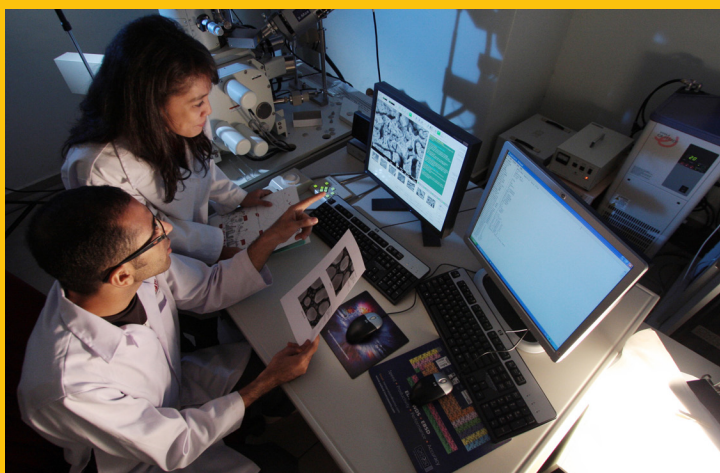




Mapping Your Future in Maryland



A Bright Future

Why Maryland?

Maryland is home to premiere bio/medical schools and facilities alongside nearly all of the nation's most critical federal research agencies. It is a fertile breeding ground for new exciting start-ups as well as an established environment for biotechnology, pharmaceutical and research tools players.

Why Biotechnology?

Biotechnology is one of Maryland's more exciting and faster growing industries. A job in biotechnology can lead to a career in biotechnology. The industry offers multiple career paths from entry level to senior level positions. Career paths may follow an emphasis on science or branch into any of several business functions.

Why Career Mapping?

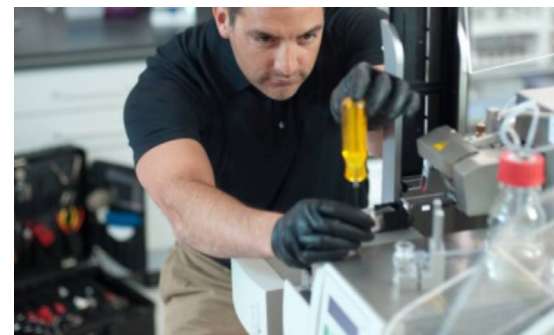
Career mapping is a "grid map" that lists jobs within an industry and outlines their required qualifications for employment. This visual overview provides information about career opportunities available in Maryland's biotechnology industry and the education and experience needed for career advancement or entry into a particular occupation.

Who Uses Career Maps?

Anyone can benefit from career mapping. Whether you have yet to attain your high school diploma/GED or have a college degree, career maps provide a pathway to rewarding careers in biotechnology. If you are already employed and want to advance or move into another biotechnology occupation, mapping will give you the basics- job duties and education requirements.

How do you Navigate Career Maps?

There are six career tracks- research and development, quality systems, manufacturing and operations, clinical studies, sales and technical support, and non-science positions. There are a series of educational steps as you read from left to right across the map. Generally education, experience and salary increase as you move left to right to higher educational degrees that appear across the top of the page. Within a given degree (column), there may be an increase in the experience and education/training required as you move from the top to the bottom of the page, although this is not



biotechnology



This career map provides navigation into the biotechnology industry and the beginnings of a vibrant and interesting career in one of Maryland's faster growing industries.



Hands-on experience is highly valued in the biotechnology industry. Applicants that have relevant experience and less formal education may compete well with those with higher education levels and little experience.

For those with advanced training or experience in the biotechnology business, an expanded career map with more positions can be found on the online career map hosted by BioBuzz (www.biobuzz.net).

Job titles, position descriptions and requirements may differ from employer to employer. For example, one company's Research Associate position may have different requirements than another company. To create this career map, similar positions were compiled and a "typical" job title, position description and requirements were created.

For careers in health care, visit the Baltimore Alliance for Careers in Healthcare at www.baltimorealliance.org. or call 443.931.3076.

