



The Bologna Process: will it affect UK biomedicine
and clinical science?

Symposium report

The Academy of Medical Sciences

The Academy of Medical Sciences promotes advances in medical science and campaigns to ensure these are converted into healthcare benefits for society. Our Fellows are the UK's leading medical scientists from hospitals and general practice, academia, industry and the public service. The Academy seeks to play a pivotal role in determining the future of medical science in the UK, and the benefits that society will enjoy in years to come. We champion the UK's strengths in medical science, promote careers and capacity building, encourage the implementation of new ideas and solutions – often through novel partnerships – and help to remove barriers to progress.



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1 Background and introduction

The Bologna Process is an agreement to reform higher education systems in Europe to make them more comparable to each other. Given that this process will undoubtedly affect elements of undergraduate and postgraduate education in the UK, it is important that every UK higher education institution understands its implications. The Academy of Medical Sciences therefore held a symposium on 31 March 2009, attended by researchers, clinicians, research funders, policymakers and others, to discuss the potential impacts of the Bologna Process on UK biomedical and clinical science courses.

The Bologna Process was initiated to strengthen the international competitiveness and attractiveness of European higher education.¹ To achieve this, the declaration sets out the intention to form a European Higher Education Area (EHEA) by 2010, with the aim of facilitating greater mobility of individuals with high-level skills within an increasingly international higher education system. The overarching objectives of the Bologna Process are to:

- Increase employability of Europe's citizens.
- Facilitate student and staff mobility.
- Enhance the attractiveness of European higher education.

The Bologna Process is a European inter-governmental initiative that is not legally binding. In the UK it relies on universities and other interested groups (e.g. independent institutions, quality assurance agencies and students) working under their own volition to implement the goals of the declaration.^{2,3} Key to the Bologna Process is the development of a common framework within which European countries can develop comparable higher education qualifications and structures. The Bologna Declaration calls for the adoption of a system based on three cycles of higher education qualification (bachelor's, master's

and doctorate) and suggests that the minimum length of a bachelor's qualification should be three years. There are no other stipulations about course length at other levels. However, some countries have adopted a '3+2+3' year model, whereby a three year bachelor's degree is followed by a two year master's and a three year doctorate. The stated purpose of the Declaration is not harmonisation but rather the development of an agreed framework that defines common characteristics while retaining autonomy and diversity on the part of individual countries.

The Bologna Declaration has 46 signatory European countries, including all 27 European Union (EU) members. In addition, Australia, countries in South east Asia, and North and South America are discussing the implications and opportunities the Bologna Process could bring to their own education systems.⁴

It goes without saying that scientific research is becoming increasingly international, with greater opportunities for researchers to interact and collaborate worldwide. The intention of the Bologna Process is to increase the compatibility of degrees within Europe and to facilitate the international ethos of scientific research. As one of the global leaders in scientific research, the UK must consider how this initiative might affect its standing compared with other countries.

One of the five strategic goals of the Academy of Medical Sciences is to campaign for the development, protection and promotion of careers for academics in the medical sciences and to encourage good practice in training and development. This work is underpinned by the Academy's 942 strong Fellowship, which includes representation from the biomedical sciences, clinical specialties, the NHS, academic institutions, industry and public service. The

1 Benelux Bologna Secretariat (2009). *Bologna beyond 2010, report on the development of the European Higher Education Area*. http://www.ond.vlaanderen.be/hogeronderwijs/bologna/conference/documents/Beyond_2010_report_FINAL.pdf

2 Oliver R & Sanz M (2007). *The Bologna Process and health science education: times are changing*. *Medical Education* **41**, 309–317.

3 The Bologna Declaration (1999). *Joint declaration of the European Ministers of Education*. http://www.ond.vlaanderen.be/hogeronderwijs/bologna/documents/MDC/BOLOGNA_DECLARATION1.pdf

4 Australian Government, Department of Education, Science and Training (2006). *The Bologna Process and Australia: next steps*. <http://www.dest.gov.au/nr/rdonlyres/d284e32f-98dd-4a67-a3c2-d5b6f3f41622/9998/bolognapaper.pdf>

Fellowship places the Academy in a unique position to take a broad overview of the challenges facing the sector and to offer a forum to discuss potential solutions.

The Academy became aware of concerns about the diverse approaches being taken by UK institutions in preparation for the Bologna Process and the alignment of biomedical and clinical sciences within these reforms. Although some disciplines, such as engineering, have been considering alignment with the Bologna Process for some time, there seems to be greater variation within the biomedical sciences. This prompted the Academy to host a symposium 'The Bologna Process: will it affect UK biomedicine and clinical science?' on 31 March 2009. The meeting brought together UK delegates representing universities, industry, regulatory bodies, funding bodies and medical research charities.

The aims of this symposium were to:

- Bring together key constituencies from the Bologna Process with representatives from the biomedical and clinical academic communities.
- Highlight the challenges and opportunities presented by the Bologna Process and

provide a forum for information exchange and debate.

- Compare approaches taken by different institutions.
- Ensure that the views of the academic community are represented in the decision-making processes.

The symposium was chaired by Professor Robert Souhami CBE FMedSci and Professor Keith Gull CBE FRS FMedSci. It included presentations from Ms Rachel Green, Department for Business, Innovation and Skills (BIS); Professor Mary Ritter, Imperial College London; Professor Simon van Heyningen, University of Edinburgh; Professor Tony Weetman FMedSci, Medical Schools Council; Dr Iain Cameron, Research Councils UK (RCUK); and Sir Leszek Borysiewicz FRS FMedSci, Medical Research Council (MRC). The programme and delegate list are shown in Appendices 1 and 2 respectively.

This report provides a summary of the meeting. The views expressed do not necessarily represent the views of the Academy of Medical Sciences.

2 The Bologna Process

Decision-making

The Bologna Process is a non-binding inter-governmental initiative between voluntary signatory countries that was established in 1999. A forum for decision-making was created through the biennial ministerial summits, which are hosted by one of the participating countries. Higher education Ministers from each participating country meet at the summit to assess progress and consider future priorities. Decisions are made where consensus is reached by all countries involved. Five ministerial summits have been held since 1999: Prague (2001), Berlin (2003), Bergen (2005), London (2007) and Leuven (2009). All ministerial summits produce a communiqué that documents the key decisions.^{5,6,7,8,9}

The Bologna Follow-Up Group (BFUG) and the Bologna Process Board support these ministerial meetings. The BFUG is the main official-level group. Its membership is composed of representatives from each of the 46 signatory countries, and representatives from a range of European-level organisations. Its role is to take forward recommendations made at the ministerial summits and to produce an official work programme on priority issues.¹⁰ The role of the Bologna Process Board is to assist in preparations for BFUG meetings. The Bologna Process Board includes:

- A representative from the country due to host the next ministerial summit.
- Representatives of the previous, current and future EU presidencies.
- Three additional country representatives, if necessary, agreed by vote in the BFUG.

