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**Documentation for the application for  
the initiation of the habilitation procedure**

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## 1. Biography and achievements in scientific activities

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Surname and name: Magdalena Biesaga  
Place of work: Department of Chemistry,  
University of Warsaw,  
02-093 Warszawa, Pasteura 1  
Scientific degree: Ph.D in chemistry  
Phone: +48 22 8220211 ext. 516  
e-mail: mbiesaga@chem.uw.edu.pl

### Education:

1982 M.Sc. in chemistry, Department of Chemistry, University of Warsaw, Thesis „The EPR radicals obtained in elemental sulphur solutions” – supervisor Prof. dr hab. Zbigniew Kęcki

1984–1985 Post graduated study of Analytical and Physicochemical methods in the field „Instrumental Methods in Analytical Chemistry”, Department of Chemistry, University of Warsaw

2001 Ph.D, Department of Chemistry, University of Warsaw  
Thesis. „The application of porphyrin stationary phases in HPLC” - supervisor Prof. dr hab. Marek Trojanowicz

### Professional position:

1982–1990 Research Assistant, Institute of Oil Mining and Gas Engineering

1990–1993 Research Assistant, Institute of Environmental Protection

1995–1996 Specialist, Institute of Environmental Protection

1993–2002 Research Assistant, Laboratory for Flow Analysis and Chromatography, Department of Chemistry, University of Warsaw

2002– Adjunct, Laboratory for Flow Analysis and Chromatography, Department of Chemistry, University of Warsaw

### Currently cultivated field, discipline and academic specialization:

Field: chemistry  
Discipline: chemistry  
Academic specialization: analytical chemistry

### Participation in research programmes:

- Grant KBN T09A 06511 „The application of porphyrin stationary phases for the separation of amino acids and peptides in high performance liquid chromatography” (1997–1998), main contractor.
- Grant KBN 3 T09A 112 16, „The application of pophyrin stationary phases in HPLC” (1999–2001), main contractor.
- Grant KBN 4 T09 A 072 22 (2002–2005), „Speciation of selenium with ion chromatography and capillary”, contractor.
- Grant KBN 3 T09A 032 28 (2005–2007) „The application of carbon nanotubes in solid phase extraction”, main contractor.
- Grant KBN NN 204 00 99 35, „The identification of arsenic compounds in continental plants – the investigation of detoxification mechanism of such element”, contractor.

### Individual Research Grant of Department of Chemistry, University of Warsaw

- BW 1562/01/02 (2002) M. Biesaga „The application of high performance separation techniques for museum objects”.
- BW:1637/1/04, (2004) M. Biesaga, „The optimalization of extraction procedure of selected flavonoids form plant materials”.
- BW1681/1/05 (2005) M. Biesaga „The application of SEM-EDX for indetification of metals in archaeological objects”.
- BW 172101 (2006) M. Biesaga „The determination of thermodynamic retention parameters for selected phenolic acids and flavonols by high performace liquid chromatography”.

### Scientific achievements:

- Scientific publications: 40 (total)  
Before Ph.D: 9  
After Ph.D: 31

- Popular-scientific publication: 7
- Patents: 2
- Conference messages: 71 (total)
  - National conferences: 35 (15 lectures or oral presentations)
  - International conferences: 36 (4 lectures or oral presentations)
- Book chapters: 5
- Reviews for editors: multiple reviews for: Journal of Chromatorgraphy, Chemia Analityczna, Chromatographia, Journal of Separation Science, Journal of Food Composition and Analysis, European Food Research and Technology

### Awards:

- 2002 Award of Polish Committee of Analytical Chemistry Polish Academy of Science PAN for the best PH.D Thesis in field of analytical chemistry in 2001
- 2004 The Second Degree Award of teaching of Department of Chemistry Council Committee for preparation new course for student about HPLC
- 2008 “Roland W. Frei Award” – for the best poster “Poster Award 25 Montreux Symposium on LC-MS The International Association of Environmental Analytical Chemistry: “Historical and archaeological textiles: an insight on degradation products of wool yarns” I. Degano, M. Biesaga, M. P. Colombini, M. Trojanowicz

