

CLIMB NBR Welcomes You to an Afternoon of Networking, Speaker Sessions, & NBR Site Tours

THURSDAY SEPTEMBER 15th, 2022
1:30PM - 5:00PM

1:45 - 2:15 PM	Pharma Drug Development Overview with speaker Jonathan Romero • NBR-111-208
2:15 - 2:45 PM	HR/Talent Acquisition Overview with speaker Danielle McGrath • NBR-111-208
3:00 - 3:45 PM	Social Networking Session • NBR Cafeteria
4:00 - 4:45 PM	Lab Tours in Building 50



Inclusive Leadership



Inspiration



Purposeful Connection

Membership

# of members	Demographic composition	Geographic composition	# of chapters
4,675	64.1% % community members 35.9% allies	64.2% US 35.8% non-US	13 US 27 non-US



Next-gen Talent Retention



Corporate Responsibility & Sustainability



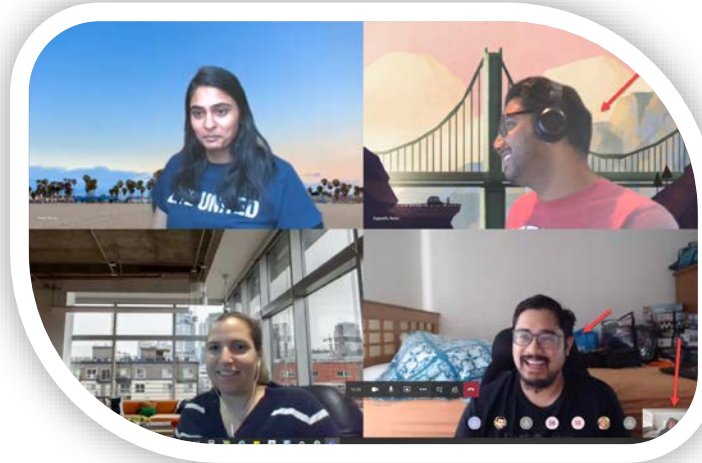
Next-gen Patient Support



Data Driven Decisions

CLIMB Priorities

A focused, confident CLIMB drives the business forward for the common good



We are
CLIMB NBR!

Jonathan Romero



Education:

- PhD Chemical Engineering, University of Delaware (2002)
 - *Dissertation Title: "The use of Semipermeable membranes for the Separation of Chiral Organic molecules"*
- B.S. Chemical Engineering, Rensselaer Poly Technic Institute (1997)
 - *Summa Cum Lau*

Work Experience:

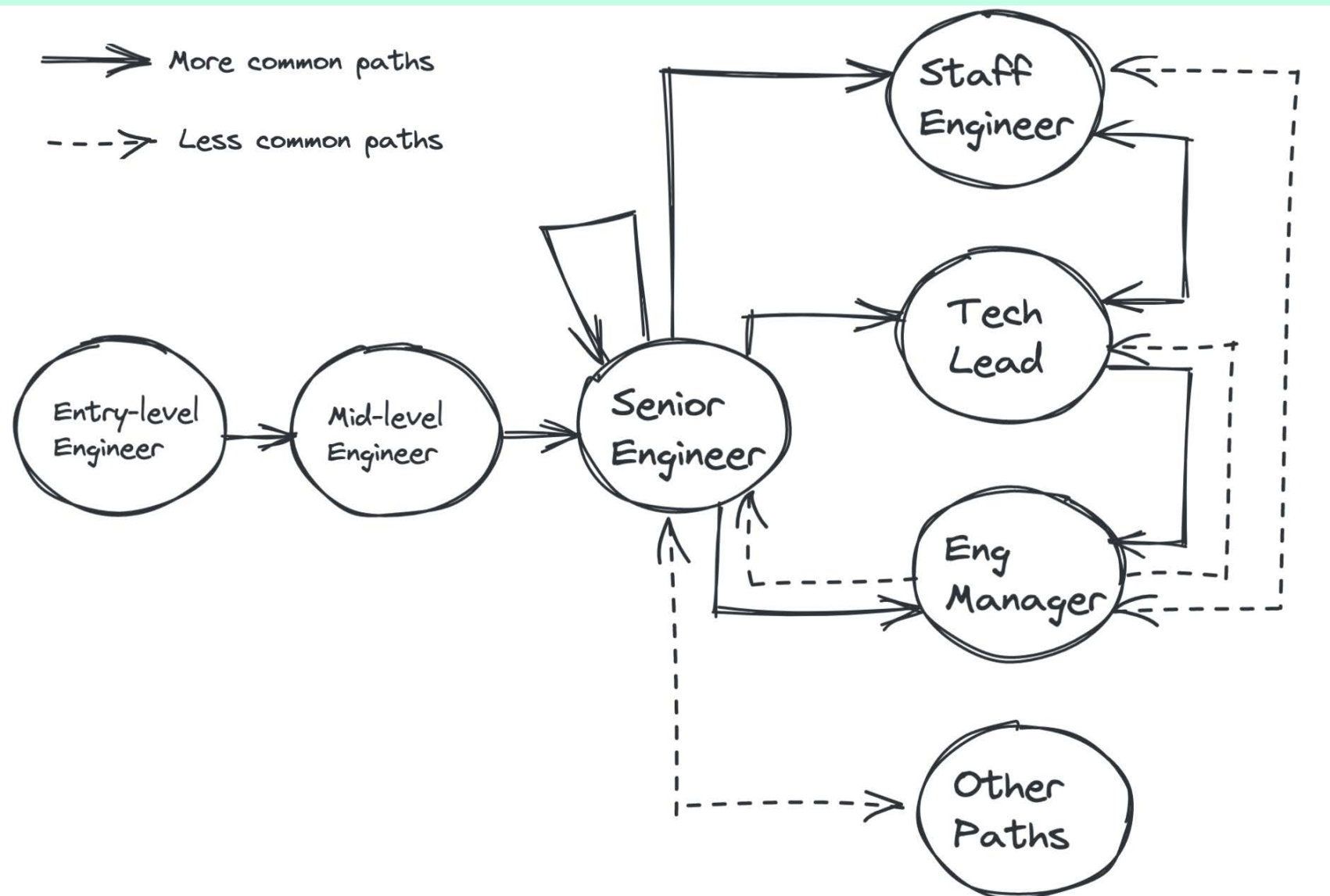
- Biogen (Cambridge, MA) 14yrs
 - Process Engineer MS&T - support clinical commercial tech trouble shooting
 - Senior Engr - Led Downstream Process Development and Pilot for Biologics
 - Associate Director - Manufacturing Engineering - clinical/commercial support
 - Associate Director, Latestage Program Lead
- Celgene (Summit, NJ) 4yr
 - Director Biologics - Technical operations (internal External)

Bristol Myers Squibb - Senior Director - Head Clinical Biologics Operations 2+ yrs

- Leading aspects of Early Stage Process Development and Commercialization of BMS's Biologics product Portfolio. Leading Build and Internalization of early Stage Biologics technology transfer and cGMP operations.
- Provides leadership and oversight of Technology Development, Product comparability, technology transfer of mammalian-based processess
- Supports Business process improvement initiatives to improve the operation of the biologics

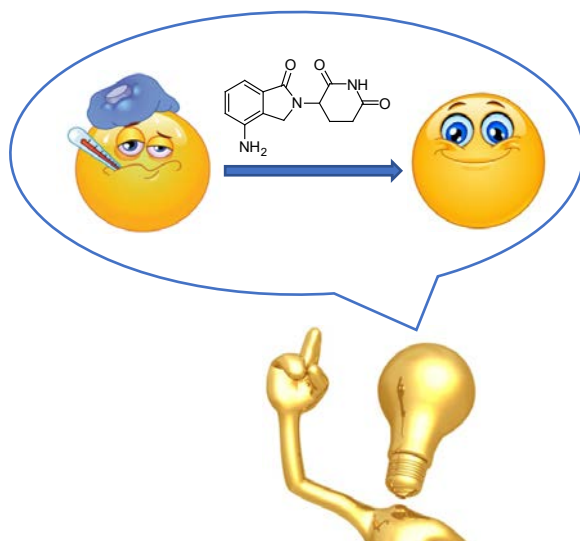
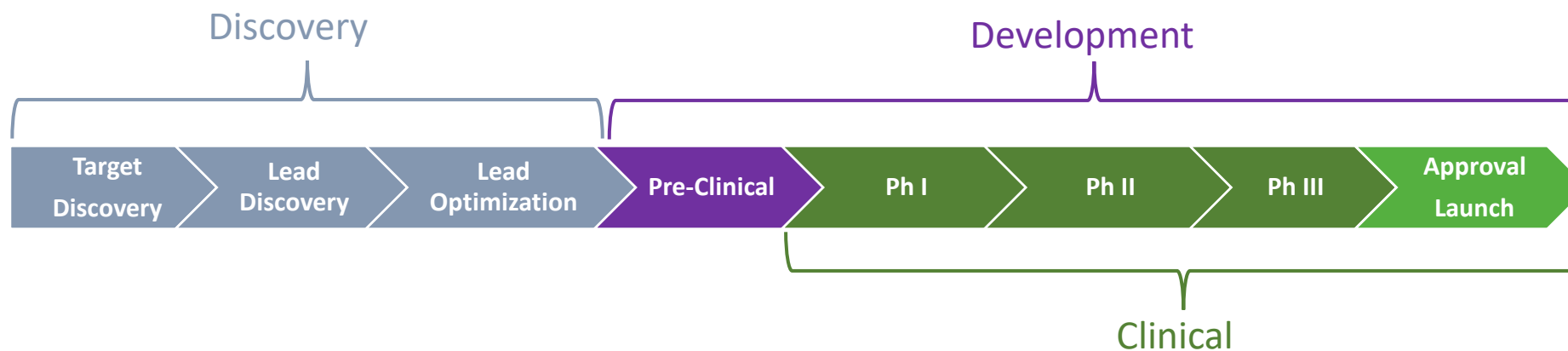