The Department for Business, Innovation and Skills (BIS) leads for the UK Government. The Europe Unit, formed in January 2004, is a sector-wide body which aims to raise awareness of the European issues affecting the UK higher education sector, and to strengthen the sector's position in debates on the Bologna Process and EU policy. It is jointly funded by Universities UK, the three higher education funding councils of England, Wales and Scotland, GuildHE and the Quality Assurance Agency (QAA). In its role, the Europe Unit liaises with BIS, the Scottish Government, the Welsh Assembly Government and the authorities in Northern Ireland.¹¹

Action lines

The overarching objectives of the Bologna Process are formalised into 10 action lines (presented in Box 1). Progress against these action lines is reviewed at each biennial ministerial summit. The aim of these objectives is to:

- Be open and inclusive.
- Avoid being overly prescriptive.
- Encourage sharing of experience.
- Adopt best practice.

Qualifications framework

Progress has been accomplished on many of the action lines, in particular lines 1, 2 and 3. These three objectives are important to the implementation of the Bologna Process as they underpin the production of a framework for qualifications for the EHEA.

5 Communiqué of the Conference of European Ministers in charge of Higher Education (2001). *Towards the European Higher Education Area*. http://www.bologna-bergen2005.no/Docs/00-Main_doc/010519PRAGUE_COMMUNIQUE.PDF

6 Communiqué of the Conference of European Ministers Responsible for Higher Education (2003). *Realising the European Higher Education Area*. <http://www.bologna-berlin2003.de/pdf/Communiquel.pdf>

7 Communiqué of the Conference of European Ministers Responsible for Higher Education (2005). *The European Higher Education Area: achieving the goals*. http://www.bologna-bergen2005.no/Docs/00-Main_doc/050520_Bergen_Communique.pdf

8 Communiqué of the Conference of European Ministers Responsible for Higher Education (2007). *Towards the European Higher Education Area: responding to challenges in a globalised world*. <http://www.dcsf.gov.uk/londonbologna/uploads/documents/LondonCommuniquedefinalwithLondonlogo.pdf>

9 Communiqué of the Conference of European Ministers Responsible for Higher Education (2009). *The Bologna Process 2020 – the European Higher Education Area in the new decade*. http://www.ond.vlaanderen.be/hogeronderwijs/bologna/conference/documents/Leuven_Louvain-la-Neuve_Communique%20C3%A9_April_2009.pdf

10 UK HE Europe Unit (2006). *Guide to the Bologna Process edition 2*. http://www.europeunit.ac.uk/sites/europe_unit2/resources/Guide%20to%20the%20Bologna%20Process%20-%20Edition%202.pdf

11 For further information see <http://www.europeunit.ac.uk>

The Framework for Qualifications is a generic overarching document developed by a working group of national ministry officials and sector experts. Representatives from UK higher education institutions and the QAA were also involved in the development of this document.¹² The 2005 ministerial summit in Bergen adopted the Framework for Qualifications of the European Higher Education Area (FQ-EHEA). This set out the broad framework for higher education within the EHEA, which consists of:

- Three cycles: bachelor's, master's and doctorate.
- Generic descriptors for each cycle based on learning outcomes and competences.
- The credit ranges to be applied to the first two cycles.¹³

This framework is used by participating countries to map their higher education structures to the Bologna model and thus facilitate comparable higher education structures between those countries.

Key aspects of the qualifications framework:

The three cycle system

Originally a two cycle system (undergraduate and postgraduate), it was extended at the Berlin summit in 2003 to three cycles: bachelor's, master's and doctorate level.¹⁴ In terms of duration of each cycle, the Bologna model promotes a three year first cycle. There are no further definitions of course lengths, although the '3+2+3' year model, where a bachelor's degree would take at least three years, a master's would take two years, and

Box 1 The Bologna Process action lines¹⁵

Established in the Bologna Declaration of 1999:

1. Adoption of a system of comparable degrees – to simplify the comparison between qualifications across Europe.
2. Adoption of a system essentially based on two cycles: bachelor's and master's level. A third doctoral level cycle was adopted at the Berlin summit of 2003.¹⁶
3. Establishment of a system of credits.
4. Promotion of mobility for students and teachers.
5. Promotion of European co-operation in quality assurance.
6. Promotion of the European dimension in higher education, including partnership activities such as joint curriculum development.

Action lines added after the Prague Ministerial summit of 2001:

7. Focus on lifelong learning – to help meet the challenges of competition in the global workplace and use of new technologies.
8. Inclusion of higher education institutions and students – ensuring student involvement in the development of the Bologna Process and its reduction to practice.
9. Promotion of the attractiveness of the EHEA.

Action line added after the Berlin Ministerial summit of 2003:

- 10 Development of synergies between doctoral studies with the EHEA and the European Research Area (ERA)

12 UK HE Europe Unit (2006). *Guide to the Bologna Process edition 2*. http://www.europeunit.ac.uk/sites/europe_unit2/resources/Guide%20to%20the%20Bologna%20Process%20-%20Edition%202.pdf.

13 The Bergen Ministerial Summit (2005). *A framework for qualifications of the European Higher Education Area*. http://www.bologna-bergen2005.no/EN/BASIC/050520_Framework_qualifications.pdf

14 Communiqué of the Conference of European Ministers Responsible for Higher Education (2003). *Realising the European Higher Education Area*. <http://www.bologna-berlin2003.de/pdf/Communique1.pdf>

15 For further information see <http://www.europeunit.ac.uk>

16 Communiqué of the Conference of European Ministers Responsible for Higher Education (2003). *Realising the European Higher Education Area*. <http://www.bologna-berlin2003.de/pdf/Communique1.pdf>

a doctorate would take at least three years, has become popular in those countries that had traditionally offered five year first degrees. Generic qualification descriptors for each cycle were also produced, known as the 'Dublin descriptors'.¹⁷

Credit systems

The European Credit Transfer and Accumulation System (ECTS) was originally introduced by the European Commission to remove obstacles to mobility between the countries involved in Erasmus exchange programmes. Now applied to the Bologna model, credit ranges are applied to the first two cycles and used to facilitate transfer between cycles and institutions within the participating countries.

ECTS credits are based on the workload required for students to achieve expected learning outcomes, where 25–30 hours worked is equal to one ECTS credit unit. The FQ-EHEA, adopted in 2005, sets out credit ranges for the first two cycles: undergraduate (180–240 ECTS) and master's (90–120 ECTS) qualifications. No credit for the third cycle (doctorate) was set.

Diploma supplement

To promote transparency and facilitate mobility, each student successfully completing a cycle is expected to receive a Diploma Supplement. The Diploma Supplement is a document that provides details of the qualification the student has received, including the accumulation of credits gained and the content of the qualification. This in turn allows institutions to assess the student's capability to move on to the next cycle, or to move institution. This is a supplementary document and is not intended to be used as a curriculum vitae or degree certificate.¹⁸

The UK framework

The FQ-EHEA provides guidelines on which the national qualifications frameworks of participating countries could be based. In the case of the UK, this related to the QAA documents: 'Framework for higher education qualifications in England, Wales and Northern Ireland' (FHEQ), and the 'Framework for qualifications of higher education institutions in Scotland' (FQHE).^{19,20}

In 2008, the QAA verified that both FHEQ and FQHE were compatible with that of the FQ-EHEA, stating that both frameworks had used the criteria and procedures adopted by the Bologna Process in 2005.^{21,22} With the UK guidelines in place, universities are therefore able to self-certify themselves as Bologna compatible. This system fulfils the intended 'bottom-up' approach that lies at the heart of the agreement in the UK. There is no requirement for external verification of an institution's compatibility with the Bologna Process; institutes can self-certify their compatibility on their website and course prospectus.

