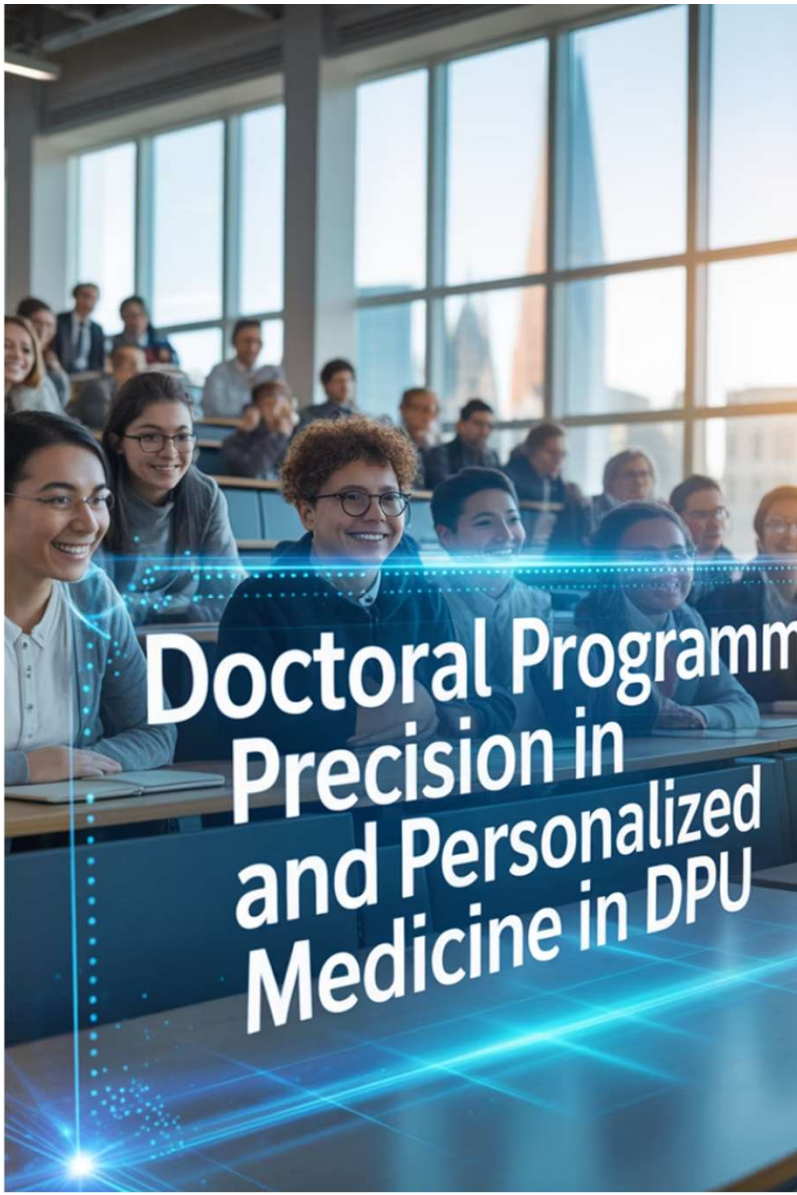
Doctoral Programme in Precision and Personalized Medicine in DPU

A comprehensive overview of our innovative doctoral program, designed to bridge the gap between laboratory discoveries and clinical applications through interdisciplinary research and strategic partnerships.

