

From the history of the study of pharmacy in Zagreb

## VLADIMIR PRELOG AND THE STUDY OF PHARMACY AT THE UNIVERSITY OF ZAGREB

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### Summary

The study of pharmacy at the University of Zagreb was established relatively early (1882) as a consequence of a long and rich tradition of 700-year long Croatian pharmacy. Particularly large contributions to the development of both academic and industrial pharmacy were given by Gustav Janeček (1848–1929), Julije Domac (1853–1928), and Vladimir Prelog (1906–1998). The first two played an important role in the establishing of the study and its development during the first 40 years. They are the authors of the first original Croatian pharmacopoeia, *Croatian-Slavonian Pharmacopoeia* of 1901, which was considered by European scientists to be one of the best in the world, and which had political significance as well. Their lives and achievements are well analysed. Vladimir Prelog had a major influence on the development of organic and pharmaceutical chemistry at the Faculty of Pharmacy (FPh), later the Faculty of Pharmacy and Biochemistry (FPhB). However, his influence is only partly described in literature. During his seven-year tenure at the University of Zagreb (1935–1941) and his subsequent acceptance of number of graduate and postgraduate students in his Laboratory of Organic Chemistry at ETH, Prelog educated ten scientists whose careers have been associated with the study of pharmacy at the University of Zagreb. Their short biographies will be presented, with an accent on their common work with Prelog and their relations to FPh/FPhB. The events that preceded the proclamation of V. Prelog as honorary doctor of pharmaceutical sciences at the FPh and *Doctor honoris causa* at the University of Zagreb are described.

**Keywords:** Vladimir Prelog; pharmacy; study; Faculty of pharmacy and biochemistry; honorary doctor.

## INTRODUCTION

The need for a scientific basis of pharmacy in Croatian lands was expressed and realized early, as a result of the long and rich tradition of Croatian pharmacy, going back for more than 700 years [1]. After several years of pressure, exerted by the Croatian-Slavonian Pharmaceutical Association and a few natural science professors from the Faculty of Philosophy, with the support of the Croatian ruler, *ban* Ivan Mažuranić, the study of pharmacy at the University of Zagreb was founded by the decision of Emperor Franz Joseph I on 4 October 1882 [2]. In the beginning, lectures were held at the natural history institutes of the Faculty of Philosophy. Separate university pharmacy departments were founded later. The Institute of Pharmacognosy, the first independent institute of its kind in the world, started operating in 1896 [3], the Institute of Pharmacy was founded in 1928, and the Institute of Pharmaceutical Technology in 1932. Finally, an independent Faculty of Pharmacy (FPh) was founded in 1942 and has been operating as the Faculty of Pharmacy and Biochemistry (FPhB) since 1963 [2]. Up until the middle 20<sup>th</sup> century, it was the only such faculty in Southeast Europe, attracting pharmacy students from Slovenia to Bulgaria. Despite three wars of 4 years each, and five different states and legal systems, the study of pharmacy at the University of Zagreb has been operating at the highest scientific level for 130 academic years without Yugoslav (now Croatian) Academy of Sciences and Arts (CASA) as well as 7 rectors of the University of Zagreb. A particularly large contribution to the development of not only academic but also Croatian industrial pharmacy was given by Gustav Janeček (1848 – 1929) [4], Julije Domac (1853 – 1928) [5], and Vladimir Prelog (1906 – 1998) [6]. The first two wrote the *Croatian-Slavonian Pharmacopoeia* in 1901. It was the first original Croatian pharmacopoeia, described by European scientists as one of the best in the world, and it had political significance too [7]. Vladimir Prelog had a major influence on the development of organic and pharmaceutical chemistry at FPh/FPhB.

Vladimir Prelog has been the subject of many books, scientific articles, reviews and other texts in Croatia. Articles about him became specially numerous after he won the Nobel Prize for Chemistry in 1975. Significant texts were published on the occasion of his death in 1998, the transfer of his urn to his homeland in 2001 and on the centenary of his birth 2006 [6,8-13]. This Croatian and Swiss Nobel Prize winner was the honorary citizen of several cities,

the honorary member of many associations and academies, the recipient of numerous honorary doctorates; symposiums were held about him; busts and plaques were put in his honor; streets, schools, societies, medals and awards were named after him; his face was printed on stamps etc. It would seem that Croatians have appropriately honored their great scientist, patriot and a great man in general. But this is not completely true. There are still unpublished and publicly unknown details and documents about his life and work. Moreover, the texts that have been published, especially those written for particular occasions – in other words, written in haste – contain incomplete and incorrect information.