¹⁷ For further information see <http://www.qaa.ac.uk/academicinfrastructure/fheq/>

¹⁸ For further information see http://www.europeunit.ac.uk/sites/europe_unit2/eu_policy_education/diploma_supplement.cfm

¹⁹ The Quality Assurance Agency (2008). *The framework for higher education qualifications in England, Wales and Northern Ireland*. <http://www.qaa.ac.uk/academicinfrastructure/FHEQ/EWN108/FHEQ08.pdf>

²⁰ The Quality Assurance Agency Scotland (2001). *Framework for qualifications of higher education institutions in Scotland* <http://www.qaa.ac.uk/academicinfrastructure/FHEQ/SCQF/2001/default.asp>

²¹ The Quality Assurance Agency (2008). *Verification of the compatibility of the framework for higher education qualifications in England, Wales and Northern Ireland (FHEQ) with the Framework for Qualifications of the European Higher Education Area (FQ-EHEA)*. <http://www.qaa.ac.uk/academicinfrastructure/FHEQ/selfcertification09/FHEQSelfCert.pdf>

²² The Quality Assurance Agency Scotland (2006). *Verification of compatibility of the framework for qualifications of higher education institutions in Scotland with the framework for qualifications of the European Higher Education Area*. <http://www.qaa.ac.uk/academicinfrastructure/FHEQ/SCQF/Scottishworkinggroup.pdf>

3 The position of the UK Government

The Department for Business, Innovation and Skills (BIS) is the lead department for the UK Government in the Bologna Process, with representation on the Bologna Follow Up Group (BFUG). BIS has emphasised that the Bologna Process is not about harmonisation of higher education within Europe, but about facilitating the introduction of a system whereby degrees within the EHEA may be compared.

The Department has also stressed that much has been achieved by the UK so far, including the completion of the self-certification process in line with the FQ-EHEA and the production of QAA standards and guidelines for university self-certification.

Credit systems

The UK Government believes that the credit system is a useful tool to facilitate mobility both between programmes and institutions.²³ UK universities have used credit systems for many years, pre-dating the introduction of ECTS. The Bologna Process does not explicitly require the use of ECTS; however, it suggests that any credit system used should be compatible with it.

The Government welcomed recommendations from the Burgess Group at Universities UK (UUK) that the higher education sector should work towards a national credit framework for England, which would be compatible with ECTS.^{24,25} As such, UK institutions agreed to credit rate their courses from the start of the 2009/10 academic year. Some institutions have chosen to use ECTS as their standard credit system.

The credit systems used in much of England and the devolved administrations do map onto the ECTS (2 UK credits = 1 ECTS); however, the credit values are not identical, where 2 UK credits = 20 notional learning hours (NLH), compared with 1 ECTS = 25-30 NLH across Europe. It should be stressed that these durations are an approximate measure, and despite the discrepancy, the UK higher education sector has consistently argued that a full academic year in the UK meets the requirements of the Bologna Process. Further clarification on how UK credit matches up with ECTS is given in the Burgess Group report.²⁶

Learning outcomes and institutional autonomy

Throughout the process of creating the EHEA, and more specifically the qualifications framework, the UK Government has consistently emphasised that student assessment must be evaluated on learning outcomes as well as workload. Furthermore, an appropriate balance between the two must be found. This was not apparent in the original development of the ECTS, where workload alone was included in the credit criteria.

As presented in the Bergen communiqué of 2005 and the London communiqué of 2007, assessment by learning outcomes has now become increasingly important to the Bologna Process.^{27,28} The Secretary of State for Education and Skills emphasised the importance of this in his final address at the London ministerial summit in 2007, stating that learning outcomes should underpin both credit

23 House of Commons Education and Skills Committee (2007). *The Bologna Process: government response to the committee's fourth report of session 2006-07*. <http://www.publications.parliament.uk/pa/cm200607/cmselect/cmmeduski/788/788.pdf>

24 *ibid.*

25 Universities UK (2006). *Proposals for national arrangements for the use of academic credit in higher education in England – final report of the Burgess Group*. http://www.universitiesuk.ac.uk/Publications/Documents/Burgess_credit_report.pdf

26 *ibid.*

27 Communiqué of the Conference of European Ministers Responsible for Higher Education (2005). *The European Higher Education Area: achieving the goals*. http://www.bologna-bergen2005.no/Docs/00-Main_doc/050520_Bergen_Communique.pdf

28 Communiqué of the Conference of European Ministers Responsible for Higher Education (2007). *Towards the European Higher Education Area: responding to challenges in a globalised world*. <http://www.dcsf.gov.uk/londonbologna/uploads/documents/LondonCommuniquefinalwithLondonlogo.pdf>

systems and qualifications frameworks.^{29,30}

In addition, the European Commission's users' guide to ECTS originally stated that one calendar year could only be allocated a maximum of 75 ECTS credits.³¹ This would have potential implications for the UK's one year (12 month) master's programmes, where insufficient credits would be accumulated (90–120 ECTS are required by Bologna). This issue was raised with the European Commission, with emphasis on the need to better reflect learning outcomes rather than simply workload. The ECTS users' guide now states that a minimum of 60 ECTS can be earned for the second cycle, where 60 ECTS are applied to a typical full-time academic year within a formal learning programme, and 90 ECTS can be applied to a full calendar year (i.e. the UK's one year master's programme).

The UK Government now believes that ECTS includes a significant amount of flexibility, while continuing to emphasise the value of assessing learning outcomes. As a result of the work of UUK's Burgess Group, there are links between the new credit arrangements in England and ECTS. There are similar links to ECTS from credit arrangements used in Scotland, Wales and Northern Ireland.

Institutional autonomy is of great importance to the UK and the Bologna Process. Universities lie at the heart of the implementation of the Process, driving the reforms from within. The UK Government believes that it is in the interest of all UK higher education institutions to engage with the Bologna Process, and underlines the importance of diversity and autonomy within the Process.³²

The Bologna Process beyond 2010

The progress of the Bologna Process is currently being evaluated by an independent review, due to report in 2010. It is clear that there is more to be done to develop the action lines at the same time as implementing what has previously been agreed. While the implementation of the EHEA is set for 2010, the process is evolutionary and governments and universities have been actively considering how the EHEA will develop over the next decade.

Flexibility is vital for the UK higher education system to function effectively within the Bologna reforms. The UK has several expectations which are outlined in Box 2. If this vision is to be realised, there is a continuing need to share awareness across the UK and to encourage informed dialogue at both governmental and institutional levels.

