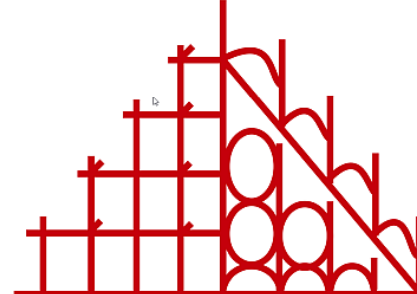




Uniwersytet
Wrocławski



Chemistry and Stereochemistry
of Peptides and Proteins

Peptide Chemistry in Wrocław Part I.

Faculty of Chemistry, University of Wrocław

Zbigniew Szewczuk



2017



1945



The **University of Wrocław** was opened in 1945, replacing the previous German **University of Breslau**.

Following the territorial changes of Poland's borders, academics primarily from the **University of Lwów** restored the university building heavily damaged as a result of the Siege of Breslau (from 13 February 1945 to 6 May 1945).



Territorial changes of Poland immediately after World War II



Many buildings were destroyed during the defense of the city.

Wrocław 1945/1946



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The first Polish team of academics arrived in Wrocław in 1945 and started to restore the university buildings, which were 70% destroyed

Tadeusz Baranowski
Jan Bogucki,
Ludwik Hirszfeld
Kazimierz Idaszewski,
Bogusława Jeżowska-Trzebiatowska
Henryk Kuczyński
Stanisław Ochęduszko,
Edwin Płazek,
Edward Sucharda
Kazimierz Zipser
Emil Taszner
Włodzimierz Trzebiatowski

The first lecture was given on November 15, 1945, by Ludwik Hirszfeld (microbiologist and serologist).



Emil Taszner (1900-1982)

Z HISTORII CHEMII

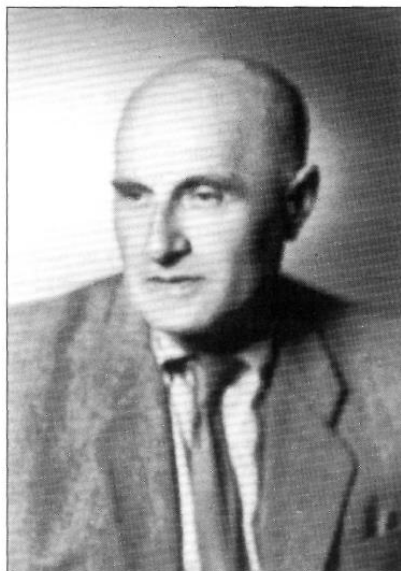
Founder of Polish Peptide Chemistry

W 100. rocznicę urodzin

Emil Taszner

Emil Taszner wniósł duży wkład w rozwój Wydziału Chemicznego Politechniki Gdańskiej, gdzie w latach 1953 ÷ 1963 był kierownikiem Katedry Chemii Ogólnej, a następnie kierownikiem Zakładu Chemii Peptydów w Katedrze Leków i Biochemii (1964 ÷ 1971). Przyczynił się również do powstania silnego Wydziału Chemicznego na Uniwersytecie Gdańskim. Na świecie jest znany jako twórca gdańskiej szkoły peptydowej¹⁾.

Emil Taszner urodził się 12 grudnia 1900 r. w Krakowie w rodzinie inteligentnej, jako syn Leona i Franciszki z Cenzorów. W 1920 r. rozpoczął studia na Wydziale Filozoficznym Uniwersytetu Jagiellońskiego. Kontynuował je na Uniwersytecie w Wiedniu, gdzie w 1927 r. uzyskał stopień doktora filozofii za pracę nad izolowaniem związków z korzenia przestępu dwupiennego *Brionia dioica*²⁾. Na uczelni tej studiował również medycynę. Staż podoktorski odbył w Paryżu w Instytucie Pasteura w pracowni M. Chirava, pracując nad lipaza osocza. We



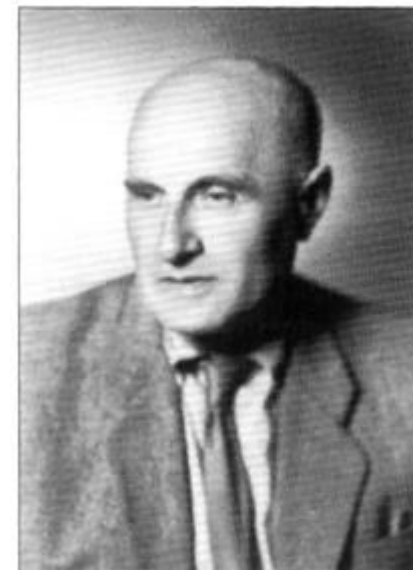
Źródło: ze zbiorów Adama Tasznera

mów, a technologię farmaceutyczną - do wielu wspianych leków o strukturze peptydów, pseudopeptydów i peptydomimetyków.