### International Fellowships:

- 1995 Department of Analytical Chemistry, University of Torino, Torino, Italy;
- 1996 Department of Analytical Chemistry, University of Torino, Torino, Italy;
- 1997 Department of Analytical Chemistry, University of Amsterdam, Holland;
- 1998 Department of Analytical Chemistry, University of Lubljana, Slovenia;
- 2000 Department of Analytical Chemistry, University of Pecs, Pecs, Węgry.

- 2002 Department of Chemistry, University of Vienna, Wiedeń, Austria;
- 2002 Department of Analytical Chemistry, University of Pecs, Pecs, Hungary;
- 2002 DAAD fellowship –Department of Analytical Chemistry, University of Marburg, Germany.
- 2005 Department of Chemistry, University of Prague, Prague, Czech Republic.
- 2007 Department of Analytical Chemistry, University of Pecs, Pecs, Hungary.
- 2008 Institute for Analytical Chemistry and Radiochemistry, Graz University of Technology, Graz, Austria

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## 2. Self-presentation – course of scientific work and scientific achievements with the exception of the results related with habilitation thesis

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In 1977 I began the 5 years study at the Department of Chemistry at University of Warsaw. I finished the study in 1982 and I obtained M.Sc. in 28.06.1982 for the thesis „The EPR radicals obtained in elemental sulphur solutions”, under supervision of Prof. dr hab. Zbigniew Kęcki”.

In 1.09.1982, I started a work as a research assistant in the Institute of Oil Mining and Gas Engineering in Warsaw. From 1982 to 1990 I was taking part in investigation concerning the new desulphurisation process for natural and coke oven gases. Some results of my researches were patented (P-143567 in 1989 and P-145675 in 1989). Some of these results were published in the Polish Journal “Gaz, Woda i Technika Sanitarna” [1]. My scientific interests in that moment were concentrated on the sulphur removal processing with the use of the redox solutions. I took part in the investigation on the optimization of the components of the redox solutions containing hydrochinone or Fe(III)-EDTA. Such solutions were applied for the H<sub>2</sub>S removal from the natural and the coke oven gases. It was tested in the semi technical plant located in the gas mining plant „Wielkie Oczy” near Lubaczów. I was responsible for the all analytical control of the efficiency of the desulphurisation process of this plant within the Mai–July 1986.

I finished the post graduated study of The Analytical and The Physicochemical methods in the field of „The Instrumental Methods in the Analytical Chemistry” in 1985. The results described in the thesis „Application of copper ion selective electrode for determination of iron in gas desulphurating solutions”, Chem. Anal. (Warsaw),” were published in Chem. Anal. (Warsaw) [2].

I worked as a research assistant in The Institute of The Environmental Protection in Warsaw between 1990 and 1993. My scientific work concerned the application of the ion chromatography for the determination of the inorganic anions in the environmental samples. I was also responsible for the implementation of the good laboratory practice (GLP) in the laboratory. I published the article in Polish Journal Ochrona Środowiska [3] about the application of the ion chromatography for the determination of inorganic anions and presented the oral presentation about GLP in Poland at OECD Conference. The chromatographic method which I developed, was applied for the determination of the inorganic anions in the tap and the rain water samples and for the atmospheric pollution in the Puszcza Borecka station.

I started work in 01.10.1993 as an assistant in the Faculty of Chemistry at the University of Warsaw in the Laboratory for Flow Injection Analysis and Chromatography under supervision of prof. dr hab. Marek Trojanowicz. During first years I developed the ion chromatographic methods with conductometric and spectrophotometric detections for the speciation of the phosphorus [4] and the chlorine anions. I worked simultaneous between 1995 and 1996 at the University

of Warsaw as the assistant and in the Institute of Environmental Protection as a specialist, where I applied the capillary electrophoresis for the determination of the anions in the environmental samples. This additional work helped me to compare these two separation techniques for the speciation of the chlorine anions. The results of my work were published [5] and presented in the IX International Ion Chromatography Symposium in Reading (Great Britain).