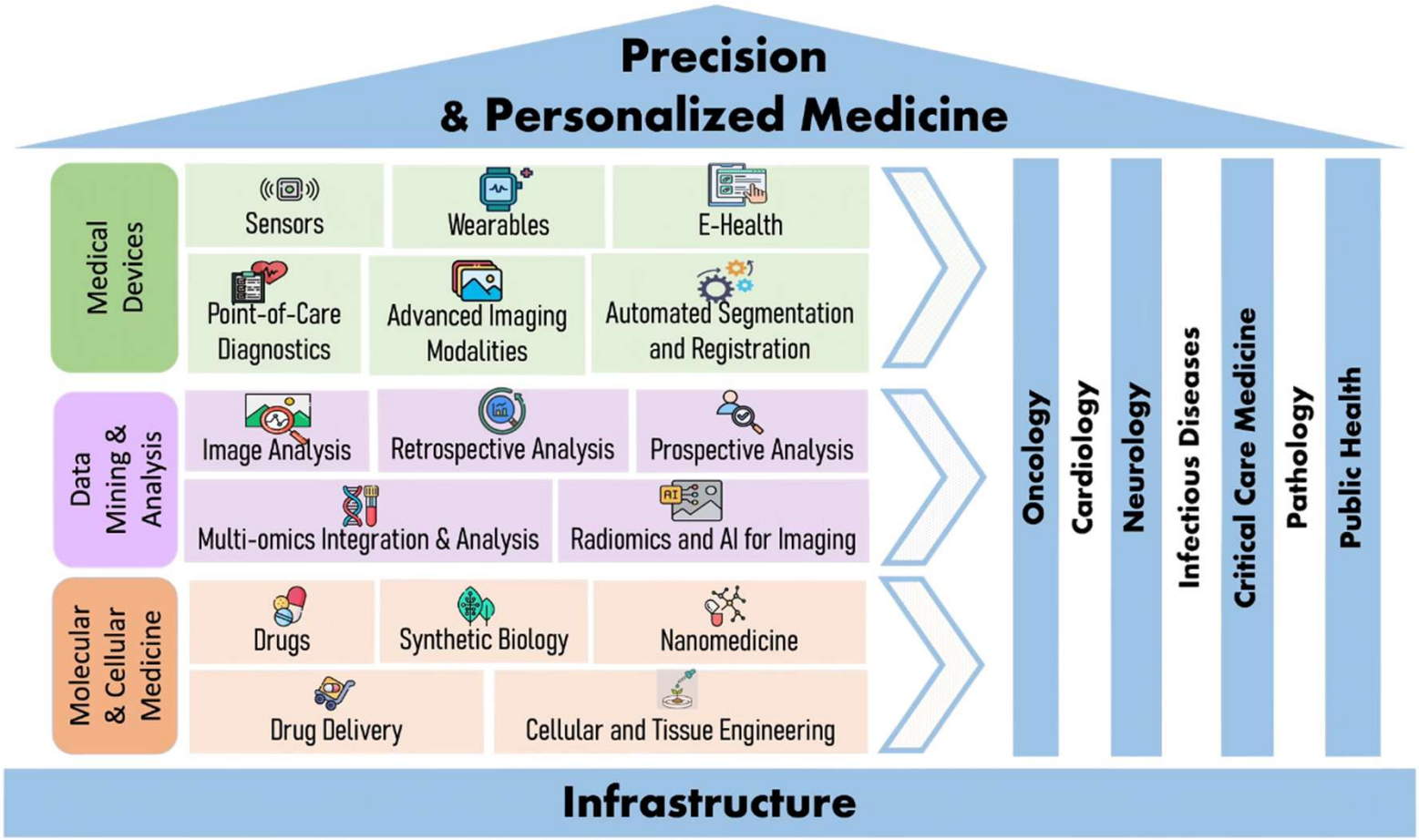
by Prof. Hossam Haick



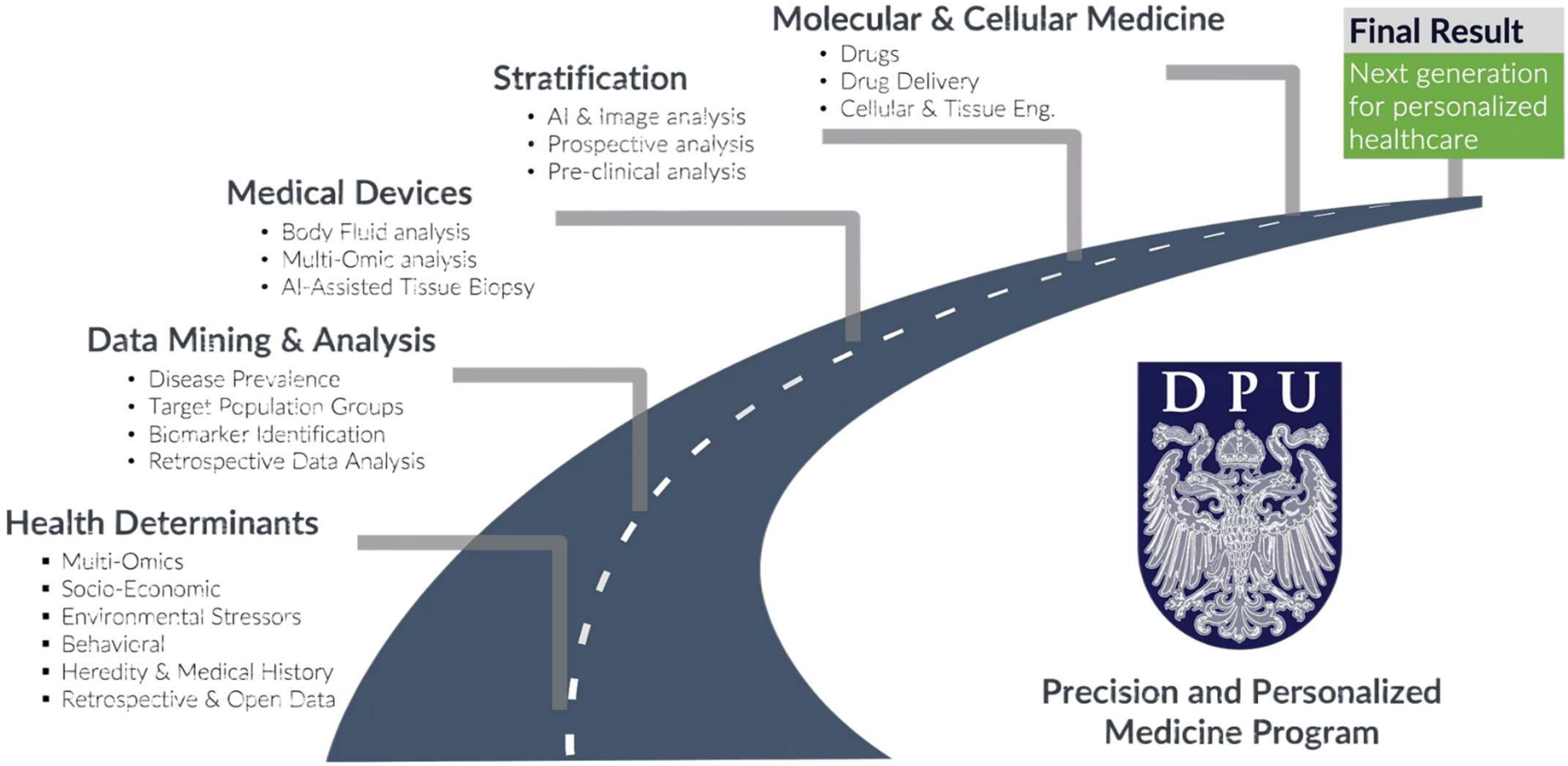
Mission Statement

Our mission at DPU's Precision and Personalized Medicine Program is to accelerate pioneering research in human health by fostering and cultivating opportunities for **synergistic collaboration** among DPU research teams, centers, facilities, and affiliated institutes. We are committed to creating an environment that not only promotes innovative **interdisciplinary studies** but also ensures that these research advancements move seamlessly from **bench to bedside**. By driving transformative breakthroughs in Precision and Personalized Medicine, we aim to improve global health outcomes, **translating cutting-edge discoveries into practical applications** that directly benefit patients worldwide.

Integration of the Science & Technology at DPU with the Clinical & Medical Research Areas



Strategy for Advancing the Precision and Personalized Healthcare from Bench to Bedside at DPU



Degree Programme

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Degree Programme Management

Main Components of the PhD Programme

1 Coursework

Assessed through knowledge application, assignments, and participation. Grading scale: 1 (Sehr gut) to 5 (Nicht genügend), with pass threshold ≥ 4.

2 Thesis

Evaluated on originality, impact, methodology, and defense performance. Must achieve ≥ 2 (Gut); summa cum laude requires unanimous excellence.

3 Overall Program

Based on credits, research milestones, publications, and ethics. Distinctions range from summa cum laude (highest) to non sufficit (fail).

Structure of the PhD Program

The PhD program in Precision and Personalized Medicine comprises 180 ECTS credits structured to develop future healthcare leaders.