Partners

Training Resources

There are numerous training resources available to those seeking a career in biotechnology and to those looking to expand their career through new skills and experiences.



www.montgomerycollege.edu/biotech

Montgomery College's biotechnology program, the largest in the State of Maryland, prepares students for a position in the biotechnology industry. Professors design curriculum and courses with input from local biotechnology professionals. Students may earn an A.A.S., Biotechnology or two Certificates in Biotechnology or Biomanufacturing.



www.biotrain.org

Advance your life science career with courses, workshops and seminars from BIOTrain. Choose from programs that enhance basic work skills, industry relevant skills or specialized technical skills. All programs are designed with biotechnology guidance and taught by industry experts. BIOTrain in partnership with Montgomery College is supported by an EARN grant from the State of Maryland.



www.BioTrac.com

Bio-Trac in partnership with Montgomery College offers graduate/post graduate level hands-on laboratory training workshops for research scientists. Courses are team taught by active researchers and innovators from leading research institutes and private industry. Bio-Trac courses deliver instruction on current research methodologies.



www.biotechmd.org

The BioTechnical Institute of Maryland, Inc. (BTI) offers specialty scientific training and placement assistance for entry-level technicians in Maryland's rapidly expanding biotechnology industry. A combination of classroom instruction, hands-on training and on-the-job work experience enables BTI's successful graduates to realize employment options and new careers.





Maryland Biotechnology Career Opportunities

Increasing Levels of Education/Training Required

HS	AA	BS	MS+
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Glasswasher
DUTIES: Washes and dries glassware and distributes it to appropriate locations within the laboratories. May involve using industrial equipment including an autoclave.
REQUIREMENTS: 0-2 yrs. laboratory experience.

Lab Animal Handler
DUTIES: Provides daily care of animals for experimental purposes. Cleans cages and racks. Maintains detailed records and documents.
REQUIREMENTS: Scientific background and 0-2 yrs. relevant laboratory experience. AALAS certification is required; some employers offer AALAS training after hire.

Greenhouse Technician
DUTIES: Performs tasks and protocols in the greenhouse to support scientific experimentation involving plants. Makes detailed observations, detects and cures horticultural or pest problems. Collect, records, and analyzes data, and assists in the interpretation of results.
REQUIREMENTS: 0-2 yrs relevant greenhouse/plant experience.

Biorepository Technician
DUTIES: Facilitates the daily operation of the biorepository, which includes management of inventory, processing, distribution, storage, and disposition of biological materials.
REQUIREMENTS: 0-2 yrs. relevant experience.

Cell Culture Technician
DUTIES: Performs a variety of laboratory tasks and techniques, following protocols, making observations and recording data. Maintains an experimental notebook and may provide summaries regarding experiments.
REQUIREMENTS: 0-2 yrs. related experience.

Clinical Data Assistant
DUTIES: Responsible for the entry and formatting of clinical data from investigative sites for statistical purposes.
REQUIREMENTS: 0-2 years data entry experience.

Clinical Administrator
DUTIES: Develops internal record keeping system(s), including maintaining and auditing data and providing status and activity reports as required. Responsible for data entry and validation to ensure legibility, completeness, and consistency of data. Assists users with requests for clinical documents and works with physicians and/or their staff to clarify any questionable information. Audits internal patient files and studies, and assists with the development and evaluation of clinical record documents.
REQUIREMENTS: 0-2 yrs. related experience.



Packaging Operator
DUTIES: Uses packaging systems to label, inspect, and package final products to comply with regulatory requirements. Enters data, prints computer-generated labels and maintains records. Performs initial checks of completed documents for completeness and accuracy.
REQUIREMENTS: 0-2 yrs. experience in a manufacturing environment.

Shipping & Receiving Technician
DUTIES: Records all materials shipped and received by a company. Pulls, packs and stages orders for delivery, ensuring order details and product integrity. Verifies incoming materials, maintains inventory levels and identifies losses.

Aseptic Fill Technician
DUTIES: Aseptic fill procedures in manufacturing processes.
REQUIREMENTS: 0-2 yrs. experience.

Environmental Technician
DUTIES: Water/air sampling and monitoring, processing permits, calibration and maintenance of scientific monitoring, data collection, and routine analysis. Records and maintains periodic data logs and information files.
REQUIREMENTS: Some specialized training.

