
Master in Human Medicine in Ticino

Report for a Faculty of Biomedical Sciences

Study Group

"Scenarios for structuring clinical education in medicine in Ticino"

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Abbreviations

BA	Bachelor
BAG	Federal Office of Public Health
CCT	Cardiocentro Ticino
CdS	State Council
CMU	Conférence pour la Médecine universitaire
CRUS	Rectors' Conference of Swiss Universities
CU	Council of the Università della Svizzera italiana
CTI	Commission for Technology and Innovation
CUS	Swiss University Conference
EMS	Aptitude test for the study of medicine
EOC	Ente ospedaliero cantonale (Multi-site hospital of Ticino)
ETHZ	Swiss Federal Institute of Technology in Zurich
GC	Cantonal Parliament
IOR	Institute of Oncology Research, Bellinzona
IOSI	Oncology Institute of Southern Switzerland
IRB	Institute for Research in Biomedicine, Bellinzona
MA	Master
MAMed	Master in Human Medicine
NC	Numerus clausus
Unibas	University of Basel
Unifr	University of Fribourg
USI	Università della Svizzera italiana
UZH	University of Zurich

To make our report more readable, we have used only the masculine gender (he, his, etc.), which also includes persons of the female sex.

Executive Summary

The Study Group investigating "Scenarios for structuring clinical education in medicine in Ticino" has so far produced two reports for the State Council (Consiglio di Stato, CdS):

- **28 January 2011 "Master in Human Medicine in Ticino"**: a feasibility study, assessing the financial aspects and the required clinical resources, and emphasising the opportunity to help solve a major national problem.
- **21 December 2012 "Master in Human Medicine in Ticino", *In-depth Report***: an analysis of organisational issues, in particular simulating the realisation of a concrete teaching model, that of the University of Zurich (UZH). This Report confirmed the financial forecasts (a cost of CHF 24 million when the programme will be up and running, and a greater burden of CHF 6 million to be borne by the Canton), and the feasibility of the MA programme, subject to cooperation with one or more Swiss university faculties. The CdS approved the *In-depth Report* and renewed USI's mandate in view of the draft of a Message for the Cantonal Parliament (Gran Consiglio, GC).

The present Report, prepared for the Council of USI (CU), takes into account developments at national level, in particular the decision of the "National Health Policy Dialogue", a common platform of the Confederation and the Cantons, which on 23 August 2012 recommended an increase by 300 graduates in medicine starting from the academic year 2018/2019. This requirement has put medical faculties under pressure, making them less willing to offer a further increase of BA places for students who would subsequently follow the MA programme at USI. During an initial phase, the places offered by USI could be considered as part of the requested increase of 300 places.

Nationally, the political pressure on medical faculties continues, due to their inability to educate a sufficient number of doctors. As for Canton Ticino, we are observing a new impetus in biomedical research activities and a confirmed interest shown by clinical institutions for a MA education in medicine.

Given the number of involved organisations, it is vital that a clear decision is taken by USI, to avoid entering dangerous vicious circles. This has motivated the proposal of establishing a **Faculty of Biomedical Sciences**, consisting initially of two Institutes: an **Institute of Human Medicine**, awarding a MA degree in medicine, and an **Institute for Research in Biomedicine**, to make the IRB a duly affiliated body and to offer an academic context to PhD education that is already being provided.

A Faculty of Biomedical Sciences would also make it possible to develop the education and research activities already being performed at USI – in computational biology, health communication and public health – and to provide a favourable context for continuing education in entrepreneurship. In addition, the new Faculty would give further impetus to developments in fundamental and clinical research.

Frequent contacts with faculties of medicine and the various federal university and health-service training bodies have shown that, without a clear decision by USI and the cantonal political authorities, it is not possible to further proceed with the project: establishing a MA programme in medicine requires decisions at university, cantonal and federal level, which cannot be taken without a definite decision by USI and the Canton.

We are facing, as in 1995, when USI was established, a favourable conjunction of circumstances. But circumstances can change very quickly and Ticino needs to take a decision without delay, also in view of similar projects currently being elaborated for Lucerne, St Gallen and Fribourg.