During next few years I investigated the new porphyrin stationary phases for the separation of the amino acids, the peptides, the proteins, the nucleosides, the nucleotides, and the anions. I compared the different phases containing the tetraphenylporphyrin (TPP) complex with Zn(II), Cu(II) and the protoporphyrin with Fe(III). The effect of the metalization of the porphyrin with Cu(II) and Zn(II) on the retention was also tested. The retention of the selected dipeptides and tripeptides containing tyrosine was examined. The observed separation was based on a mixed mechanism involving  $\pi$ - $\pi$  and hydrophobic interactions as well as complex formation between immobilized metal ions and peptides. A satisfactory separation was demonstrated for C-peptide and bovine insulin. The possibility of the separation of various insulins was also investigated. The stable complexes between transitional metal cations and porphyrins enabled the coordinative interaction with the extra ligands, while the structure of the porphyrin molecule could cause the hydrophobic or the  $\pi$ - $\pi$  interactions. This double mechanism of the interaction offered the broad possibilities for the separation of the several analytes and was especially important for the biomolecules. During this time, I also stayed on the CEEPUS scholarship at the University of Pecs (Hungary), where I worked on the separation of nucleosides and nucleotides. The interactions of the nucleosides and the nucleotides with the metalloporphyrins have been utilized for the HPLC separation of these species with the silica-based stationary phases with the immobilized tetraphenylporphyrins metallated with Zn(II) and Cu(II). A satisfactory separation of adenosine nucleotides in biological samples had been obtained with the eluent consisted of phosphate buffer pH 3, an acetonitrile, and the sodium sulphate gradient. These investigations were described in Ph.D thesis entitled "The application of porphyrin stationary phases in HPLC" (defended in 2001) and scientific articles [6–9]. My Ph.D thesis was awarded by Polish Committee of Analytical Chemistry Polish Academy of Science PAN as the best PH.D Thesis in field of analytical chemistry in 2001.

After the completion of my Ph.D. thesis in the area of chemistry, I began to work as an assistant professor. I continued the research devoted to the application of the HPLC techniques. In the initial period after obtaining Ph.D I continued research on the application of porphyrin stationary phases [10-12]. The results presented in the work of 6–12 were carried out within the framework of two research projects KBN T09A 06 511 "The application of porphyrin stationary phases for separation of amino acids and peptides in high performance liquid chromatography" (1997–1998) and 3 T09A 112 16 "The application of porphyrin stationary phases in HPLC" (1999–2001).



During the next period, one of my scientific interests has become researches of using the HPLC to identify the dyes in the archaeological textiles and I came back to the investigations related to the speciation analysis. The possibility of enhancing the fluorescence signal with the post-column reaction with Al(III), Ga(III), In(III), and Zn(II) were used for the investigation of the plant extracts and extracts from Coptic textiles [13]. The application of the ion chromatography with the preconcentration step for the speciation of selenium was described in the article published in *Chromatographia* [14]. The selenium speciation studies were carried out under the research project KBN 4 T09 A 072 22, "Speciation analysis of selenium using ion chromatography and capillary electrophoresis."

I spent three months In 2002 in the DAAD scholarship at the Department of Chemistry, University of Marburg in the laboratory of prof. A. Seubert, where I developed my interests in the use of ion chromatography. For that reason a coupled ion chromatography (IC) system was used by me for the determination of the chloride, the sulphate and the phosphate ions in the high-purity nitric acid. Such a high ionic strength matrix caused a selectivity problem in the single IC systems. The first part of the system was used for a pre-separation of the analytes from the nitrate matrix. A specially designed the high-capacity anion exchanger with the low retention for the analytes and the high retention for the nitrate was developed. The results of this work I published two articles [15, 16].

