

Research Manager in Biomedical Devices

National Occupational Standard Summary



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Definition of occupation | **Research Manager in Biomedical Devices**

The Research Manager in Biomedical Devices oversees and facilitates the work of interdisciplinary research and development (R&D) teams, ensuring devices are designed, engineered, and developed on schedule and within budget. This involves the development and communication of project timelines and budgets, tracking timelines and budgets against performance measures, securing the application for research ethics, liaising with external contractors on technical matters, communicating and reporting project performance results to the director or senior management team, overseeing contractor performance to milestones and contract objectives, and ensuring compliance with standard operating procedures, engineering specifications, and legal and regulatory requirements.

The Research Manager develops and maintains a full overview of the projects, including technical, financial, and business aspects, and therefore interfaces with many parts of the organization. The Research Manager assists in the preparation and management of strategic and operating plans, budgets, and forecasts related to the organization's R&D program.

Although not necessarily involved in the day-to-day R&D activities, this position is generally held by a senior engineer who provides technical expertise and management oversight to multiple research projects. The Research Manager identifies potential project and product problems and works with key staff to identify remedies. Depending on the size of the organization, the Research Manager may be responsible for the management of the R&D team.

A Research Manager may work for a private or government organization, a research center, or an academic institution.

Level of education, training or designations requirements

Typical Education Required	Secondary	College	Bachelor	Master	PhD
Typical Starting Experience	0-5 yrs.	5-10 yrs.	10-15 yrs.	15-20 yrs.	20+ yrs.

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- PhD in biomedical, electrical, mechanical engineering, or equivalent, and at least two years of experience in a similar role
- OR master's degree with at least four years of experience in a similar role
- OR bachelor's degree with at least eight years of experience in a similar role
- Minimum of three years of management experience is recommended
- Certificate in project management or equivalent experience is an asset
- Experience in training others on scientific techniques and skills and managing students/research technicians is essential

This role works in the following subsectors:

Applicable To	Bio-Health	Agri-Bio	Bio-Industrial	Bio-Energy
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The level of complexity of the role is:

Span of Complexity Levels	Foundational	Operational	Specialist/ Management	Expert/Executive
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RESEARCH MANAGER IN BIOMEDICAL DEVICES BIO-HEALTH COMPETENCY SUMMARY

Competencies	Complexity Level Required			
	1 Foundational	2 Operational	3 Specialist/ Manager	4 Expert/ Executive
Core				
Research Ethics				
Collaboration				
Technical				
Budget Management				
Developing &/or Overseeing an R&D Program				
Leading & Managing the R&D Team				
Conducting a Feasibility Study				
Designing an R&D Project				
Planning & Implementing R&D Projects				
Usability Engineering Modeling & Design				
Data Generation & Analysis				
Managing Quality in R&D				
Digital Skills for R&D				
Liaising with Key Stakeholders and Influencers				
Knowledge Transfer				
Professional Writing for R&D				

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Competencies	Complexity Level Required			
	1 Foundational	2 Operational	3 Specialist/ Manager	4 Expert/ Executive
Industry Regulatory				
Legal/Regulatory Compliance in R&D				
Occupational Health & Safety in R&D				
Personal and Professional				
Continuous Learning				
Creative Leadership				
Critical Thinking/Decision-Making in R&D				
Effective Interpersonal Communication				
Professionalism/Emotional & Cultural Intelligence				

Core competencies

Research Ethics

Exercises integrity and professionalism to ensure all R&D is performed in a responsible manner in keeping with the ethical principles of beneficence and nonmaleficence.

Collaboration

Works effectively with others to foster trust and cooperation in the achievement of R&D goals and project objectives.

Technical competencies

Budget Management

Establishs, tracks, and manages budgets for the team/project, laboratory/department, and/or organization to ensure sound fiscal responsibility with designated funds.

Developing &/or Overseeing an R&D Program

Defines the focus and strategy of the laboratory/organization's R&D program, determines which projects will be included in the program, generates funding to support the program, and oversees the program from inception to commercial development, if applicable.

Leading & Managing the R&D Team

Applies positive leadership and performance management principles and practices to foster high performing research and development teams.

Conducting a Feasibility Study

Conducts a feasibility study—including a thorough literature review; analysis of market, technical, and economic viability; environmental, safety, and permitting considerations; and performance of preliminary experiments if required—to minimize the likelihood of error, manage costs, and determine the probability of success of commercialization of a research venture.