Manufacturing Technician
DUTIES: Manufactures and packages products. Operates small production equipment to weigh, measure and check raw materials. Ensures manufactured batches contain the proper ingredients and quantities. Maintains records and production areas to comply with regulatory requirements.
REQUIREMENTS: 3+ yrs. training or experience.

Receptionist
DUTIES: Operates telephone system, greets visitors and supports clerical activities.

Administrative Assistant
DUTIES: Responsible for a wide variety of general administrative duties including filing, photocopying, preparing correspondence, maintaining calendars, coordinating video conferencing and teleconferencing, making travel arrangements and managing itineraries.
REQUIREMENTS: 0-2 yrs. experience varied administrative and support experience.

Bookkeeper
DUTIES: Executes tasks related to accounts payable imprest accounts and payroll.
REQUIREMENTS: 0-2 yrs. experience in accounts payable.

Lab Animal Technician
DUTIES: Responsible for the health and welfare of animals for experimental purposes. Coordinates with vendors and investigators conducting the research projects. Oversees procurement of animals and supplies. Develops standard operating procedures and maintains records compliant with regulatory requirements.
REQUIREMENTS: 0-2 yrs. relevant experience. AALAS certification is required; some employers offer AALAS training after hire.

Media Prep Technician
DUTIES: Prepares media and solutions used in labs following established standards and work instructions. Maintains detailed records for batches prepared.
REQUIREMENTS: Science degree and 0-2 yrs. related experience.

Laboratory Assistant
DUTIES: Performs a variety of laboratory tasks and techniques, following protocols, making observations and recording data. Maintains an experimental notebook and may provide summaries regarding experiments.
REQUIREMENTS: Science degree and 0-2 yrs. laboratory experience.

Quality Documentation Associate
DUTIES: Clerical and administrative support to the documentation system. Coordinates the review and revision of procedures, specifications, forms, etc.
REQUIREMENTS: 0-3 yrs. experience.

Validation Technician
DUTIES: Compiles and analyzes validation data, prepares reports, and makes recommendations for changes and/or improvements.

May investigate and troubleshoot problems and determine solutions. Maintains appropriate validation documentation and files.
REQUIREMENTS: 0-2 yrs. related experience.

Quality Control Technician
DUTIES: Performs a wide variety of inspections, checks, tests and sampling procedures for the manufacturing process according to Standard Operating Procedures (SOP). Performs in-process inspection and documents results. Monitors critical equipment and instrumentation. Writes and updates inspection procedures and checklists as necessary.
REQUIREMENTS: 0-2 yrs. experience with quality control systems. BS degree with additional experience is desirable.

Facilities Technician
DUTIES: Daily monitoring, repair, and preventative maintenance on facilities, systems and equipment.
REQUIREMENTS: Completion of technical school and/or knowledge and aptitude in major trades.

Instrument/Calibration Technician
DUTIES: Performs maintenance, testing, troubleshooting and repair of analytical equipment and instrumentation to comply with regulatory requirements. Maintains logs and required documentation.
REQUIREMENTS: Electronics technology degree with 2 yrs. related experience.

Customer Service Representative
DUTIES: Ensures product delivery in accordance with customer and manufacturing capabilities and for responding to customer product inquiries and satisfaction issues.
REQUIREMENTS: Technical or Scientific field degree desired.

Technical Support Representative
DUTIES: Provides technical direction and support to customers on the use and maintenance of company products. Serves as a contact for customers on technical and service-related problems.
REQUIREMENTS: 2+ yrs. relevant experience. BS degree desired.

Buyer
DUTIES: Responsible for obtaining materials, scientific equipment, and services. Checks requisitions, obtains price quotations, examines bids, and awards contracts. A buyer develops new supply sources where vendors and suppliers are inadequate. Ensures the quality, integrity and value of the purchase.
REQUIREMENTS: 0-2 yrs. experience in purchasing, preferably in a scientific area. Scientific discipline degree desired.

Systems Analyst
DUTIES: Responsible for the all operating system software, performing upgrades, and maintaining related system and user documentation. Assists in the implementation of system validation and documentation.
REQUIREMENTS: 2 yrs. related experience.

Human Resources Representative
DUTIES: Responsible for a variety of activities in personnel administration, including employment, compensation and benefits, employee relations, equal employment opportunity, and training programs. Conducts job interviews, counsels employees, maintains records, and conducts research and analyzes data on assigned projects.
REQUIREMENTS: 2 yrs. related experience.

