LIFE SCIENCES 2020 REAL ESTATE DEVELOPMENT SYMPOSIUM

NYC BUILDS BIO+
SGA is an Architecture and Interior Design practice that is currently delivering over 4 million square feet of state-of-the-art Commercial Life Science facilities in the New York and Boston metropolitan areas.
2020 Boston Real Estate Times
Architecture Firm of the Year

2020 Architizer A+ Awards
Architecture + BIM | TitletownTech

2020 IIDA New England
Student Housing | Williams College Passive House

2019 Architizer A+ Awards
Finalist | Commercial Coworking Space

2018 Fast Company Magazine | World Most Innovative Companies

2017 ENR New England
50 & 60 Binney Street | Best Mixed-use Project
Life Science Design Considerations

**DESIGN CONSIDERATIONS**
- Construction premium for lab-use flexibility now is less cost compared to doing this work later
- Proximity of hazardous uses to property lines
- Chemistry vs. Biology vs. Dry Lab uses
- How to put labs in high rises and maintain proper control area relative to use and code (can affect lab type - Chemistry vs. Biology)
- Ratio of lab vs. office (determines MEP upgrades)

**ENVELOPE**
- High performance envelopes are required for lab use due to higher moisture content
- Some lab uses are affected by light within the space
- Security - Access & Visibility

**STRUCTURE**
- Bay spacing typically an 11’ module but can flex
- Floor-to-floor height 14/6” minimum for new construction without detailed pre-coordination. Lower floor-to-floor heights require specific solutions for ductwork pathways.
- Increased floor loading
- Increased floor stiffness and vibration

**CORE + SHAFT**
- Lab-ready bays with available core space that can be taken for a future shafts
- Increased floor loading for high capacity storage

**MEP**
- Lab exhaust studies may be needed to understand how exhaust plumes effect neighboring areas
- Additional rooftop equipment space is required (and can be rented) for tenant standby generators and other equipment
- Additional mechanical penthouse equipment space for tenant plumbing equipment (RO/DI Systems) (this space can be rented)

**VIVARIUM**
- Enclosed loading is important to tenants with animal control facilities
- Dedicated elevators for animals due to animal care facility loading and elevator transportation
- Dedicated first floor animal disposal/staging area
The Difference Between “Lab Ready” and “Lab Friendly”
Life Science Expertise

“LAB-FRIENDLY” BUILDING

- 10%-20% cost increase
- Increased floor-to-floor heights
- Increased floor loading
- Increased floor stiffness
- Added mechanical shafts
- Added plumbing shafts & risers
- Added core & shell rooms for PH neutralization systems
- Added service elevators & elevator lobbies
- Flexible floor framing to allow future slab knockouts
- Increased primary electrical service
- Increased sprinkler service & fire pumps
- Increased structural fire resistance (non-high rise buildings)
- Locate potential future process gas storage
- Added first floor hazardous material storage rooms
- Added MEP area
- Added loading dock bays (possibly enclosed for ACF/vivarium temporary storage)

“LAB-READY” BUILDING

- 25%-35% cost increase
- Increased floor-to-floor heights
- Increased floor loading
- Increased floor stiffness
- Increased primary electrical service
- Increased sprinkler service & fire pumps
- Increased structural fire resistance (non-high rise buildings)
- Locate potential future liquid nitrogen storage
- Increased curtain wall performance
- Added standby power, typically a tenant cost not a LL cost

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1) Impacts cost of skin, structure, foundations, MEP/FP risers, other systems
2) With duct risers and catwalks for access, sized for future capacity
3) High-rise buildings already have increased fire resistance rating
4) To base building systems & room for future standby power generations

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*Need to establish acceptable access & locations for these elements for future placement/construction. Lab-friendly buildings need a loading facility with a service elevator and chemical storage locations that can support laboratories, or plan to add these areas as needed.
Recent New York Life Science Studies

NEW YORK CITY / NJ PROJECT LOCATIONS

- Titletown Tech
- 320W 31ST STREET
- Vertical Cluster
- Center of Excellence
- 55 Greene St
- Skillman Avenue
- 207 Park Ave South