W latach pięćdziesiątych chemia peptydów w sposób naturalny była przede wszystkim zorientowana na metody syntezy peptydów i metody analizy ich struktury pierwszorzędowej. Taszner wraz z Bogdanem Liberkiem, Gotfrydem Kupryszewskim i Teresą Sokołowską, którzy należeli do jego pierwszych współpracowników w Gdańsku, rozpoczął badania różnych aspektów reakcji rozszczepiania estrów, uretanów i grup amidowych, a także metod syntezy aminokwasów i wytwarzania wiązania peptydowego. Najbardziej znanym dorobkiem tego pionierskiego okresu są procedury acydolitycznego usuwania N-osłony benzyloksykarbonylowej i tzw. haloliza estrów za pomocą halogenków litu. Ta ostatnia "... chociaż nie jest powszechnie używana w chemii peptydów, znalazła swoją drogę do chemii organicznej jako metoda z wyboru dla rozwiązania specyficznych

A. Chimiak, B. Rzeszotarska, Przemysł Chemiczny 79, 313-314, 2000

Emil Taszner (1900-1982)



1920, M.Sci. (chemistry) , Jagiellonian University

1927, Ph.D., (Chemistry) University of Wien

1928-1929, Postdoc, Pasteur Institute, Paris

1929-1931, Biochemistry Institute in Sorbonne, Paris

1934 - 1936, Jagiellonian University (Pharmacology Department)

1937-1939, Pharmaceutical Company A. Wander (Kraków)

1939-1945, Hohere Alkohole Company in Lwów (hiding from Nazis).

1945- **1953**, University and Polytechnic in Wrocław
Wrocław Medical University

Research area:

Chemistry of amino acids and their derivatives
(with Marian Kocór and Stanisław Majer)

1953- 1971, Gdańsk University of Technology

Research area:

Peptide Chemistry

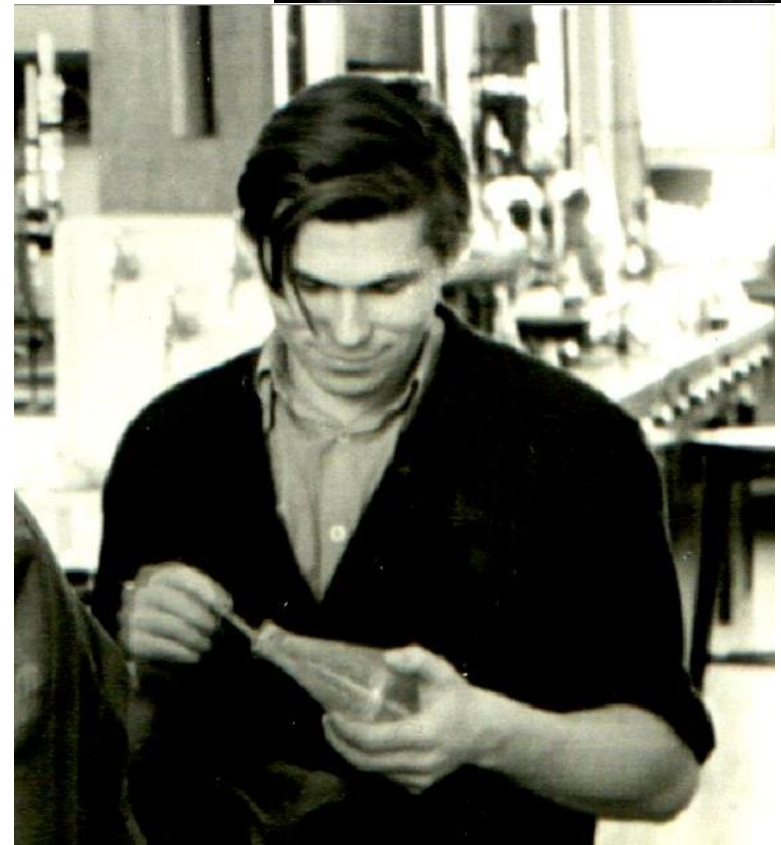
Prof. dr hab. Ignacy Zenon Siemion,

one of the founders of Polish Peptide Community.

