratory where, through the use of color and a multisensory framework, staff can connect with nature and the spaces where they work. An artistic representation of Circadian rhythms at the entry gives way to dynamic spaces that offer lab employees a respite from their sensory-deprived work. To take advantage of key views of the bay and a landscaped plaza, labs run along one long, angled wall away from the exterior, allowing the corridor to become shared space along the building’s perimeter.

Programmatic Components

26,000 SF
cGMP Program
Quality Control Laboratory Program
Office / Workplace Program

View the video >>


473231
GOWNING
WAVE TO OPEN

Regeneron Pharmaceuticals, Inc.,
Biopharmaceutical Campus Expansion

campus connectivity

As a leading biotechnology company driven by a culture of scientific curiosity, Regeneron seeks to discover and develop life-transforming medicines for a wide range of serious conditions. To accommodate continued growth and further improve upon the traditional drug development process, Regeneron initiated a campus master plan, the Loop Road Expansion, and the creation of the Preclinical Manufacturing and Process Development (PMPD) Building.

Master Plan // After an initial strategic planning effort that examined the existing campus and planned growth, a master plan was established to help guide a multiphase expansion. The plan emphasizes connectivity among the therapeutic focus areas and scientific leaders based upon a model of convergence facilitated by the people collider concept, which acts as a means to connect people across a linear campus. Redistributing operations, establishing three geographic centers that are physically connected: a development cluster in the middle bookended by two discovery clusters. The resulting expansion includes 900,000 square feet of new laboratory and office space, along with additional buildings for parking, amenities, and infrastructure to support research and development.

PMPD Building // The new Preclinical Manufacturing and Process Development (PMPD) Building offers extensive, technically complex space for bench and pilot-scale operations. Designed around the concept of flow, the PMPD Building draws staff into the main entrance and through the facility to move from community and collaboration spaces to focused research areas.

Programmatic Components

900,000 SF
Laboratory Program
Office / Workplace Program
Bench & Pilot-Scale Operations


FUTURE PHASE

Promega,
Chappelle Manufacturing Center

supporting global biotechnology

As a global leader in providing high-quality solutions and technical support to the life science industry, Promega provides a wide range of products supporting cellular and molecular biology, driving innovation in fields such as live cell analysis, drug discovery, molecular diagnostics, and human identification. Scientists and technicians utilize their products in academic and government research, forensics, pharmaceuticals, clinical diagnostics, and agricultural and environmental testing.

The new, 159,000-square-foot Chappelle Manufacturing Center (CMC) offers multifaceted chemical production in flexible and scalable facilities with H-2 and H-3 ratings, enabling agile operations to adapt manufacturing systems to any number of components from Promega's expansive product line.

The manufacturing program includes a range of scales to accommodate reactions at lab-scale using bench-scale glass reactor systems, small-scale and kilo-lab manufacturing in reactors ranging from 30 to 100 liters, and large-scale manufacture of product in 100- to 500-gallon volumes. Operational support spaces include quality control and process development capabilities, as well as a GMP warehouse for incoming materials and finished product staging.

The production spaces also include access to extensive natural light, while office, conference, and all-hands meeting areas offer exceptional transparency to the exterior and the CMC's Midwest prairie setting.

Programmatic Components

159,200 SF
Laboratory Program
Office / Workplace
Large- and Small-Scale Manufacturing
Quality Control and Process Development
GMP Warehouse

Mayo Clinic Laboratories,
Center for Regenerative Biotherapeutics,
Biomaufacturing Development Facility

responding to changing research needs

In support of Mayo Clinic's Center for Regenerative Biotherapeutics (CRB) and cGMP Cell Therapy Manufacturing program, the mission of this Biomanufacturing Process Development Facility is to develop cell and tissue regenerative therapy discoveries in preparation for eventual production. Multi-product human cell and tissue therapies will be developed concurrently in the Process Development Laboratories. In addition, the center also utilizes the space for training the next generation of clinicians and scientists.