CLIMB Cultivating Leadership and Innovation
for Millennials and Beyond



Drug Discovery & Development & Manufacturing

Stages in Drug Discovery & Development



Discovery

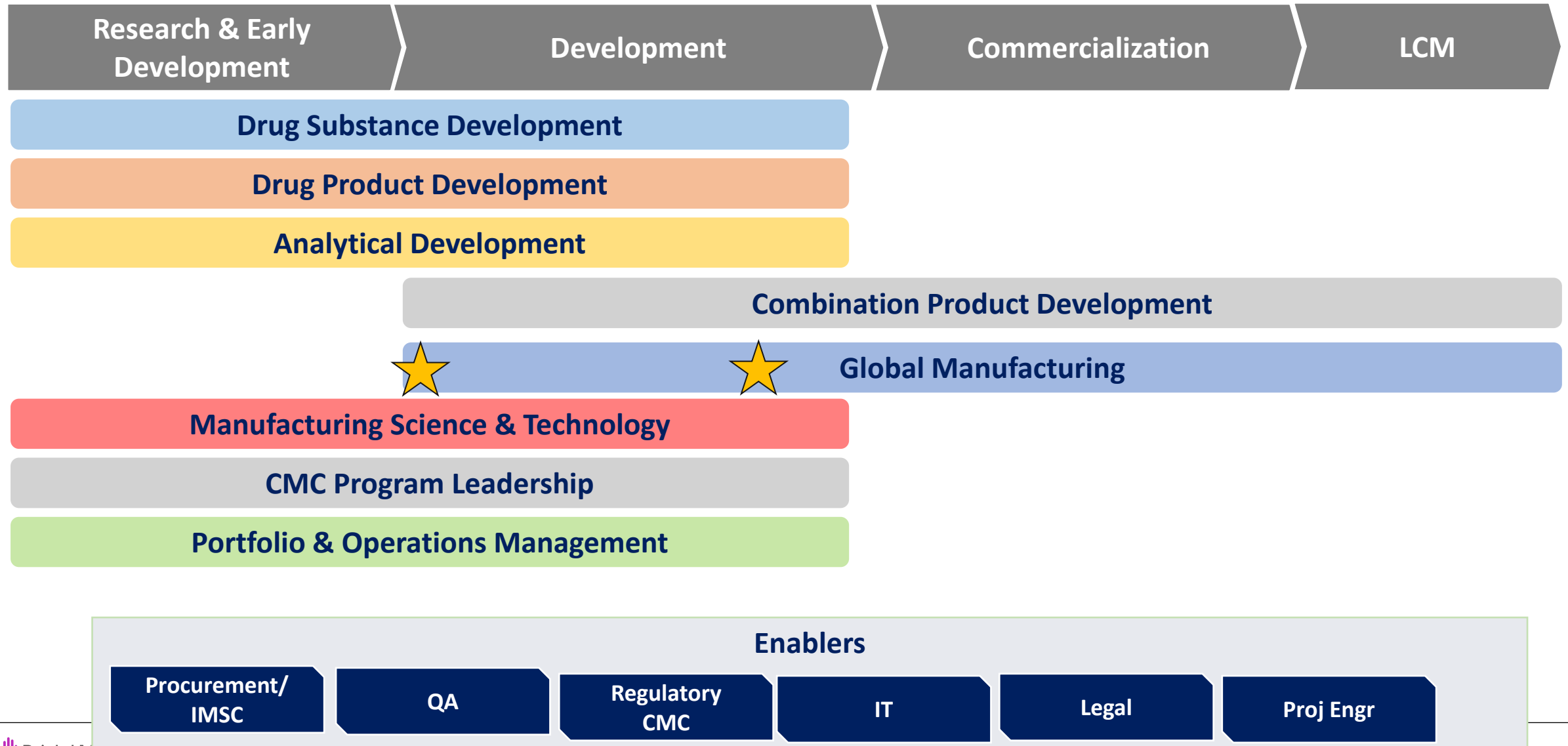


Safe and Effective



Market

Biologics Development & Manufacturing



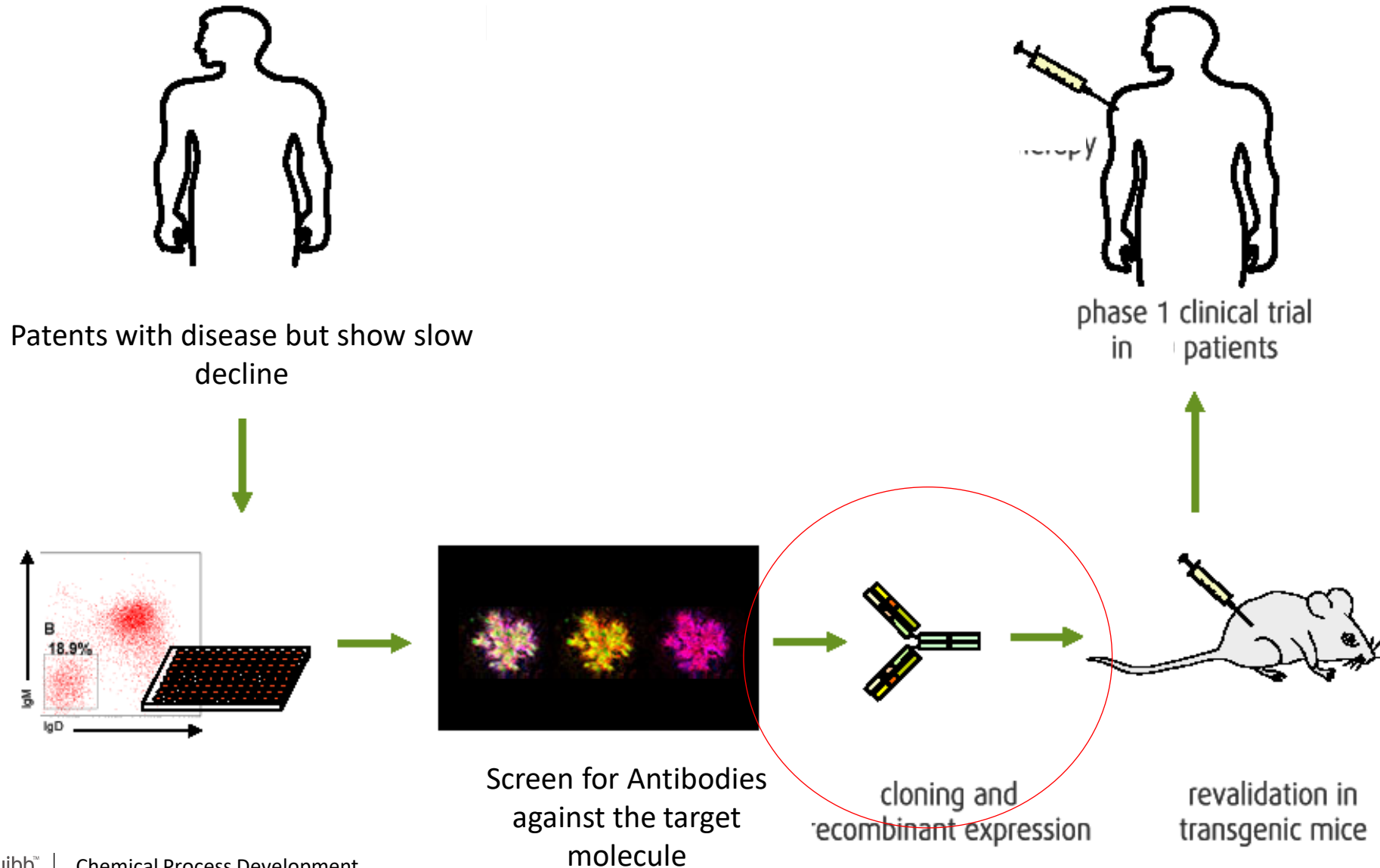
Building a foundation for success

Before the floor

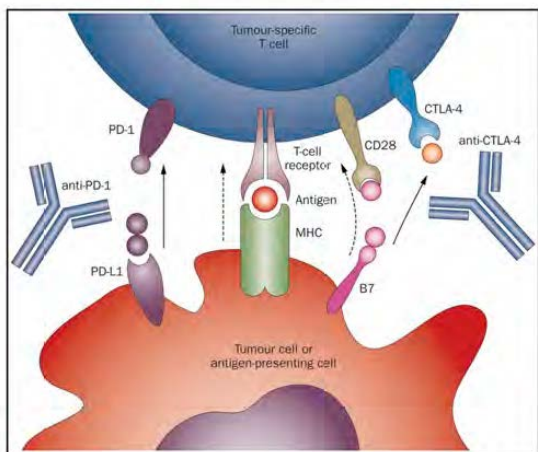
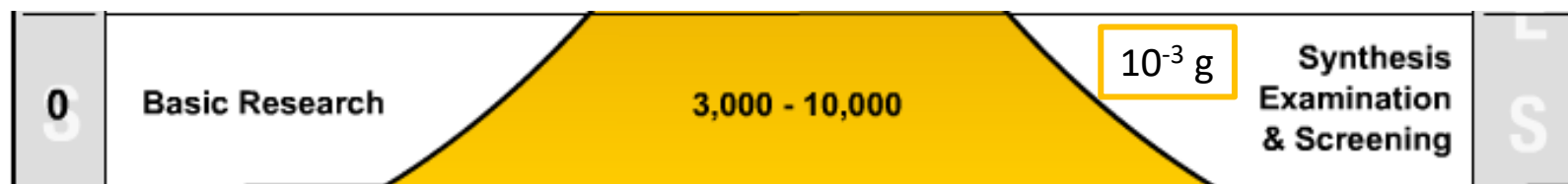
Before the Floor

- A huge amount of work occurs before the process ever enters a manufacturing facility
 - Drug Discovery
 - Expression System
 - Small Scale Process Development
 - Design Space
 - Media, Buffer, filter determination, chromatography resins and types and on and on
 - Assay Development
 - How do we measure our success?
 - Technology Transfer and Scale up
 - Does the as design process fit?
 - What can we change without impacting the product quality
- These initial steps have a huge impact on the final process!