Technical Recruiter
DUTIES: Responsible for recruiting, interviewing, and screening applicants for technical exempt and nonexempt positions. Coordinates employment physicals, travel, reporting dates, security clearances, and employment processing for new hires.
REQUIREMENTS: 2 yrs. experience.

Patent Agent
DUTIES: Responsible for preparing, filing, and processing patent applications. Negotiates and drafts patent licenses and other agreements. A patent agent also conducts state-of-the-art searches and may assist with appeal and interference proceedings.
REQUIREMENTS: 2 yrs. related experience. Registration to practice before the U.S. Patent and Trademark Office.

Research Assistant
DUTIES: Conducts research on projects independently and in collaboration with others, making detailed observations, analyzing data and interpreting results. Maintains an experimental notebook and prepares reports and protocols. Remains current with within a scientific discipline and may contribute to scientific literature.
REQUIREMENTS: 0-2 yrs. experience in a research laboratory.

Plant Breeder
DUTIES: Designs and executes plant breeding regimes in collaboration with larger research projects. Maintains an experimental notebook and prepares reports and protocols.
REQUIREMENTS: 0-2 yrs. of plant breeding experience.

Scientific Programmer
DUTIES: Designs, develops, evaluates, and modifies computer programs to solve scientific or engineering problems and support of research and development efforts. Analyzes existing systems and formulates logic for new systems. A scientific programmer analyst also devises logical procedures, prepares flow charts, performs coding, tests, and debugs programs.
REQUIREMENTS: 0-2 yrs. experience. MS degree is preferred in a related discipline.

Quality Control Analyst
DUTIES: Conducts routine and non-routine analysis of raw materials, compiles data for documentation of test procedures and reports compliance (or abnormalities) with specifications. Drafts and updates standard operating procedures and may perform special projects on problem solving.
REQUIREMENTS: Scientific discipline degree and a minimum of 0-2 yrs. experience in quality control systems.

Quality Documentation Specialist
DUTIES: Provides required documentation through a documentation system. Ensures accuracy and completeness, performs daily filing, and organizes contents. Tracks batch records and other documentation. Maintains and updates the document control and tracking databases. Coordinates the review and revision of procedures, etc.
REQUIREMENTS: Up to 3 years of experience.

Quality Control Engineer
DUTIES: Develops, applies, revises, and maintains quality standards for processing materials into partially finished or finished products. Designs and implements methods and procedures for inspecting, testing, and evaluating the precision and accuracy of products and prepares documentation for inspection testing procedures. May ensure conformance to in-house specifications and good manufacturing practices and may conduct training programs.
REQUIREMENTS: Degree in a scientific discipline and 2 yrs. experience in quality control systems.

Quality Assurance Auditor
DUTIES: Responsible for performing audits of production and quality control. Ensures compliance to in-house specifications, standards, and good manufacturing practices.
REQUIREMENTS: Degree in a scientific discipline and 2 yrs. experience in biological or pharmaceutical manufacturing.

Validation Engineer
DUTIES: Responsible for calibrating and validating equipment and systems and for assisting in the selection, specification, and negotiation of competitive pricing of equipment. Maintains all of the documentation pertaining to qualification and validation and serves as an information resource for validation technicians, contractors, and vendors.
REQUIREMENTS: 0-2 yrs. related experience.

Clinical Research Associate
DUTIES: Responsible for the overall direction of clinical research projects including design, planning and implementation. Evaluates and analyzes clinical data and coordinates activities of associates to ensure compliance with clinical protocol and overall objectives. May travel to field sites to supervise and coordinate clinical studies. Remains current on FDA regulatory requirements.
REQUIREMENTS: Degree in science or nursing, and 2 yrs. clinical experience in medical research, nursing, or the pharmaceutical industry.

Technical Writer
DUTIES: Responsible for writing and editing standard operating procedures, clinical study protocols, laboratory procedure manuals, work instructions and other related documents. Edits and/or rewrites various sources of information into a uniform style and language for regulatory compliance, and assists in developing documentation for instructional purposes, descriptions, reference and/or informational purposes.
REQUIREMENTS: 2 yrs. of experience in writing technical documentation.