Designing an R&D Project

Defines the parameters and specifications of a research/development project, including the project scope, objectives, goals, resource requirements, project timeline, and budget. Also designs the experiments, identifies the testing and validation methodologies that can be employed to create a manageable research/development project, and takes the application, translation, and scale-up of research discoveries/results into consideration during the design phase, if applicable.

Planning & Implementing R&D Projects

Prepares a deliverable-oriented work breakdown structure that details milestones, resources, schedules, and budgets for the planned project outcomes. Also develops a risk management plan, manages activities, provides project updates, and oversees project close-out to ensure project outcomes are delivered on time and in budget.

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Usability Engineering Modeling & Design

Applies usability (human factor) engineering principles and user interface design practices issued by provincial or national regulatory bodies and/or ISO in an iterative experimental design and engineering process in order to develop intuitive and user-friendly biomedical devices and instruments, considering the risk-benefit ratio at each step of the design/integration process and making the safety of users a top priority.

Data Generation & Analysis

Collects, generates, analyzes, and manages research data according to approved standards and model practices to ensure data integrity and to optimize the value of the data.

Managing Quality in R&D

Implements and monitors the standard quality management processes to ensure that all R&D activities are conducted according to required standards and create reproducible results in the tests performed, the data generated, the results reported, and the products and technologies created.

Digital Skills for R&D

Makes effective use of the Internet and computer software to identify existing scientific activity relevant to the area of study, to investigate the depth and breadth of that research, to record and maintain data, to develop and disseminate reports and presentations, and to drive R&D and process digitalization with the use of modern approaches to data science, etc.

Liaising with Key Stakeholders and Influencers

Liaises with investors, government, regulatory authorities, and other influential organizations in order to build positive relationships and support for the laboratory/organization's R&D program.

Knowledge Transfer

Shares and disseminates technical or scientific knowledge, experience, and ideas from one individual or source to other individuals, groups, or organizations for purposes such as building others' knowledge, training them in a new process, ensuring reproducibility in the event of absence, creating efficiencies, preserving corporate memory, and providing a foundation for scientific collaboration and development.

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Professional Writing for R&D

Develops and publishes scientific papers in refereed journals or scientific reports and other technical documents internally in order to chronicle and advance the body of R&D knowledge. Also creates project reports to ensure that all relevant R&D information is tracked and available to stakeholders as required and to demonstrate compliance with all regulatory requirements.

Industry regulatory competencies

Legal/Regulatory Compliance in R&D

Manages R&D documents, data, tools, resources, waste products, processes, and procedures in accordance with relevant safety, security, environmental, and ethical protocols—including intellectual property protection—to ensure legal protection and compliance with regulatory and funding requirements.

Occupational Health & Safety in R&D

Actively participates in/manages the health and safety program for R&D staff and their workplace in order to ensure the health and safety of staff. Also ensures the organization's compliance with legislation and regulations related to safe work practices and procedures, corporate procedures, and facility health, safety, and environmental rules.

Personal and professional competencies

Continuous Learning

Continuously undertakes introspection in order to understand current knowledge and skills in a changing environment, recognize personal knowledge gaps, undertake independent action to actively seek targeted opportunities to acquire new knowledge, and reflect on how new knowledge can be integrated and applied.

Creative Leadership

Create clarity of purpose for colleagues, teams, staff, and the organization, inspires them to transform an idea or vision into reality, cultivates innovative solutions even in the face of complex and challenging circumstances, and effectively manages change.

Critical Thinking/Decision-Making in R&D

Analyzes, synthesizes, and evaluates arguments, information, and data. Also exercises sound judgement to solve problems and make timely decisions that strategically benefit the laboratory/organization's R&D activities and strategy.

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Effective Interpersonal Communication

Communicates in ways that create shared understanding, generate support for the achievement of goals and objectives, and facilitate conflict resolution and problem-solving.

Professionalism/Emotional & Cultural Intelligence

Applies emotional and professional sensitivity to become aware of both their own emotions and those of others they interact with in such a way that they can manage personal and professional decorum to cope with challenging situations, enhance performance, and maintain productive relationships within a diverse, globalized working world.

USE NATIONAL OCCUPATIONAL STANDARDS TO:

- ✓ Build a job description
- ✓ Plan professional development
- ✓ Map career progression and succession planning
- ✓ Benchmark compensation

View the full National Occupational Standards at biotalent.ca/NOS

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