### **ABOUT THE NOBEL PRIZE WINNER VLADIMIR PRELOG**

The peculiar life of Prelog is hard to summarize in a few sentences, so we will cover only the key points of his biography. He was born in Sarajevo on 23 July 1906 and attended the comprehensive secondary school in Osijek (1918-1921), writing his first scientific work in 1921. He passed his matriculation exam at a comprehensive high school in Zagreb (1924). Then he studied in Prague, graduating chemistry in 1928 from the Department of Chemistry and Technology of the College of Technology, where he obtained his PhD in Chemistry in 1929. From 1929 to 1934, he worked as the head of the laboratory for fine chemicals of the chemical wholesale company of G. J. Dřize in Prague. In 1934, he came back to Zagreb, where he started lecturing Organic Chemistry at the Chemistry Department of the Technical Faculty as assistant professor until 1940, when he became associate professor. In autumn 1941 he started working in the Laboratory of Organic Chemistry at Eidgenossische Technische Hochschule (ETH) in Zürich, Switzerland, with the first Croatian Nobel Prize winner, Lavoslav Ružička. Working in this new environment, Prelog became assistant professor in 1947 and full professor in 1950. When Ružička went into retirement in 1957, Prelog became the head of the Institute of Organic Chemistry, holding that position until 1965. He published around 420 papers. He won the Nobel Prize for Chemistry in 1975 for his scientific achievements in the research of stereochemistry of large molecules. He obtained numerous honorary doctorates from many universities around the world (the University of Paris, the University of Cambridge, the University of Liverpool, the University of Zagreb etc.). He became a member, honorary member or associate of many academies and associations (the Croatian Academy of

Sciences and Arts, the American Academy of Arts and Sciences, the Academy of Pharmaceutical Sciences in Washington DC, the Academy of Sciences in Paris, the European Academy of Sciences and Arts, the Irish Royal Academy, the Danish Royal Academy of Sciences, the Pontifical Academy, the Chemical Society of London, the Pharmaceutical Association of Japan, the Japanese Chemical Society, the Austrian Chemical Society, the Royal Society of London, the Swiss Chemical Society, the Croatian Chemical Society, the Czechoslovak Chemical Society etc.). He won many prizes, medals and orders (the Croatian order *Hrvatska Danica s likom Ruđera Boškovića*, the *Werner* award and medal of the Swiss Chemical Society, the *William Marsh* order of merit of Rice University, Houston, Texas, the *Paul Karrer* medal in Switzerland, the *August-Wilhelm von Hoffman* medal of the German Chemical Society, the *Davy* medal of the Royal Society of London, the *Roger Adams* award of the American Chemical Society, the *Božo Težak* medal of the Croatian Chemical Society, the *Hamilton* award of the University of Nebraska, the *Evans* award of the University of Ohio etc.). He was the honorary citizen of Zagreb, Osijek and Sarajevo [6,14].

## THE INFLUENCE OF VLADIMIR PRELOG ON CROATIAN CHEMISTRY AND PHARMACY

Prelog's influence on Croatian chemistry and pharmacy is huge. The *Zagreb School of Organic Chemistry* is the term used to describe the effect of V. Prelog during his seven-year tenure at the University of Zagreb (1935-1941) and his subsequent acceptance of an exceptional number of graduate and postgraduate students from Croatia in his Laboratory of Organic Chemistry at ETH. When they went back to Croatia, as a rule, they embarked upon distinguished scientific and academic careers, imparting their knowledge and Prelog's spirit to Croatians.

His contribution to the development of industrial pharmacy is also exceptionally large. In 1936, Prelog initiated the establishment of a research laboratory with a chemical and pharmacological department in "Kaštel", a pharmaceutical and chemical plant, thus linking university and industrial research. "Kaštel" went on to grow into PLIVA, a major pharmaceutical industry, while its research laboratory became an institute. Prelog enabled the doctoral and postdoctoral specializations of many PLIVA researchers in his laboratory at ETH.

This paper will highlight the influence of Vladimir Prelog on the development of organic and pharmaceutical chemistry at FPhB.



**Figure 1.** Vladimir Prelog in his laboratory at the ETH  
(Courtesy: Prof. M. Žinić).

## **PRELOG'S DOCTORAL STUDENTS AND COLLEAGUES AT THE FACULTY OF PHARMACY AND BIOCHEMISTRY**

When books and other texts about Vladimir Prelog mention his numerous colleagues, they rarely mention that some of those colleagues spent a large part of their career at FPh/FPhB. It paints an incomplete picture of the scope of Prelog's influence on Croatian science and the biographies of some of his colleagues. We will present their short biographies here, pointing out the parts about their work with V. Prelog and their relations to FPh/FPhB.

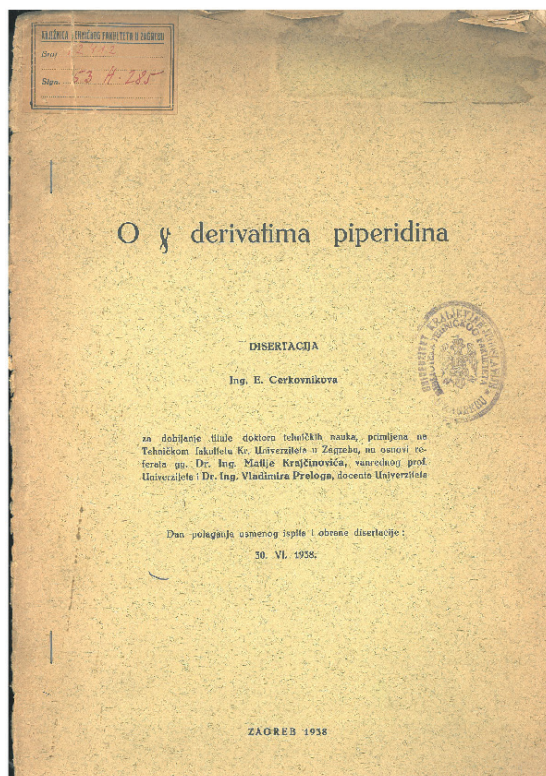


**Figure 2.** V. Prelog with his former associates in the PLIVA Club, (1989). *Sitting from the left: R. Seiwerth, D. Kolbah, V. Prelog, Mrs. Prelog and M. Proštenik; Standing from the left: M. Dumić, S. Mutak, B. Glunčić, K. Kovačević, B. Gašpert, M. Žinić, M. Kovačević, S. Borčić, V. Šunjic & S. Đokić. (Bolded are names of Prelog's collaborators associated with FPHB).*