This new 15,440-square-foot, fourth-floor tenant infill includes process development laboratories, tissue culture and tissue engineering spaces, an ISO 7 level GXP Suite, quality control laboratories, high-density and climate controlled cold room storage, as well as office and tenant amenities. An additional 3,440 square feet of space within the third floor of the adjacent building was fit up to accommodate additional storage space including more high-density and climate controlled cold room storage as well as kitting, shipping, and receiving areas.

Programmatic Components

15,440 SF
cGMP Program
Laboratory Program
Quality Control Laboratory
Cold Room Storage
Office / Workplace

Read More >>
The Hypothesis:
Conversations on scientific research environments
Accelerating Clinical Therapy with GxP Facilities

Takeda Pharmaceuticals,
Quality Control Laboratory

enabling lean operations through visual connectivity

Takeda's Quality Control Laboratory is central to the firm's strategy to ensure a better, faster, and more economical delivery to patients worldwide. Every feature of the plan and design of the facility is based upon equally innovative operational principles and focused on providing the highest quality of space for the staff including ideal adjacencies, clear Lean flows, access to natural light, and unequaled views to the surrounding city and hillsides.

Concepts such as shared workspace versus a single desk per person were implemented, reinforcing teamwork and knowledge sharing while minimizing capital expenditures. The strategic use of transparency in the design solution allows for exceptionally clear lines of sight that offer increased safety, quality, and efficiency.

The project is the recipient of the ISPE Facility of the Year Awards, 2018 Category Winner for Operational Excellence

Programmatic Components

16,000 SF
Quality Control Laboratory Program
Scientific Workplace Program
Office / Conference / Amenity

Read More >>
ISPE 2018 Facility of the Year Award
Operational Excellence

Genentech,
Fill Finish Facility

fast-track pharmaceuticals

This super-block building is comprised of manufacturing, warehouse, distribution, administration, and a central utility plant – totaling 295,000 square feet for pharmaceutical drug manufacturing. Designed to FDA and cGMP standards, the building incorporates formulation, filling, and packaging suites.

Flad's scope included master planning, programming, and full architectural design for the building core and shell, TI fit-out, process equipment layout coordination, and FDA flow diagrams for personnel, raw material, final product, and waste streams. The master plan established a long-term vision for the 75-acre campus.

An entire team of experts from disciplines including planning, architecture, process design, and engineering collaborated with Genentech to optimize innovation, minimize cost, and provide a holistic design approach.

Temperature-controlled rooms for finished product, quality control, and raw materials, along with high- and low-bay ambient and cold-box storage rooms and CIP stations are located in a warehouse and distribution center. The cafeteria, food preparation, training rooms, quality control labs, analytical labs, and offices are located in the administration building. All clean utility systems and housing systems are located in the central utility building.

Programmatic Components

295,000 SF
GMP Program
Quality Control Laboratory Program
Development Laboratory Program
Office / Workplace Program

MilliporeSigma,
cGMP Manufacturing Facility

accommodating rapid growth

Considered one of the premier high-potency development and manufacturing companies in the world, MilliporeSigma provides active pharmaceutical ingredient used by a variety of drug manufacturers throughout the world. The company was in need of additional space to accommodate rapid growth.

Fully equipped R&D suites, kilo lab, and commercial pilot plant manufacturing facilities help researchers develop the highly potent compounds used by drug manufacturers. Isolator labs keep toxic chemicals contained. The manufacturing areas of the facility are designed to provide clean, flexible modular spaces to accommodate changes in process requirements. The layout accommodates efficient material and personnel flows for cGMP manufacturing. The building includes large-scale manufacturing suites; 150L suites; QC labs; offices; conference and break areas; locker areas; warehouse, shipping and receiving; and utility support.

