



Introduction*

DANICA RAMLJAK, Ph.D.

Director General of the Ruđer Bošković
Institute

Ruđer Bošković Institute
Bijenička 54, 10000 Zagreb, Croatia
E-mail: danica.ramljak@irb.hr

In the year when we are commemorating the sixtieth anniversary of the Ruđer Bošković Institute, founded at the initiative of the visionary, scientist, humanist and academician Ivan Supek, who together with several eminent professors of the University of Zagreb decided to propose the establishment of the Institute for Physics, it is important to recall the past and the Institute's contribution to Croatian science and education. It is also equally important to say a few words about the Institute today and all the challenges awaiting us in the near future.

The world-famous European physicist Niels Bohr said during a visit to the Institute that at the moment when Dr. Supek founded the RBI, the former blankness and great emptiness in scientific research in this part of Europe disappeared. He was right. Ruđer became one of the leading institutes in this part of the world, a success that has continued for 60 years. Soon after the founding of the Institute, realizing that people are the key to success, Dr. Supek sent several persons from Ruđer to the best laboratories abroad, thereby creating an elite group of scientists who brought the best from the world to Croatia and began serious research in the natural sciences. Affiliation with the global scientific community has enabled Ruđer scientists to be constantly involved in cutting-edge scientific research. During the difficult period in which Croatia found itself in the 1990s, this link with the world made it possible for scientists from Ruđer, by virtue of their reputation, to gather support from the 124 Nobel Laureates who signed the Appeal for Peace in Croatia in 1991.

From Dr. Supek to the present, the Institute has been led by experienced scientists, whom I commend for the efforts, knowledge and engagement that they invested for the good of Ruđer. Institute scientists have participated in a number of worthy projects and contributed to the recognizability of Croatia in world science.

It is difficult to enumerate all the achievements by our scientists. Our physicists have assumed a leading role in CERN – the European Organization for Nuclear Research, and the RBI has long been a leading center for the study of the nuclear interaction of systems with a small number of particles and broken symmetry. Our molecular biologists have participated in many discoveries published in *Nature*, *Science*, *EMBO* and other leading scientific journals in the world. Ruđer scientists have participated in the discovery of new diseases in children, while our physicians have developed preclinical methods that led to the first bone marrow transplant in Croatia in 1982. In cancer research, the RBI is the leading Croatian institute, which collaborates with all six domestic oncological centers and makes it possible for the tumors of Croatian patients to be subjected to molecular analysis, contributing to the quality of the therapies used. The first computer in Croatia was built at the Institute, at the same time as computers were being developed in

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the world. The first e-mail in Croatia was sent from Ruđer, which also established the first Croatian computer cluster, Grid, which is connected to the University Computing Center, Sreće, as well as all the European clusters. Ruđer's chemists have participated in all the major projects of the Croatian pharmaceutical industry and the development of new drugs at Pliva. Ruđer has the only NMR in the country, making modern chemistry research possible. Work with the cyclotron has enabled Ruđer scientists to produce radiopharmaceuticals, which they have sold for decades in several countries of Europe. This tradition continues today through the newly founded company of Ruđer Medikol Cyclotron with one of the most modern cyclotrons in Europe, which is housed at the Institute. Scientists from Ruđer founded the European Physical Society as well as many European and world scientific societies and associations. In long-term studies of the sea, rivers, lakes, potable water and the environment conducted in Zagreb, Rovinj and Martinska near Šibenik, Ruđer has played a leading role in protecting our natural resources. Through the results achieved, it has improved the quality of life of the Croatian populace.

There are nearly 900 persons employed at the Institute today. Over 550 of them are scientists, including 229 young researchers, and they publish over 440 scientific papers annually. The young are the strength of our Institute since over 60% of the scientists at the RBI are less than 45 years old. Our scientists participate in a number of fundamental and applied research projects in collaboration with Croatian and international universities, institutes and industry. Today, the RBI today has 124 projects financed by the Ministry of Science, Education and Sports as well as several NATO projects and other international projects. We are a leading scientific institution with 12 European scientific projects worth somewhat more than 3 million euros.

Ruđer currently constitutes 6% of the total scientific community in Croatia, with 30% of the scientific papers and total scientific activities. Over 200 Ruđer employees teach at the undergraduate and postgraduate levels at all the universities in the country, thereby contributing to the education of the young in Croatia. The Institute's experimental equipment, expertise in the fundamental sciences, and information and computer services maintain a high scientific standard and encourage the acquisition of new skills, which are important to the future of science and the transfer of technology in the economic sector. Cooperation with industry, based upon high technologies, is increasing daily, making Ruđer's contribution to the economic progress of Croatia indispensable. Ruđer has begun the process of technology transfer from science through patents via spin-off companies, of which we currently have five. We are also developing cooperation with leading Croatian companies, such as Končar and others. Recently, we sold the license of the Robin Hood Method, developed at the RBI, to the Massachusetts Institute of Technology.

At present, the RBI is facing a great challenge and has begun serious preparations for a strong performance on

the EU stage, where our goal is to become, at least in some disciplines, a center of excellence of the EU. We have begun serious preparations for the restructuring of the Institute, to be preceded by an independent international evaluation. In the preparations for that process, we are being helped by top world scientists of Croatian origin, which is a great contribution by the RBI in connecting the Croatian homeland with Croatian emigrants – a process that is respected and practiced by all modern countries.

Independent international evaluation will precede the modernization and informatization of the administration. Through the Office of International Projects, we are actively trying to double the number of international and EU projects. We are about to establish an office in Brussels and are setting up inter-institutional cooperation with leading institutes such as the Weizmann Institute in Israel and consolidating our connection with the Max Planck Institute in Germany, the National Institutes of Health in the United States and the Jozef Štefan Institute in Slovenia. We are establishing collaboration in Finland, a country similar in size to Croatia with the best innovational system in Europe. We are sending scientists on fellowships abroad. We are just in the process of opening four foundations for the RBI in places in the world where Croatian emigrants have a key role in gathering support for the projects of the Institute. We are achieving these endeavors with the whole-hearted support of the Croatian foreign minister and our ambassadors, who have worked hard to help us establish cooperation with these countries. Many of our worthy diplomats are helping and supporting our entrance on the world stage. We are also receiving considerable assistance in achieving this goal from the ambassadors accredited to Croatia. Certainly, I want to stress the important role of the Croatian citizens, who finance 85% of our budget and who make the financing of our daily operations possible via our relevant ministry. The Croatian citizens have indebted us with their support but we shall try to justify their confidence. This is important support and it is essential to us for the Croatian public, the Croatian government and the Croatian president to know that we shall only be able to activate the economy with the adequate financing of science and support for the work of scientists.

Ruđer is prepared for new challenges and advances, ready to contribute new technologies and jobs in Croatia. Nonetheless, it needs support in these efforts. The future of Ruđer is in our hands but the confidence and support of our ministry, our government, our president and the Croatian citizens are the key to our future success, for which we are grateful.

Finally, I especially want to thank everyone who has worked at Ruđer. For over 60 years, you have woven a part of yourselves into all the successes of the Institute. I thank you from my heart for your dedicated efforts to promote the betterment of Croatian science and the society as a whole.