Component	ECTS Credits	Details
Coursework	30	Core (18), Electives (8), Workshops (4)
Core Courses	18	3 courses (6 ECTS each) across different disciplines
Elective Courses	8	2 courses (4 ECTS each) aligned with research focus
Mandatory Workshops	4	Teaching Methods (2), Supervision Skills (2)
Research & Thesis	150	Independent research culminating in doctoral thesis

Additionally, students must complete four extra-curricular workshops (3 hrs each) focused on **Technology and Innovation Management** and **Policy & Innovation Economics** before thesis submission.

Coursework

Core Courses (6 ECTS each)

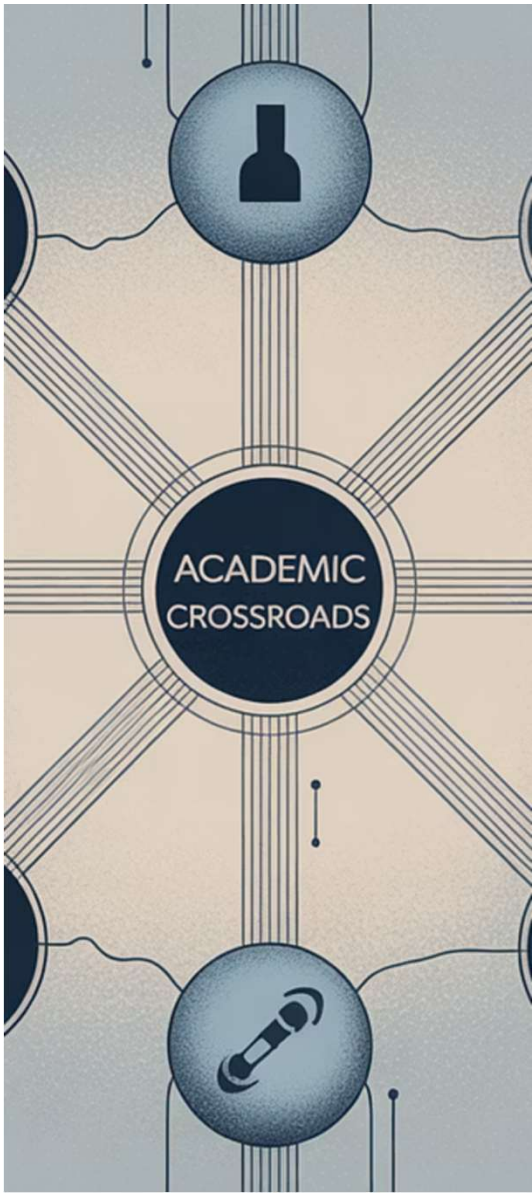
- **Biomedical Sciences:**
  (i) Human Physiology & Pathophysiology;
  (ii) Molecular and Cellular Biology.
- **Life Sciences:**
  (i) Molecular Genomics and Bioinformatics; (ii) Systems Biology.
- **Engineering:**
  (i) Biomedical Engineering Fundamentals; (ii) Nanotechnology in Medicine; (iii) Fundamentals of Biosensor Development.
- **Computer Science**:
  (i) Artificial Intelligence in Healthcare;
  (ii) Computational Biology;
  (iii) Imaging Biomarker Development.
- **Interdisciplinary Courses:**
  (i) Interdisciplinary Approaches to Health Innovation; (ii) Ethics and Policy in Biomedicine.

Elective Courses (4 ECTS each)

- **Medical Imaging:**
  (i) Advanced MRI Techniques;
  (ii) Imaging in Oncology;
  (iii) Medical Imaging for Non-Medics.
- **AI in Healthcare:**
  (i) Deep Learning for Healthcare;
  (ii) Explainable AI in Medicine.
- **Drug Delivery Systems**:
  (i) Nanotechnology in Drug Delivery
- **Advanced Biosensing**:
  (i) Electrochemical Biosensors;
  (ii) Optical Biosensors
- **Computational Biology**:
  (i) Genomic Data Science
- **Regulatory Science**:
  (i) Regulatory Affairs for Medical Products; (ii) Translational Medicine
- **Health Economics:**
  (i) Health Economics

Professional Development Workshops (2 ECTS each)