1 Introduction

"Master in Human Medicine in Ticino", the Report addressed to the CdS on 28 January 2011, was a general feasibility study, assessing the financial aspects and the required clinical resources, and emphasising the opportunity to help solve a major national problem. The conclusions of the Report were approved by the CdS, which gave USI a mandate to continue its work.

The *In-depth Report "Master in Human Medicine in Ticino"*, published on 21 December 2012, examined the organisational issues involved, in particular by simulating the realisation of a concrete educational model, that of the University of Zurich (UZH).

The Report confirmed the financial forecasts and the feasibility of the MA programme, subject to cooperation with one or more Swiss medical faculties.

The project required a priority cooperation with one such faculty (when the report was being drafted, negotiations were in progress with UZH) and included a mechanism for increasing the number of places for BA students nationwide, didactic cooperation, and joint award of the first MA.

The financial forecasts, calculated analytically using the chosen didactic model, confirmed the estimates set out in the first Report.

The CdS approved the *In-depth Report* and confirmed USI's mandate in view of the draft of a Message for the GC.

This present *Report for a Faculty of Biomedical Sciences*, prepared for the Council of USI (CU), takes into account national developments, in particular the decision of the "National Health Policy Dialogue", a common platform of the Confederation and the Cantons, which on 23 August 2012 accepted the Study Group's recommendation for an increase by 300 of the number of diplomas in human medicine, from the academic year 2018/2019 on. This requirement has put medical faculties under pressure, making them less willing to offer a further increase in BA places for students who would subsequently follow the MA programme at USI.

This is particularly true for the Faculty of Medicine at UZH: a very promising meeting held on 10 February 2012 between the Canton (State Councillor Aeppli) and UZH (Vice-rector Wyler and Dean Grätz) was followed by a long silence, due in particular to ongoing discussions within the UZH Faculty regarding the creation of 60 new BA places. Subsequent meetings confirmed the UZH Faculty's willingness to cooperate, particularly in teaching activities, but also the impossibility of a further increase in the number of BA places in the near future, and the Faculty's reluctance to separate the third BA year from the first year of the MA, which are regarded as a single unit. The Canton of Zurich has always underlined the strategic importance of increasing the number of training places and its interest in a privileged alliance with Ticino, on both the clinical and the scientific level.

The lack of progress in our negotiations with UZH has induced a sense of urgency to make contacts with the universities of Basel (Unibas) and Fribourg (Unifr). Unibas has expressed strong interest and willingness to assume the role of a reference university. Unifr, not having a MA programme, is interested in securing future perspectives for its first BA graduates. It has also signalled great interest in working with us in the field of biomedical education and research.

As for Canton Ticino, we are observing a new impetus in biomedical research activities and a confirmed interest shown by clinical institutions for a MA education in medicine.

Contacts with Swiss medical faculties and various national bodies have also highlighted the need to define a precise institutional context for the MAMed education at USI. The arrangements set out in the *In-depth Report* were not clear enough and conveyed the impression that we were planning to set up a mere "branch office", with most of the decision-making left to the partner faculty.

This Report can be considered sufficiently complete to enable the CdS to take a decision and prepare a Message for the GC. It has become evident that, without a definite political decision, further contacts and the decisions that need to be taken at federal level are impossible. A request to participate in the Study Group as observers, made by USI to the CRUS on 30 November 2012, was rejected. The CRUS's refusal was motivated by the lack of a political decision, and by its concern of not granting us an unfair advantage in relation to similar projects in Lucerne, St Gallen and, recently, Fribourg (see Annexe A).

2 General considerations

2.1 A politically favourable moment at national level

The shortage of doctors and the consequent need to rely on foreign medical personnel, as well as the limited number of training places at Swiss medical faculties, is an issue often at the centre of national political debate.

This is clearly reflected in the popular initiative of 1 April 2010 on family medicine ("Ja zur Hausarztmedizin") and the motions by Fehr (08.3608) "A strategy to combat the shortage of doctors...", Gutzwiller (09.3210) "The attractiveness of studying human medicine", and finally Häberli-Koller (11.3526) for the abolition of the numerus clausus (NC).

Also the motion (12.4028) by Jacques Neiryck, from 3 December 2012, deserves attention: he called for stronger intervention by the federal government in medical education, particularly by establishing a BA in medicine at the federal schools of technology.

Difficulties faced by Swiss medical faculties in achieving the objective of increasing the number of human medicine graduates by 300.