### **EUGEN CERKOVNIKOV (1904-1985)**

He studied chemistry at the Chemical Department of the Faculty of Technology in Zagreb, graduating in 1929. From 1931 to 1932, he worked at the Faculté de Médecine in Paris, where he started doing scientific work on the synthesis of organic compounds with biologic effects. After returning to Zagreb, he volunteered at the Institute of Organic Chemistry of the Faculty of Technology in Zagreb, where he became Prelog's assistant in 1935. Prelog was his mentor for his PhD in technical sciences in the field of organic chemistry in 1938. From 1938 to 1947, he worked as research associate in the institute of the Kaštel plant (which would become PLIVA). In that period, he published 18 scientific papers together with Prelog. Cerkovnikov became assistant professor and was appointed as the first head of the Department of Organic Chemistry of the Faculty of Pharmacy in 1947. At the same faculty, he became associate professor in 1948 and full professor in 1956. Cerkovnikov was

among the first Croatian scientists examining the relationship between the structure of organic compounds and their pharmacological effects. In 1957, he moved to the newly established Faculty of Medicine in Rijeka, where he founded the Institute of Chemistry and Biochemistry and became its head. He was Dean of the Faculty of Medicine in Rijeka (1958/59). Cerkovnikov researched the synthesis of organic compounds, especially antimalarials, sulfonamides, spasmolytics and antihistamines, on the effects of ionizing radiation on living beings etc. He published some 200 scientific and 60 technical papers [10,14-16].



**Figure 3.** Cover page of Eugen Cerkovnikov's dissertation [17].

## DRAGUTIN KOLBAH (1912-1990)

He studied chemistry at the Department of Chemistry and Technology of the College of Technology in Prague, where he graduated in 1935. At that time, Prontosil (4,-sulfanilamido-2,4-diaminoazobenzene) began to dominate the pharmaceutical market as the first successful drug for bacterial infections. Prelog proposed to Kolbah to synthesize a number of azo dyes related to Prontosil within his doctoral thesis. One of those compounds, 4,-sulfanilamido-4-N-piperazyl-azo-benzene, known in literature as Kolbah's dye, showed excellent properties, so it was prepared for the market. In 1936, it was proven that Prontosil was reductively split in the organism and that the antibacterial effect was the property of one of its products, called sulfanilamide, which was the starting material in the synthesis of Kolbah's dye. Since sulfanilamide was not protected by a patent, it was quickly placed on the market by the Kaštel plant in 1937 as Streptazol, which was very successful. More than anyone else, it was the achievement of Prelog and his PhD graduate Kolbah. Kolbah earned his doctorate at the Faculty of Technology of the University of Zagreb as the first PhD graduate of Vladimir Prelog (1938). Kolbah worked as Prelog's private assistant until 1939. Then he did various jobs as a chemist until 1946, when he became the head of the sulfonamide facility in PLIVA. Kolbah worked on the isolation of alkaloids at ETH with Vladimir Prelog (1954) and on the preparation of compounds with antitumor effects at the Department of Chemistry, University of Michigan, Ann Arbor, Michigan, USA (1960-1962). He was appointed associate professor of organic chemistry at FPhB in 1962 and full professor in 1969, where he stayed until retirement. Kolbah was the head of the Institute of Organic Chemistry from 1962 to 1980. At the postgraduate studies in organic chemistry at the University of Zagreb, he gave lectures on selected topics in the chemistry of heterocyclic compounds. Kolbah researched the synthesis of biologically active compounds and the relationship between the structure of organic compounds and their biologic effects. He researched the synthesis of quinine, sulfonamides, benzodiazepines etc. Kolbah published around 50 scientific papers. Kolbah edited the well-known *Chemists' Textbook* (1951), which was republished in 1961 and 1986, and translated *Organic Chemistry*, the textbook by R. T. Morrison and R. N. Boyd, into Croatian. [8,14,15].



### **PAVAO ŠTERN (1913-1976)**

P. Štern was born in 1913 in Varaždin, where he completed his secondary education in 1931. He studied medicine at the Faculty of Medicine in Zagreb, graduating in 1936. From 1937, Štern worked in the Kaštel plant (later PLIVA), where he established the pharmacological laboratory and closely cooperated with Vladimir Prelog. In 1945, he moved to the Institute of Pharmacology of the Faculty of Medicine. Examining antihistamines and the autonomous nervous system, Štern introduced the scientific concept of receptors. He gave lectures on pharmacology at the Faculty of FPh in Zagreb from 1945 to 1948. Štern continued his academic career as full professor at the newly established Faculty of Medicine in Sarajevo, where he founded the Institute of Pharmacology, which now bears his name. Štern had a wide range of scientific interests, from the antihistamines we mentioned, to muscle illnesses, leukemia and antileukemic drugs, mechanisms of inflammation, mechanisms of effects of psychopharmacological drugs etc. He published around 500 papers. Štern was Dean of the Faculty of Medicine in Sarajevo (1952/53), full member of the Academy of Sciences and Arts of Bosnia and Herzegovina, and corresponding member of CASA. [15,18].

