



Methodological Courses in Biology and Medicine: 8 years experience

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Molecular biology methods have become essential not only in biology and medicine, but also in biotechnology, veterinary sciences, agriculture, and in all fields of basic and applied science, especially so for diagnostics. However, mostly due to the lack of appropriate funding, students that graduate at Croatian Universities don't always have the opportunity to obtain adequate methodological knowledge. Furthermore, it is a sad fact that the laboratories in Croatia are mostly limited by the available or affordable methods. This choice of methods frequently dictate or influence the field of scientific interest, although it should be the other way around – the scientific interest should determine the methods to be used. I personally had a good fortune to learn a wide variety of methods from colleagues at *Ruđer Bošković Institute* (RBI) and abroad where I spent some time during my PhD and post-doctoral study. However, quite a number of the methods I learned in the most painful and time consuming way i.e. by trial and error. And, as with most of my colleagues, it took me many years to accomplish that. I think that there is no need for everyone to go through this process. Obviously, there should exist a less expensive way for the scientist and practitioners to learn the necessary laboratory methods.

Acting on that notion, in 2002 I decided to organize *Methodological Courses in Biology and Medicine* (*Metodološki tečajevi u biologiji i medicini*, MTBM) mainly for the PhD students but also for the experienced scientists who are interested in learning both fundamental and advanced-level molecular biology techniques. My intention was for participants to perform the real experiments in a lab, not just to organize a demonstration of the method. RBI is an ideal place for this because laboratories are already there with a critical mass of young, enthusiastic scientists working on different subjects, using various methods. The primary objective of these practical courses is to enable participants to implement newly learned techniques in their home laboratories.

During 5 days of a course we share our knowledge but also our enthusiasm and offer participants a possibility to get to know us very well so that they will not hesitate to contact us in the future when methodological problems arise. I hope that by doing this we contributed to a better interaction within Croatian scientific community. Our participants come from all over Croatia, but also from Bosnia and Hercegovina. Participants are very heterogeneous in terms of basic University education. From the beginning the only motivation for participants was acquiring the knowledge, thus creating an excellent atmosphere. The *Certificate of Completion*, that is obtained after the Course, did not have the formal value for a long time. Only three years ago the participation to

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Courses has been awarded with 4 ECTS points within Doctoral studies.

So far I have organized 30 courses with the number of participants limited to 8 per group, giving a total of over 200 attendees – some of them have participated in multiple courses. Table 1 shows titles of Courses that have been organized and their frequency. Courses are self-sustained and have some economical benefit to the lecturers through a hourly wage and to the participating laboratories through reimbursement for the necessary material. I am trying to organize around 4 Courses per year. Courses need no advertising except through e-mails sent through Croatian scientific Societies.

There are some distinct social benefits of MTBM. The most important one is that courses in Croatia present the opportunity for a better communication and that, afterwards, participants have the possibility to contact us whenever they need. Lecturers have the opportunity to learn what other scientist in Croatia do and this can give us ideas for collaborations in future. Finally, work in small groups enables establishing future collaborations between participants.

I would like to use this opportunity to thank all the lecturers of MTBM (Table 2). The enthusiasm of lecturers in Courses is outstanding and is the basis for our success. I would also like to thank the heads of all laboratories that supported the idea and allowed us to use their premises for this purpose. However, one scientist who deserves most credit for the actual launching of the courses, who shared my enthusiasm from the initial idea and to whom I am sincerely grateful is the former director of RBI Prof. Stjepan Marčelja who provided us with the initial financial support and reduced the red tape to the minimum.

Since the beginning, for each course we have been preparing material for participants with short theoretical introduction and detailed laboratory protocol. At one point we recognized that we need a textbook in Croatian. A few months later I sent an e-mail to scientists on RBI with an invitation for participation in a book »Methods in molecular biology« (<http://www.mmb.irb.hr>). As an Editor in chief I designated another 10 scientists for edi-

tors (incidentally, we are all women), and most of us have already been involved in Courses as lecturers.

