



BIOMED

group

RENTRÉE ACADÉMIQUE DE LA FILIÈRE BIOMÉDICALE 2024

Prof. Bernardo Innocenti, PhD

President Biomedical Track



BEAMS Department (Bio Electro and Mechanical Systems) École Polytechnique de Bruxelles ULB - Université Libre de Bruxelles Av. F. Roosevelt, 50 CP165/56 1050 Bruxelles

Agenda



18h30: Introduction - Prof. Bernardo Innocenti;

18h40: Examples of the development of innovative medical devices at ULB in 2024

- Dr Ir Adrien Foucart (LISA);
- Ir Victor-Paul Grandjean (BEAMS);
- Ir Clément Rigaud (TIPS);

18h55: : Challenges to translation (what are the main challenges to transform a prototype in a medical device ready for clinical evaluations) – Prof. Anne Vanhoestenberghe – Kings College London;

19h15: Presentation of the projects of the Fondation Michel Cremer - Prof. Jacques Devière et Ir Cécile Sztalberg;

19h30: Drink!

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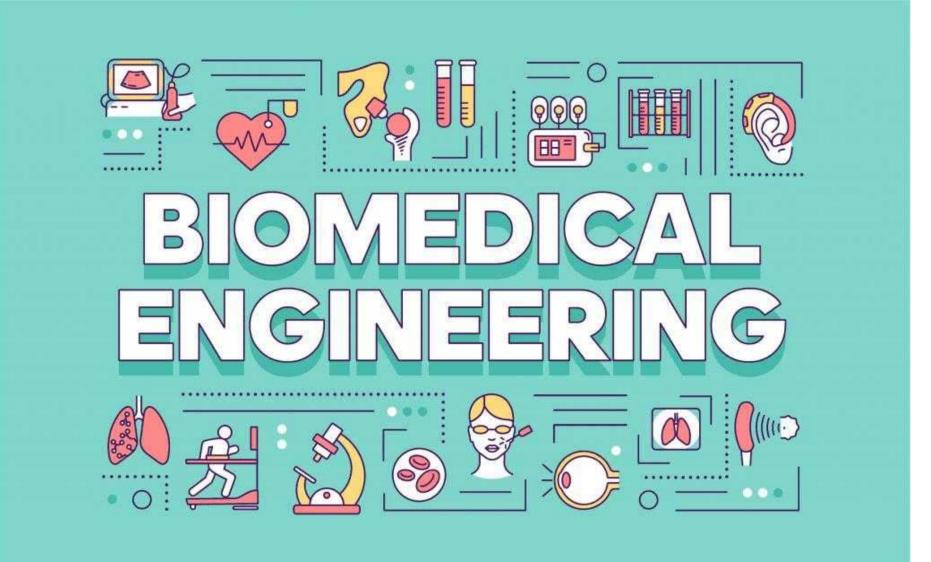
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Rentrée académique de la filière biomédicale

Biomedical Engineering:

- Why?
- What?
- How?



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Why Biomedical Engineering?

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Top 10 technical fields in patent applications. Number of patent applications filed with EPO, 2017 (ref. 1)

13,090	MEDICAL TECHNOLOGY		
11,694	DIGITAL COMMUNICATION		
11,174	COMPUTER TECHNOLOGY		
10,402	ELECTRICAL MACHINERY, APPARA	ATUS, ENERGY	
8,217	TRANSPORT		
7,999	MEASUREMENT		
6,462	ORGANIC FINE CHEMISTRY		
6,330	PHARMACEUTICALS		
6,278	BIOTECHNOLOGY	1 /2	
5,548	OTHER SPECIAL MACHINES	MedTech Euro	pe 2019 Report