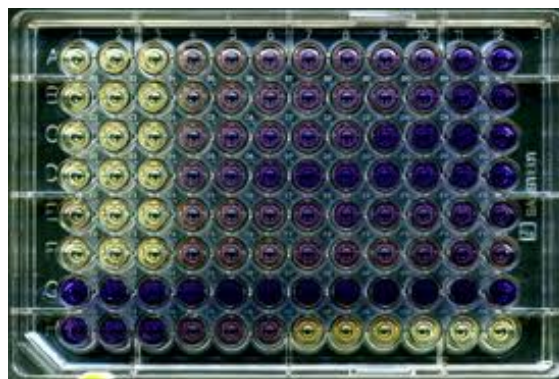
Discovery of Biologics (Antibodies)



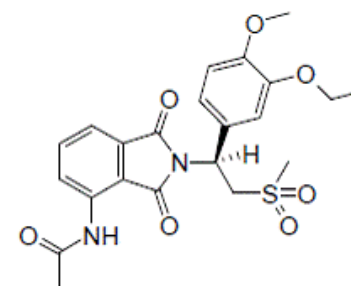
Basic research



Disease Pathway

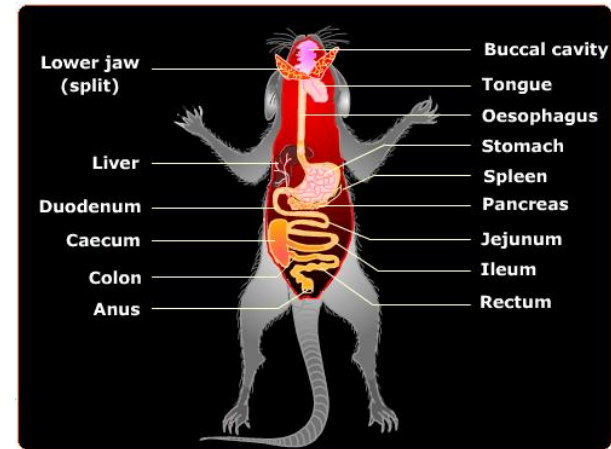
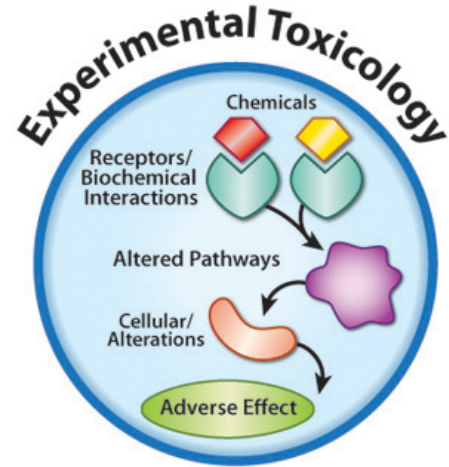
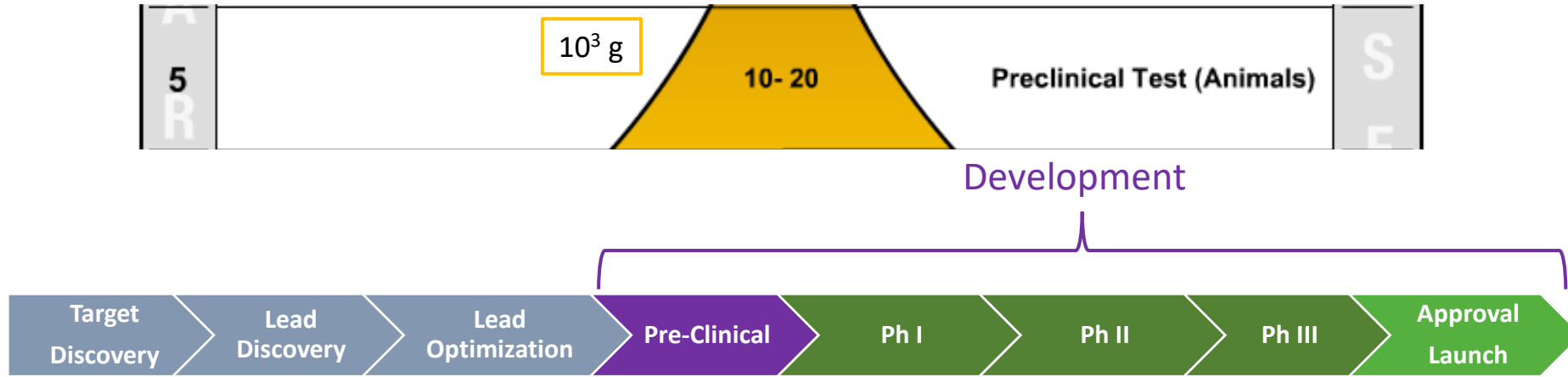