Clinical Coordinator
DUTIES: Coordinates the clinical development plan as outlined by the company or clinical department, including defining objectives, strategy, and studies. Provides support for planning, including detailed effort estimates, scheduling, and critical path analysis. Monitors clinical activities to identify issues, variances, and conflicts, and analyze and recommend solutions. Responsible for project staffing, tracking drug supply to outside vendors, as well as providing ongoing, objective updates on progress and problems with projects, tracking and follow-up on action items.
REQUIREMENTS: Degree in health science, information technology, or business and 3-5 yrs. experience in the health care industry.

Clinical Data Specialist
DUTIES: Collaborates with various departments on the design, documentation, testing and implementation of clinical data studies. Develops systems for organizing data to analyze, identify, and report trends. Also analyzes the interrelationships of data and defines logical aspects of data sets.
REQUIREMENTS: 2 yrs. related experience.

Clinical Programmer
DUTIES: Responsible for coordinating and monitoring the flow of clinical data into the clinical database. Analyzes and evaluates clinical data, recognizes inconsistencies, and initiates the resolution of data problems. Implements data management plans designed to meet project and protocol deadlines, and consults in the design and development of clinical trials, protocols, and case report forms. Also acts as liaison between clinical management and subcommittees and project teams on an as-needed basis.
REQUIREMENTS: Entry-level position requires a BS degree but a MS degree is preferred. 2 yrs. experience in pharmaceutical programming in the clinical research area is also required.

Process Development Technician
DUTIES: Responsible for the modifications to and enhancements of existing products and processes. Involved in new product scale-up, process optimization, technology transfer and process validation, consistent with regulatory requirements.
REQUIREMENTS: 0-2 yrs. related experience.

Environmental Health & Safety Specialist
DUTIES: Responsible for developing, implementing, and monitoring industrial safety programs within an organization. Inspects plant areas to ensure compliance with Occupational Safety and Health Administration (OSHA) regulations. Evaluates new equipment and raw materials for safety, and monitors employee exposure to chemicals and other toxic substances. May also conduct training programs.
REQUIREMENTS: 2+ years related experience.

Production Planner & Scheduler
DUTIES: Plans, schedules, and coordinates products through the production cycle. Works with Customer Service, Marketing, Production, Quality Control, and Sales to review back orders, prioritize production orders, and deal with other potential schedule interruptions or rescheduling.
REQUIREMENTS: 2+ yrs. related experience.

Manufacturing Research Associate
DUTIES: Responsible for optimizing manufacturing processes and procedures for products, including packaging. Helps maintain production equipment.
REQUIREMENTS: Scientific discipline degree and 2+ yrs. experience in a manufacturing setting.

Web Assistant
DUTIES: Responsible for maintaining existing content, supporting the creation of new content and developing a look and feel that supports a positive user experience. Assists with the day-to-day activities necessary to produce and deliver web content. Gathers metadata to ensure a robust search engine.
REQUIREMENTS: 3+ yrs. relevant experience. BS degree desired.

Sales Representative
DUTIES: Responsible for direct sales of company products or services. Calls on prospective customers, provides product information and/or demonstrations, and quotes appropriate customer prices. Responsible for new account development and growth of existing accounts within an established geographic territory.
REQUIREMENTS: 2 yrs. of related sales experience and some knowledge of the company's products.

Marketing Analyst
DUTIES: Researches and analyzes a company's markets, competition, and product mix. Performs literature research, analyzes and summarizes data, and presents market, competitive and technical trends.
REQUIREMENTS: 2 yrs. of experience in market research, competitive analysis, and product planning, as well as excellent writing skills.

Product Manager
DUTIES: Leads a team charged with a product line contribution as a business unit. Manages the entire product line life cycle from strategic planning to tactical activities.
REQUIREMENTS: Degree in a scientific discipline. 3 yrs. experience in sales or marketing. MBA desired.

Marketing Manager
DUTIES: Responsible for managing all aspects of product marketing, product strategy and development, strategic planning and implementation of marketing strategies.
REQUIREMENTS: Degree in a scientific discipline. MBA with 3 yrs. experience in brand strategy in a regulated environment desired.