- **Academic Development**:
  (i) Teaching Methods Workshop
- **Leadership and Mentoring Skills:**
  (i) Supervision Skills Workshop



PhD Program Timeline

The PhD in Precision and Personalized Medicine follows a structured 3-4 year journey totaling 180 ECTS credits:

Year 1: Foundation Building

1

- Complete 18-22 ECTS coursework
- Submit detailed research proposal
- Begin extra-curricular workshops

Year 2: Research Advancement

2

- Conduct initial research
- Complete remaining 8-12 ECTS
- Present first research seminar

Year 3: Research Refinement

3

- Finalize data collection and analysis
- Begin drafting thesis
- Deliver formal seminar lecture

Year 4: Completion (if needed)

4

- Submit doctoral thesis
- Undergo evaluation processes
- Defend thesis before committee

Guidelines for Progress Reviews & Examinations

Review Type	Timeline	Components	Support
Annual Progress	Yearly	Written report, presentation, panel feedback	Supervisor mentoring
Qualifying Exam	Year 1	Initial research evaluation, knowledge assessment	Preparation workshops
Candidacy	Mid-program	Research proposal defense	Faculty guidance
Pre-Submission	Before final	Thesis draft review	Writing resources
Defense	Program end	Final oral examination	Practice sessions

The Doctoral Affairs Committee schedules all reviews. Evaluation focuses on research progress, originality, ethical considerations, and presentation skills.

Students may revise and retake examinations according to committee guidelines if needed.

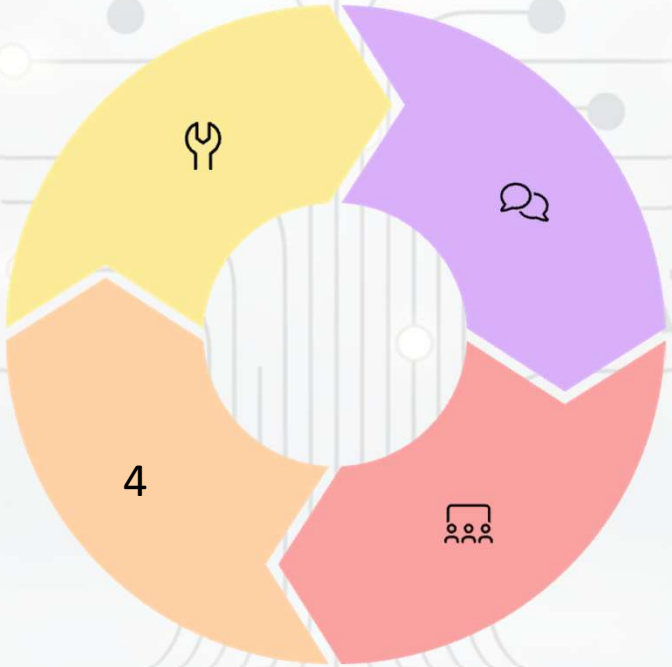
Academic & Professional Development

Workshops

Hands-on training develops essential research capabilities and entrepreneurial mindset.

Collaborative Events

Industry partnerships bridge theoretical knowledge with clinical applications.



Seminars

Expert-led sessions keep students at precision medicine's cutting edge.

Conferences

Funded participation expands research visibility and career networks.

Exchange & Short Programs

1 Exchange Programs

Open to candidates in good standing with advisor approval.

- Research-plan proposal required
- International collaboration opportunities
- Access to specialized facilities
- Network expansion with global experts

2 Short Programs

Intensive specialized training in precision medicine fields.

- Winter/Summer schools
- Specialized workshops
- Academic research visits
- Dual degrees or certifications

3 Format Options

Flexible learning opportunities to fit research schedules.

- In-person immersion
- Online accessibility
- Hybrid participation
- Duration: days to weeks

Organizational Support for Research

Grant Writing

Expert assistance with proposal development

Budget Planning

Financial expertise for research projects

Project Management

Post-award administration and reporting

Ethical Compliance

Institutional committee ensures research integrity

Entrepreneurship & Commercialization Support

Mentorship & Hubs

Seasoned entrepreneurs guide pioneering ideas from concept to market.