High Throughput Screening



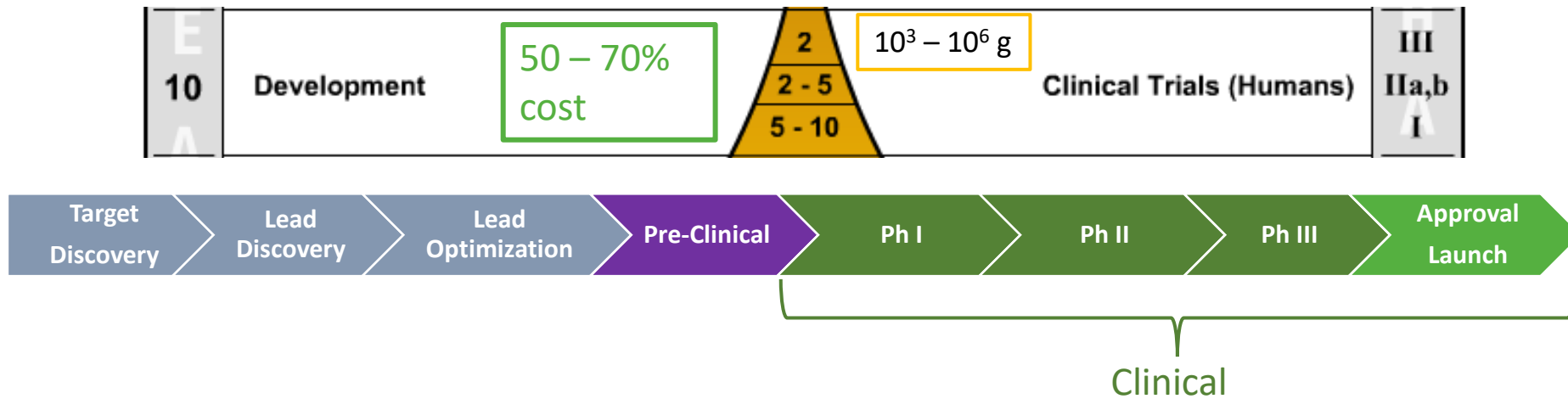
Optimization

Preclinical research



Pharmacokinetics

Clinical development



Formulation

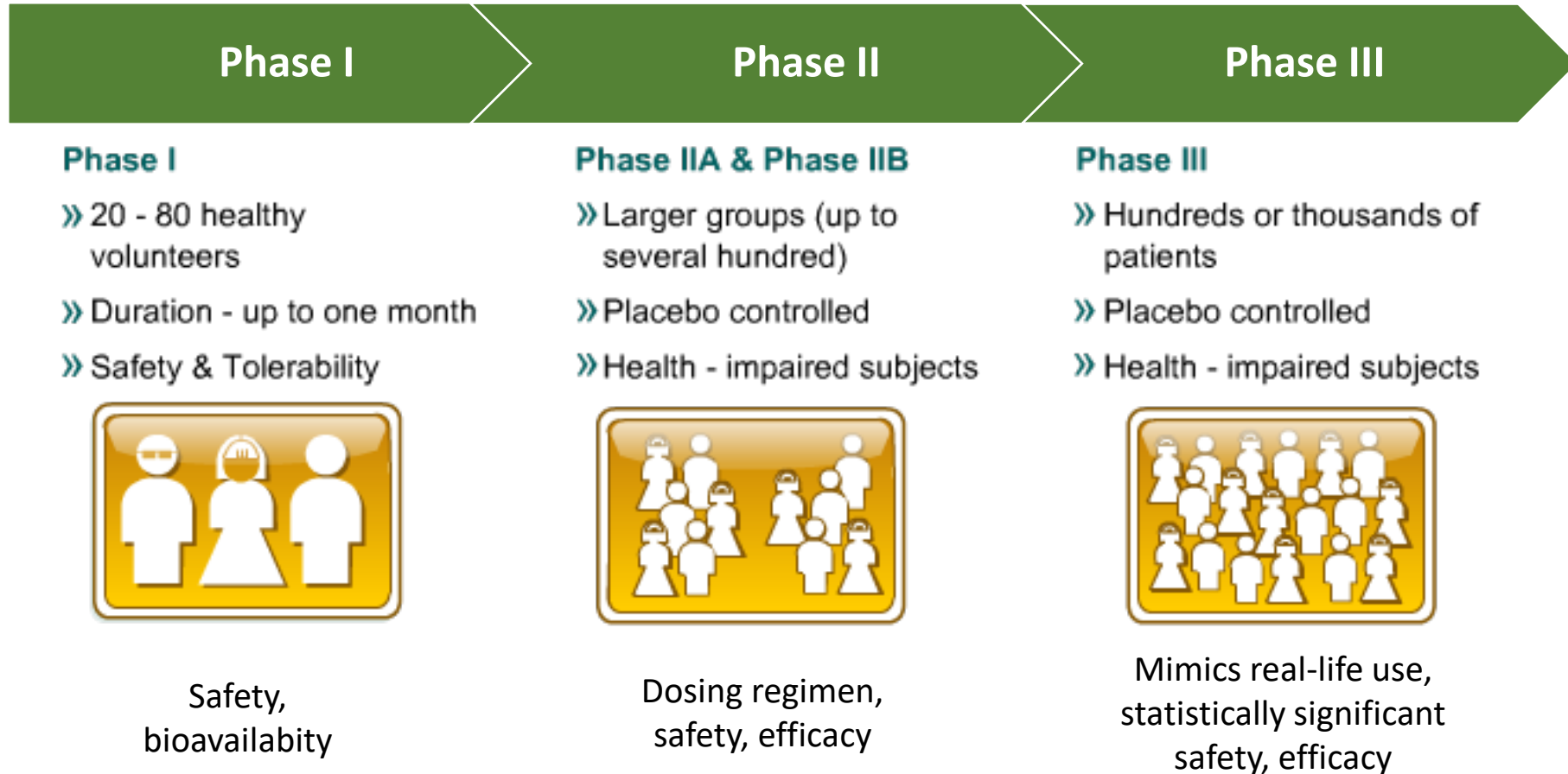


Pharmacokinetics



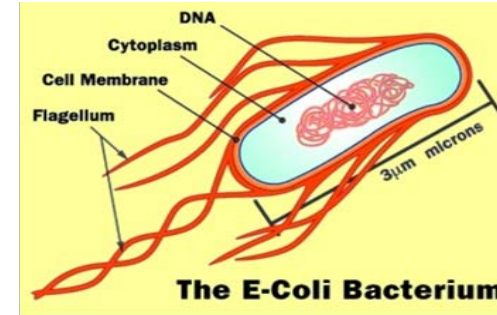
Safety & Efficacy

Clinical Trials

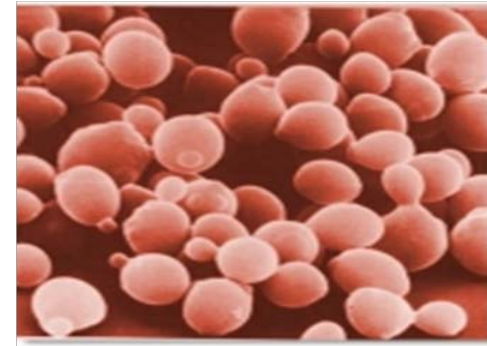


Typical Cell Types

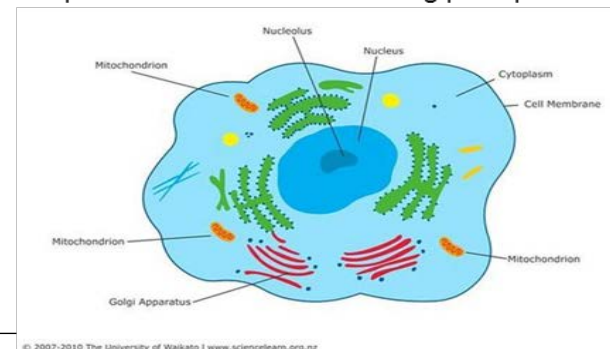
- Cell type selection based on both economic and biologic requirements
 - Considerations
 - Tertiary Structure
 - Glycosylation
 - Expression levels
 - Process Time
- Cell Types
 - Bacterial (E.Coli; B.subtilis)
 - Yeast (Saccharomyces Cerevisea, P.Pastoris)
 - Mamalian (CHO; BHK; Vero)
 - Plant
 - Insect



<http://www.nature-education.org/cell-ecoli.jpg>



<http://www.umass.edu/vetimm/img/pemap/close->



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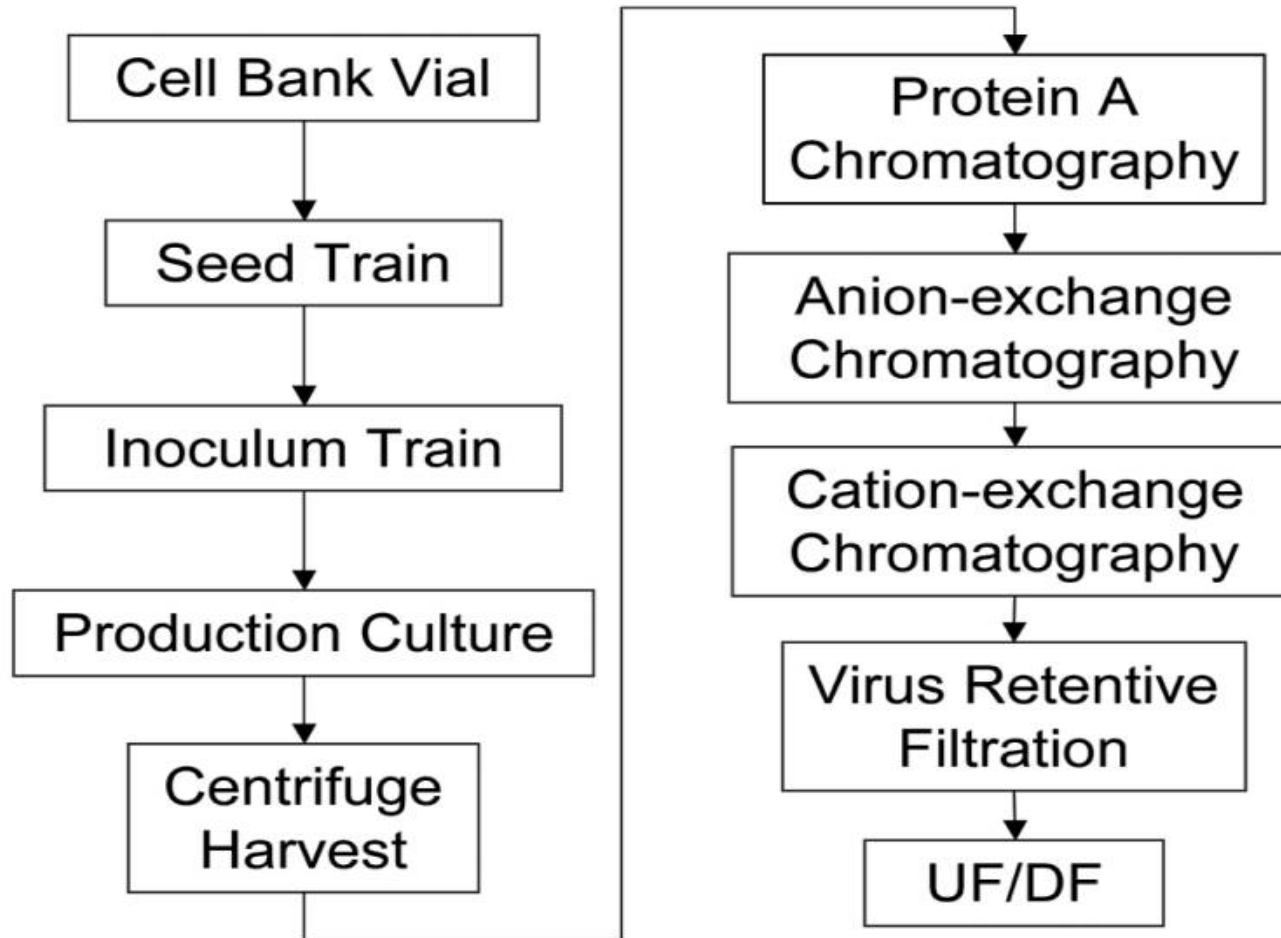
The boots on the floor

Manufacturing Process

process flowsheet for mAb Bulk Drug Substance

5 – 25kL bioreactor
Fed-batch production
2 – 5 gm/L titer

70 – 80% yield
Multiple cycles per harvest
50 – 100 kg per batch



Adapted from Brian Kelley, 2009, MAbs

Typical Process – Cell Cultivation



WCB vial



wave bag



N-3 reactor (seed)



N-1 reactor (seed)



N reactor
(production)

<http://www.firstenbergequip.com>

Human Body Process Control

- Breathing
 - Lungs transfer oxygen
- Temperature
 - Shiver/sweat
- pH
 - Food
- Sterility
 - Skin and immune system
- Mixing
 - Circulation of Nutrients



Bioreactor Process Control

- Breathing
 - Lungs transfer oxygen
- Temperature
 - Shiver/Sweat
- pH
 - Food
- Sterility
 - Skin and immune system
- Mixing
 - Circulation of Nutrients



- Dissolved Oxygen
 - Agitation
 - Air/Oxygen Flow
- Temperature
 - Glycol Supply
 - Steam
 - Heat Exchangers
- pH
 - CO₂
 - Chemical Addition (NaOH)
- Sterility
 - Steaming
 - Positive system pressure
- Mixing
 - Agitation

Typical Process – Clarification

Highly product-specific



Centrifugation



Depth Filtration



Microfiltration

Sterile Filtration



Hold Tank

Purification

- Start with “Clarified Conditioned Media”
- Contains target protein and impurities
 - Host cell proteins, DNA, metabolic byproducts, media components, “theoretical contaminants”
- Need to separate the target protein from the impurities
- Need to get target protein into a buffer that is close to physiological conditions

Types of Purification

- Chromatography

- Can remove non-target proteins, aggregated or partial target protein, **HCP**, DNA, viruses

- Filtration

- Depth Filtration: Removal of precipitates and other impurities from CCM
- Viral Filtration: Ensures removal of virus
- Ultrafiltration/Diafiltration: Concentrates and performs buffer exchange