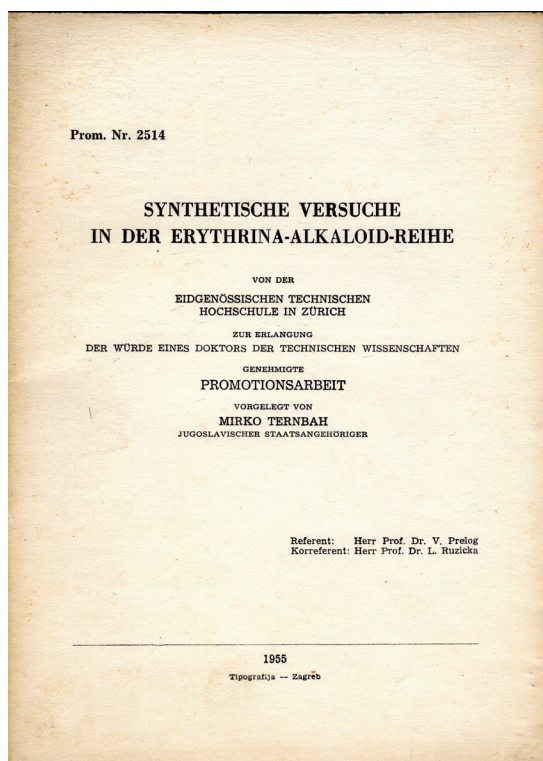
### **KREŠIMIR BALENOVIĆ (1914-2003)**

K. Balenović graduated from the Department of Chemistry of the Faculty of Philosophy (1937) and obtained his PhD (1939) in Zagreb. He did his postdoctoral studies under the Nobel Prize winners Albert Szent-György at the University of Szeged (1942-1943) and Vladimir Prelog at ETH (1949/50), where he later worked as visiting professor (1968/1969). From 1939, Balenović worked as assistant at the Chemical Institute of the Faculty of Philosophy. In 1945, he was elected associate professor at same faculty, where he gave lectures on organic chemistry until 1946. He moved to the Faculty of Natural Sciences and Mathematics in Zagreb (FNSM) as associate professor in 1946 and full professor in 1952. He was Dean of FNSM in 1958/59. Balenović was one of the founders of chemistry at the Ruđer Bošković Institute. He was elected as associate member of YASA (CASA) in 1958 and full member in 1975. Balenović researched natural organic compounds, amino acids, polyketones, organic sulfoxides and selenoxides and published around 100 scientific pa-

pers. When Croatia gained independence, Balenović was among the first six vice-presidents of the country [14,15].

### MIRKO TERNBAH (1920-?)

M. Ternbah studied pharmacy at the FPh, where he graduated in 1946. Then he was the principal of the Secondary School of Pharmacy in Zagreb for a year. Ternbah was elected assistant at the Department of Inorganic, Analytical and Physical Chemistry of the FPh in 1946. In 1948, and became assistant at the same faculty. He spent the period from 1952 to 1955 at the Laboratory for Organic Chemistry at ETH, where he made his doctoral dissertation under Vladimir Prelog and obtained his PhD in 1955. Ternbah worked at FPh until 1957, when he continued his scientific career abroad [15].



**Figure 4.** Cover page of Mirko Ternbah's dissertation whose second referee was Nobel Prize winner Lavoslav Ružička [19].

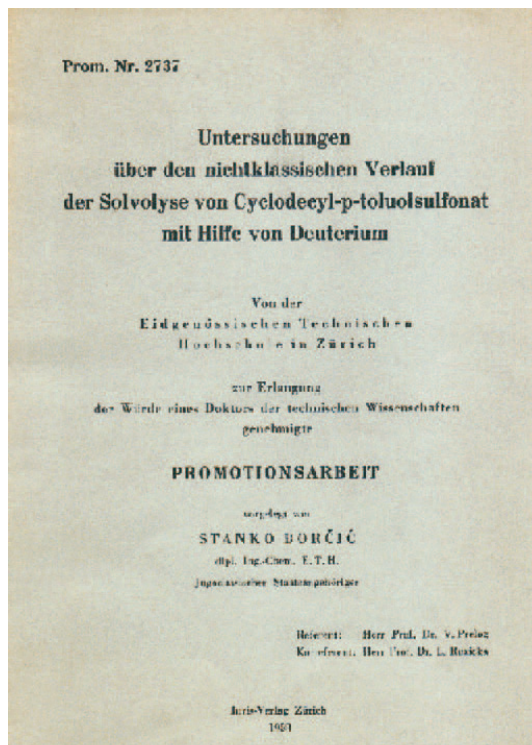
### **MIHOVIL PROŠTENIK (1916-1994)**

M. Proštenik graduated from the Department for Chemistry and Technology of the Faculty of Technology in Zagreb (1939) and obtained his PhD from the same faculty (1944). He did his postdoctoral studies in the laboratories of L. Ružička and V. Prelog, at ETH (1948/49), and at the Department of Biochemistry, University of Illinois, Urbana, Illinois, USA. At the Faculty of Medicine of the University of Zagreb, Proštenik was appointed private docent in 1949, university docent in 1952, associate professor in 1953, and full professor in 1963. He gave lectures on organic chemistry at FPh from 1957 to 1962. He was elected associate member of YASA (CASA) in 1963 and full member in 1986. Proštenik mostly researched the chemistry and biochemistry of lipids and the heterocyclic compounds with nitrogen and published around 100 scientific papers and a dozen technical papers [14,15].