The financial support for such a project was a specific problem in a small country as Croatia. Sponsors covered

TABLE 2

Lecturers and associate lecturers of MTBM.

<i>LECTURERS</i>
Andreja Ambriović Ristov
Mariastefanija Antica
Ružica Bago
Tatjana Borukalo Nikšić
Anamaria Brozović
Branka Bruvo Mađarić
Tamara Čačev
Helena Četković
Hrvoje Fulgosi
Koraljka Gall Trošelj
Magdalena Grce
Maja Herak Bosnar
Dubravka Hranilović*
Sanja Kapitanović
Silva Katušić Hećimović
Sanja Krča*
Sonja Levanat
Lada Lukić Bilela*
Nevenka Meštrovic Radan
Brankica Mravinac
Renata Novak Kujundžić
Vlatka Petrović*
Jasenska Piljac
Martina Podnar Lešić*
Neda Slade
Oliver Vugrek
Bojana Vukelić
Igor Weber
Ksenija Zahradka
<i>ASSOCIATE LECTURERS</i>
Robert Belužić
Ivana Grbeša
Koraljka Husnjak*
Arijana Komar
Marko Košiček
Martina Malnar
Mihaela Matovina
Nina Milutin Gašperov
Vesna Musani
Ivan Sabol

*presently not working at IRB

TABLE 1

Titles and number of Courses organized at RBI.

Course Title	Number of groups
DNA & RNA	16
DNA & RNA from animals	3
DNA & RNA from plants	2
Fluorescence and Confocal Microscopy	2
Molecular Medicine	2
Cells and proteins	2
Molecular phylogeny	2
Apoptosis	1

only a small part of expenses. However, RBI (in the persons of former director Prof. Mladen Žinić and his financial adviser Jaroslav Horvat, PhD) again stood behind us, i.e. lend us money, and now, after 3 and half years, I am very happy to state that we succeeded to return invested funds. The importance of our project was recognized by Ministry of Science, Education and Sports of the Republic of Croatia and their subvention lowered the price of a book for graduate students. I refer the reader to the exciting article written by one of the editors of the book Maja Herak Bosnar: »Metode u molekularnoj biologiji« – Methods in Molecular Biology: a journey from the bench to a comprehensive textbook (*Periodicum biologorum* 111 (1): 145–147, 2009).

There has been no such a book in Croatian and, with contributions from 119 authors from RBI and University, »Methods in molecular biology« has been accepted as a regular textbook by the University in Zagreb. The question that I answered numerous times to my colleagues is why we didn't translate but decided to write such a book *ab initio*. There is no doubt there exist excellent books in English but a book in Croatian gives some additional benefits to society. First, we tried to standardize Croatian language and translate English terms and expressions in a way that the language is simple but understandable. Second, and this is what I find of outstanding importance, our textbook gives you information on experts in the field in Croatia that you can ask for an advice. Behind

every protocol in the book there is an expert with an extensive experience in using the method.

There is one point I would like to emphasize in this time when economy and BNP growth are of the utmost importance. It is very difficult for science to have an impact on industrial productivity in a country with virtually nonexistent high tech industry. It is my belief that, at the time, knowledge dissemination is the best way for Croatian scientist to positively influence society's economic output. Thanks to Methodological Courses there are at this moment in Croatia over 200 laboratory practitioners who produce more results, and spend less time and expensive material in the process, and the cumulative economic effect of this is considerable.

In this short personal review of 8 years of Methodological courses in Biology and medicine I would like to thank not only lecturers but also all the colleagues that supported and encouraged me, especially at the beginning when I didn't know whether the idea was good or not. My thanks also go to all participants who always created an excellent atmosphere and feed our enthusiasm even more with their anonymous comments in a survey.

At the end I would like to remind our scientific community that initiatives should not be always official and tailor made, that ideas and individual efforts should be given an opportunity to show themselves valuable. We shouldn't be afraid of new ideas, but of accepting status quo or lack of ideas at all.