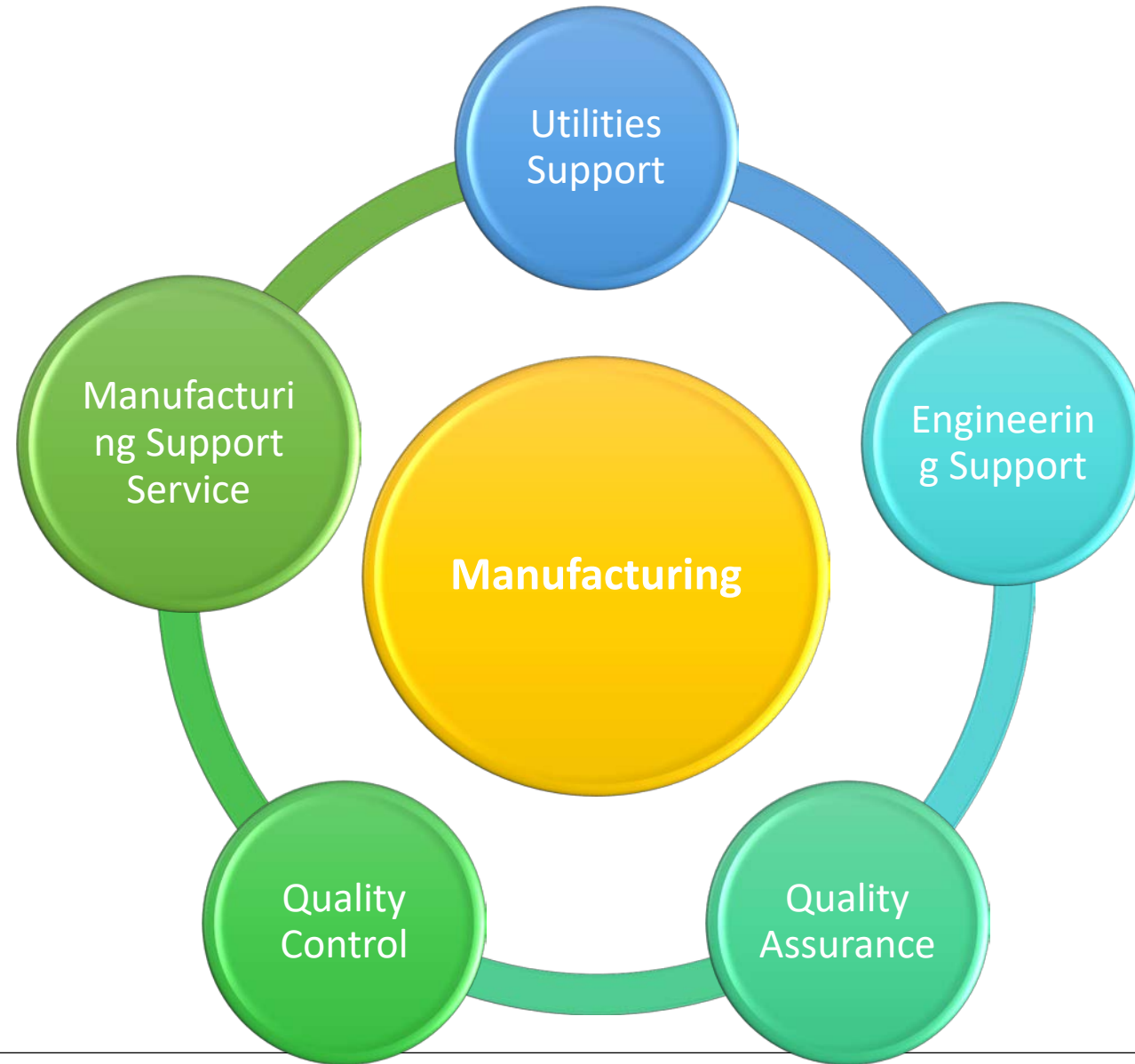
- Membrane Adsorbers

- Filters that act as a chromatography step removing residual impurities

- Other

- Chemical viral inactivation

What Makes A Facility Tick?



Areas of Focus

Therapeutic areas

Oncology



Immunoscience



Cardiovascular



Fibrosis



Drug platforms

Antibody-drug
conjugates



Cell therapy



Drug delivery
technology



Biologics



Epigenetics



Gene therapy



RNA
oligonucleotides



Millamolecules



Protein
homeostasis

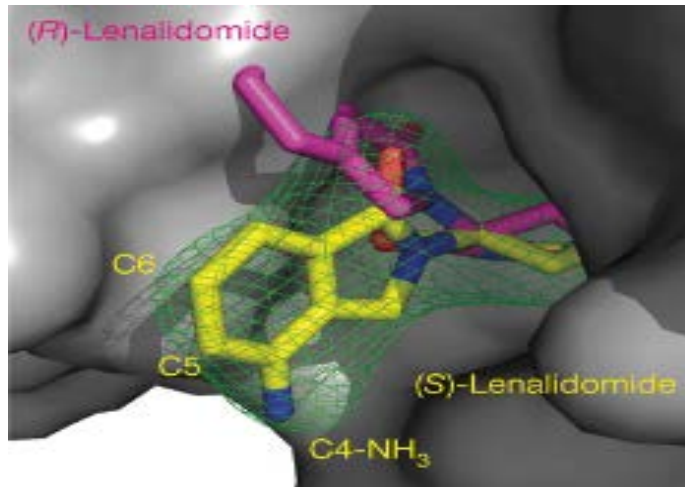


Small
molecules



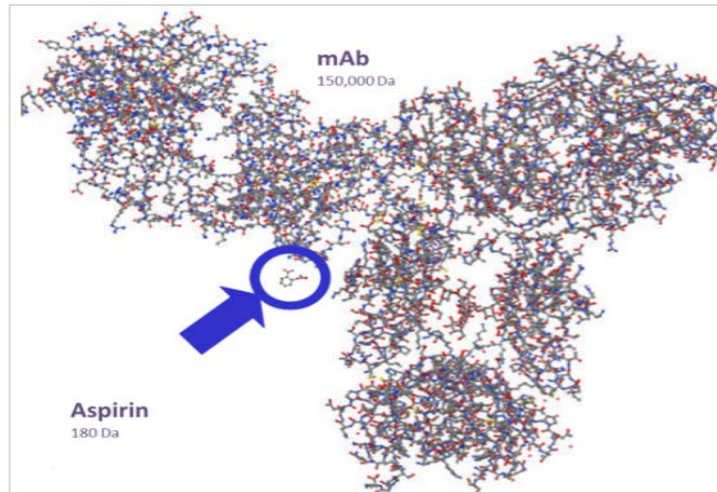
CAR T-cell Therapy Represents a Change in Paradigm

Pillar I: Small Molecule Drugs



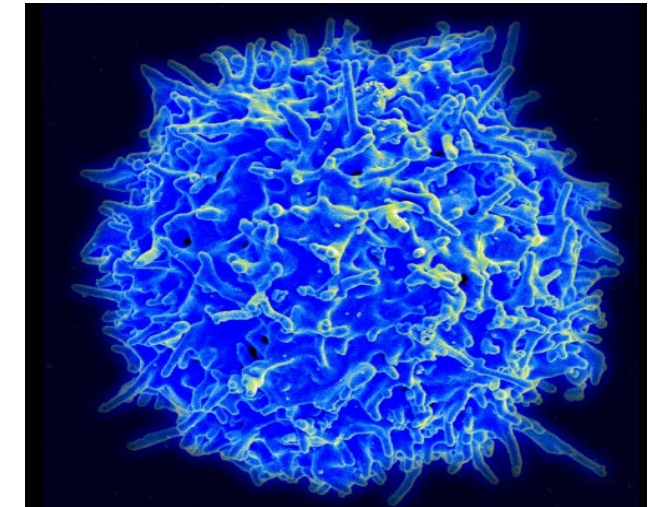
- Chemical synthesis
- Focused on specific targets

Pillar II: Biologics



- Biomanufacturing of large, complex molecules
- Produced using recombinant DNA technology

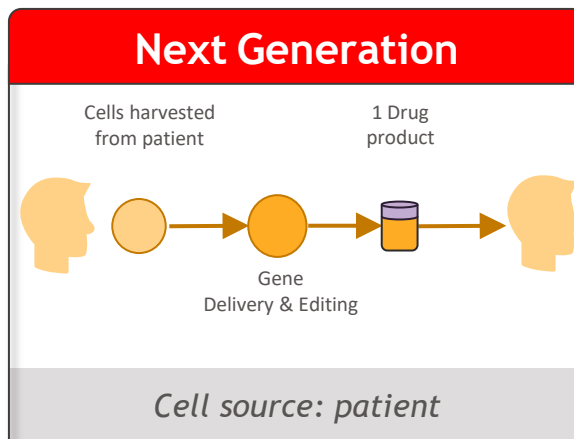
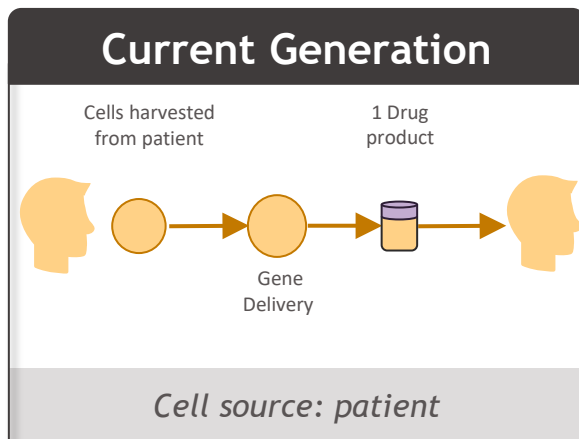
Pillar III: Cell & Gene Therapy



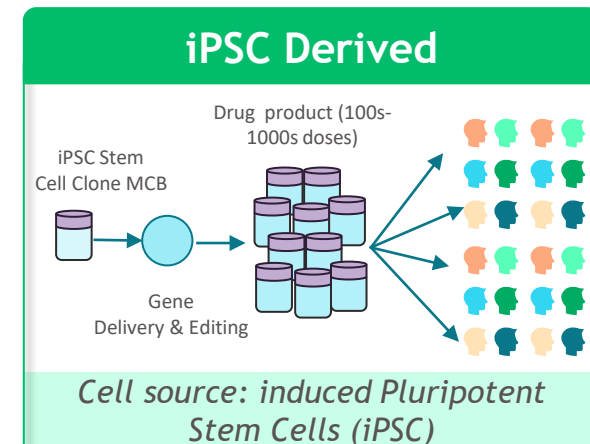
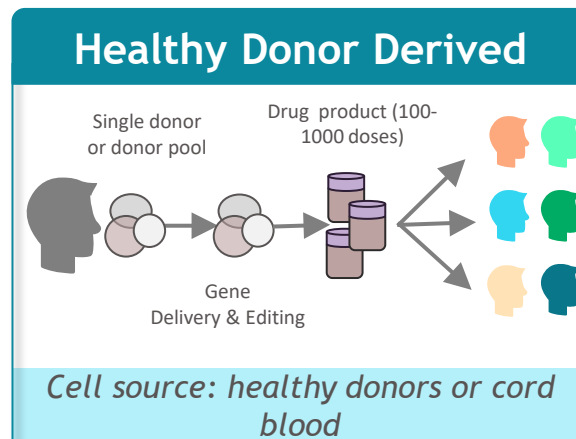
- Regenerative therapy
- Manufacturing using cellular/molecular biology for cell products

Multiple cell therapy platforms are being developed with off-the-shelf platforms addressing many autologous limitations