After my return I became involved in a series of the studies on the development of the separation conditions for the determination of the chlorophenoxy acid herbicides and their radiolytic degradation products. These investigations were carried out in the cooperation with the Institute of Nuclear Chemistry and Technology. The results were published in the articles [17, 18].

The next period of my researches were concerned in the developing conditions for the separation, the MS detection, the extraction and the hydrolysis of polyphenolic compounds in the food samples. These results were discussed in the articles [20, 22, 24, 25, 27–32, 34, 38, 40] and in the same time became the base for my habilitation thesis. The co-related publications [33, 35, 36, 39] even if somehow related with the topics of the habilitation thesis were not included in this group.

In the same time, I conducted the investigations on the application of the solid phase extraction, including the sorbents containing the carbon nanotubes, for the preconcentration of selected herbicides. I determined the dependence of analytes sorption on the pH of the sample solution. I tested the composition of the eluent for the desorption of the analytes and I determined the sorption capacity of studied columns [19, 21, 23].

In cooperation with the Central Institute for Labour Protection – National Research Institute I developed the application of HPLC for the quantification of some active compounds in the air samples at the pharmaceutical workplaces. The results were published in the article in *Journal of Biochemical and Biophysical Methods* [26].

In the collaboration with the research group of dr hab. T. Gierczak from Department of Chemistry at University of Warsaw I determined the conditions for separation and mass spectrometry detection of the amino acids for the identification of the protein binders in the paintings. The results of these studies were published in Analytical Methods [37].

The results of my researches, related and not directly related with my habilitation thesis were presented at the various national (35) and the international (36) conferences.

In numerous books, [Chapters in books 1–5] the knowledge developed by myself during the years of the researches in the fields of the liquid chromatography, the solid phase extraction is presented. All of these books are considered as the framework in these fields written in Polish.

I am the author of the reviews of articles at the request of the editors of the scientific journals: Journal of Chromatography, Analytical Chemistry (Warsaw), Journal of Separation Science, Chromatography, Journal of Food Composition and Analysis, and applications to the Foundation for Polish Science.

Beside the mainstream part of my researches, in cooperation with the Structural Research Laboratory Department of Chemistry at University of Warsaw, I am a part of the team which develops the investigations for the industry and the scientific institutes. This work includes the development of the conditions for the separation and the identification by LC-MS/MS after the synthesis of the organic pollutants, the drugs, the urea herbicides, the dyes, the degradation of drugs, the polyurethanes. The list of the reports of these studies developed by me is also added.



### 3. Scientific interests

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My main research interests are related to:

- the investigations related to the environmental protection including the recycling of waste and the use of HPLC in the analysis of the pollutants
- the application of the separation techniques for the speciation analysis
- the application of liquid chromatography with the various detection methods for the determination of the organic compounds in the various samples with the complicated matrix
- the investigations of the new sorbents for the solid phase extraction (SPE) of the analytes from the natural samples
- the identification of the unknown compounds in the environmental samples using LC-MS

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## 4. Organizational achievements

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My scientific research in Department of Chemistry at University of Warsaw University was related with organizational work, including:

- the member of the Council of the Faculty of Chemistry in the terms 2005–2008; 2008–2012, 2012–2016
- the Faculty Coordinator of the ECTS points since 2005
- the member of the Library Dean Committee for term 2005–2008; 2008–2012
- the member of the Faculty Council Committee for the development of the scientific and the teaching for young scientists in term 2008–2012
- I have organized, since 2006, an annual Faculty poster sessions presenting the the results of the scientific research of the Department of Chemistry and the Masters annually poster sessions in which the master students from Department of Chemistry present their results

## 5. Teaching

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### Courses for students of Faculty of Chemistry:

- the tutorials of the General Chemistry (1st year)
- the tutorials of the fundamentals of analytical chemistry (1st year)
- the Specialization Laboratory for 4th year students
- the Laboratory of the General Chemistry (1st year)
- the Laboratory „Fundamentals of Analytical Chemistry” I (1st year)
- the HPLC Laboratory: an e-learning and the experimental exercises
- the repetitory of basic chemistry – the tutorials

I organized in 2000, in cooperation with dr Ewa Pobozy, the new occupation for students about HPLC. I have organized since 2006 e-learning course for the helping learning of HPLC. The exercises in the chromatography have been divided into two parts: the practical exercises in the lab and the e-learning courses – the classes over the Internet. The results of the students achieved in such activities I presented at the national conference: “Information technology in the teaching of chemistry at the university level” in Krakow in 2007. I received in 2009 a grant from the UW Teaching Innovation Fund FID 500/04–66: "The blended e-learning and stationary course of HPLC" for the full implementation of these activities

### Courses for students of the Interfaculty Studies in Environmental Protection undergraduate degree:

- the laboratory of the environmental protection

### Course for students of macro-field of Study Nanostructures Engineering – the first cycle study:

- the repetitory of general chemistry – the tutorials
- the laboratory Introduction to General Chemistry

### Courses for students of Interdisciplinary studies, Nuclear power engineering and nuclear chemistry:

- the repetitory of general chemistry – the tutorials
- the laboratory Introduction to General Chemistry

### Courses for master students of macro-field Environmental Management:

- the laboratory of the environmental analysis (in Polish and in English)

## Other educational activities

### Postgraduate Studies for Teachers:

- the Lecture: Environmental Protection
- the Laboratory of Inorganic Chemistry
- the e-learning course: Introduction to e-learning in chemistry

### Postgraduate Study „The application of chemistry in Environmental Protection. Course of chromatography”:

- the Lecture: Introduction to LC-MS
- the HPLC laboratory

I have taught chemistry the winners of Polish Biological Olympiad in the preparation course for the International Biological Olympiad since 2009

I was supervisor of 2 master thesis, I carried of 13 master thesis and I was supervisor of 3 bachelor thesis.



## 6. Scientific achievements

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- All publications (including those directly related to the habilitation thesis)
- the total number of the publications 40 – only those published after PhD 31
  - Summarized IF = 85.113 after PhD IF = 72.303
  - Index H = 11

The following 13 publications were chosen as a basis for the habilitation thesis indicated in the list below as 20, 22, 24, 25, 27–32, 34, 38, 40.

### Publications in national and international journals before defense of the PhD thesis

1. K. Dowbor, M. Szelaǳowski, M. Biesaga, „Removal of H<sub>2</sub>S from air by absorption in redox solution”, *Gaz, Woda i Technika Sanitarna*, 9, 1987, 190–192 (in Polish). IF=0  
I declare that my contribution to this work is at the level of 40% and it lies in the determination of H<sub>2</sub>S with GC.
2. A. Hulanicki, T. Krawczyński vel Krawczyk, M. Biesaga, „Application of copper ion selective electrode for determination of iron in gas desulphurating solutions”, *Chem. Anal. (Warsaw)*, 32, 1987, 937–939. IF=0.293  
I declare that my contribution to this work is at the level of 60% and it lies in the developing of the method of the determination of Fe(III) with the ion selective electrode.
3. M. Biesaga, „Ion chromatography – an attractive method in environmental protection”, *Ochrona Środowiska*, 2, 1991, 123–131. (po polsku) IF=0  
I declare that my contribution to this work is at the level of 100%.
4. M. Biesaga, M. Trojanowicz, „Phosphorus speciation in nickel plating bath by ion chromatography”, *J. Chromatogr. A*, 705, 1995, 390–395. IF=3.359  
I declare that my contribution to this work is at the level of 70% and it lies in the optimization of the separation method for the speciation of phosphorous.
5. M. Biesaga, M. Kwiatkowska, M. Trojanowicz, „Separation of anions containing chlorine by ion chromatography and capillary electrophoresis”, *J. Chromatogr. A*, 777, 1997, 375–381. IF=3.359  
I declare that my contribution to this work is at the level of 70% and it lies in the optimization of the separation methods for the speciation of chlorine.
6. M. Trojanowicz, M. Biesaga, K. Pyrzyńska, M.E. Meyerhoff, G.B. Martin, „Application of tetraphenylporphyrin – silica as stationary phases in HPLC and for preconcentration of trace elements”, *Egypt. J. Anal. Chem.*, 6, 1997, 50–57. IF=0  
I declare that my contribution to this work is at the level of 30% and it lies in the optimization of the method for the amino acids separation with the porphyrin stationary phases.