The 15-acre site accommodates future expansion without a major impact on the ongoing operations of the facility. Approximately 40 people will work at the plant initially, with the possibility of expanding to 80 with around-the-clock operations.

Programmatic Components

51,000 SF
R&D Suites / Kilo Laboratory
Manufacturing Program / QC Laboratory
Warehouse / Shipping / Receiving
Vial Filling / Inspection / Cold Storage
Office / Workplace Program

**Georgia Institute of Technology,
Marcus Center for Cell Therapy
Characterization and Manufacturing** ⓘ

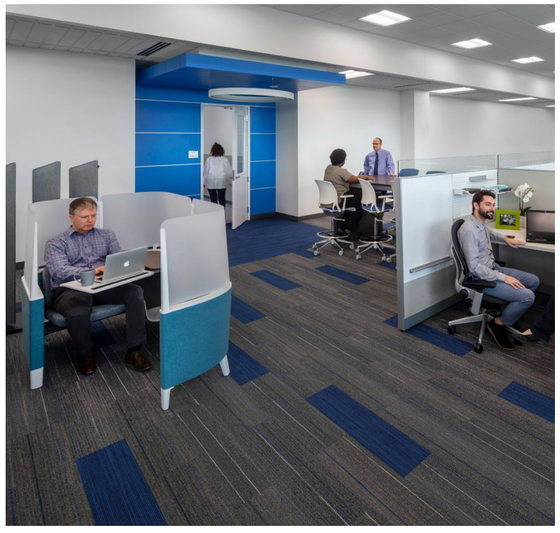
accelerating medical therapies research

The new Marcus Center for Cell Therapy Characterization and Manufacturing is devoted to developing processes and techniques to manufacture living cells and develop transformative technologies to bring forward cell-based therapies faster and at a lower cost. This cGMP program brings together bioengineers, manufacturing engineers, and industrial engineers to work closely with cell biologists, clinicians, and industry partners to make cell therapy manufacturing a well-characterized, quality-controlled, efficient, and highly reproducible process for broad clinical use.

Because the cGMP program is a new R&D initiative at Georgia Tech, the design team carefully planned this life science program embedded within a related, but dissimilar, nanochip cleanroom facility. This effort required a comprehensive overview of cGMP operations and FDA licensure to ensure ease of operations and future licensure.

Programmatic Components

5,200 SF
cGMP Program
Cell Processing Facilities
Development Facilities



**Illumina,
Enzyme Manufacturing Facility** ⓘ

aiding next-gen genomics

As a leading developer and manufacturer of life science tools and integrated systems for large-scale analysis of genetic variation and function, Illumina needed a new home for their Enzyme Reagent Development and Manufacturing Group. With no available room for expansion at the current location, their forecasts predicted the need for a new building and site within two years.

Flad was selected to design the interior fit-out of the new building shell. The multi-wing, two-story facility includes a 117,000-square-foot main building housing manufacturing space, labs, and offices and 16,000 square feet of warehouse space.

The building is organized around a main circulation corridor with manufacturing/lab areas and a service corridor to the west and the office areas to the east. The hub at the intersection of the north and south wings of the building includes a lunch room and conferencing center designed to promote collaboration and interaction among staff.

Specific goals for the project included flexible, reconfigurable process suites based on a modular planning grid; an energetic work environment that fosters interaction and communication among staff; and connectivity between the lab and office environments.

Programmatic Components

133,000 SF
Laboratory Program
Manufacturing Program
Office / Workplace Program
Warehouse

Flad Architects is a national planning and design firm committed to creating environments that enhance human potential. In partnership with leading research organizations, universities, healthcare institutions, and science-based companies, Flad designs innovative facilities that enable revolutionary discoveries that have a profound impact on society.

Over 95 years of passionate and rigorous focus on buildings devoted to the sciences has earned Flad consistently high rankings among the top 20 architectural firms, both overall and in the specific areas of science & technology, academic, and healthcare design.

Flad.com

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