- Expert mentorship from industry leaders
- Innovation hub access for prototyping
- Dedicated incubator space

Workshops & Training

Skill-building programs develop business acumen alongside research expertise.

- IP management strategies
- Business model design
- Market analysis techniques
- Funding acquisition skills

Commercialization Pathway

Structured approach transforms research into marketable solutions.

- Idea validation with feasibility testing
- Lean Startup methodology application
- Business Model Canvas development
- Scale-up support through investor networks

Specialized Programs & Entrepreneurial Activities

Targeted Programs

- Transfer Canvas & R2V Path Finder workshops
- Patent Search & IP Strategy sessions
- Entrepreneurship Bootcamps
- Innovation challenges and hackathons

Accelerators & Seminars

- Startup accelerators with dedicated workspace
- Mentorship from industry experts
- Investor networking opportunities
- Alumni-led commercialization seminars

Hands-On Innovation

- Prototype development in partner labs
- Industry co-development for regulatory guidance
- Pilot studies with clinical partners
- International licensing pathways

Ecosystem & Events

- Startup fairs and investor meetups
- Collaborative innovation events
- Vibrant network of mentors
- Alumni entrepreneur connections

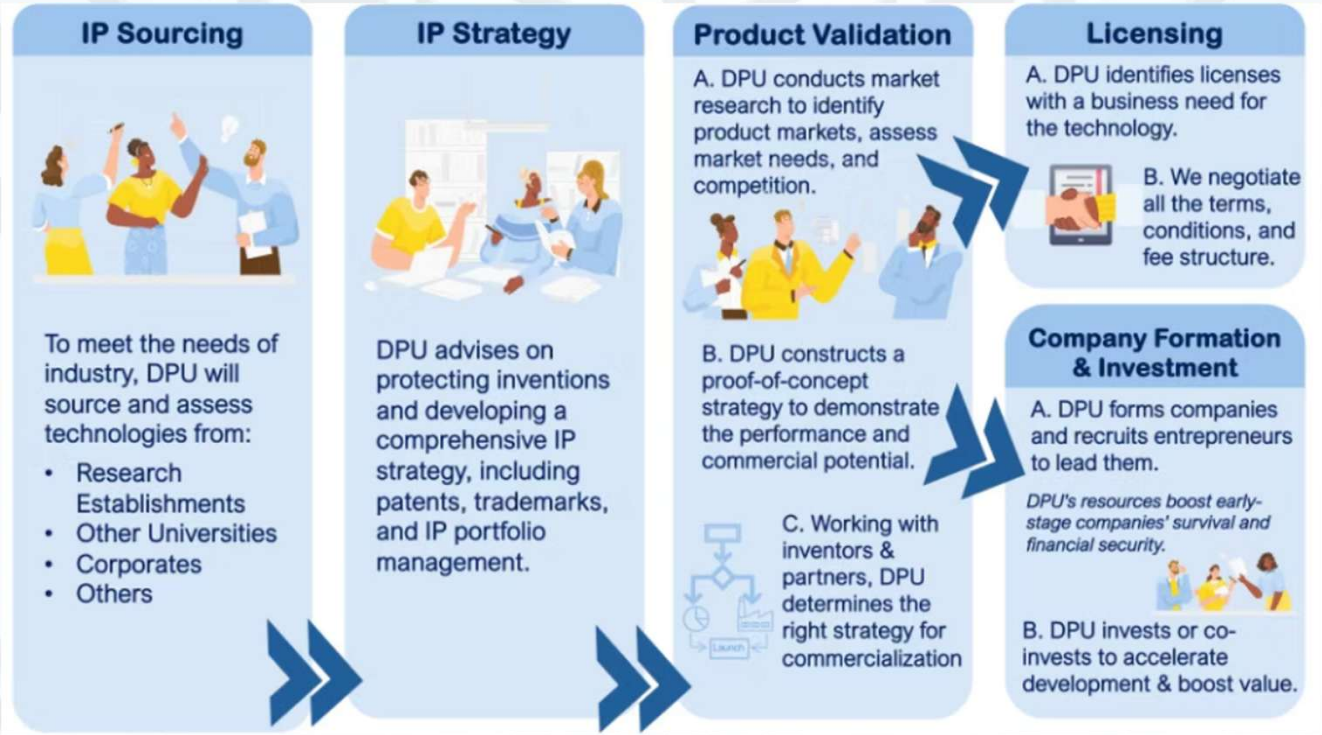
DPU's IP Commercialization Framework

Sourcing
From various entities

Strategy
Formulating an IP strategy

Validation
Validating product concepts through market research

Licensing & Investment
Negotiating licensing agreements, company formation & investment



Institutional Support for Procedural Adjustments

Supervisor Guidance

Consult supervisors early when challenges arise. Explore potential solutions together. Prepare documentation for formal requests. Develop realistic adjustment timelines.