Discussion points

Differences remain in the educational culture between the UK and the rest of Europe. The Bologna Process aims to shorten the existing degrees within Europe, replacing five year programmes with the 3+2 year model; however, there are concerns that the UK might need to consider lengthening a number of its higher education courses to comply with Bologna. This is particularly relevant to the 12 month 'stand-alone' and integrated master's programmes, and could create funding issues for UK higher education. Nevertheless, the Bologna Process is intended to be flexible and there is no requirement in the agreement for the UK to lengthen its courses. Yet it will be important for the UK to continue to emphasise the value of learning outcomes, rather than time served.

29 House of Commons Education and Skills Committee (2007). *The Bologna Process: government response to the committee's fourth report of session 2006-07*. <http://www.publications.parliament.uk/pa/cm200607/cmselect/cmeduski/788/788.pdf>

30 Communiqué of the Conference of European Ministers Responsible for Higher Education (2007). *Towards the European Higher Education Area: responding to challenges in a globalised world*. http://www.dcsf.gov.uk/londonbologna/uploads/documents_LondonCommuniquefinalwithLondonlogo.pdf

31 The European Commission (2009). *ECTS users' guide*. http://ec.europa.eu/education/lifelong-learning-policy/doc/ects/guide_en.pdf

32 House of Commons Education and Skills Committee (2007). *The Bologna Process: government response to the committee's fourth report of session 2006-07*. <http://www.publications.parliament.uk/pa/cm200607/cmselect/cmeduski/788/788.pdf>

Box 2 The UK Government's vision for the EHEA beyond 2010³³

- Retaining institutional autonomy within the national framework set by government.
- Achieving a balance in fair competition and collaboration between institutions.
- Focusing on learning outcomes rather than exclusive assessment of courses in terms of time served.
- Maintaining sustainability through a diversity of funding sources.
- Continuing to develop links with employers to understand their needs and contribution to education.
- Recognising that institutions engage in a range of activities beyond teaching, research and knowledge transfer, e.g. their local presence.
- Taking into account the growing value of lifelong learning.
- Ensuring support for increasing mobility.

³³ Presentation by Ms Rachel Green, Department for Business, Innovation and Skills and UK representative on the Bologna Follow Up Group (BFUG).

4 A case study: Imperial College London

There is much variation in the UK higher education sector's familiarity with the Bologna Process. Imperial College London is an example of one institution that made an early strategic decision to recognise, and be compatible with, the Bologna Process. The institution is aiming to be compatible with Bologna in the delivery of all of its undergraduate and postgraduate courses for all students entering the university from the academic year 2009–2010. It will use ECTS as the European standard, rather than the system of UK credits. This approach required collection of data and analysis of the current degrees on offer at Imperial College, outlined in Box 3.

Evaluation of the undergraduate and postgraduate courses offered at Imperial College revealed that most were already compatible with the Bologna requirements. Where this was not the case, programmes were modified to be compatible.

The bachelor's degree

All bachelor's degrees were shown to fall within the required ECTS range. All three year bachelor's courses were approved as attaining 180 ECTS, and the four year sandwich degree with a placement year in industry or abroad would accrue 180–240 ECTS. The year in industry has not yet been credited for all disciplines; therefore some attain 180 ECTS rather than 240 ECTS. Imperial College is aiming to make all placement years credit bearing for future students.

The master's degree

The 12 month master's programme at Imperial College is highly intensive and requires an average of 47 hours a week from students. Therefore most of the existing master's courses delivered the target of 90 ECTS (81

Box 3 The process of becoming compatible with Bologna at Imperial College London³⁴

1. Collection of evidence and analysis included:
 - i. The creation of an institutional Task Force.
 - ii. Collection and evaluation of detailed information on learning outcomes and study hours of individual courses.
 - iii. The comparison of courses against other European universities.
2. Internal verification: Consultation on findings with staff and students.
3. Phase I response: Devising a consolidated system of master's programmes, comprising:
 - i. Four academic year integrated courses (comprising a bachelor's and master's) equivalent to 240 ECTS.
 - ii. Four academic year integrated courses (comprising a bachelor's and master's) with 30 ECTS worth of additional assessed material, equivalent to 270 ECTS.
 - iii. 12 month intensive courses equivalent to 90 ECTS.
 - iv. Two academic year collaborative courses with other European or worldwide institutions equivalent to 120 ECTS – where part of the degree would take place at the corresponding institution.
4. Phase II response (in progress): Mapping ECTS onto elements within individual courses.

³⁴ Presentation by Professor Mary Ritter, Pro Rector for Postgraduate and International Affairs, and Chair of the Bologna Task Force at Imperial College London. For further information on the Bologna Process, courses and their ECTS see <http://www.imperial.ac.uk/pgprospectus/whatcanyoustudy/bolognaprocess>.

out of 87 courses for the 12 month intensive course). Those courses that did not deliver the required credits were modified to meet the requirements.

The integrated master's qualification was also evaluated. Analysis of this course showed that those taught over four academic years accrued 240 ECTS, whereas courses that included additional work outside term-time, primarily engineering courses, attained 270 ECTS. Imperial College considered this difference in ECTS across all faculties and assessed whether to modify all courses to accrue 270 ECTS. The conclusion was that Imperial College should offer both 240 and 270 ECTS integrated models. However, it would advise students taking the 240 ECTS master's course that there could be implications should they wish to move on to a third cycle doctoral programme, depending upon the flexibility of the route of entry at the selected university.

Imperial College also took this opportunity to introduce a master's course format of two academic years in duration, attaining 120 ECTS. These courses aim to foster collaboration with universities (in Europe and worldwide) by offering courses of similar length, allowing portions of the course to be taken at either university.

This analysis and redesign incurred new work for the course organisers but has been judged worthwhile, not least in opening up important new opportunities for collaborative postgraduate training programmes and research with partners abroad.

The doctoral degree

The Bologna Process does not set ECTS for the doctoral cycle, therefore these three to four year programmes remain unchanged because they are compatible with the existing UK model. However, there are concerns that Bologna's

proposed master's entry requirement onto these courses could pose problems for some UK universities in the future, although for others, such as Imperial College, a master's qualification is already the normal entry requirement for PhD (see Chapter 7 for further discussion).

Key points

In reflecting on the lessons learnt from the experience of Imperial College London, several points emerged:

- The objectives of the Bologna Process are more similar to the UK higher education system than other European systems, and therefore the UK has the potential to take a leadership role in defining the framework.
- The credit systems in the UK are comparable; however, there may be an advantage in selecting ECTS as the standard for the UK.
- Universities should understand the importance of systematically collecting and presenting the relevant data to substantiate claims for Bologna compatibility of their programmes.
- The 12 month master's course can be compatible with the Bologna framework and could be a new model for European implementation. This has significant advantages for students in terms of time, cost and flexibility. The course also offers advantages for universities in maintaining their attractiveness to overseas students.
- It is also important for UK institutions to explore the opportunities for joint programmes with institutions abroad.

5 The UK bachelor's qualification

The UK undergraduate bachelor's degree is a course of academic study that, undertaken full-time, is typically three to four years in duration.³⁵ Undergraduate degrees in biomedical sciences are designed to give a thorough understanding of a subject and to equip an individual for further study through a postgraduate master's or doctorate, or for a career without further study.

