OBSTACLES

Curriculum design
- lack of interdisciplinarity and of long-term career options

Educational resources
- lack of modernization and of up-to-date activities

Healthcare system
- lack of attraction for medical research scientists

Mutual recognition of degrees
- lack of facilitating international collaborations

Cooperation academia-industry
- now in the great majority of cases two worlds apart

New private and public funding schemes
- lack of energy spent (not only for tangible research products, but also) for seemingly intangible, but still fundamental education and training

Diversity of Degrees and Diplomas

Great diversity of post-graduate qualifications in the medical research field:
- PhD (doctor of philosophy)
- MSc (Master of Science)
- MD (doctor of medicine)
- DSc (doctor of science)
- parallel MD-PhD programmes.

Adverse effects related to disparity in salaries and social security

Difficulty in the exchange of professionals between countries

Possible remedies

Member states of the EU must:
- extend the mutual Recognition of post-graduate medical degrees
- allow researchers in various medical-related disciplines to move freely between countries and to pursue a pan-European research career, independently on a single country

Curriculum design
Absence of RESEARCH in MD curricula
lack of time in the long study course to be devoted to learn how to carry out research projects

Compensation by PhD curricula, but
- Very small proportion
- Lack of emerging disciplines in the programmes
- Lack of comparability and recognition among states (and Universities)

Possible remedies
Curriculum development in Biomaterials that, in addition to all those disciplines in biomaterial research, includes:
- PHYSICS, CHEMISTRY, ECONOMICS, REGULATORY AFFAIRS, ETHICS, BUSINESS, MANAGEMENT, ADMINISTRATION, LAW

Continuous professional development programs for senior medical researchers

Mutual recognition of degrees and diplomas (pan-European tracking scheme):
support development of quality standards for biomaterials

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Healthcare system

Lack of RESEARCH in Hospitals

Possible remedies

Biomaterials should be one of the corner stones of personalized medicine

Management constraints need to become more user-friendly to research activities

Academia vs. Industry

Insufficient participation of researchers from other organizations in the clinical world and – in general – in hospital-based research settings

Duplication of efforts and Inadequate use of time and resources

Possible remedies

Greater involvement of large and small industry in the early development and implementation of new ideas.

Sharing of: Didactic educational courses, Work placement, Training programmes, “Technology clusters”, Consortia for ad-hoc projects

Policy recommendations for Improved Education & Training in Biomaterials for Health.

The acquisition of research skills in PhD programmes related to Biomaterials needs to become an integral part of training for medical students and for doctors.

The degree of PhD should be given the same career merit as specialist training for doctors, which needs to incorporate hands-on, problem-based and systems-based approaches along with top-notch theoretical science-based training.

Educational systems need to develop this combined approach which would offer more opportunities for candidates and increase the diversity in the choice of thematic modules and institutions.

This would result not just in greater mobility and career choices, but also in practical skills acquired, facilitating a better response to the challenges that lie ahead.

Resources and Strategies

No educational and training resources for new smart biomaterials found in one single location

Missing integration with: Economy, Management, Business, Intellectual property protection

Deficiency of skill in: Administrative, Regulatory, Ethical issues

No integration in funding schemes ⇝ little resources

Lack of infrastructures

Excessive duplication of funding bodies and types of programmes, with the problem of getting the right info

Possible remedies

Reverse the above!

Medical Education (both basic and post-graduate, as currently provided by institutions such as Universities) is not able to promptly follow the emerging fields of research.

Changing courses and/or activation of new updated education programs require time and usually “fighting” against the established academic power, habitually reluctant to accept new instances. Moreover, quite bulky bureaucracy is needed.

One help could come by a deeper involvement of public/private Research Institutions and Industries, because usually they are on the forefront of the (basic and applied) research.