Administrative Assistance

Doctoral Affairs Committee provides structured support. Transparent request processing. Clear decision communication. Detailed implementation timelines.

3 Mental Health & Counseling

Comprehensive well-being services available to all doctoral candidates. Confidential counseling sessions. Stress management workshops. Peer support networks.

4 Financial Guidance

Expert assistance with funding implications during program changes. Agency communication support. Funding adjustment planning. Alternative resource identification.

DPU Course-Specific Advisory Services

Academic Mentorship & Research Supervision

(Committee for PhD Studies: Prof. Haick, Prof. Mahbod, Prof. Woitek, Prof. Braun, Prof. Atanasov)

Ensures expert oversight of research design, execution, and career strategy to align projects with institutional strengths.

Course & Curriculum Guidance

(PhD Program Coordinator & Doctoral Affairs Committee: Prof. Kleber, Winfried Neuhaus, Prof. Haick, Prof. Knoll)

Provides strategic advice on course selection and ECTS alignment to support seamless academic progress toward research goals.

Industry & Career Advisory Services

(Entrepreneurial & Translational Research Mentors: Prof. Haick, Prof. Woitek, Prof. Atanasov)

Facilitates industry partnerships and commercialization planning to translate student innovations into real-world impact.

Student Support & Well-Being Advisory Services

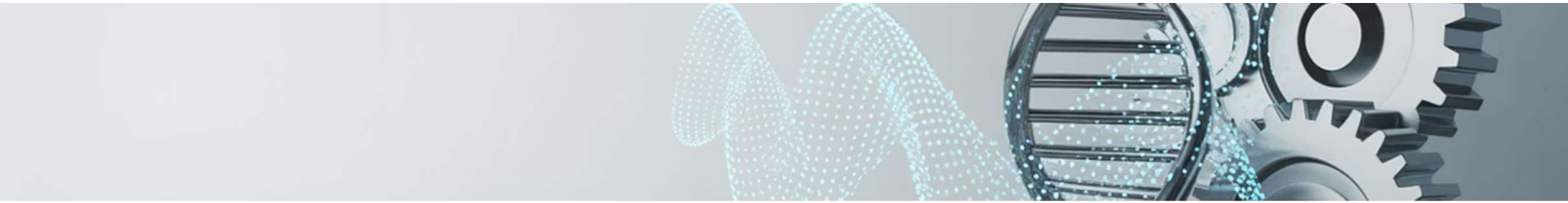
(University Support Services & Doctoral Affairs Committee mentors)

Offers mental health, conflict resolution, and administrative assistance to maintain student welfare and program continuity.

Pedagogical Leadership & Educational Excellence

(Prof. Haick, Assoc. Prof. Furtner-Srajer, Prof. Mahbod, Prof. Braun)

Champions best teaching practices and curriculum innovation to uphold the highest educational standards.



Graduate Competencies & Career Readiness

Transformative Skills for Healthcare Leaders

Cross-disciplinary expertise in analytics, bioinformatics, AI, and clinical research for integrated healthcare solutions.

Diverse Career Pathways

Graduates lead research, apply precision medicine, and hold leadership roles in biotech, pharma, and academia.

Ethical Decision-Making

Ethical leadership in research, privacy, access, and culturally aware care.

Advanced Critical Thinking

Analytical, self-directed skills to interpret biomedical data, recognize patterns, and develop evidence-based solutions.

Translational Research Experience

Hands-on translational R&D, turning lab discoveries into clinical applications.

Healthcare Innovation Leadership

Entrepreneurial skills in product development, regulation, IP, and commercialization for precision medicine.