### **STANKO BORČIĆ (1931-1994)**

S. Borčić studied chemistry at ETH (1949-1953), where he graduated (1953). He made his doctoral dissertation under two Croatian Nobel Prize winners, Lavoslav Ružička and Vladimir Prelog, and obtained his PhD in 1957. Upon the invitation of Ivan Supek, who was the director and founder of the Ruđer Bošković Institute, Borčić came to the Laboratory for Physical and Organic Chemistry in the institute, where he worked until 1967, when he was appointed associate professor at the FPhB. Borčić was appointed full professor in 1972. He spent a year at postdoctoral studies at the Department of Chemistry, California Institute of Technology, Pasadena, California, USA (1963/1964). Borčić was a visiting professor at several American universities: Department of Chemistry, University of Oregon, Corvallis, Oregon, USA (1970-1971); Department of Chemistry, University of Minnesota, Minneapolis, Minnesota, USA (1977); Department of Chemistry, Indiana University, Bloomington, Indiana, USA (1984); and Department of Chemistry, University of Ottawa, Ottawa, Canada (1981-1982). He gave lectures on Organic Chemistry at the FPhB, and lectures on Organic Reaction Mechanisms, Magnetic Resonance Methods and Organic Chemistry Methods at the postgraduate studies of the University of Zagreb. He was president (1984-1986) and vice-president (1986-1988) of the *Croatica chemica acta*. Borčić researched physical and organic chemistry, especially the organic reaction mechanisms and secondary isotope effects and NMR spectroscopy, publishing about 40

scientific papers on those topics. He was Vice Dean of the FPhB from 1972/73 to 1975/76 and Dean from 1985/86 to 1988/89. [14,15].



**Figure 5.** Cover page of Stanko Borčić's dissertation whose second referee was Nobel Prize winner Lavoslav Ružička [18].

## MLADEN ŽINIĆ (1947-)

M. Žinić completed the Secondary School of Chemistry and Technology in Zagreb in 1966 and graduated from the Faculty of Technology in 1971. After graduating, he started working with D. Kolbah at the FPhB, first as an assistant volunteer and then as a resident assistant at the Department for Organic Chemistry of the FPhB. He obtained his MA after a postgraduate course in Organic Chemistry (1974) and obtained his PhD at FPhB (1978). After his postdoctoral studies under Vladimir Prelog at ETH, Žinić shortly returned to FPhB, but then went to the Ruđer Bošković Institute in 1985. He was

appointed full professor at the FNSM in 2004 and of the Faculty of Medicine at the University of Rijeka in 2009 as a titled full professor of chemistry. Žinić was elected associate member of CASA in 2004 and became Head of the Laboratory for Supramolecular and Nucleoside Chemistry in 1993. From 1989 to 1991, he closely cooperated with Jean-Marie Lehn, the French Nobel Prize winner and the founder of supramolecular chemistry. He published 107 scientific papers. Žinić performed the duty of the director of the Ruđer Bošković Institute from 2005 to 2009. Žinić was elected full member of CASA in 2014 [20].

In addition, two more researchers were associated both with Vladimir Prelog and FPhB. **Miljenko Dumić** made his doctoral dissertation at FPhB and worked as postdoctoral fellow with Prelog at ETH (1983-1985). After thirty-five years working in pharmaceutical research and development in PLIVA industry he moved to the Department of Biotechnology of the Rijeka University where he was appointed as professor. Prof. Dumić was close with Prelog and wrote a number of texts about him. **Krunoslav Kovačević** received his M.S. degree from FPhB and during 1981-1982 he worked with Prelog at ETH on his PhD thesis which he finished at University of Zagreb. His career was associated with research and scientific management within PLIVA's Research Institute. Drs Dumić and Kovačević are authors of the most complete monography published about life and achievement of Vladimir Prelog [6].

## VLADIMIR PRELOG, HONORARY DOCTOR OF PHARMACEUTICAL SCIENCES AT THE FACULTY OF PHARMACY

In his letter of 25 January 1952, (Fig. 6) Dr Eugen Cerkovnikov, then a professor of organic chemistry and Head of the Institute for Organic Chemistry of FPh, informed Prelog about his efforts to make him an honorary doctor of FPh. In his reply of 09 February 1952, Prelog writes: *"...I was very moved and honored by your efforts to make me an honorary doctor of your faculty. Regarding my current position, your idea is not questionable. Yet I believe I am still too young for such a title, so you can take your time and reopen the issue in ten years or so. I know from practice that such proposals for honorary doctorates lead to discussions that are better avoided. I am happy that our colleague Ternbah is coming here. The Swiss Fremdenpolizei recently made inquiries here for his entry visa. I hope he has already obtained it..."* The letter reveals Prelog's proverbial modesty befitting a great man, and his care for the education of young Croatian scientists [21].