7. M. Biesaga, J. Orska, M. Trojanowicz, „HPLC of amino acids with tetraphenylporphyrin stationary phases”, *Chem. Anal. (Warsaw)*, 43, 1998, 647–656. IF=0.428  
I declare that my contribution to this work is at the level of 60% and it lies in the optimization of the method for the amino acids separation with the different porphyrin stationary phases.
8. M. Biesaga, J. Orska, D. Fiertek, J. Izdebski, M. Trojanowicz, „Immobilized metal-ion affinity chromatography of peptides on metalloporphyrin stationary phases”, *Fresenius J. Anal. Chem.*, 364, 1999, 160–164. IF=1.649  
I declare that my contribution to this work is at the level of 60% and it lies in the optimization of the method for the peptides separation with the porphyrin stationary phases.
9. M. Biesaga, K. Pyrzyńska, M. Trojanowicz, „Porphyrin in analytical chemistry”, *Talanta*, 51, 2000, 209–224. IF=3.722  
I declare that my contribution to this work is at the level of 40% and it lies in the developing of idea of the review and the descriptions the application of porphyrins in chromatography and electrochemistry.

### Publications in international journals after defense of the PhD thesis

10. M. Biesaga, F. Kilar, N. Hartvig, M. Trojanowicz, „Application of the tetraphenylporphyrin stationary phases in nucleotides and nucleosides chromatography”, *Chromatographia*, 54, 2001, 619–623. IF=1,317  
I declare that my contribution to this work is at the level of 60% and it lies in the optimization of the method for the nucleosides and the nucleotides separation with the porphyrin stationary phases.
11. M. Trojanowicz, M. Biesaga, J. Orska-Gawryś, „Chromatographic applications of porphyrins”, *Anal. Sci.*, 17 Supplement, 2001, i587–590. IF=0,916  
I declare that my contribution to this work is at the level of 40% and it lies in the optimization of the method for the amino acids and peptides separation with the porphyrin stationary phases.
12. M. Biesaga, E. Stolarczyk, K. Pyrzyńska, M. Trojanowicz, „Retention of anions on silica-based metalloporphyrin stationary phases”, *Anal. Sci.*, 18, 2002, 151–154. IF=0,916  
I declare that my contribution to this work is at the level of 60% and it lies in the optimization of the method for the anions separation with the porphyrin stationary phases.
13. I. Surowiec, J. Orska-Gawryś, M. Biesaga, K. Urbańska-Walczak, R. Halko, M. Hutta, M. Trojanowicz, „Identification of natural dyestuff in Coptic textiles by HPLC with fluorometric detection”, *Anal. Lett.*, 36, 2003, 1211–1229. IF=1,000  
I declare that my contribution to this work is at the level of 20% and it lies in the supervising of the optimization of the post column reaction conditions.
14. P. Wójcik, K. Pyrzyńska, M. Biesaga, „Ion-chromatography of inorganic selenium species with a preliminary preconcentration step” *Chromatographia*,



57, 2003, S67–S71. IF=1,317

I declare that my contribution to this work is at the level of 60% and it lies in the optimization of the separation methods for the speciation of selenium.