Recent New York Life Science Studies
95 Greene Street | SGA Designed the 340,000 sf Lab-Ready Facility for Thor Sciences
Incubators and Accelerators
Boston Life Science Sub-Clusters
Some of the over 4 Million square feet of Life Science Buildings on the boards...
Vertical Cluster
**Typical Drug Discovery Pipeline**

**COMPUTATIONAL BIOLOGY**
Dry labs which go hand in hand with wet labs; the research is done on the computer.

**PROCESS DEVELOPMENT LABS**
Study how a drug or biological can be made on a commercial scale.

**QUALITY INSURANCE AND QUALITY CONTROL**
Laboratories to assess the final product.

**BIOINFORMATICS**
Computer based facilities to obtain and organize the clinical trial data for FDA submission.

**PACKAGING AND DISTRIBUTION**
Putting the material in its final form (solid dose, liquid, gelcap, capsule, sterile injectable, transdermal, etc.) and then boxed up and shipped.

**SALES AND TRAINING**
Once a new drug gets to market the sales staff need to be trained on how to sell it.

**BASIC RESEARCH**
Wet labs to research new small molecules or biologicals.

**VIVARIA**
Animal facilities used in research; two types of study: basic research; evaluation; animals are used in Pre-clinical trials and toxicology studies.

**PILOT PLANT**
A miniature process which can be validated; this will be the pre-cursor to the full-sized manufacturing facility.

**CLINICS**
Typically organizations which partner with the manufacturer; they administer the three levels of clinical trials.

**MANUFACTURING**
Once the drug or biological is approved by the FDA it needs to be manufactured on a large scale.

**CORPORATE HEADQUARTERS**
Administrative and regulatory support for the product.
Drug Discovery Pipeline - Currently in New York

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Thank You From SGA
Life Science in NYC
Ennead Architects
October 27, 2020
Who We Are
Ennead Architects

44% of work from Repeat Clients
14 National Honor Awards
275 Employees
57 Years in Business
47 LEED Certified Projects

92 Registered Architects
2 Offices: New York & Shanghai
400+ Project Awards
45% of employees have been with us over 10 years
2000-2020
22 Laboratories Built
5+ Million Square Feet
3.3+ Billion US Dollars

Who We Are Experts in Laboratory Design
Who We Are

The Ennead Symposium on New York Life Science

© 2020 Ennead Architects LLP
Who We Are

Campus Labs

University of Michigan, Biomedical Science Research Building
University of Michigan, Biological Science Building
Stanford University, ChEM-H and Wu Tsai Neuroscience Institute
Stanford University, Bass Biology Building
The University of Texas at Austin, EERC
University of Oregon, Knight Campus for Accelerating Scientific Impact
Who We Are: Vertical Labs

- Cambridge Crossing, 441 Morgan Avenue
- New York Blood Center, Upper East Side Headquarters
- Weill Cornell Medicine, Weill Greenberg Center
- Weill Cornell Medicine, Belfer Research Building
- Alexandria Center for Life Science
- New York University, Center for Genomics and Systems Biology
Who We Are New York City Approvals Experience
Who We Are New York City Landmarks & Special Circumstances Experience
A Rapidly Growing Life Science Cluster The New York City Bio Arc
Understanding the Demand: The Fields of Life Science, and Where They’re Locating
Meeting the Demand: Different Approaches to Developing for Life Science
Meeting the Demand

Rapid Assessment
Meeting the Demand Adaptive Reuse
Meeting the Demand: Ground Up Development
Meeting the Demand Special Permit (ULURP)
Meeting the Demand: Options Beyond Manhattan
The Future is Hybridization A Mix of Life Science, Office, and Residential
History Repeats Itself Skirball Institute for Biomolecular Medicine and Residence Tower
LIFE SCIENCES 2020 REAL ESTATE DEVELOPMENT SYMPOSIUM

NYC BUILDS BIO+
Matt Malone
AIA, NCARB, LEED AP
Associate Principal
Science & Technology Practice Leader
King Street Properties
Innolabs at Court Square
Long Island City, NY

Architecture, Adaptive Reuse,
Lab/Office Space, Amenities
Taconic Investments
HiberCell at Hudson Research Center
New York, NY
Taconic Investments
HiberCell at Hudson Research Center
New York, NY
Diagnostic Laboratory Design, Flexibility, Neighborhood context

MSK Laboratory
New York, NY
Zoning Constraints

Functional Organization

MSK Laboratory
New York, NY
New Roof Canopy creates a four season space out of the courtyard.