The proposal "to give the diploma of the honorary doctor of pharmaceutical sciences to Dr. Eng. Vladimir Prelog, full professor at the Technical College in Zurich", including an explanation, was submitted to the Council of FPH on 01 March 1952 by the professors Dragutin Barković and Eugen Cerkovnikov [21]. Already on 03 March 1952, there was an extraordinary session of the Council, presided by the dean, Prof. Fran Kušan. The session had only one agenda item: *Proposal of Prof Dr D. Barković and Prof Dr E. Cerkovnikov to give the diploma of the honorary doctor of pharmaceutical sciences to Dr Eng Vladimir Prelog, full professor at the Technical College in Zurich.* The faculty secretary Antun Kajfeš read the following explanation of the proposal:

*Professor V. Prelog founded the school of organic chemists specialized in therapy, contributing to the development of pharmaceutical science in Yugoslavia and espe-*

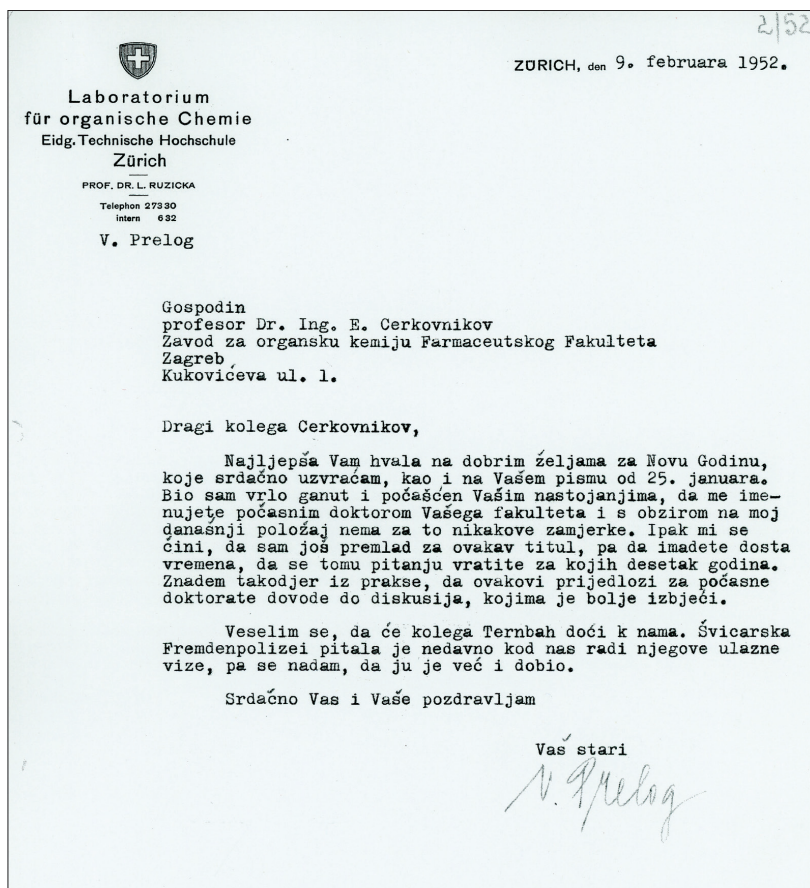


Figure 6. Prelog's letter of 09 February 1952.

cially in Croatia. He successfully resolved certain important problems in the field of pharmaceutical chemistry, such as the problem of malaria, and helped resolve the problem of the link between chemical constitution and antimalarial effect. He set the foundations of our production of synthetic drugs, and his co-workers and students rose to leading positions in the chemical and pharmaceutical industry in the field of synthetic chemistry and at the University (Prof Dr Balenović, Prof Dr Hahn, Prof Dr Režek, Doc Dr Proštenik, Dr Seiwertth etc.). Prof Dr Prelog has been worthily representing science abroad and is greatly admired in Europe and America. He has also had success in the area of natural compounds, contributing to the development of pharmaceutical science. While abroad, Prof Dr Prelog helps the work of our young scientists, thereby helping the development of science in Yugoslavia. The proposers are of the opinion that the awarding of a honorary doctor's diploma to Prof Dr Prelog would be visible proof that the University of Zagreb knows how to honor its deserving workers. If their proposal is accepted, Prof Dr Barković and Prof Dr Cerkovnikov also propose to ask Prof Dr Prelog to accept the honorary doctorate at our faculty and use the occasion to hold a few lectures in Zagreb.