Achieving the objective of an increase by 300 graduates has put several faculties in a difficult position, and may be only partially achieved.

2.2 A politically favourable moment in Ticino

There is agreement in Ticino that new development strategies are needed, also in order to counterbalance the problems faced by the financial industry. Scientific research could be an important development factor, especially in the biomedical field: apart from the work of the Institute for Research in Biomedicine (IRB), major research initiatives are under way in cardiology, oncology and neurology.

As far as clinical medicine is concerned, the Cardiocentro Ticino (CCT) has been recognised as a teaching hospital by the University Hospital of Zurich. The EOC is in line for a similar recognition.

Entrepreneurial training activities in the field of biomedicine have more than proved their value.

3 Institutional aspects of USI

Our conversations with Swiss medical faculties have placed institutional matters centre stage: organising a teaching programme without establishing a faculty is regarded as unrealistic and is likely to compromise future developments.

In any case, the USI statutes stipulate that faculties are the bodies that organise teaching and research, and that award study degrees.

The impossibility of offering a full education in human medicine (BA+MA) is an established fact, but we have realised that, without a precise institutional context, it is not possible to award degrees and it is difficult to cooperate with other universities. Agreements between institutions with different academic levels would be unbalanced, with the risk of creating relationships of dominance/subjection, which would then be difficult to reverse.

In addition, various activities developed at USI and in the cantonal scientific context – in particular, PhD education activities at the IRB and entrepreneurial training in biomedicine – make it necessary to define a more precise academic "container".

We therefore suggest the establishment of a Faculty of Biomedical Sciences, which, apart from the Master in Human Medicine, could host other education and research activities in the biomedical field, and could contribute to the development of other activities in this sector.

4 Faculty of Biomedical Sciences

On a national level, some faculties of medicine are monothematic and focus only on the education of doctors (in human medicine, dentistry and veterinary science). Some also cover other fields of education and research (for instance Lausanne, which has a "Faculté de biologie et de médecine", or Basel, which, while retaining the name of "Medizinische Fakultät", provides training courses in nursing ("Pflegerwissenschaft") and physical education ("Sportwissenschaft"), and cooperates with some autonomous research institutes ("Tropeninstitut").

During its study days, the Swiss Academy of Medical Sciences (SAMW) is constantly tackling the issue of epoch-making changes currently in progress in health care, and their consequences for care institutions and the training of care personnel. An integrated approach is gaining ground where the various disciplines and professions are required to find a context that is favourable for interaction.

We need to add to these considerations that, at USI, the Institute of Communication and Health (Prof. Schulz) of the Faculty of Communication Sciences and the Public Health Unit (Prof. Crivelli) of the Faculty of Economics have developed education and research activities to a level of competence and national visibility that attributes to them an important complementary role in biomedical education and research.

At the Faculty of Informatics, in particular at the Institute of Computational Sciences, there has been an intensification of research activities with a biomedical content, in cooperation with clinical or research institutions. An assistant professorship in computational biology has recently been established, funded by the Daccò Foundation for projects carried out in collaboration with the IRB.

As part of the continuing education programme, it would be desirable to consolidate entrepreneurial training in biomedicine.

These considerations have given rise to the proposal for a Faculty of Biomedical Sciences comprising:

- an Institute of Human Medicine, responsible for organising the MA programme;
- an Institute for Research in Biomedicine, performing also education activities, in particular for PhD students;
- Education and research activities in collaboration with the Faculties of Communication Sciences, Economics and Informatics.
- Advanced training in entrepreneurship in collaboration with the Center of Advanced Studies in Biomedical Entrepreneurship (CASEbiomed).

USI's current statute already foresees that tasks can be delegated to its Institutes, without the need to define special bodies to manage them, leaving the responsibility for this to the respective faculty.

To ensure that the Institute for Research in Biomedicine (managed by a Foundation) and the Institute of Human Medicine have the necessary autonomy, we suggest an addition to the statute: it should be stipulated that a faculty is allowed to establish a management body for any institute it constitutes, so as to give it the necessary autonomy, even within the respective faculty.

Institute Council

This is the Institute's management body, consisting of professors, ex officio members of the Faculty Council and other delegates appointed to ensure efficient management (e.g. project leaders).