Ignacy Z. Siemion studied at the Chemistry Department of the Moscow University (Soviet Union), earning the M. Sc. degree (1955).

He returned to Poland and started to work at the Wrocław University (1955-1958) and Medical Academy (1958-1969), under the supervision of Professor Tadeusz Baranowski,

Ignacy Z. Siemion received his doctorate (in 1964) and habilitation (in 1968) at the Technical University of Wrocław.



Professor of chemistry (1974)



In 1969, Prof. Siemion formed and led research groups at the Faculty of Chemistry, University of Wrocław.

- **Research Group of Chemistry and Stereochemistry of Peptides and Proteins (1969-2002)**

- **Department of History of Chemistry (2002-2015)**



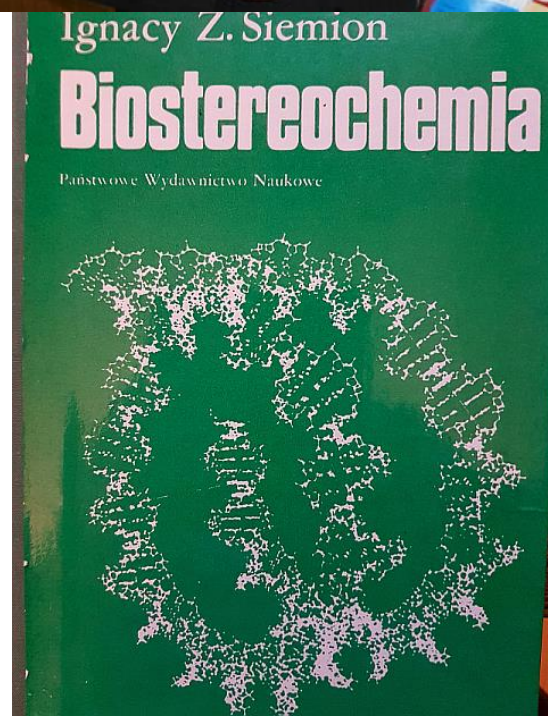
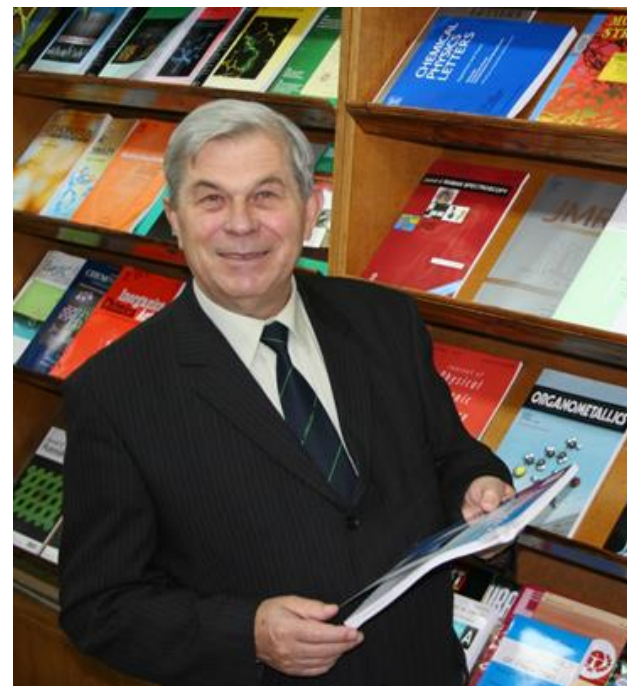
Prof. Siemion made highly significant contributions in many areas of peptide science, most notably in the **conformational analysis of peptides** and also in **design and synthesis of new analogs of biologically active peptides**.