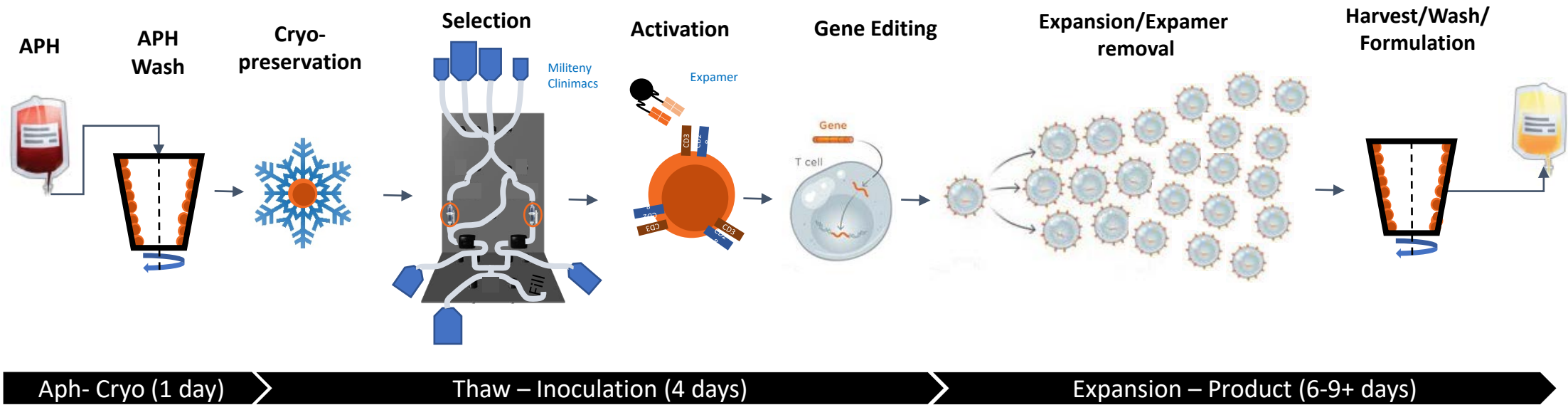
Autologous



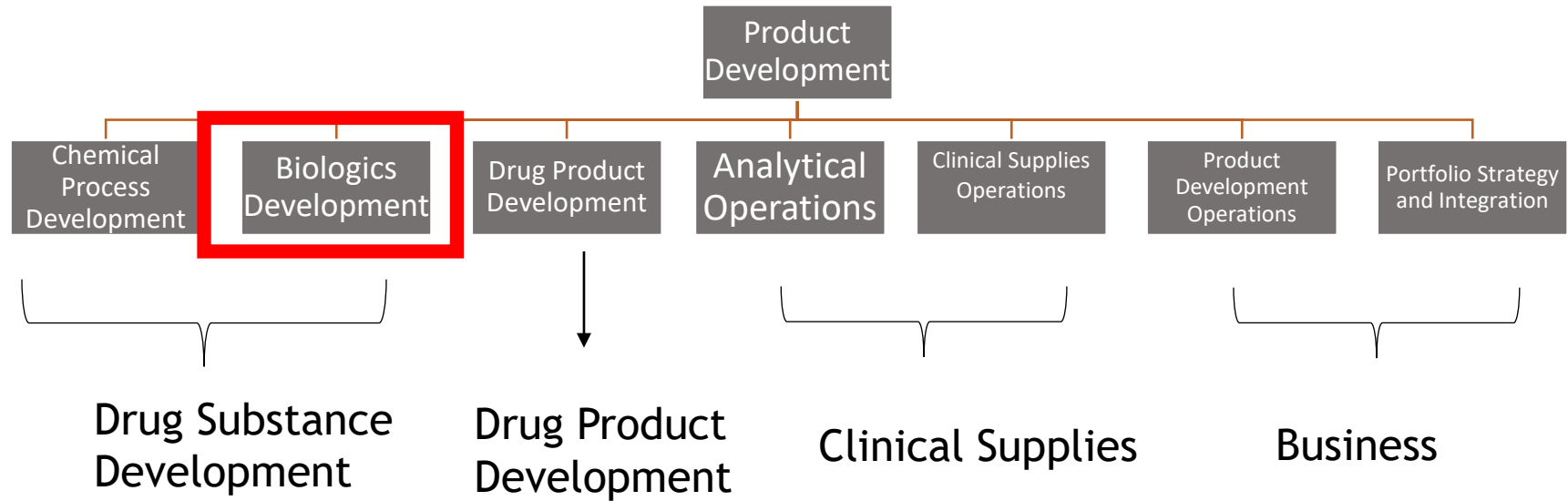
Off-the-shelf



CAR-T Drug Product Manufacturing Process



Product Development



Vision Statement

Develop and transfer safe, efficient and approvable Biologics DS manufacturing processes

Our Locations



Site	Core Biologics Capability
Devens, MA	<ul style="list-style-type: none">Process DevelopmentAnalytical Method DevelopmentIn-Process Analytics500L Pilot Plant
Cambridge, MA	<ul style="list-style-type: none">Analytical Development
New Brunswick, NJ	<ul style="list-style-type: none">Cell Line Development & 'OmicsProcess DevelopmentAnalytical Development
Summit West, NJ	<ul style="list-style-type: none">Cell Line Development & 'OmicsProcess DevelopmentAnalytical Development & Attribute SciencesIn-Process AnalyticsS6A 1000L FIH Facility

Additionally, BD works with both domestic and international suppliers globally

*As of August 2022

Functional Areas

Our functional areas each play an important role in developing innovative medicines that transform patients' lives

Cell Line & Upstream Process Development



Rapidly develop cell lines capable of delivering desired productivity and product quality as well as to create an end-to-end upstream development organization to support clinical development and commercialization

Global Downstream Bio-Process Development



Create an integrated, data driven, end-to-end downstream development organization capable of meeting the needs of BMS's biologics portfolio and be recognized as an industry leader in the downstream field

Biologics Analytical Development & Attribute Sciences



Develop and transfer robust, consistent, and QC friendly attribute science driven integrated control strategy and analytical methods for biologics manufacturing, characterization, and release

Biologics Process & Analytical Integration



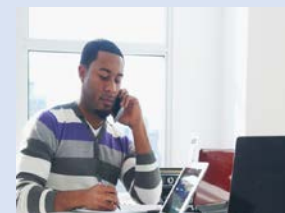
Enable speed and strategic execution across the portfolio through integration of Process and Analytical Science

Clinical Biologics Drug Substance Manufacturing



Ensure scale up, facility fit and uninterrupted supply of drug substance for clinical trials

Business Operations



Enable innovation and operational support to the Biologics Development network

Career Opportunities

- **Regulatory Related**

- Quality assurance, Regulator in Pharma Industry
- Health authority (FDA, EMA etc.), Basic Research (NIH)

- **Technical Pathway**

- **Chemist**

- Drug Discovery (medicinal/synthetic);
 - Analyst

- **Biologist/ Chemical Engineer**

- Pharmacologists
 - Biochemist
 - Pharmacometrician
 - Non-clinical development (Toxicologists)

- **Pharmacy/Pharmaceutical scientist**

- Formulation development
 - Clinical research
 - Clinical/hospital/retail pharmacists

- **Engineer**

- Safety
 - Process Chemistry
 - Drug Product Process Development
 - Statistician

- **Sales/Marketing**

QUESTIONS ??

Danielle McGrath



Education:

- B.S. Economics & History, University of Vermont 2008

Work Experience:

- Points Group:
 - Marketing Manager, Healthcare Marketing
- BMS:
 - Specialist, Human Resources Communications (Celgene)
 - Senior Recruiter, Early Career Talent Acquisition Strategy and Delivery

Current Job Function:

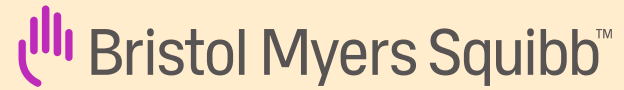
- My team executes the full cycle recruitment and management of programs for Early Career Talent Acquisition at BMS. We partner with the business to build a recruitment strategy and hire based on the function's Early Career talent needs. We develop and launch all Early Career programs including our summer internship program, co-op programs and 14 Rotational Development Programs.

Prior Job Function:

- Responsible for planning, organizing, development, and implementation of internal and external communication strategies relating to employee experience, company culture, diversity & inclusion, benefits, compensation, recruiting, talent, and executive announcements/ presentations. Works directly with New Hire Orientation materials, emerging leaders development programs and Acquisition/Merger communication materials. Managed communications and events for the 6 internal employee resource/affinity groups.



CLIMB Cultivating Leadership and Innovation
for Millennials and Beyond



We're inspired by a single vision:

Transforming patients' lives
through science™





Our mission

To discover, develop
and deliver innovative
medicines that help
patients prevail over
serious diseases



Our values

INTEGRITY

We demonstrate ethics, integrity and quality in everything we do for patients, customers and colleagues

PASSION

Our dedication to learning and excellence helps us to deliver exceptional results

INNOVATION

We pursue disruptive and bold solutions for patients

ACCOUNTABILITY

We all own BMS' success and strive to be transparent and deliver on our commitments