4.1 Institute of Human Medicine

The main task of the Institute of Human Medicine would be to organise the MA programme in medicine as described in the *In-depth Report* of 21 December 2012.

We insist again on the need for a reference faculty (primary cooperation) which, given the diversity of educational models to be found in Switzerland, enables us to immediately ensure the quality and guaranteed recognition of the MA degree (a vital condition if we are to recruit students).

As a result of our conversations with the various faculties, the three central aspects of this cooperation (recruitment of students, delivery of teaching programmes, accreditation and recognition of the MAMed degree) have undergone significant changes, compared to the proposals made in the *In-depth Report*. From a model concentrated on a single faculty, we have moved to a model that foresees different kinds of cooperation with various faculties.

- The role of the reference faculty is to ensure a high quality level of education and to assist in the accreditation process and the recognition of the first awarded degrees, in addition to cooperation in the recruitment and teaching of students.
- The role of the faculties with which we stipulate agreements (affiliated faculties) is to participate in the delivery of teaching programmes, in research, in clinical cooperation and, in various ways, in the recruitment of students.

The agreements we are working on with the various faculties foresee the appointment of constituent bodies, cooperation in the delivery of teaching programmes and in the recruitment of students.

4.1.1 Recruitment of students

No faculty is able to receive a large number of additional students in its BA programme who would then continue with their MA studies at USI, as was suggested in the previous reports; we therefore have to adopt a different model.

In addition, the difficulties experienced by faculties of medicine in achieving the planned increase of 300 graduates by 2018 suggests that, in an initial phase, the new USI degrees (between 50 and 70 in 2020) will have to be part of the planned increase. In a second phase, they might represent a net increase beyond the 300 asked for by the Dialogue on National Health Policy.

The **first source** of potential candidates is based on the EMS (aptitude test) mechanism: the reference university or an affiliated university proposes to increase the number of its BA students, who are assigned BA training places via the EMS mechanism, without the right, however, to pursue their MA studies at the same faculty. These students are in the same position as those studying in Fribourg who can, through agreements with other medical faculties, continue their MA studies elsewhere. The individual student would sign an agreement recognising that he has been admitted to study medicine on the understanding that the increase in BA places does not imply an increase in the number of MA places at the same university, but that other possibilities are open to him, in particular at USI (Mobility Model). In its reply to Christine Bulliard-Marbach's postulate regarding the lack of mobility of medical students, the Federal Council acknowledged the problematic situation and explicitly referred to the new education opportunities that are under way at USI, as well as to an increased cooperation with the federal schools of technology.

The mechanism for the allocation of additional BA places with no guarantee of being able to continue with MA studies at the same university is being elaborated with the body responsible for organising the

EMS (CRUS, CUS). In any case, an increase by several dozens of students being admitted to BA programmes would certainly not result in a decrease in quality. It is worth remembering that, in 2012, there were 120 candidates with scores of 106 and only 5 places to be allocated. These were allocated on the basis of rankings for individual questions. If all 120 had been admitted, the entry level would not have been lowered at all (EMS Report 2012, p. 45).

This is clearly a delicate matter whose legal implications need to be verified and that will have to be approved by the CRUS, as proposed by the faculties and the Cantons.

Secondly, we believe that it is likely that students holding a BA degree will spontaneously choose USI for their MA studies (also with the encouragement and the active support by other medical faculties). This is more probable if USI's MA programme is innovative and of high quality.

A third source consists of students with a BA degree in biomedical sciences who might be admitted to USI after having acquired the clinical and subject-related competences not covered by their biomedical sciences programmes. Such an approach already exists in the cooperation between EPFL and UNIL, and between ETHZ and UZH.

A fourth source might be represented by students holding a Swiss school-leaving certificate (or residence in Switzerland) and a foreign BA degree (or equivalent). Also in these cases, students would be admitted only after an assessment of potential gaps in their education.

Setting up a **scholarship fund** might act as an incentive, as it would help reduce the financial burden on students living far from their home Canton.

4.1.2 Teaching programme

Generally speaking, we shall be able to rely on the education programme of the reference faculty, making the necessary changes to take into account the diversity of students. Special attention will be given to the introduction of innovative elements and to in-depth studies in specific fields.