His first research papers were devoted to synthesis and **racemization** of some amino acid derivatives, including *N*-substituted-amino acid anhydrides, azlactones and hydantoines.

He also analyzed **conformational properties of peptides in solution**, with particular interest in cyclic oligopeptides. Since late 1970s His studies had been devoted mainly to the synthesis and analysis of structure-activity relationship for peptide **immunomodulators**, including: cyclolinopeptides, tuftsin, thymopoietin, interleukin fragments, proline-rich peptides isolated from ovine colostrum and enkephalins.

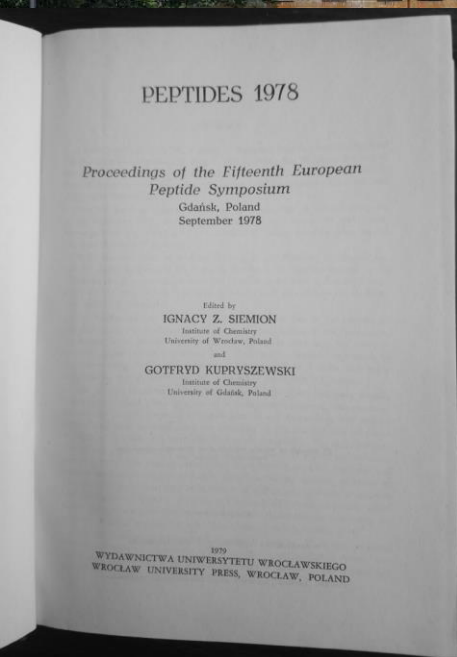
He was one of the first researchers indicating **links between central nervous and immune systems**.

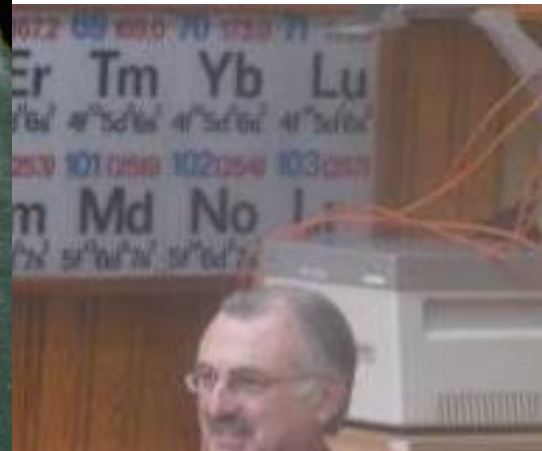
He was an author of over 300 scientific papers and textbooks



Scientific and Organizing Committees of meetings:

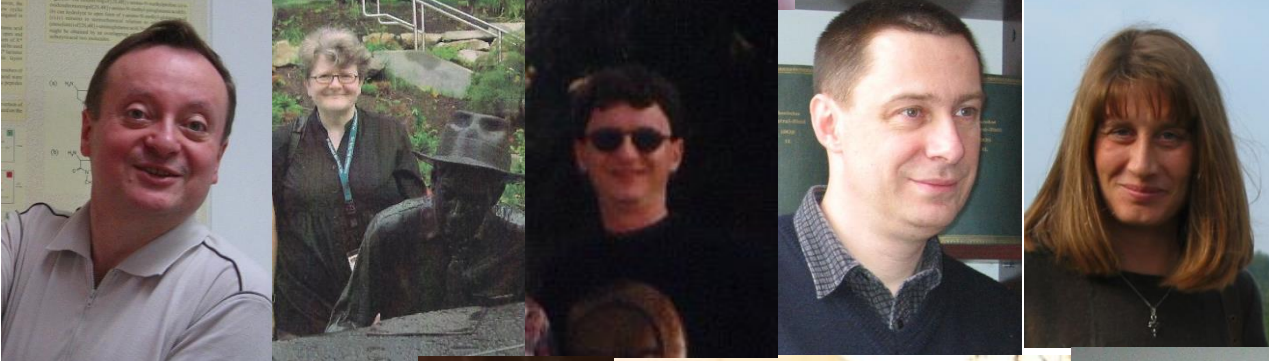
Professor Siemion organized several conferences, schools and symposia, including **IV Polish Peptide Symposium in Oleśnica near Wrocław (in 1977).**