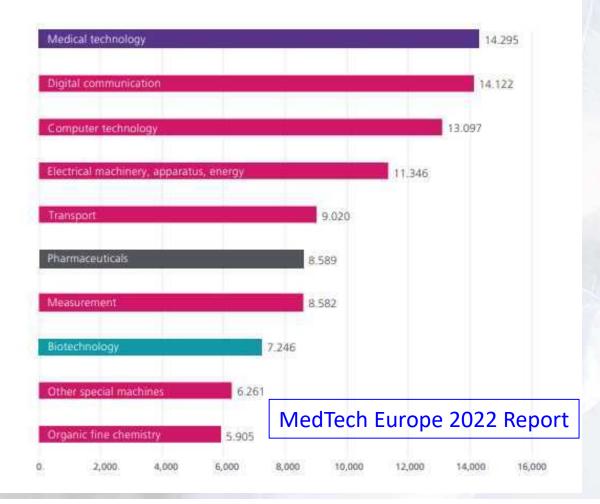
Evolution of European patent applications by technical field, 2017 (ref. l)



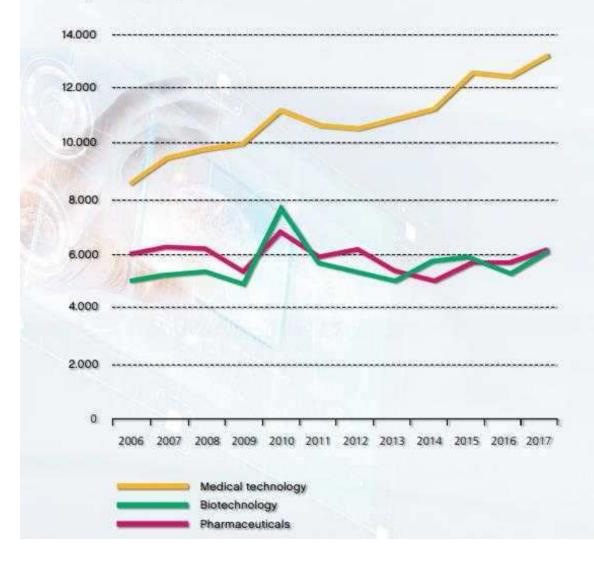
Why Biomedical Engineering?



Graph 1 – Top 10 technical fields in patent applications Number of patent applications filed with EPO, 2020 (ref. 2)



Evolution of European patent applications by technical field, 2017 (ref. l)

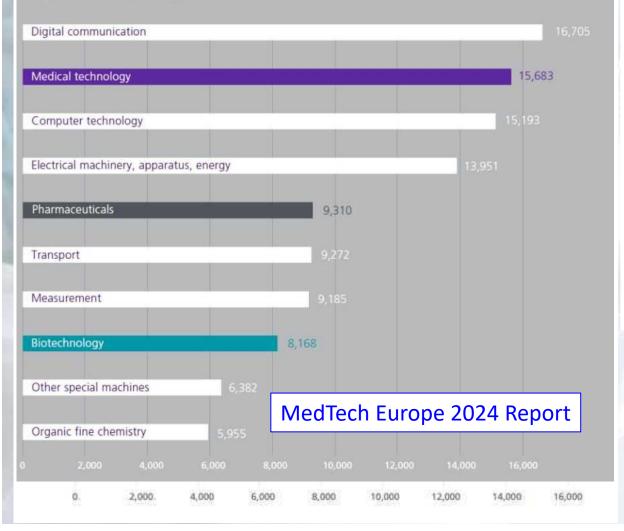


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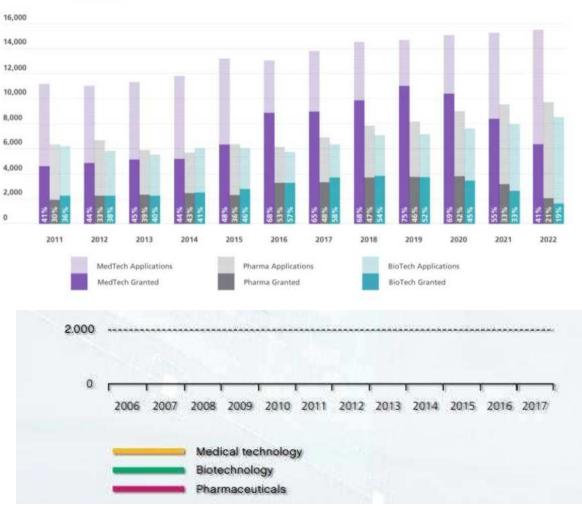
Graph 1 – Top 10 technical fields in patent applications

Number of patent applications filed with EPO, 2022 (ref. 3)



Evolution of European patent applications by technical field, 2017 (ref. 1)

Graph 2 – Evolution of European patent applications and granted patents by technical field 2022 (ref 3.)