With the affiliated faculties it will be possible to define areas of cooperation for particular disciplines, lecturers/teaching staff and/or double-chair arrangements.

4.1.3 Accreditation and award of the first MA degrees

The MAMed's objective is to become completely autonomous. Therefore, we will immediately request the appointment of a BAG/CRUS accreditation committee.

The possibility of awarding degrees jointly with the reference faculty will provide security for students and a guarantee for the project as a whole, in case of a delay by the Accreditation Committee,

4.1.4 Innovative characteristics of the MAMed at USI

The MAMed will be successful in the long run only if it provides both high quality education and opportunities that distinguish it from other education programmes.

The experience of Fribourg demonstrates that a clear focus on teaching is highly appreciated by students: this does not mean neglecting research, but initially giving priority to first-class teaching. This avoids a situation where teachers are put under pressure by research, clinical practice and teaching obligations, with the danger of them considering teaching as a hindrance to career progress.

Regarding other possible features of the MAMed, always in compliance with the BAG Catalogue of Competences, there are two elements that we would like to emphasise:

A specialisation in the scientific skills required to prepare students for research:

The programme enabling students a transition from the EPFL's BA in biomedicine to the UNIL's MAMed foresees 30 additional ECTS related to specialised scientific disciplines, enabling students to obtain a MAMed with mention of the specialisation followed. Drawing on the competences of the Institute for Research in Biomedicine and the Institute of Computational Sciences, USI can offer this possibility and thus make clinical training at USI more attractive.

A specialisation in public health management with special attention to family medicine (“Hausarztmedizin”):

Already in the *In-depth Report*, we mentioned the possibility of establishing an Institute of Family Medicine, as has occurred in several medical faculties, and as is advocated in various political initiatives now being discussed. An education in family medicine is a specialisation after the MAMed, but single courses could already be offered as part of the MA programme, as is also foreseen for the teaching of scientific skills. The Health Communication and Public Health Institutes already present at USI, with their respective competences and scientific networks, could provide valuable support.

4.2 Institute for Research in Biomedicine (IRB)

The IRB's affiliation with USI was decided by the GC in 2009 and is based upon a Convention between USI and the IRB, concluded on 4 February 2009.

The inclusion of the IRB as an institute of the future Faculty of Biomedical Sciences would accentuate this academic integration but still allow the IRB to maintain its managerial and financial autonomy.

In practical terms, this is very similar to the situation in which USI initially found itself in 1996, with the Faculties of Economics and of Communication Sciences being integrated with USI but administered financially by the Foundation for Lugano's Faculties, a management instrument created and funded by the City of Lugano. The considerations that applied at that time, regarding the need to ensure academic consistency while distributing the financial risk, are just as valid today.

In practical terms, the following changes are required:

- The Foundation Council of the IRB would retain its present competences.
- The academic staff would be appointed by the USI Council and ratified by the Foundation Council, as is already foreseen for the appointment of the Director.
- An IRB Council would be instituted, consisting of the academic staff. The Institute's professors would also be members of the Faculty Council.

The separation of competences between the Foundation Council and the IRB Council would be a quite common arrangement in the research context, allowing both bodies to work more efficiently (see Annex B).

4.2.1 Doctoral (PhD) programme

Already today, more than 20 students are in PhD education at the IRB, conducting their research projects and following a strong teaching programme. The IRB is not able to award PhD degrees, therefore students need to be registered at another university. A rather unpleasant situation for the IRB, because its research efforts are not rewarded with a prestigious academic distinction.

4.2.2 Other educational offers

The IRB has the competences and prestige required to offer basic educational programmes (Master of Science) and advanced education (Master of Advanced Studies). In the field of immunology, in particular, the IRB's director is already active in educational programmes offered by other universities. The implementation of other courses at the IRBould depend on the availability of laboratories, as well as on the cooperation and interest of other universities.

4.3 Continuing education

The courses in entrepreneurship in the biomedical field organised at USI are recognised by the CTI and highly regarded in scientific and business circles.

Because of its interdisciplinary nature, the suggested continuing education would depend directly on the Faculty, not on the individual institutes.

The present continuing education proposals could be offered under a joint name, such as the Center of Advanced Studies in Biomedical Entrepreneurship (CASEbiomed).