Few problems have been revealed when aligning the UK bachelor's degree with the Bologna framework. This is due to the length of study and the learning outcomes meeting the requirements of the qualifications framework. 60 credits can be applied to one academic year, therefore a three or four year bachelor's degree meets the ECTS requirement of 180–240 credits.

Many European universities have made significant changes to their higher education structures to ensure their qualifications are compatible with the Bologna framework. Five year courses, providing a master's level qualification at completion, were offered at many universities throughout Europe. However, since the inception of the Bologna Process, these countries have adapted their structures, generally splitting the course into a three year undergraduate and a two year master's to comply with the Bologna framework.

The four year sandwich degree

A number of four year courses, offered by many universities throughout the UK, provide an industrial placement or year abroad after the second academic year. In the biomedical sciences, this year generally consists of a laboratory-based position either in industry or at another university in the UK or abroad. Courses like this are becoming increasingly popular as they give students the opportunity

to gain additional experience before the completion of their degree.

There appears to be variation throughout the UK on how, and if, credit is applied to the placement year. In some institutions the placement year is credit bearing; in others it is not. The standard 180 ECTS are attained where the placement year is not credited. Where credit is applied to the placement year, 240 ECTS can be attained. As discussed in Chapter 4, institutions such as Imperial College London currently offer both the 180 and the 240 ECTS four year course; however, they are looking to make every placement year credit bearing in the future.

It is important to note that the 240 ECTS undergraduate bachelor's degree and the 240 ECTS integrated master's degree (see Chapter 6) are not equivalent. This is because the level of qualification is based on learning outcomes and would therefore be greater at master's level.

Mobility of students

An undergraduate degree in a biomedical science discipline provides individuals with the opportunity to pursue a career in science or to use their acquired skills within another sector. Within science, postgraduate study can be undertaken to establish a research career; in addition, alternative careers within the science sector can be pursued without need for a higher-level qualification. This is not the case in some other disciplines such as engineering, where a master's degree would be necessary to enter professional practice.

Both employers and universities see the value in students undertaking a placement year during their degree. UK and overseas employers are more likely to recruit individuals who have gained experience of the workplace.

³⁵ http://www.direct.gov.uk/en/EducationAndLearning/QualificationsExplained/DG_10039021

This is also the case for students intending to undertake further study, particularly for entry into a doctoral programme, where those with an industrial placement year are more likely to gain a PhD position than those without the same significant laboratory experience.

However, there is a concern that European employers, which are accustomed to the five year system (that includes a master's), might overlook students with a bachelor's degree alone. This could have implications for the international mobility of individuals with a UK

bachelor's degree. It is thought this issue will lessen over time as European countries adapt to the Bologna system of comparability. Similar concerns were raised about the competitiveness of UK students with a bachelor's degree alone when applying for PhD posts in Europe (this is discussed further in Chapter 7).

6 The UK master's qualification

Currently, all signatory countries are evaluating their progress towards alignment with the Bologna Process. The evidence indicates that many UK universities are aligned with the reforms, with recognition and implementation of standards and guidelines taking place. However, the master's qualification continues to be a point of debate within the higher education sector.

The UK one year master's programme

The 12 month master's degree has been a focus for discussion in the UK. While the Bologna Declaration does not require the master's degree to be two years in length, most European universities offer a two year master's – although even within Europe there is considerable variation. The continental master's programme is essentially aimed at preparing students for a PhD and a career in academia, whereas the UK master's generally offers high-level skills required for the workplace (however, UK research-based master's degrees, for example MRes, are explicitly designed as preparation for a PhD).³⁶

Misunderstanding of the nature of the UK master's qualification could potentially lead to it being erroneously perceived as 'lightweight'. This is because the UK has a tradition of relatively short undergraduate and postgraduate courses, in contrast with many other countries. However, a system that is based on learning outcomes, as called for by the UK Government, validates the UK courses against those in other European countries.

In Scotland, there has been lengthy discussion about the value of creating an extended master's course in biomedical sciences. However, there are obstacles to overcome,

such as the need for additional funding to ensure sufficient teaching staff and the capacity to accommodate laboratory projects. Institutions such as the University of Edinburgh are exploring new options to foster European scientific and educational collaboration and mobility. For example, Eurolife, a network of universities including Edinburgh, provides a joint programme in translational and experimental medicine, allowing master's students to perform part of their studies in a partner institution.^{37,38}

Integrated master's programmes

The integrated master's degree is a four year enhanced undergraduate degree that provides a Master in Science (MSci) qualification on completion. For example, MBiol denotes a Master in Biology. Relatively few UK universities currently offer an integrated master's course in biomedical sciences, and this is anomalous compared with other disciplines. In disciplines such as physics (MPhys) and engineering (MEng), this type of qualification is the requisite for entering professional practice.³⁹ It is seen as a high quality qualification that equips the student for both further study and employment within academe and industry. The integrated master's is compatible with Bologna credit ranges for first and second cycles, providing both 240 and 270 ECTS. This is based upon workload and learning outcomes of the taught components of the course, where further study outside term-time is required to reach 270 ECTS.

The stimulus afforded by the Bologna Process might be used as an opportunity for universities that do not offer the integrated master's to start thinking about new course design, i.e. reconsidering the scope, length and diversity of

³⁶ Fearn H (2008). *The long and the short of it*. Times Higher Education, October 2.

³⁷ Further information see <http://www.eurolifeuniversities.org>

³⁸ Presentation from Professor Simon van Heyningen, Vice-Principal, University of Edinburgh.

³⁹ Institute of Physics. *Memorandum for the review of science and innovation policies of government, the Bologna Process*. http://www.iop.org/activity/policy/Consultations/Higher_Education/file_21254.doc

biomedical courses and their place in delivering the multidisciplinary expertise that is often called for by employers.⁴⁰

Funding implications

With some countries adopting the '3+2+3' year model, there are concerns that this trend will influence the UK's programme provision, i.e. to increase the length of its postgraduate courses, which could have an impact on funding. However, UK research funders have no plans to expand their current master's funding provision, and it was reiterated that it is up to each institution to decide on the length of their master's courses independently. Further development of the 12 month intensive course model could serve as an attractive alternative to increasing course duration and could maintain the movement of overseas students to the UK institutions.

The UK has a tradition of attracting both domestic and overseas students to its master's programmes. The widespread acceptance for including learning outcomes into the criteria for assessment, and the alignment of the UK qualifications framework with that of the EHEA, demonstrates that UK master's degrees (both the integrated and stand-alone master's degrees) are compatible with the Bologna Process. In the current economic climate, the one year master's course should be particularly attractive, allowing students to undertake a shorter and more intensive course and not to incur the greater cost of a two year degree.

7 Research training and PhD courses

One of the aims of Research Councils UK (RCUK) is to enhance the international reputation of UK research training. The Research Councils collectively fund approximately 15,500 doctoral students at any one time throughout the UK and therefore have significant influence over UK higher education.⁴¹ RCUK works to ensure the views and needs of the UK research community are represented in European forums.