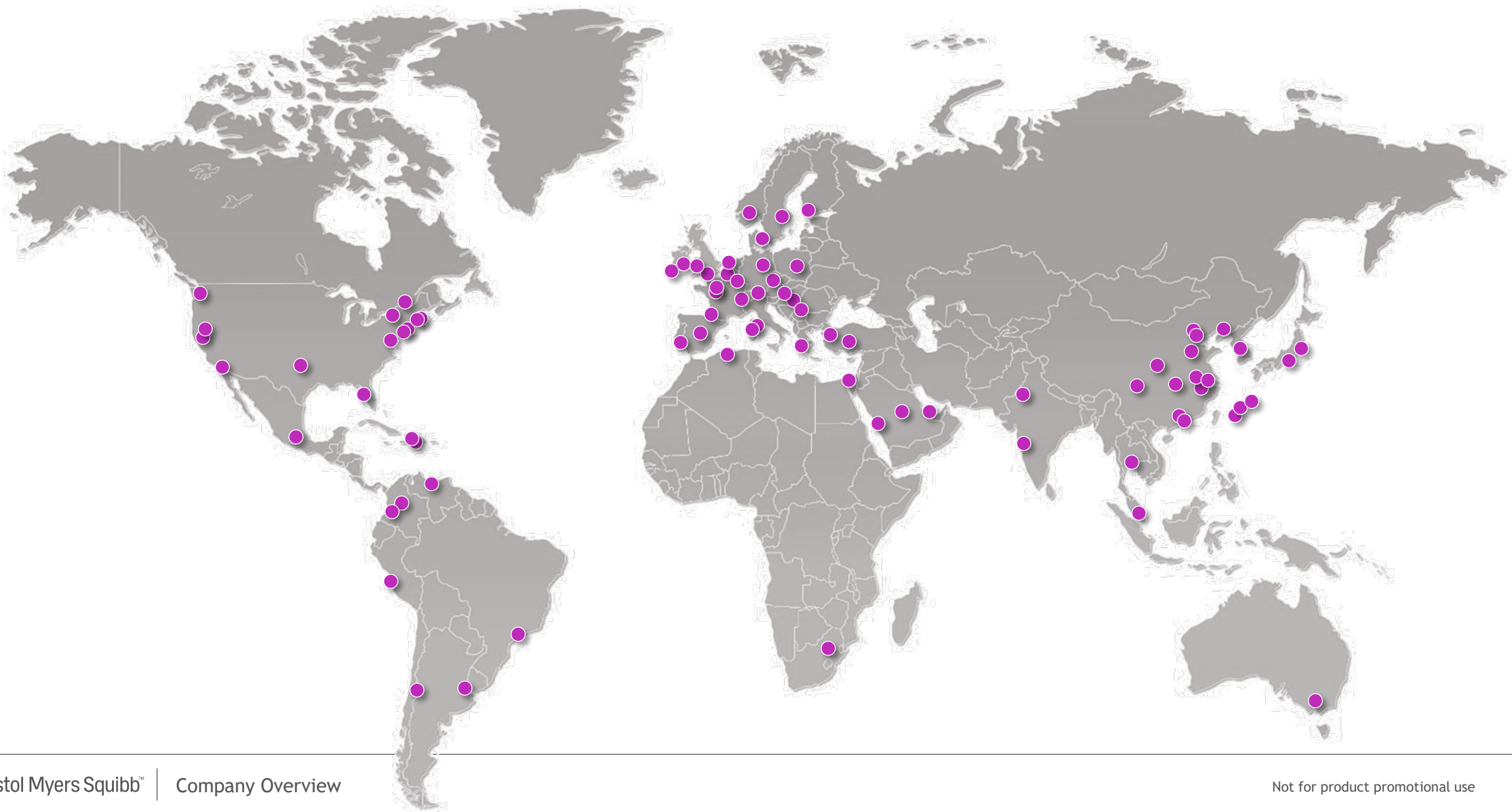
URGENCY

We move together with speed and quality because patients are waiting

INCLUSION

We embrace diversity and foster an environment where we can all work together at our full potential

Our Global Presence



Bristol Myers Squibb at-a-Glance



Giovanni Caforio, MD

Chairman of the Board and
Chief Executive Officer



Business

Biopharmaceuticals



Global Employees

Over 32,000






[View Quarterly Results](#)

In 2021:

\$46.4B ▲ **9%** Total Sales

\$11B Invested in R&D

Largest Selling Products

	Net Sales \$ in Billions	Vs. Prior Year	Therapeutic Area
 <small>(lenalidomide) capsules</small>	\$12.8	▲ 6%	Hematology
 <small>apixaban</small>	\$10.8	▲ 17%	Cardiovascular
 <small>(nivolumab) INJECTION FOR INTRAVENOUS USE 50mg/5mL</small>	\$7.5	▲ 8%	Immuno-Oncology
 <small>(abatacept)</small>	\$3.3	▲ 5%	Immunology
 <small>(pomalidomide) capsules</small>	\$3.3	▲ 9%	Hematology

A leading patient-focused biopharmaceutical company

Leading Products across Four Therapeutic Areas

Solid Tumor Oncology



Hematology



Cardiovascular



Immunology



Deep and Broad Late-stage Pipeline

9 Recent/potential near-term new product launches



Additional expansion opportunities across multiple assets

Robust Early-stage Pipeline*

>50 assets

Across leading drug discovery platforms:

- Small molecules
- Protein homeostasis
- Biologics
- Cell & gene therapy

*Phase I / II Assets

Cutting edge technologies and discovery platforms



Chemistry



Biologics



Cell Therapy

with access to additional modality platforms through strong external partnerships

Patient-Centric Innovation

Research & Development

Discovering & developing
for patients

50+ Investigational
Therapies

Oncology

Hematology

Cardiovascular

Immunology

Fibrotic Diseases

Neuroscience

Capabilities

- Biologics
- Cell Therapy
- Small Molecule
- Protein Homeostasis

Areas of focus

Pipeline



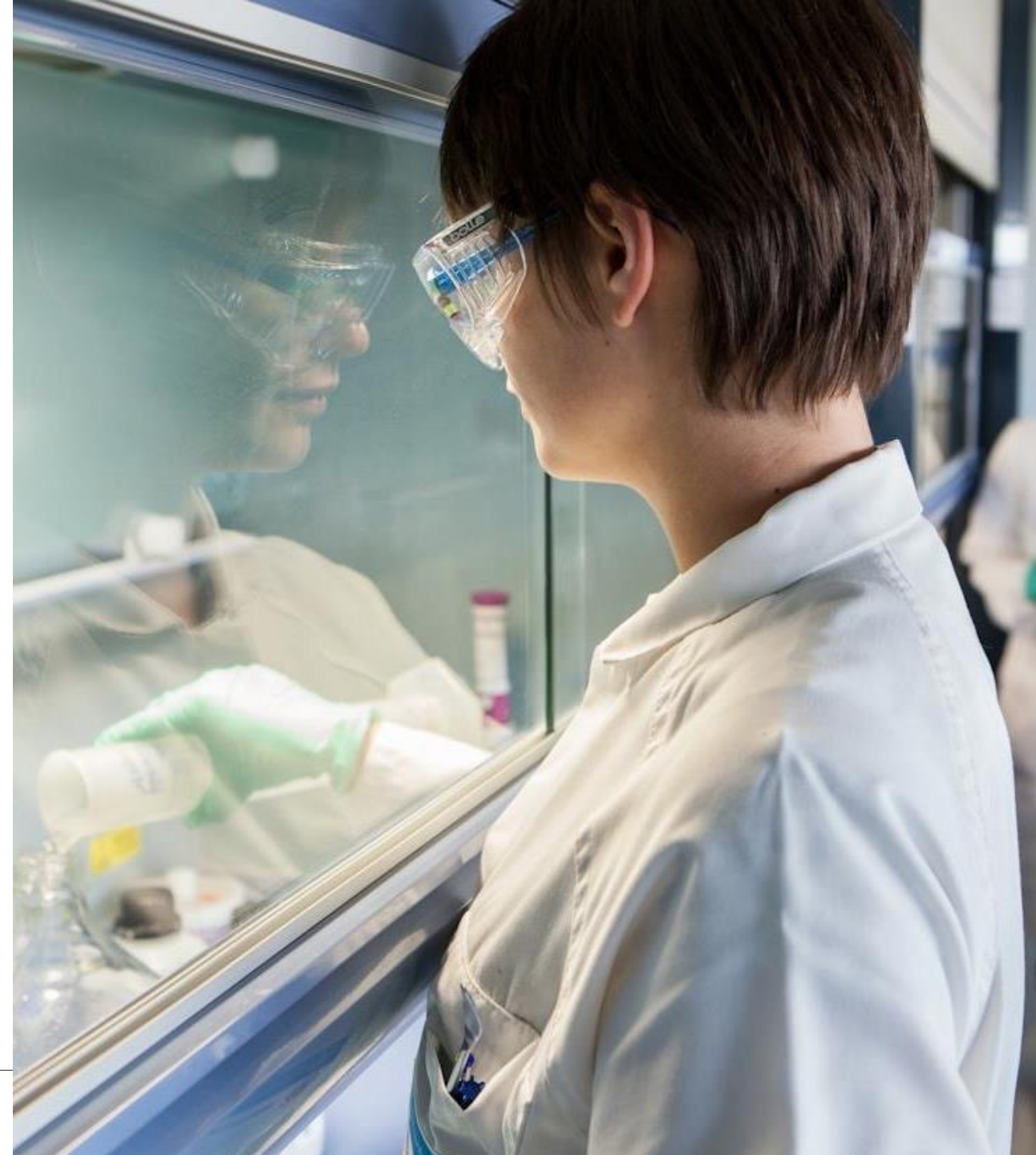
Global Product Development and Supply

Advancing the company pipeline

19 Manufacturing and Development Sites around the world

Capabilities

- Biologics
- Cell Therapy
- Small Molecule
- Product Development



Commercialization

Driving market performance

FY 2021 Sales

\$46.4B ▲ 9%

Four franchises

Oncology

Hematology

Cardiovascular

Immunology





\$150M

Investment to address health disparities; supplier diversity; clinical trial diversity and workforce representation

\$1.0B

By 2025, \$1 billion in global spend with Black/African American and other diverse owned businesses



\$150M

Commitment to address health disparities

Train and develop

250

new clinical trial investigators



Innovating for change

Our vision is a world where access to quality healthcare doesn't depend on who you are or where you live.

Our passion is working with our grantees to bridge the divide that separates people from equitable healthcare.

[BMS Foundation](#)



Global HOPE

Hematology-Oncology Pediatric Excellence

- Launched in 2017 with \$50 million commitment
- First comprehensive program to treat children with cancer and blood disorders and to train health care professionals in Southern and East Africa
- Trained more than 3,500 health professionals and treated nearly 9,000 children so far

[Global Hope](#)



*“Our goal is and must continue to be that no child - anywhere in the world - should die from cancer. But at a minimum, **all children should have the same fighting chance.**”*

- Giovanni Caforio

People & Business Resource Groups

Driving Business Results in Talent Management, STEM education, Business Insights, Diversity in Clinical Trials, Corporate Reputation and Community Responsibility

Over 13,000 members in 43 countries



B-NOW Bristol Myers Squibb
Network of Women

PRIDE Alliance

PAN Pan Asian
Network

DAWN Disability Advancement
Workplace Network

CLIMB Cultivating Leadership and Innovation
for Millennials and Beyond

BOLD Black Organization for
Leadership and Development

OLA Organization for
Latino Achievement

VCN Veterans Community
Network

PBRGs

Environmental, Social and Governance



In 2020, we developed our ESG strategy and reinforced our commitment to Health Equity, Diversity and Inclusion and Environmental Responsibility through the creation of bold new targets for our business.