4.4 Possible developments in the field of fundamental research

In the future Faculty, we are foreseeing the presence of other institutes in particular research fields.

As for research institutes already active in Ticino and governed by Foundations or other bodies, we might follow a mechanism similar to the affiliation procedure adopted for the IRB. Once an institute has reached a certain critical mass, international scientific recognition and financial sustainability, it would be eligible for an affiliation. Legally, it would be necessary to find out whether a formal decision by the GC would still be necessary (the institute being affiliated with an existing faculty), or whether the obligation to communicate and the inclusion in the four-year plan would be sufficient.

This mechanism, which requires a clear separation of financial risks, and which makes it possible to assess the costs of education very precisely, has been met with approval by the federal bodies. We should bear in mind that one of the problems in managing medical faculties is the difficulty in getting a clear picture of the costs involved.

In Ticino, three research entities have been established and are at different stages of development. The first one is the Institute of Oncology Research (IOR), which receives federal subsidies on the basis of Art. 16 of the Law on Research. The Ticino Neuroscience Foundation was established in April 2013, one purpose of which is to support the research of the Neurocentro della Svizzera Italiana, located in Taverne. Also in Taverne, research began in April 2013 supported by the Foundation for Cardiological Research and Education (FCRE).

4.5 Other collaborative activities

We refer here to a number of activities already under way at USI's Faculties that might be able to interact with the future Faculty of Biomedical Sciences, in ways yet to be defined. These represent important resources, with national and international cooperation networks which could make an important contribution to education and research.

4.5.1 *Institute of Communication and Health (ICH)*

The Institute of Communication and Health (ICH), directed by Prof. Peter Schulz, is part of the Faculty of Communication Sciences. Within the field of communication sciences, the ICH conducts both theoretical and applied research with the aim of maintaining and improving individuals' health; it also runs social and company-related programmes to promote health, well-being and health policy.

Furthermore, the institute offers an outstanding doctoral programme in Communication and Health, funded by the Swiss National Science Foundation, and a MA programme in Communication Management and Health, in collaboration with the Virginia Tech University (USA). The ICH currently has 33 members, taking into account teaching staff, researchers, PhD students and scientific collaborators.

4.5.2 *Institute of Economics (IdEP)*

Within the Faculty of Economics, the IdEP is also concerned with the economics of health. Prof. Luca Crivelli is a board member of the Swiss School of Public Health SSPH+, which coordinates a doctoral programme at national level, and he is director of an advanced training programme leading to a MA degree in the health management and social health sector (Net-MEGS). Crivelli also promotes and coordinates the Summer School in Public Health Policy, Economics and Management organised in collaboration with the Swiss Tropical and Public Health Institute (Basel) and the SSPH+.

4.5.3 *Institute of Computational Sciences (ICS)*

The Institute of Computational Sciences (ICS), part of the Faculty of Informatics, is directed by Prof. Rolf Krause, an expert in modelling biomedical, bioengineering, environmental, economic and social processes.

The application of advanced mathematical models supported by modern super-computers is opening up new prospects for the study of complex biomedical problems. For some years now, the ICS and the CCT have been conducting collaborative advanced research in the field of cardiology.

The Daccò Foundation recently funded an assistant professorship in computational biology, with plans for close cooperation between the ICS (Prof. Krause and Prof. Parrinello) and the IRB (Prof. Lanzavecchia).

5 Management bodies

Since this is a Faculty "under construction", the management bodies will need to be set up in subsequent phases, taking into account that the education and research activities will be implemented at different stages.

2013 – By autonomous decision of the CU	2014 – After approval of the Faculty of Biomedical Sciences by the GC	2017 – From the start of the Master in Human Medicine
Constituent Council of the Faculty of Biomedical Sciences	Council of the Faculty of Biomedical Sciences	
Constituent Committee of the Institute of Human Medicine		Council of the Institute of Human Medicine
	Council of the Institute for Research in Biomedicine	

Table 1: Staged development of the constituent bodies

Immediately (2013) after an autonomous decision by USI's CU, the following bodies will need to be set up:

- a **Constituent Council of the Faculty of Biomedical Sciences**, provisionally consisting of the Constituent Committee of the Institute of Human Medicine and the Director of the IRB.
- a **Constituent Committee of the Institute of Human Medicine** (MAmed) consisting of 3 to 7 members, with members appointed in consultation with the reference university, affiliated universities and the federal institutions. The secretary functions will be performed by the USI Study Group. These bodies would be dissolved should the GC not approve the creation of the Faculty of Biomedical Sciences.