Re-imagined courtyard becomes the heart of the campus.

New pavilion defines entry to campus and courtyard.

Existing buildings renovated to Unilever Agile Workplace.
Unilever North American Headquarters
Englewood Cliffs, NJ
Laboratory Design, Research & Development, Flexibility, Build-to-Suit

ON3
Nutley, NJ
BEST IN CLASS:
INNOVATION: MEETING, SHARING, COLLABORATING

In today’s corporate wellness marketplace, the critical focus for design is to develop environments that foster an atmosphere of discovery! Successful design solutions will enable teams to meet, share and collaborate to the benefit of their work. With this project, over 30,000 SF is fully devoted to a collaborative zone, totaling 35% of the project building area, including a 5,000 SF multi-functional “Nucleus,” that will enable large scale interactively across disciplines and between locations.

BioMed Realty
Regeneron
Tarrytown, NY
BEST IN CLASS:  
WORKPLACE DESIGN

SCIENCE SPINE

Beginning at the opposite end of the existing campus, a single second-level corridor links all of the buildings and spaces to one another. This corridor serves as a conduit for the movement of personnel, materials, supplies and waste. There are no “off-stage” areas. The corridor serves as a transition space between program elements and lab entries, the space is enlarged with white boxes and freed of seating for an openness and uncluttered feeling.

VISUAL TRANSPARENCY

Enshrined within the corporate philosophy is an openness and transparency between office and lab across all areas. The design reinforces and amplifies this core belief by locating open labs to the perimeter and private offices inboard. Between banks of private offices are created continuous workspaces across the width of the building, promoting connections between offices and labs alike.

COLLABORATION SPACES

“ME” workspaces are provided for focused quiet. Social work. A mix of formal, informal, group, and casual workspaces provides different environments to accommodate individual needs. “ME” spaces are work-related group gathering areas. Tables are generalized, planned out, and presented in these collaborative spaces. “WE” spaces are for everyone. Both work-related and non-work-related interactions occur here.

BioMed Realty  
Regeneron  
Tarrytown, NY
Matt Malone
AIA, NCARB, LEED AP
Associate Principal
Science & Technology Practice Leader

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LIFE SCIENCE KEY CONSIDERATIONS FOR EXISTING BUILDINGS

**Time to Market**

**Trend from Chemicals to Computational**

**Adaptive Reuse**

**Flexibility: Open Benchling**
- Movable benches
- Overhead plug-in panels
- Fixed casework in core areas

**User Experience**

**Maintainability/Serviceability**
- Reliability/Redundancy
- Modularity
- Energy Efficiency/Sustainable Design
Lendlease Life Sciences Capabilities

October 27, 2020
Lendlease Life Sciences

Lendlease has performed within the Life Science sector for over 40 consecutive years.

- 1979: The year we started building a stellar track record of health systems across the US.
- 300+: Experienced and dedicated life science professionals.
- $5.7B: Million volume of life science work with 350+ projects across the nation.
- 14M: Million square feet of work completed.
- 100%: Repeat life science clients.

The image shows a corridor with lab equipment, emphasizing the company's commitment to the life sciences sector.
Experts in delivering cutting edge life science solutions

Our specialty is in delivering bespoke, cutting edge solutions for many of the country’s leading biomedical companies and we pride ourselves on having long-established relationships with these companies.
Life science experience

Manufacturing

AZ Newark Transformation Project
NEWARK, DELAWARE
OSD Manufacturing

Pfizer Plasmids
ANDOVER, MASSACHUSETTS
Manufacturing

Momenta
CAMBRIDGE, MASSACHUSETTS
Product Developer Facility

Shire Project Atlas
LEXINGTON, MASSACHUSETTS
Manufacturing

Pfizer Building E Clinical Manufacturing Facility
ANDOVER, MASSACHUSETTS
Manufacturing/Biologics