[View our report and commitments here](#)

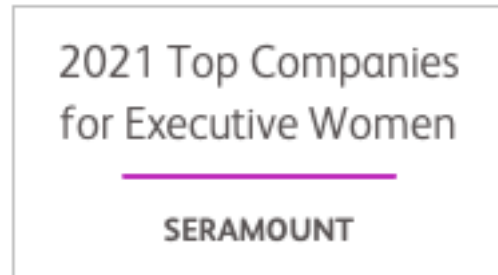
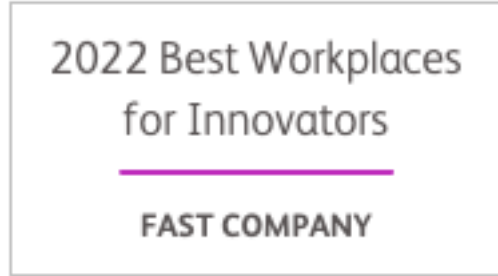
Our patients
are at the center
of everything we do.

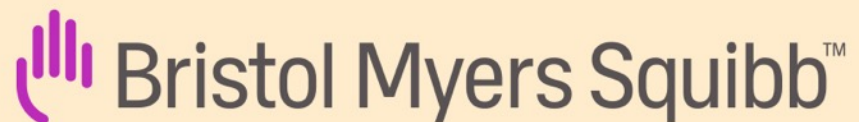
We are inspired by our patients,
whose courage and determination
to prevail never ceases to amaze us.

Who are *you* working for?



A Great Place to Work





“We come to work each day driven by our mission, acting with a sense of urgency for our patients and their families, because there is still so much more to do.”

Giovanni Caforio, M.D.

Board Chair and Chief Executive Officer



Internships

10-12 week summer experiences.

Opportunities in all Bristol Myers Squibb functional areas.

Applications accepted
September – January

Co-Ops

Six month programs
(January – June or July – December)

Opportunities in Biologics; Chemistry; Discovery; Engineering; Environmental, Occupational, Safety & Sustainability; Manufacturing; North America Capability Center; Procurement; Quality; Supply Chain; Technology.

Applications accepted
September – November

Development Programs

Full-time programs for Bachelor's, Master's and MBA graduates.

Opportunities in Accounting; Business Insights & Analytics; Cell Therapy Development & Operations; Commercial; Corporate Security; Environmental, Occupational, Safety & Sustainability; Finance; Global Product Development & Supply; Human Resources; Law Department; Philanthropy; Procurement; Technology

Applications accepted
November

Opportunities Nationwide

New Jersey; Devens, MA; Cambridge, MA; Syracuse, NY; New York City; Seattle, WA; Bothell, WA; Tampa, FL; Phoenix, AZ; San Diego, CA; Bay Area, CA; Puerto Rico.

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Sexual Orientation/Gender Identity. ©2022 Bristol-Myers Squibb Company. All rights reserved. 2/22



Global Drug Development (GDD) Academy

Accelerate your career

careers.bms.com

Advance Your Career.

Transform your education and experience into fast-track career growth by joining a high performance culture where every voice counts. Join us and use your education, experience, curiosity, critical thinking and leadership to make a difference every day.

Requirements for the GDD Academy include:

- MD, Ph.D., or equivalent advanced degree of relevance
- 3-5+ years of relevant experience in the drug development process
- Leadership experience in academic or industry setting, including education where applicable
- Expertise in the early and/or late development space, matrix team leadership, relevant regulatory perspective and overall drug development principles
- Strong leadership skills/potential with proven ability to lead and work effectively in a team environment



Enhance Your Skills.

Dynamic people drive innovation. At Bristol Myers Squibb, you will hone and enhance your skills as you advance in your career. During the 2-year program, you will gain exposure to one of our main functional groups:

- 8 Month Rotations: Clinical Development, Regulatory and Safety
- 6 Month Rotations: GDO, Biometrics, Medical and one more optional area

Gain Vital Experience.

Upon completion, each participant will gain valuable drug development experience, contribute meaningfully to on-going development projects and teams through challenging assignments, learning opportunities and networking across the company.

Relevant rotation experiences may include: contributing to the selections of new indications, working on clinical development and regulatory strategies, clinical trial design & execution, and interactions with health authorities.

Participants will have executive mentors, learning and networking sessions to accelerate their personal and professional development and help prepare for senior leadership roles in the company.

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Bristol Myers Squibb Mentorship Program

Applications are now open!

APPLY HERE!



Sign Up Now!

- Apply by February 14th
- Program cycle: March - December 2022
- Survey to understand your desired goals and growth areas

Who Should Apply?

- Junior or senior in college
- Graduate student expected to graduate in 2022
- Postdoctoral fellow



Serving Humanity

Patients are at the center of everything we do. They inspire us. They are the reason we come to work each day.



Powered by People

Our inclusive culture encourages all to pursue innovative ideas, develop leadership capabilities and gain valuable, diverse experiences to shape exciting careers.



Work with Purpose

At BMS, our inspiring work and career options give you the opportunity to learn and grow professionally with talented and passionate colleagues.



To learn more about BMS, visit our website at careers.bms.com.

Bristol-Myers Squibb Company is an Equal Opportunity Employer - M/F/Veteran/Disability/Sexual Orientation/Gender Identity.



Helpful Links

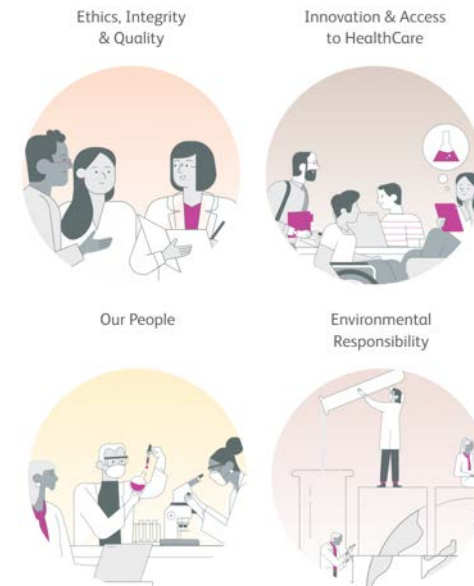
[Global D&I Report](#)



[Global Access Report](#)



[Sustainability Resources](#)



[History Timeline](#)



[Annual Report](#)



QUESTIONS ??

CLIMB NBR Welcomes You to an Afternoon of Networking, Speaker Sessions, & NBR Site Tours

THURSDAY SEPTEMBER 15th, 2022
1:30PM - 5:00PM

1:45 - 2:15 PM	Pharma Drug Development Overview with speaker Jonathan Romero • NBR-111-208
2:15 - 2:45 PM	HR/Talent Acquisition Overview with speaker Danielle McGrath • NBR-111-208
3:00 - 3:45 PM	Social Networking Session • NBR Cafeteria
4:00 - 4:45 PM	Lab Tours in Building 50

Bristol Myers Squibb Mentorship Program

Applications are now open!

APPLY HERE!



Sign Up Now!

- Apply by February 14th
- Program cycle: March - December 2022
- Survey to understand your desired goals and growth areas

Who Should Apply?

- Junior or senior in college
- Graduate student expected to graduate in 2022
- Postdoctoral fellow



Serving Humanity

Patients are at the center of everything we do. They inspire us. They are the reason we come to work each day.



Powered by People

Our inclusive culture encourages all to pursue innovative ideas, develop leadership capabilities and gain valuable, diverse experiences to shape exciting careers.



Work with Purpose

At BMS, our inspiring work and career options give you the opportunity to learn and grow professionally with talented and passionate colleagues.



To learn more about BMS, visit our website at careers.bms.com.

Global Drug Development (GDD) Academy

Accelerate your career

careers.bms.com

Advance Your Career.

Transform your education and experience into fast-track career growth by joining a high performance culture where every voice counts. Join us and use your education, experience, curiosity, critical thinking and leadership to make a difference every day.

Requirements for the GDD Academy include:

- MD, Ph.D, or equivalent advanced degree of relevance
- 3-5+ years of relevant experience in the drug development process
- Leadership experience in academic or industry setting, including education where applicable
- Expertise in the early and/or late development space, matrix team leadership, relevant regulatory perspective and overall drug development principles
- Strong leadership skills/potential with proven ability to lead and work effectively in a team environment



Enhance Your Skills.

Dynamic people drive innovation. At Bristol Myers Squibb, you will hone and enhance your skills as you advance in your career. During the 2-year program, you will gain exposure to one of our main functional groups:

- 8 Month Rotations: Clinical Development, Regulatory and Safety
- 6 Month Rotations: GDO, Biometrics, Medical and one more optional area

Gain Vital Experience.

Upon completion, each participant will gain valuable drug development experience, contribute meaningfully to on-going development projects and teams through challenging assignments, learning opportunities and networking across the company.

Relevant rotation experiences may include: contributing to the selections of new indications, working on clinical development and regulatory strategies, clinical trial design & execution, and interactions with health authorities.

Participants will have executive mentors, learning and networking sessions to accelerate their personal and professional development and help prepare for senior leadership roles in the company.

Early Career Program Opportunities

careers.bms.com

At Bristol Myers Squibb, each one of us is dedicated to our mission of discovering, developing and delivering innovations that help patients overcome serious diseases. When you join Bristol Myers Squibb, you become part of our bold vision to transform patients' lives through science.



Internships

10-12 week summer experiences.

Opportunities in all Bristol Myers Squibb functional areas.

Applications accepted
September – January

Co-Ops

Six month programs
(January – June or July – December)

Opportunities in Biologics; Chemistry; Discovery; Engineering; Environmental, Occupational, Safety & Sustainability; Manufacturing; North America Capability Center; Procurement; Quality; Supply Chain; Technology.

Applications accepted
September – November

Development Programs

Full-time programs for Bachelor's, Master's and MBA graduates.

Opportunities in Accounting; Business Insights & Analytics; Cell Therapy Development & Operations; Commercial; Corporate Security; Environmental, Occupational, Safety & Sustainability; Finance, Global Product Development & Supply, Human Resources, Law Department; Philanthropy; Procurement; Technology

Applications accepted
November

Opportunities Nationwide

New Jersey; Devens, MA; Cambridge, MA; Syracuse, NY; New York City; Seattle, WA; Bothell, WA; Tampa, FL; Phoenix, AZ; San Diego, CA; Bay Area, CA; Puerto Rico.