After approval will have been given by the GC (presumably in 2014), the following management bodies will be set up:

- **Council of the Faculty of Biomedical Sciences**, provisionally consisting of the Constituent Council of the Institute of Human Medicine (Master) and the Council of the IRB. The Faculty Council will appoint a dean, who will become a member of the CU.
- The **Constituent Committee of the Institute of Human Medicine** (Master) will retain its constituent role until course delivery begins and will follow the USI procedures for appointing the first professors. The secretary functions will be performed by the USI Study Group, which will maintain organisational and operational contacts.
- **Council of the Institute for Research in Biomedicine**: the IRB will become active as an academic institute immediately after the GC's decision. The Council can be constituted in its permanent form, since education and training activities are already under way.

Once delivery of the MA programme in human medicine will have begun, the various management bodies can be regarded as permanent:

- **Council of the Faculty of Biomedical Sciences**, consisting of the Faculty professors/teaching staff, under the direction of a dean
- **Council of the Institute of Human Medicine**, with a director responsible for teaching matters
- **Council of the Institute for Research in Biomedicine**, with a director appointed jointly by the IRB Foundation and USI.

Continuing education activities (Center of Advanced Studies in Biomedical Entrepreneurship (CASEbio-med)) will be managed directly by the Faculty.

6 Financial forecasts

The *In-depth Report* concentrated solely on the Master in Human Medicine. The proposal for a Faculty of Biomedical Sciences broadens the scope of activity, but at the same time provides a coherent organisational context for activities which are already in place and funded through their own channels.

The new and costly activity, as in the previous report, is the Master in Human Medicine. The forecasts set out in the previous report can be repeated without change:

Calculation of revenues	Per student (in CHF)	For 210 students (in CHF)	For research
AIU	50,000	10,500,000	
UFG	16,000	3,360,000	
Fees	* 4,000	630,000	
Competitive research			2,200,000
UFG(LPSU) – Research			1,100,000
Total teaching	70,000	14,490,000	3,300,000
Total teaching and research			17,790,000

**For fifth year students a reduced fee of CHF 1,000 is foreseen.*

Table 2: Revenues for the three MA years

Calculation of costs	in CHF
Full professors	2,750,000
Purchase of teaching hours	769,000
Cost of practical teaching	3,600,000
Administrative costs of medical studies	288,000
Cost of training candidate physicians	1,155,000
Salary of candidate physicians	630,000
Cost of Master theses	525,000
Partial total	9,717,000
Cost of technical, administrative and library staff	971,945
Research	* 5,500,000
General running costs/Overheads	6,939,000
Total costs	23,130,000

** This figure represents only the teaching costs of the MA programme: as for research, we have limited ourselves to an endowment for the professorships (CHF 3,300,000 in total) and a contribution of CHF 200,000 per chair for the acquisition of projects funded by third parties (making a total of CHF 2,200,000).*

Table 3: Costs for the three MA years

The difference between revenues (CHF 17,790,000) and expenditure (CHF 23,130,000) amounts to around CHF 6 million. We have taken this figure as the basis for calculating the Canton's extraordinary contribution, as indicated in the *In-depth Report*.

In the proposed model, for basic research we will have to draw on the support of foundations which are willing to take on the management and funding, and which allow for a clear separation of costs as far as accounting is concerned.

6.1 Scholarships

One of the possible measures suggested for the recruitment of students is the award of scholarships. However, securing funding from public sources, thereby increasing the planned additional contribution of CHF 6 million, could be very problematic. Nevertheless, it might be possible to secure short-term funding to attract students during the launch phase of the MA.

6.2 Assessment of the cost of medical and biomedical research in Ticino

Basic and clinical research are already important components of the Canton's scientific activity. The following table shows the major organisations that are currently active in this field and the costs covered by the Canton. Obviously, these research activities can be funded by competitively awarded national and European research grants and by contributions from private foundations.