Prof. Siemion has promoted 23 PhDs:

1. Danuta Konopińska (1972)
2. Jan Morawiec (1973)
3. Lucyna Kania (1975)
4. Ibraheam Attia (1976)
5. Wiesław Kliś (1977)
6. Andrzej Jankowski (1978)
7. Eleonora Bolewska (1980)
8. Zbigniew Szewczuk (1982)
9. Marek Lisowski (1984)
10. Bolesław Picur (1984),
11. Katarzyna Sobczyk (1984)
12. Artur Pędyczak (1991)
13. Jacek Słoń (1992)
14. Piotr Stefanowicz (1993)
15. Aleksandra Wyśtouch (1995)
16. Marek Cebrat (1995)
17. Alicja Kluczyk (1998)
18. Iwona Strug (1999)
19. Renata Zbozień-Pacamaj (1999)
20. Krzysztof Krajewski (2000)
21. Piotr Ruchała (2001)
22. Paweł Buczek (2001)
23. Monika Gawłowska (2006)





Professor Siemion had broad knowledge. His scientific interests were focused not only on the chemistry, but also on history of chemistry.

“*Notatki Chaotyczne*” – short essays on historical and current concepts in chemistry, were regularly published in *Wiadomości Chemiczne*

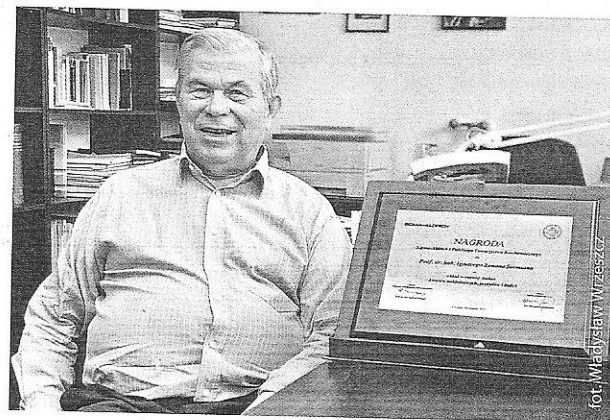


Professor Siemion's contributions to the peptide field have been recognized by many awards, as well as honors from science societies and local communities, including Scientific Award of the Polish Academy of Sciences (1986), and 1st grade Awards from the Polish Ministry of Higher Education (1980 and 1984).

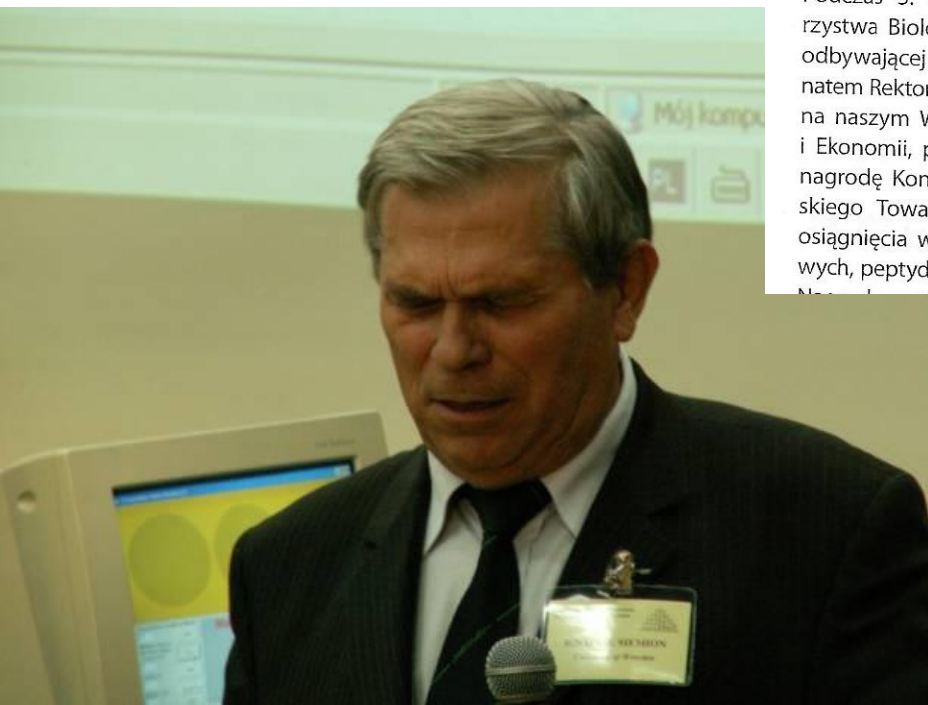
Profesor Ignacy Siemion podwójnie uhonorowany