There are more than

2.000.000

medical technologies, categorized into more than 7,000 generic devices groups¹, available in hospitals, community care settings and at home.

Medical technologies can be everyday objects such as sticking plasters, syringes, surgical masks, and latex gloves, as well as spectacles, wheelchairs, COVID-19 tests and medical apps. Medical technologies also include total body scanners, gene mutation tests, implantable devices such as heart valves and pacemakers, and replacement joints for knees and hips.



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MedTech Europe 2023 Report



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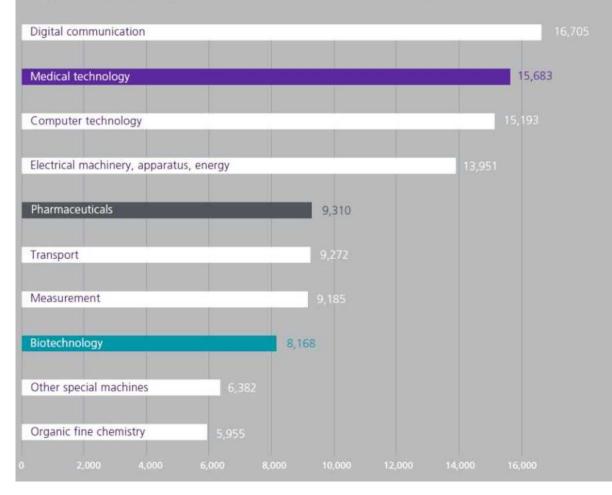
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You may not always notice medical technologies, but they are always there for you. Medical technologies provide value in different ways. They allow people to *live longer and better lives*. At the same time, medical technologies improve the quality of care, and the efficiency and sustainability of healthcare systems.

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Graph 1 – Top 10 technical fields in patent applications

Number of patent applications filed with EPO, 2022 (ref. 3)



What is medical technology

Medical technologies are products, services or solutions used to *save and improve people's lives*. In their many forms, they are with you from prevention to diagnosis and cure. There are three main categories of medical technologies:



Graph 1 – Top 10 technical fields in patent applications

Number of patent applications filed with EPO, 2022 (ref. 3)

Digital communication		16,705
Medical technology		15,683
Computer technology		15,193
Electrical machinery, apparatus, energy		13,951
Pharmaceuticals	9,310	
Transport	9,272	
Measurement	9,185	
Biotechnology 8,1	68	
Other special machines 6,382		
Organic fine chemistry 5,955		
2,000 4,000 6,000 8,000	10,000 12,000	14,000 16,000

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Medical Devices (MDs) Are products, services or solutions that prevent, diagnose, monitor, treat and care for people.



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In-vitro diagnostics (IVDs)

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Digital health

Are tools and services that use nformation and communication technologies (ICTs) to improve prevention, diagnosis, treatment, monitoring and management of a person's health and lifestyle.





Grap **Digital health** Num Digita Medic 5,683 In terms of breakthrough technologies, the digital health sector is increasingly being recognised Comp for the prominent technological innovations that could address many of the underlying challenges Electri in healthcare. Pharm In 2023 biggest European markets, Germany and France, reimbursed 57 and 56 digital health technologies, respectively.4 Transp Meas **57** digital health technologies reimbursed Biotec in Germany 56 digital health Other technologies reimbursed in France Organ

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Employment

The jobs created by the medical technology industry account for around 0.36% of total employment in Europe⁷. These jobs are also highly productive, as the value added per employee is estimated to reach around €177,000 per employee. These indicators show that the medical technology industry has an important economic and societal impact in Europe.





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ECOLE POLYTECHNIQUE DE BRUXELLES

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Graph 4

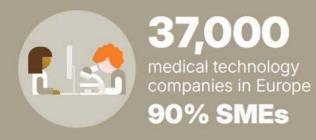
Number of people directly employed in the medical technology industry per 10,000 inhabitants Latest year available (ref. 4)



Last but not least!!!!