The Council unanimously accepted the proposal (Fig. 7). Aside from the dean Fran Kušan, the following were present at the session: Hrvoje Iveković, Dragutin Barković, Božidar Vajić, Branka Akačić, Jaroslav Ječmen, Eugen Cerkovnikov, Marijana Fišer-Herman, Dragan Marković, Vera Vukčević-Ko-

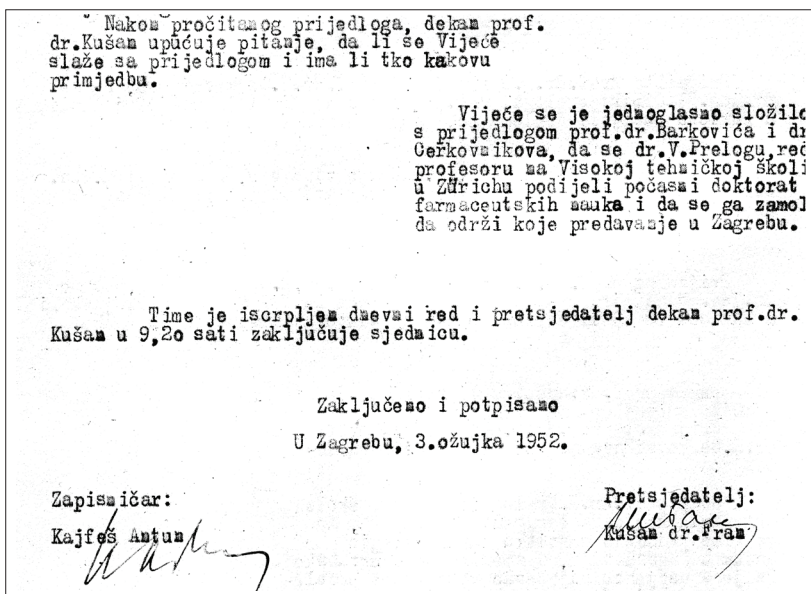


Figure 7. Part of the minutes from the FPh Council meeting of 03. March 1952.

vačević, Ivan Filipović, and Vladimir Seifert. They were the first in Croatia to recognize this great man of Croatian and world science, 23 years before he was awarded the Nobel Prize. They, too, are worthy of praise [19].

In his letter to Prof Cerkovnikov of 01 April 1952, (Fig. 8), Prelog expressed his gratitude at the news that FPh awarded him an honorary doctorate: *I was all the more moved by this news because I know best that I have not deserved it* [21].

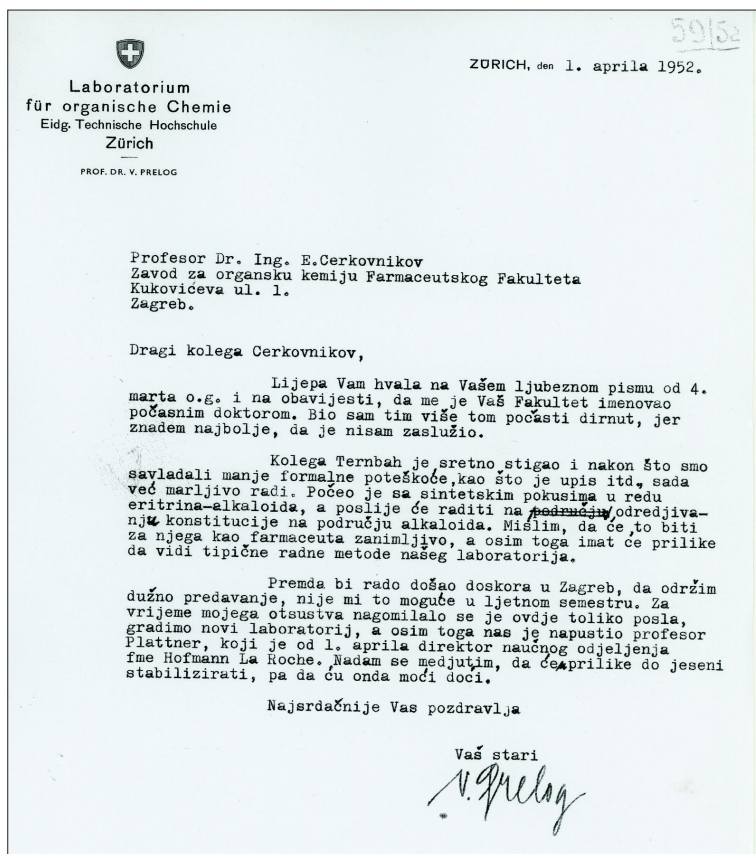
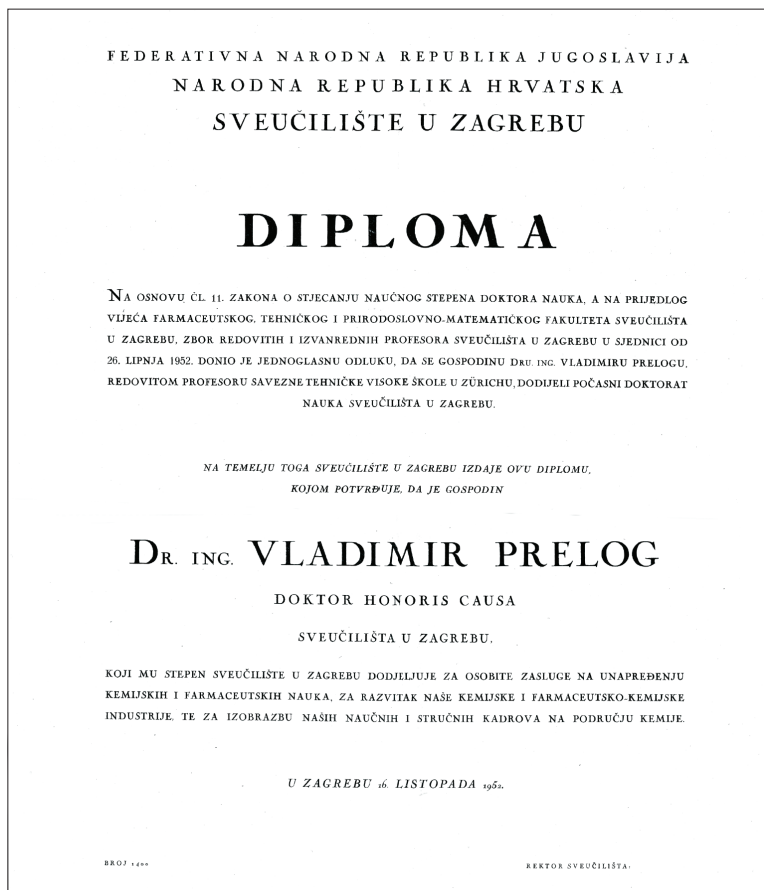