Konsorcjum Sigma-Aldrich i Polskie Towarzystwo Biochemiczne oraz redakcja czasopisma „Wiadomości Chemiczne” nagrodziły za badania naukowe i zasługi wydawnicze prof. Ignacego Z. Siemiona, chemika z naszej uczelni.

Podczas 5. Konferencji Polskiego Towarzystwa Biologii Eksperymentalnej Roślin, odbywającej się 6–9 września pod patronatem Rektora UWr i Prezydenta Wrocławia na naszym Wydziale Prawa, Administracji i Ekonomii, prof. Ignacy Siemion odebrał nagrodę Konsorcjum Sigma-Aldrich i Polskiego Towarzystwa Biochemicznego za osiągnięcia w badaniu kwasów nukleinowych, peptydów i białek.



Prof. Ignacy Z. Siemion z nagrodą Konsorcjum Sigma-Aldrich i Polskiego Towarzystwa Biochemicznego



Professor Ignacy Z. Siemion was a mentor and a friend to many of us.



He was a very sociable person 😊



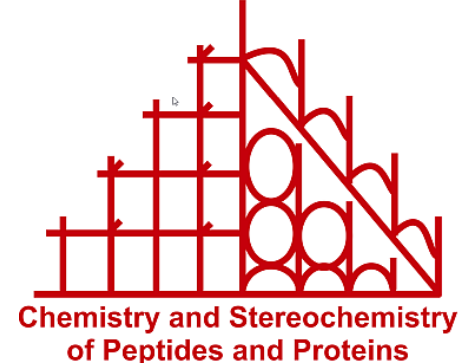


Professor Ignacy Z. Siemion was a scientist of great intellect, he remained active and enthusiastic until the end.



Uniwersytet
Wrocławski

**ZB-3 Research Group of Chemistry and Stereochemistry
of Peptides and Proteins 2002 -**



Current research activities:

Search for immunomodulatory oligopeptides containing a thymopentin-like sequence located within sequences of various proteins (including human leukocyte antigens and ubiquitin).



Design and synthesis of peptide analogs with improved biological activity, by cyclization , dimerization and introduction of unnatural amino acids (containing heterocyclic side chains)



Application of mass spectrometry for structural analysis of peptides and proteins



Derivatization of peptides for improved detection by mass spectrometry.



We promoted 18 Ph.D. students,

2000 Andrzej Wilczyński

2003 Inga Petry

2006 Monika Biernat

2007 Anna Staszewska

2009 Małgorzata Ratajska

2010 Katarzyna Kapczyńska

2011 Marzena Cydzik,

2011 Monika Kijewska

2012 Paweł Pasikowski,

2012 Magdalena Rudowska

2014 Remigiusz Bąchor

2017 Bartosz Setner



Promoted by dr hab. Piotr Stefanowicz:

2012 Karolina Radziszewska

2015 Martyna Kielmas-Pałach

2016 Maciej Modzel,

2016 Marta Cal

2017 Mateusz Waliczek





18th Polish Peptide Symposium

4-8 September 2005

Faculty of Chemistry
University of Wrocław



Wrocław

We organized several conferences and schools







prof. dr hab. Danuta Konopińska

Research areas:

- Structure-activity study on immunomodulators (tuftsin etc.)
- Studies on insect peptide hormones (proctolin, alloferon, leucopyrokinin etc.)



An author of over 160 scientific papers and patents

- 1962 MSc. (Graduated from the Pharmaceutical Faculty of the Medical University in Wrocław).

- 1972 PhD (UWr)

- 1978 DSc. (habilitation, UWr)

- 1991 Professor of Chemistry.