Companies

There are more than 37,000 medical technology companies in Europe. The highest number of them are based in Germany, followed by Italy, the UK, Poland, Sweden and Switzerland. Small and medium-sized companies (SMEs) make up around 90% of the medical technology industry, the majority of which employs less than 50 people (small and micro-sized companies)⁵.



Medtech market in Europe



26.1% of world market

2nd largest market after US

Graph 6 European medical device market by country 2022 (mt. 9)





Last but not least!!!!

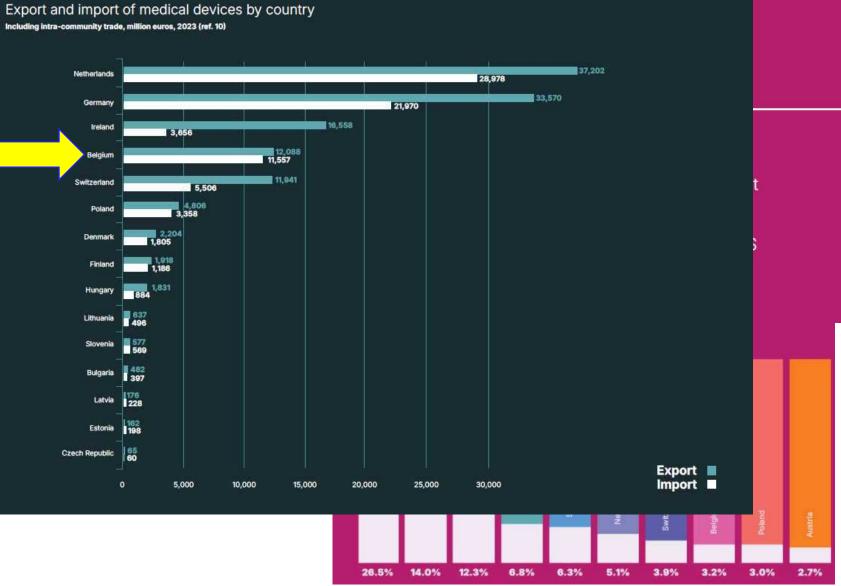
Graph 14



Compa

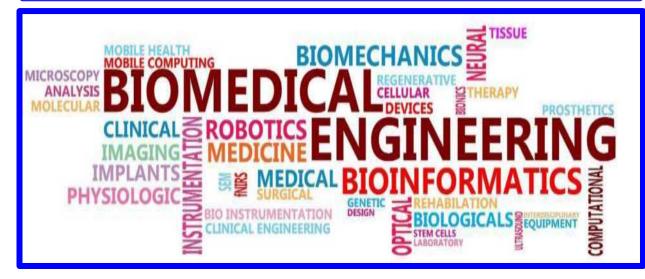
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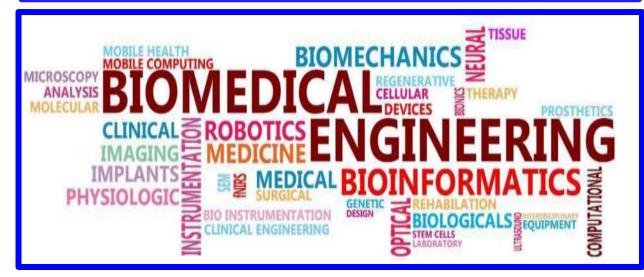


Interdisciplinary fields of biomedical engineering.



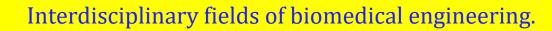


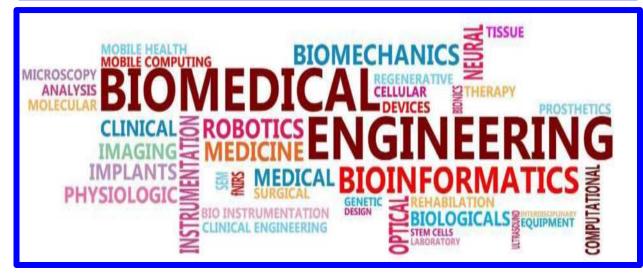
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ICMMB2024

Sharing today's knowledge for a better tomorrow

23rd International Conference on Mechanics in Medicine and Biology

11 – 13 September 2024, Bruxelles, Belgium





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Thank you for your attention!!



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