Systems Analyst
DUTIES: Responsible for the all operating system software, performing upgrades, and maintaining related system and user documentation. Assists in the implementation of system validation and documentation.
REQUIREMENTS: 2 yrs. related experience.

Human Resources Representative
DUTIES: Responsible for a variety of activities in personnel administration, including employment, compensation and benefits, employee relations, equal employment opportunity, and training programs. Conducts job interviews, counsels employees, maintains records, and conducts research and analyzes data on assigned projects.
REQUIREMENTS: 2 yrs. related experience.

Technical Recruiter
DUTIES: Responsible for recruiting, interviewing, and screening applicants for technical exempt and nonexempt positions. Coordinates employment physicals, travel, reporting dates, security clearances, and employment processing for new hires.
REQUIREMENTS: 2 yrs. experience.

Patent Agent
DUTIES: Responsible for preparing, filing, and processing patent applications. Negotiates and drafts patent licenses and other agreements. A patent agent also conducts state-of-the-art searches and may assist with appeal and interference proceedings.
REQUIREMENTS: 2 yrs. related experience. Registration to practice before the U.S. Patent and Trademark Office.

Education Columns

- HS: High school diploma or GED
- AA: Associate's degree (2 yr.)
- BS: Bachelor's degree (4 yr.)
- MS+: Advanced degree (MS, MA, MBA, PhD, PharmD, MD)

Career Tracks

- Research & Development
- Quality Systems
- Clinical Studies
- Manufacturing & Distribution
- Sales & Technical Support
- Non-Science Jobs

MS+

Bioinformatics Analyst/Programmer
DUTIES: Designs and develops software, databases, and interfaces for analyzing and manipulating genomic databases.
REQUIREMENTS: 2+ yrs. experience in a related discipline. Typically specialize at the graduate level.

Research Associate
DUTIES: Conducts research on projects independently and in collaboration with others, making detailed observations, analyzing data and interpreting results. Maintains an experimental notebook and prepares detailed reports, summaries, and protocols. Remains current with scientific literature and technology advances within a scientific discipline. May participate in scientific meetings and/or contribute to scientific literature.
REQUIREMENTS: 2+ yrs. of laboratory research experience.

Plant Breeder
DUTIES: Designs and executes plant breeding regimes in collaboration with larger research projects. Plans and manages resources including personnel for each project. Maintains an experimental notebook and prepares reports and protocols. May participate in the filing of patents.
REQUIREMENTS: 2 yrs. of plant breeding experience.

Laboratory Manager
DUTIES: Responsible for all operational aspects of the laboratory, including equipment, personnel, scheduling, supplies, software, documentation and safety.
REQUIREMENTS: 2 yrs. of laboratory experience.



Biostatistician
DUTIES: Works with others to define and perform analyses of databases for publications, presentations at investigator meetings, and for meetings of professional scientific and medical societies.
REQUIREMENTS: Biostatistics Degree and 3-5 yrs. related experience.

Drug Experience Coordinator
DUTIES: Handles the drug experience activities for marketed products. Provides drug information on the products. Oversees day-to-day processing of adverse event information and coordinates the receipt, classification, investigation, and processing of adverse experience reports.
REQUIREMENTS: Pharm D or equivalent in clinical training and 2 yrs. related experience.

Manufacturing Development Engineer

DUTIES: Designs the processes and identifies equipment to scale-up from the laboratory through the pilot plant and the manufacturing plant. Recommends new processes and technologies to achieve desired costs and product quality. Involved in process improvement, technology transfer, and process-validation activities.
REQUIREMENTS: Biological, chemical, or pharmaceutical engineering degree. 2+ yrs. relevant experience.

Sales Manager

DUTIES: Leads, motivates and develops a team of sales professionals through excellent coaching, professional development, recruitment of talent, performance management, and ongoing technical training.
REQUIREMENTS: Degree in a scientific discipline. 3-5 yrs. experience in sales position. MBA desired, BS entry-level.



There are a great number of job positions in the biotechnology industry.

This career map is not an exhaustive list of positions. Additional jobs can be found on the online career map hosted by BioBuzz (www.biobuzz.net).

Increasing Levels of Education/Training Required

HS	AA	BS	MS+
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