Scientific Stays and Visits

In 1973 - 1974 postdoctoral stay in the Institute of Organic Chemistry and Biochemistry of Czechoslovak Academy of Sciences in Prague

Visits:

1979 - 1980 and 1983 and 1985 in Tufts University in Boston (USA)

1984 Lille University (France) and Paoul Brousse Hospital (Paris, France)

1988 Weizman Institute in Rehovoth (Israel)

1992 North-Western University in Chicago (USA)

1993 Institute of Entomology, Czeske Budeiovice (Czech Rep.)

1997 Washington University in St. Louis, (USA)

2000 Johnson University, Johnson City, Tennessee (USA)

2000 Leuven University (Belgium),

2005 Institute of Plant Products CAS, Prague (Czech Rep.)



Group Leader

1992–1999 Chemistry of Invertebrate Natural Products

1999-2008 Chemistry of Natural Products



Chair of Scientific and Organizing Committees of meetings:

12 Polish Peptide Symposium in Karpacz (1993),

I-st International Conference on Insects: Chemical, Physiological and Environmental Aspects, 1994;

II-nd International Conference on Insects: Chemical, Physiological and Environmental Aspects, 1997;

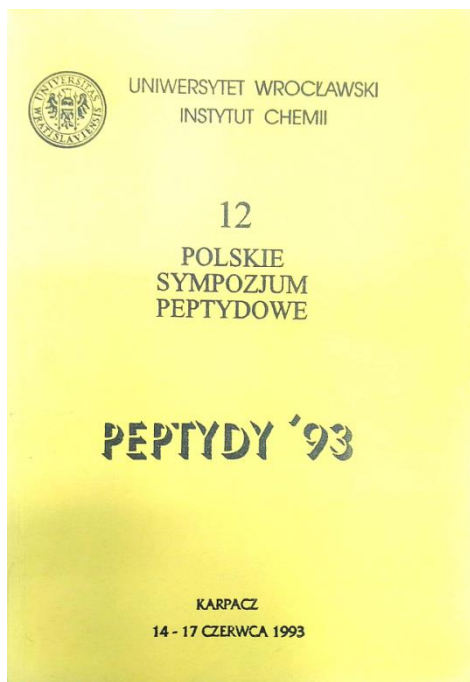
III-rd International Conference on Arthropods: Chemical, Physiological and Environmental Aspects, 2001;

IV-th International Conference on Arthropods: Chemical, Physiological and Environmental Aspects, 2005;

V-th International Conference on Arthropods 2007

as well as

II - VII Polish Symposia: Ecological Friendly Pesticides in 1995, 1996, 1998 - 2000 and 2003 - 2006.



Prof. Konopińska promoted 6 PhDs:

1. Hubert Bartosz-Bechowski (1989).
2. Mariola Kuczer (1998)
3. Wioletta Szeszel-Fedorowicz (2001)
4. Iwona Woźnica (2004)
5. Sebastian Grodecki (2008)
6. Katarzyna Dziubasik (2009)





prof. dr hab. Henryk Kozłowski

Founder of Polish School of Bioinorganic Chemistry

Research areas:

Metal ion-biomolecule interaction.

Research Interests:

Molecular mechanisms of metal-related toxicity and carcinogenesis

Interactions of metal ions with different drugs

Modification of peptide bioactivity by various metal ions

Structure and activity of metalloenzymes

Chelating agents for toxic metals and effect of toxic metal on biomolecules

Coordination ability of amino acids and peptides

Impact of metal ions on biochemistry and chemistry of drugs

Interaction and transport of drugs by serum proteins

An author of over 500 scientific papers
cited more than 10 000 times





Henryk Kozłowski

1968 M. Sci., University of Wroclaw

1973 Ph.D, University of Wroclaw
(supervisor
Professor Jeżowska-Trzebiatowska)



1974-1975 Postdoc, University of Tokyo.