Figure 8. Prelog's letter of 01 April 1952



## VLADIMIR PRELOG, HONORARY DOCTOR OF SCIENCE OF THE UNIVERSITY OF ZAGREB

On 29 March 1952, immediately after Prelog became honorary doctor of pharmaceutical science at FPh, professors Dragutin Barković and Eugen Cerkovnikov submitted a proposal to the faculty Council to get together with the Faculty of Technology, where Prelog taught for 6 years, and the Faculty of Natural Sciences and Mathematics to start a joint procedure at the University of Zagreb to award the honorary doctorate of the University to Vladimir Prelog. In the explanation, they pointed out that the Yugoslav Congress of Chemists will take place in Zagreb, coinciding with the 75<sup>th</sup> anniversary of practical teaching of chemistry at the University of Zagreb and the 25<sup>th</sup> anniversary of the establishment of the Croatian Chemical Society. They also noted that *this year* (1952) was the 70<sup>th</sup> anniversary of pharmaceutical studies at the University of Zagreb, and that it was planned to hold the *International Congress of Pharmacy Scientists*, so if the Council accepted their proposal, *all these celebrations and jubilees could be combined in a great common event of our chemical and pharmaceutical science and study at the University of Zagreb*. The session of the Choir of Full and Associate Professors of the University of Zagreb, called to award the honorary doctorate of science to Prof Vladimir Prelog, was held on 26 June 1952. The session, presided by Rector Prof Dr Franjo Bošnjaković, was attended by 107 out of 165 professors (only 83 were needed for a quorum). They included professors from the Faculty of Pharmacy: D. Barković, H. Iveković, F. Kušan, B. Vajić, B. Akačić E. Cerkovnikov and J. Ječmen. References were given by Prof D. Barković from FoPh, Prof V. Hann from the Faculty of Technology, and Prof K. Balenović from the Faculty of Natural Sciences and Mathematics, in that order, explaining the proposals in the name of their faculties. During the discussion, the proposals were supported by F. Bubanović, a professor from the Faculty of Medicine. In a secret ballot, the professors unanimously supported the proposal that Vladimir Prelog should receive the honorary doctorate of science (*honoris causa*) of the University of Zagreb. The awarding ceremony was held on 16 October 1952 [22]. It was also the occasion of the First Congress of Pure and Applied Chemistry, where Prelog held a lecture.



**Figure 9.** The diploma Doctor Honoris Causa of the Zagreb University, presented to Vladimir Prelog on October 16, 1952 [22].

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### Sažetak

#### **Vladimir Prelog i studij farmacije na Sveučilištu u Zagrebu**

Studij farmacije na Sveučilištu u Zagrebu utemeljen je relativno rano (1882), kao posljedica više od 700 godina duge i bogate tradicije hrvatskog ljekarništva. Posebice velik doprinos razvoju akademske, kao i industrijske farmacije, dali su Gustav Janeček (1848–1929), Julije Domac (1853–1928) i Vladimir Prelog (1906–1998). Prva dvojica odigrala su ključnu ulogu u formiranju studija i njegovu razvoju prvih 40 godina. Autori su prve originalne hrvatske farmakopeje, *Hrvatsko-slavonske farmakopeje* iz 1901, koju su europski znanstvenici smatrali jednom od najboljih na svijetu, a koja je imala i političko značenje. Njihovi životi i djela dobro su obrađeni. Vladimir Prelog imao je ogroman utjecaj na razvoj organske i farmaceutske kemije na Farmaceutskom (FPh), kasnije Farmaceutsko-biokemijskom fakultetu (FPhB). Međutim, njegov utjecaj je tek djelomično opisan u literaturi. Tijekom sedmogodišnjeg rada na Sveučilištu u Zagrebu (1935-1941), i kasnijeg prihvaćanja brojnih doktoranada i postdoktoranada u njegov Laboratorij za organsku kemiju pri ETH, Prelog je educirao deset znanstvenika čije su karijere povezane sa studijem farmacije na zagrebačkom sveučilištu. Ovdje ćemo ih predstaviti kratkim biografijama s naglaskom na njihov zajednički rad s Prelogom i vezu s FPh/FPhB. Opisani događaji su predhodili izboru V. Preloga za počasnog doktora farmaceutskih znanosti na FPh i *Doctor honoris causa* na Sveučilištu u Zagrebu.

**Ključne riječi:** Vladimir Prelog; farmacija; studij; Farmaceutsko-biokemijski fakultet, počasni doktor.

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