The doctoral (third) cycle was first introduced as an action line (Box 1) in the Bologna Process at the Berlin summit in 2003.⁴² Successive ministerial summits since then have increasingly concentrated on issues appertaining to doctoral programmes, and closer links are developing between the EHEA and the European Research Area (ERA). The ERA is an EU initiative to create a unified research area within Europe, facilitating mobility, networking and collaboration.⁴³ It is beneficial for the constituents taking forward the Bologna Process to interact with this body, to enhance careers and prospects for researchers in Europe.⁴⁴

Individuals undertaking a doctorate are seen both as students and as early stage researchers within the Bologna Process. At the Bergen summit of 2005, it was stated that overregulation of doctoral programmes must be avoided, and therefore the doctoral cycle is not allocated credits under the ECTS.⁴⁵

RCUK considers it important that the Bologna requirements remain flexible to accommodate the range of doctoral programmes in Europe, including flexibility of access and variation in purpose, duration and delivery. A single, regulated model of doctoral training must be avoided. Institutional autonomy allows for this

flexibility and enables universities to define their own criteria for entry to PhD level. In considering doctoral level programmes, it is also important to maintain a focus on learning outcomes, and to emphasise the value of higher-level skills and enhanced employability of PhD students in all sectors of the economy.

Entry requirements to a PhD course

The Bologna Process allows some flexibility in entry to a doctoral level programme. However, it also states that it is committed to the second cycle (master's) providing access to the doctoral cycle.⁴⁶ As mentioned in Chapter 5, this has led to some concern that the Bologna Process may lead to the requirement for a master's degree as a necessary entry criterion for a doctoral programme. The UK Government's position is that decisions on access to doctoral qualifications are matters for individual institutions. RCUK have expressed the view that the proposed requirement would reduce the current flexibility within the UK system, and could have several implications for the UK doctorate including:

- Major funding implications for the UK; currently master's degrees are not a pre-requisite for entry to doctoral level.
- The standard of UK doctorates could be perceived as lower than in the rest of Europe because of the perceived lower entry level.
- The potential impact on mobility of students; individuals may not be able to progress directly from a UK bachelor's degree to a doctoral degree course in another signatory country.

Students are becoming increasingly aware of the Bologna Process and seeking clarification

41 For further information see <http://www.rcuk.ac.uk/rescareer/rcdu/default.htm>

42 Communiqué of the Conference of European Ministers Responsible for Higher Education (2003). *Realising the European Higher Education Area*. <http://www.bologna-berlin2003.de/pdf/Communique1.pdf>

43 For further information see http://ec.europa.eu/research/era/index_en.html

44 UK HE Europe Unit (2006). *Guide to the Bologna Process edition 2*. http://www.europeunit.ac.uk/sites/europe_unit2/resources/Guide%20to%20the%20Bologna%20Process%20-%20Edition%202.pdf

45 Communiqué of the Conference of European Ministers Responsible for Higher Education (2005). *The European Higher Education Area: achieving the goals*. http://www.bologna-bergen2005.no/Docs/00-Main_doc/050520_Bergen_Communique.pdf

46 European University Association (2006). *Final recommendations, EUA Bologna seminar on doctoral programmes*. <http://www.eua.be/research/doctoral-programmes/doctoral-programmes-in-the-bologna-process/doctorates-seminar/>

on course compatibility. Overseas students are noted to be particularly conscious of the reforms, and anecdotal evidence suggests that some UK universities are failing to attract as many overseas students to their master's courses as previously. This may be due to the perception that UK courses are not compatible with the Bologna Process for entry onto doctoral programmes. To avoid these problems and to retain flexibility, it is imperative for UK universities to develop a clear process for defining alternative PhD entry criteria.

In creating a system that allows alternative entry routes, it is also necessary to take account of the variation between content and duration of PhD programmes. For example the University of Glasgow runs a 1+3 year PhD programme (funded by the MRC), where the first year is for completion of a master's (MRes) and the following three years for completion of PhD.⁴⁷ Participants are able to leave the programme after completion of the MRes should they wish. Organisations such as The Wellcome Trust and the Biotechnology and Biological Sciences Research Council (BBSRC) fund four year PhD programmes, and others such as the British Heart Foundation fund three year PhD programmes.^{48,49,50} A master's qualification is not necessary for entry onto these schemes. This shows some of the variation of PhD schemes within the UK and highlights the fact that a flexible entry system is essential.

Discussion points

The impact of the Bologna Process on entry onto the doctoral cycle is clearly a source of some concern. In contrast to most European universities, many UK students do not take, nor are required to take, a master's level qualification before starting a doctoral degree. This difference in entry requirements to the

doctoral level could create a problem in the future where the mobility of UK students, who wish to undertake doctoral studies in Europe, could be hindered.

It is essential to continue to enhance the international reputation of the UK for research and training. Currently, 13% of the annual UK output of PhDs is accounted for by students from the EU and 42% from the rest of the world.⁵¹ However, one difficulty in quantifying UK excellence is the lack of internationally comparable statistics. For example, although the UK has relatively robust data on PhD completion rates, not all countries do. It has been suggested that there is need to create a European database with compatible data. The newly launched European Universities Association Council for Doctoral Education plans to address this need.⁵²

There has been an increase in European funding for UK medical research and capacity building, and a growing level of research collaboration across Europe. It is therefore essential that the UK occupies a central place in European efforts to build excellence in both education and research.

47 For further information see <http://www.gla.ac.uk/faculties/fbls/g/prospectivestudents/phdstudentshipsotherprogrammescscholarships/13mrcphdstudentshipsinnivomammalianbiology/>

48 For further information see <http://www.wellcome.ac.uk/Funding/Biomedical-science/Grants/PhD-programmes-and-studentships/WTD004384.htm>

49 For further information see http://www.bhf.org.uk/research_health_professionals/apply_for_research_grants/grant_types_guidelines/non-clinical_phd_studentship.aspx

50 <http://www.bbsrc.ac.uk/funding/index.html>

51 Presentation from Dr Iain Cameron, Head of RCUK Research Careers and Diversity Unit, Research Councils UK.

52 <http://www.eua.be/events/eua-council-for-doctoral-education/>

8 The UK medical degree and clinical academic qualifications

28 medical schools award a primary medical qualification in the UK and all must meet the criteria set by the European Commission's Directive 2005/36/EC, which requires 5,500 hours of theoretical and practical training, over a minimum of five years.⁵³ This directive is independent of the Bologna Process and underpins the European mutual recognition of medical degrees.

In the UK, the requirements of the undergraduate medical degree are audited by the General Medical Council (GMC) as part of its determination of proficiency standards. There were significant changes in medical education following the GMC initiative 'Tomorrow's doctors', which sets out the standards and outcomes for medical schools, with a new emphasis on an integrated curriculum being the joint responsibility of clinicians, basic scientists and educationalists.⁵⁴ This represented a welcome move away from the traditional pre-clinical/clinical divide in medical education – a divide that risks being reinforced by the Bologna model.

Despite the Bologna Process framework being cross-disciplinary and not addressing individual subjects, the GMC Education Committee previously expressed concern that an inflexible application of a three cycle approach could threaten the diversity of provision of medical degrees in the UK. The GMC sought clarification from the UK Ministerial representatives in the Bologna Process and was reassured that the Bologna Process is compatible with the present structure for UK medical education.