1977 – Doctor of Sciences

1989 – Professor of Chemistry



2015- present

Wrocław Research Centre, EIT+



Doctor Honoris Causa
of the Shevchenko University in Kiev,
Ukraine, 2009



Doctor Honoris Causa
of the University of Gdańsk, 2014



Member of the Polish Academy of Sciences, 2009

Henryk's Awards and Honours

Ministry of Science Awards: 1973, 1977, 1978, 1982

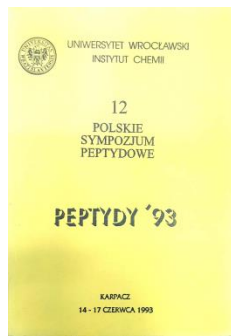
Ministry of Education Awards: 1984, 1988, 1991, 1992, 1997, 1999 and 2003

The prize of the Polish Academy of Sciences, 1980 Year of Polish Science Award, 1973

Honorary Professor of Wrocław University of Technology, 2013 Officer's Cross of the Order of the Polish Rebirth, 2012 Gold Medal of Wrocław University of Technology, 2011 Member of the National Center for Science, Maria Skłodowska-Curie Award in Chemistry, 2002. Medal of the National Education Committee, 2000

International Advisory Editorial Board of JCS Dalton Transactions, 1997-2003 Member of the International Advisory Editorial Board of the New Journal of Chemistry, since 2003 Member of the Editorial Board of Polish Journal of Chemistry, 2003-2005 Member of the International Advisory Editorial Board of the Journal of Inorganic Biochemistry, since 2006 V-President of the Molecular Biology Commission, PAS Wrocław, since 1991 V-President of the Molecular Biology and Biotechnology Commission, PAS Wrocław, 1996-1998 Member of the Scientific Council of the Institute of Bioorganic Chemistry PAS, 1999-2002 Member of the Scientific Board of the Centre of Molecular Science, PAS Łódź, since 2003 V-Director of the Institute of Chemistry UWr, 1982-1984 and 1993-1996 V-Dean for Science and International Relations, Department of Chemistry UWr, 1996-1999 Senator of the University of Wrocław, 1995-1999 Member of the Central Commission for Academic Titles and Degrees, since 1997 An expert in the pilot project in the field of Foresight "Health and Life" Ministry of Science, since 2004 Member of the Alberta Prion Research Institute, Canada, since 2005 Coordinator of the International Research Project COST Action D8/0018 (1998-2001) Member of the Management Committee of COST Actions: D8 (1996-2001), D20 (2000-2005), D21 (2001-2005), D34 (2005-2009) and D39 (2006-2011) President of the Discussion Group in Chemistry for Life Sciences of European Association for Chemical and Molecular Sciences EuCheMS, 2009-2011

Henryk organized more than 45 conferences, including 12. PPS





The Team of Bioinorganic and Biomedical Chemistry, 2013

Henryk Kozłowski has supervised 36 PhDs:

1979 Ewa Matczak-Jon

1980 Teresa Kowalik-Jankowska

1982 Małgorzata Jeżowska-Bojczuk, Zdzisław Siatecki

1983 Jolanta Świątek-Kozłowska

1990 Tomasz Pawłowski, Jean-Francois Galey, Kamel Cherifi

1991 Wojciech Bal, Saad Boushima

1992 Abdellah Anouar



1979 Ewa Matczak-Jon
1980 Teresa Kowalik-Jankowska
1982 Małgorzata Jeżowska-Bojczuk, Zdzisław Siatecki
1983 Jolanta Świątek-Kozłowska
1990 Tomasz Pawłowski, Jean-Francois Galey, Kamel Cherifi
1991 Wojciech Bal, Saad Boushima
1992 Abdellah Anouar
1993 Nasser Youyou
1995 Bogdan Gulanowski
1997 Anna Duda
1998 Marcin Dyba
1999 Aldona Karaczyn
2001 Justyna Brasuń, Piotr Młynarz
2002 Elżbieta Gumienna-Kontecka
2004 Marek Łuczowski
2007 Joanna Gałęzowska, Anna Janicka-Kłos, Paweł Stańczak
2008 Kinga Kulon
2010 Ewa Gralka, Magdalena Taraszkiewicz
2011 Anna Maciąg, Łukasz Szyrwiel, Magdalena Rowińska-Żyrek
2012 Danuta Witkowska, Monika Pyrkosz
2014 Karolina Krzywoszyńska, Sławomir Potocki
2015 Agnieszka Szebesczyk, Paulina Kołkowska
2016 Joanna Wątyły



Dr hab. Justyna Brasuń

UNIwersytet Medyczny
IM. PIASTÓW ŚLĄSKICH WE WROCLAWIU

WILL ORGANIZE

25. POLISH PEPTIDE SYMPOSIUM (2019)