Novartis Viral Pilot Plant
HOLLY SPRINGS, NORTH CAROLINA
Pilot Plant

Bristol-Myers Squibb North America Biologics Center of Excellence Expansion
DEVENS, MASSACHUSETTS
Manufacturing/Biologics

Merck West Point Capital Expansion
WEST POINT, PENNSYLVANIA
Various
Life science experience

Laboratory & Research

Mount Sinai Hess Center for Science and Medicine
NEW YORK, NEW YORK

NYU Winthrop Research Institute
MINEOLA, NEW YORK

Mount Sinai - Atran Berg Laboratory
NEW YORK, NEW YORK

Weill Greenberg Center
NEW YORK, NEW YORK

NYU Langone Health Lab Renovations
NEW YORK, NEW YORK

NewYork-Presbyterian Lab Renovations
NEW YORK, NEW YORK

NewYork Presbyterian Allen Hospital Labs
NEW YORK, NEW YORK

NewYork Presbyterian Blood Bank
NEW YORK, NEW YORK
NEW YORK, NEW YORK

Jerome L. Greene Science Center

CLIENT: COLUMBIA UNIVERSITY
COMPLETION: 2017
SIZE: 457,000 SF
ARCHITECT: RENZO PIANO BUILDING WORKSHOP
NEW YORK, NEW YORK

Taystee Lab Building

CLIENT: THE JANUS PROPERTY COMPANY
COMPLETION: 2020
SIZE: 350,000 SF
ARCHITECT: LEVENBETTS, SLCE
Skanska
USA Building
Life Sciences
Skanska USA Building Statistics

$5.2 billion
2019 U.S. revenue

7th largest
Building contractor by U.S. revenue (EMR 2019)

28
USA office locations

0.60
Experience Modification Rating (EMR)
National Life Sciences Statistics

$1.8 billion+
30+ in progress life sciences projects

$17 billion+
Completed life sciences projects in our portfolio

1st
Ranked in Building Design + Construction
(Science & Technology, 2019)

7th
Ranked in ENR’s Top Contractors
(Research/Pharmaceuticals, 2019)

75 percent
Repeat private sector pharmaceutical clients
New York University Langone Health, BioLabs@NYULangone

- $8.68 million
- 50,000-SF renovation
- Fit out of flexible office & fully equipped laboratories

- Created 48 benches in the open lab, three large private labs, three medium private labs, nine small private labs, 19 offices, conference and event space
Regeneron Pharmaceuticals, Sleepy Hollow Office Renovation & DNA Learning Center

- $25 million
- 128,000-SF four-story renovation
- Façade restoration
- Fit out of DNA Learning Center
- Renovation of office spaces and plaza reconstruction
- Waterproofing MEP spaces
Cold Spring Harbor Laboratory, DNA Learning Center @ City Tech

- $13 million
- 20,000-SF renovation and exterior reclad
- New MEP equipment
- New finishes: slat ceilings, curved plastic glazing, millwork in classrooms, offices and computer labs
City University of New York (CUNY), Advanced Science & Research Center

- $595 million
- 400,000-SF dual tower building
- LEED Gold certified

- Research facilities, teaching labs, wet labs, vivarium
- Imaging suites, clean room, electron microscope, food service area and 100-seat auditorium
New State-of-the-Art Facility in Harlem

Public Health Laboratory

- 10-story building
- 230,000-SF
- Client: New York Economic Development Corporation
- Architect: Skidmore, Owings and Merrill, LLP
Importance of collaboration during preconstruction
Importance of collaboration during preconstruction
Lessons Learned

• Lab casework mockups and layout
• Stand-alone MEP systems and redundancy for lab requirements
• Lab equipment procurement
• Fume hoods and decision for general exhaust or dedicated exhaust fans
• Centralized gas bottles/mobile bottles
• Lab monitoring systems, lighting/controls tied to emergency systems
• Determining size of generators based on redundancy