The Medical Schools Council is pleased with the standing of the UK medical qualification in Europe. The UK needs to continue to engage with other Bologna Process countries to portray the benefits and diversity of the comprehensive integrated course and to monitor developments

to ensure the continued recognition of the UK medical qualification.

The primary medical degree classification

It has been suggested that the standard five year medical degree should be classified a master's degree, due to its equivalence to master's level rather than bachelor's. This could be justified on the grounds that students who do not wish to complete the full medical qualification can be offered the option of exiting medical school after three years study, having attained a BMedSci.

The Quality Assurance Agency (QAA) has concluded that even if the five year integrated medical degree is formally a bachelor's qualification, it has master's level equivalence.⁵⁵ There is therefore a question of whether UK universities should call their medical degrees a master's. This may be influenced by how other countries classify their medical degrees and the demands for the current trend to encourage graduate entry. This approach to classify the medical degree as a master's is not favoured by the GMC, nor by the medical schools, as this could affect the current integrated structure of the degree.

Intercalated BSc or BMedSci

The intercalated Bachelor of Science (BSc) or Bachelor of Medical Science (BMedSci) is a qualification offered to medical students at most medical schools in the UK. It is a chance to gain knowledge and understanding of basic biomedical and clinical science. The course occupies one full academic year and is generally completed after the second or third year of the undergraduate medical degree. These degrees

⁵³ Official Journal of the European Union (2005). *Directive 2005/36/EC of the European Parliament and the Council*. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:255:0022:0142:FN:PDF>

⁵⁴ General Medical Council (2003). *Tomorrow's doctors*. http://www.gmc-uk.org/education/undergraduate/GMC_tomorrows_doctors.pdf

⁵⁵ The Quality Assurance Agency (2008). *The framework for higher education qualifications in England, Wales and Northern Ireland*. <http://www.qaa.ac.uk/academicinfrastructure/FHEQ/EWN108/FHEQ08.pdf>

are strongly recommended if a student wishes to embark on a future career as an academic.⁵⁶ This type of qualification is an option at many medical schools, however, it is a compulsory part of training (bar graduate entry) at some universities.⁵⁷

Due to the apparent short length of this programme, where a bachelor's degree is completed in one year, there were previously some concerns about its fit within the Bologna Process. However, in reality there is no difficulty in the intercalated BSc or BMedSci course meeting the ECTS requirements. This is due to recognition of the preceding medical course, where the first two or three years of the medical degree contain substantial science components. These years of medical training, completed with a full academic year, provide the required 180 ECTS *in toto* for completion of the BSc or BMedSci.

Integrated MBPhD programmes

The MBPhD programme, run by a small number of UK medical schools, allows promising medical students to undertake a PhD whilst studying for a medical degree. Similar to the intercalated BSc or BMedSci, the PhD is generally taken after the first three years of the medical degree. This programme is designed for students who would like to embark on an academic career. Early graduates of the programme have played an important role in building clinical research capacity and in contributing to translation of basic science research into health care benefits.⁵⁸ Protecting this programme is therefore considered by many researchers and research funders to be very important.

There is uncertainty as to how these courses should be treated within the Bologna qualifications model. Whilst the Bologna Process generally allows flexibility in routes of entry to a PhD course, clarification is needed for those MBPhD programmes where the student embarks on the PhD component without yet attaining even a bachelor's degree. This issue may become increasingly problematic for PhD funders as well as for students.

The UK should take the initiative to articulate the importance and value of MBPhD programmes. It is important to protect and enhance this prestigious clinical research training programme.

⁵⁶ Gardner K and Olojugba C (2008). *Should I do an intercalated BSc?* Student BMJ **16**, 238-239.

⁵⁷ For further information see <http://www1.imperial.ac.uk/medicine/teaching/undergraduate/>

⁵⁸ The Academy of Medical Sciences (2007). *MB PhD Programmes, a position paper by the Academy of Medical Sciences*. <http://acmedsci.ac.uk/p99puid107.html>.

Conclusions

These conclusions are those of the delegates and speakers that attended the symposium.

The symposium confirmed that there is much variation among UK institutions in their approach to the Bologna Process. University autonomy is both important to the UK and key to the Bologna Process, however, it has led to different degrees of integration with the Process, with some universities becoming fully compatible, and others not.

The Bologna Process is not legally binding in the UK, and therefore universities can align themselves with it as they see fit. However, universities need to be aware that the Bologna Process aims to create the European Higher Education Area by 2010. UK universities need to think how they would like to be positioned within it and what they want to provide to students, in order to maintain or increase their attractiveness and competitiveness in Europe. Communication within the UK about the Bologna Process is vital to this, and the UK should ensure that its degrees are seen to be of high value to both domestic and overseas students. The academic community needs to ensure that the UK Government is fully aware of its position on key issues. Similarly, the UK Government needs to ensure that its strategy is coherent across its departments.

Funders such as the MRC report an increase in scientific collaboration throughout Europe, supported by designated funding. UK universities must be aware of, and be in a position to harness these opportunities by ensuring they remain competitive and attractive within Europe. Universities must therefore be aware of the affect the Bologna Process could have.

Flexibility

Flexibility is a fundamental requirement for maintaining a first-class education system. The

option for mobility within Europe throughout each level of qualification will enhance learning and experience gained by students and staff alike. This is also important in maintaining the influx of highly skilled overseas staff and students to the UK at all levels. Building a flexible system that is attractive to these individuals is a necessity, and will provide funders with the ability to maintain the current number of courses available in the UK.

The bachelor's degree

Flexibility is required by both employers and universities across Europe to recognise the UK bachelor's as a qualification that is adequate to start a career in science or outside science. The value of the undergraduate sandwich degree, with a year in industry or abroad, must also be recognised as this provides valuable experience for entry into further study and employment alike. To do this, universities should look into crediting the placement year to showcase its value.

The master's degree

UK master's programmes are an important element in attracting both domestic and overseas students into postgraduate education. 12 month intensive master's courses can deliver 90 ECTS and will be attractive to domestic and overseas students, especially in the current economic climate.

The options for collaboration between institutions could also be explored. As shown by Imperial College London, collaborative master's courses with other European universities provide an additional option. The Bologna Process could therefore provide universities with a chance to be creative in considering how best to design future biomedical master's courses, including further inclusion of integrated master's programmes.

The UK Government is aware that concerns still exist in some quarters regarding both the one year master's and the integrated master's. However, it believes that such courses are not incompatible with the requirements of the Bologna agreement.⁵⁹ It is the responsibility of each university to analyse their master's programmes to align themselves within the framework as they see fit.

The doctoral degree

The symposium highlighted the concern that master's courses may be seen as a requirement for entry onto PhD courses both in the UK and throughout Europe. Flexible entry onto PhD courses is essential to increase student mobility between UK and other European institutions. Alternative routes, other than via master's qualification, should be taken into account, for example the value of the industrial placement year. Efforts to avoid overregulation of the doctoral cycle are strongly supported.

The UK medical degree

The UK medical degree is recognised as Bologna compliant and no change in its structure is deemed necessary by the UK medical community. This has been reiterated by the Medical Schools Council (MSC), which is pleased with the standing of the UK qualification within Europe. The MSC is not in favour of re-classification of the medical degree to master's level due to concerns that this could reinstate an unhelpful pre-clinical/clinical divide, and thus diminish the status of the current integrated medical degree. Close monitoring of the situation throughout Europe will be necessary to ensure that recognition of the UK medical degree is maintained.