Basic research	in CHF
IRB	15,500,000
IOR	4,500,000
Institute for Research in Cardiology *	1,000,000
Institute for Research in Neuroscience *	500,000
Total basic research	21,500,000
Clinical research	in CHF
IOSI	2,000,000
EOC hospitals	3,000,000
Cardiocentro	2,500,000
Other institutes and clinics	1,000,000
<i>Direct costs</i>	<i>8,500,000</i>
Building costs (10%)	850,000
Total clinical research	9,350,000
General total	30,850,000

*Data marked * are for 2013*

Table 4: Costs of medical and biomedical research 2011

The creation of new professorships and the arrival of students and post-graduates will lead to an increase in research activities and opportunities to draw on third-party funding. Already with the Faculty of Biomedical Sciences, there will be clear signals for further developments, so that it is not presumptuous to expect that, when the MAmed will begin in 2017, we might have a volume of research worth considerably more than the present CHF 30 million.

7 Stages and timing

In the project management, some processes will have to be carried out simultaneously:

- The creation of the constituent bodies, which is the exclusive competence of USI's CU (in the absence of political approval, they will be dissolved);
- The political procedure, in particular the preparation of a Message by the CdS and a decision by the GC;
- Negotiations with other universities (on ways of cooperation);
- Decision-making procedures involving federal bodies (CRUS, CUS, BAG):
 - Allocation of students via the EMS mechanism (Mobility Model);
 - Accreditation procedure.

A purely linear process tends to result in continuous vicious circles with political decisions chasing organisational and educational measures and vice versa.

A first step to avoid such a situation would be the immediate establishment of constituent bodies to set up organs of sufficient status to engage on an equal footing in negotiations and in the preparation of agreements and decisions at national level (changes to the EMS, our admission to planning committees, etc.). These agreements would be concluded subject to approval by the GC, but would make it possible:

- on the one hand, to give the GC a clear picture of the procedures required to make the Faculty of Biomedical Sciences a reality;
- and, on the other hand, to present precise proposals to the universities and to national bodies, proposals that would come into force subsequent to the GC's approval.

After a long period of time spent exploring various possibilities, it is vital to speed up this process. We need to exploit the present window of opportunity on both the national and the cantonal political level. Moreover, the projects put forward by Lucerne, St Gallen and Fribourg should not be underestimated.

The phases planned for in the previous report can be confirmed, but we emphasise their close interconnection and the impossibility of implementing them in a linear way.

A decision by the CU and the CdS/GC is essential if we are to proceed with the project, even though not all problems are resolved yet. We should not forget about the CRUS's response to our request to be represented with observer status in the CMU (Conférence pour la Médecine universitaire): it was refused because the necessary academic and political decisions had not been taken yet (see Annexe A).

With regard to the different phases outlined in the *In-depth Report*, the following updates and changes are necessary:

- **Phase 1** can be regarded as concluded with the presentation of the Report of 28 January 2011 and its acceptance by the CdS.
- **Phase 2** (preparation period, 2012-2014) is based on the Government Resolution of 1 March 2011 and the approval of the *In-depth Report* by the CdS. After USI's decision, on 19 October 2013, to establish a Faculty of Biomedical Sciences, the Message for discussion and, hopefully, approval by the GC will be prepared.

- **Phase 3** (BA period: 2014-2017). The new Faculty consolidates its management bodies and the IRB assumes the status of an academic Institution. The CRUS decides to increase the number of BA training places using the EMS mechanisms, adopting the Mobility Model (spring 2014) and initiating BA education in the reference and affiliated medical faculties (winter semester 2014/15).

Constitution of the Accreditation Committee (CRUS/BAG).

- **Phase 4** (MA period, 2017-2020) sees the start of the MA programme at USI (winter semester 2017/18), the completion of the Faculty's management bodies and the appointment of the teaching staff. It ends with the award of the first MA degrees and the first state examinations (summer 2020). Conclusion of the accreditation procedure.

8 Decisions to be taken by the CU

1. Approval of the creation of a Faculty of Biomedical Sciences and submission of this Report to the CdS for preparation of an official Message addressed to the GC.
2. Approval of the appointment of the constituent bodies:
 - Constituent Council of the Faculty of Biomedical Sciences
 - Constituent Council of the Institute of Human Medicine
3. Subject to a favourable decision by the GC:
 - Approval of changes to the agreement between the IRB and USI.

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