Clinical academic qualifications

The MBPhD programme is an important qualification for those pursuing a career in academic medicine. Flexibility of entry to the PhD phase of this course is essential for it to function properly. This qualification should be supported, protected and promoted throughout Europe as a good introduction to clinical academia.

Beyond 2010

Many individuals in the UK academic sector have already devoted much time to participating in the Bologna Process and to addressing the issues for their own institutions. It is important to capitalise on this expertise by sharing good practice, and to continue building the evidence base to substantiate the UK position. Additional evidence would be highly valuable in the following areas:

- Documenting the current impact of international perceptions of UK compatibility with the Bologna Process.
- Demonstrating the added value in terms of learning outcomes for bachelor's options (e.g. four year sandwich degrees) and master's options (e.g. integrated and one year courses).
- Demonstrating the added value in terms of learning outcomes for PhD options and the MBPhD programme.
- Developing comparable statistics on PhD completion rates across Europe.

Appendix 1: Symposium programme

Welcome

Professor Robert Souhami CBE FMedSci, Foreign Secretary, Academy of Medical Sciences and Chair of the symposium.

An overview of the Bologna Process and the governmental view on the reforms

Ms Rachel Green, Department for Business, Innovation and Skills, and the UK representative on the Bologna Follow Up Group.

An institutional view – how Imperial College London has approached the Bologna reforms

Professor Mary Ritter, Pro Rector for Postgraduate and International Affairs and Chair of the Bologna Task Force at Imperial College London.

A series of short presentations from biomedical, medical and clinical academic representatives:

Bologna, Bioscience, Scotland, and the UK

Professor Simon van Heyningen, Vice-Principal, The University of Edinburgh.

The UK Medical Degrees and the Bologna Process

Professor Tony Weetman FMedSci, Dean of the School of Medicine and Biological Sciences, University of Sheffield. Deputy Chair of the Medical Schools Council.

A funder's perspective from RCUK

Dr Iain Cameron, Head of RCUK Research Careers and Diversity Unit, Research Councils UK.

A UK medical research funder's perspective – a detailed analysis of the implications for clinical academic qualifications

Sir Leszek Borysiewicz FRS FMedSci, Chief Executive of the Medical Research Council.

Panel discussion

Chaired by **Professor Keith Gull CBE FRS FMedSci** with a panel comprising the symposium speakers and Bologna experts.

Appendix 2: Delegate list

Ms Nona Ahamat Policy Officer, Wellcome Trust	Dr Howard Davies Senior Advisor, European University Association
Ms Emma Bennett Senior Officer, Biomedical Grants and Policy, Academy of Medical Sciences	Professor Richard Denton FRS FMedSci Professor of Biochemistry, University of Bristol
Sir Leszek Borysiewicz FRS FMedSci Chief Executive, Medical Research Council	Dr Isabelle de Wouters Senior Manager, NIHR Coordinating Centre for Research Capacity Development (NCCRCDC)
Ms Sarah Butler Assistant Director of the Development and Enhancement Group, Quality Assurance Agency	Mr Paul Dowling Policy Officer, Europe Unit
Ms Zehra Buyuktuncer University of Chester	Dr Diana Dunstan Consultant, Research Councils UK
Professor Jane Calvert Head of School of Biomedical Sciences, Newcastle University	Professor Steven Edwards Head of School of Biological Sciences, University of Liverpool
Dr Iain Cameron Head of RCUK Research Careers and Diversity Unit, Research Councils UK	Professor Darrell Evans Associate Dean, Brighton and Sussex Medical School
Dr Suzanne Candy Director, Biomedical Grants and Policy, Academy of Medical Sciences	Dr Robin Fears Report Writer
Professor Hardial Chowdrey Head of Department of Biological Sciences, University of Westminster	Dr Angela Flannery Director, Science Policy, AstraZeneca
Ms Gill Clarke Director, Education Support Unit, University of Bristol	Professor Barry Furr OBE FMedSci Chief Scientist/Consultant, Astrazeneca
Professor John Coggins FRSE Vice-Principal (Life Science, Medicine and Veterinary Medicine), University of Glasgow	Professor William Gilmore Manchester Metropolitan University
Professor John Connell FRSE FMedSci Professor of Endocrinology & Head of Graduate School, University of Glasgow	Ms Rachel Green Deputy Director, Higher Education Strategy and Implementation Directorate, Department for Business, Innovation and Skills
	Professor Anne Greenough Head of the Medical School, King's College London

Professor George Griffin FMedSci
Vice Principal (Research), St George's,
University of London

Professor Keith Gull CBE FRS FMedSci
Wellcome Trust Principal Research Fellow
and Professor of Molecular Microbiology,
University of Oxford

Dr Anne Hamblin
Head of the Graduate School, The Royal
Veterinary College, London

Ms Eve Jagusiewicz
Policy Advisor, Universities UK

Professor Ronald Laskey FRS FMedSci
Honorary Director MRC Cancer Cell Unit,
University of Cambridge

Professor Jane Lewis
Dean, Schools of Biosciences & Integrated
Health, University of Westminster

Ms Sally Lukins
Mentoring and Outreach Officer, Academy of
Medical Sciences

Dr Winston Morgan
Programme Leader (Bioscience Masters
programmes), University of East London

Professor Roger Morris
Head, School of Biomedical and Health
Sciences, King's College London

Mr Huw Morris
Academic Registrar and Bologna Expert,
University of Wales, Swansea

Professor Jim Neilson
Dean for Training, National Institute for Health
Research

Mr Dan Nicholls
Grants Officer, Academy of Medical Sciences

Dr Sue Parkin
Head of Division, School of Life Sciences,
University of Bradford

Dr Shirley Price
Director of Postgraduate Taught Studies,
University of Surrey

Professor Nick Rawlins FMedSci
Watts Professor of Psychology, University of
Oxford

Dr Richard Rayne
Lecturer in Biology and Head of School,
Birkbeck, University of London

Professor Mary Ritter
Pro Rector for Postgraduate and International
Affairs, Imperial College London

Mr Emlyn Samuel
Policy Officer, Academic Careers, Academy of
Medical Sciences

Dr Alan Seddon
Head, School of Life Sciences, Kingston
University

Dr Anne-Marie Seymour
Reader and Director of Biomedical Science,
University of Hull

Professor Robert Souhami CBE FMedSci
Foreign Secretary, Academy of Medical Sciences

Ms Clare van Hamel
Acting Foundation School Director,
Severn Deanery

Professor Simon van Heyningen
Vice-Principal, University of Edinburgh

Dr Simon Vincent
Head of Personal Awards and Training,
Cancer Research UK

Professor Tony Weetman FMedSci
Chair of the Medical Schools Council
Pro-Vice-Chancellor for Medicine, University of
Sheffield

Professor Olwyn Westwood
Associate Dean (Education Quality), Barts and
The London School of Medicine & Dentistry

Dr John Williams
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