15. M. Biesaga, N. Schmidt, A. Seubert, „Coupled ion chromatography for the determination of chloride, phosphate and sulphate in concentrated nitric acid”, *J. Chromatogr. A*, 1026, 2004, 195–200. IF=3.359

I declare that my contribution to this work is at the level of 60% and it lies in the optimization of the coupled ion chromatographic system conditions and the optimization of the separation conditions for the inorganic anions.

16. N. Schmidt, M. Biesaga, A. Seubert, „Trace anion determination in concentrated nitric acid by means of two coupled ion chromatography systems”, *Microchim. Acta*, 146, 2004, 119–128. IF=1,050

I declare that my contribution to this work is at the level of 50% and it lies in the optimization of the coupled ion chromatographic system conditions and the optimization of the separation conditions for the inorganic anions.

17. A. Jankowska, M. Biesaga, P. Drzewicz, M. Trojanowicz, K. Pyrzyńska, „Chromatographic separation of chlorophenoxy acid herbicides and their radiolytic degradation in water samples”, *Water Res.*, 38, 2004, 3259–3264. IF=2.304

I declare that my contribution to this work is at the level of 45% and it lies in the optimization of the separation conditions for the selected pesticides and chlorophenols.

18. M. Biesaga, A. Stafiej, K. Pyrzyńska, P. Drzewicz, M. Trojanowicz, „Chromatographic determination of the products of gamma radiolysis of aqueous solution of chlorophenoxy acid herbicides”, *Chem. Anal. (Warsaw)*, 50, 2005, 863–873. IF=0,415

I declare that my contribution to this work is at the level of 45% and it lies in the optimization of the separation conditions for the selected pesticides and chlorophenols.

19. M. Biesaga, A. Jankowska, K. Pyrzyńska, „Comparison of different sorbents for solid phase extraction of phenoxyalkanoic acid herbicides” *Microchim. Acta*, 150, 2005, 317–322. IF=1,150

I declare that my contribution to this work is at the level of 70% and it lies in the optimization of the preconcentration step and the separation conditions for the selected pesticides.

20. M. Biesaga, A. Wach, M. Donten, J. Maik, K. Pyrzyńska, „Acidic hydrolysis and extraction of natural dyes present in plants and ancient textiles”, *Chem. Anal. (Warsaw)*, 51, 2006, 251–265. IF=0,566

I declare that my contribution to this work is at the level of 60% and it lies in the optimization of the hydrolysis, the extraction and the separation conditions for the selected natural dyes in the plants and the archaeological textiles..

21. M. Biesaga, K. Pyrzyńska, „The evaluation of carbon nanotubes as a sorbent for dicamba herbicide”, *J. Sep. Sci.*, 29, 2006, 2241–2244. IF=2,535

I declare that my contribution to this work is at the level of 70% and it lies in

the preparation of the nanotube columns, the testing these sorbents for the preconcentration of dicamba and chromatographic analysis.

22. A. Wach, K. Pyrżyńska, M. Biesaga, „Quercetin content in some food and herbal samples”, *Food Chem.*, 100 (2), 2007, 699–704. IF=3,052

I declare that my contribution to this work is at the level of 70% and it lies in the optimization of the hydrolysis, the extraction and chromatographic analysis of selected polyphenols in the food samples.

23. M. Biesaga, A. Stafiej, K. Pyrżyńska, „Sorption behavior of acidic herbicides on carbon nanotubes”, *Microchim. Acta*, 159 (2007) 293–298. IF=1,959

I declare that my contribution to this work is at the level of 60% and it lies in the preparation of the nanotube columns and the testing these sorbents for the preconcentration of selected pesticides.

24. M. Biesaga, A. Stafiej, K. Pyrżyńska, „Extraction and hydrolysis parameters for determination of quercetin in *Hypericum perforatum*”, *Chromatographia*, 65, 2007, 701–706. IF=1,145

I declare that my contribution to this work is at the level of 70% and it lies in the optimization of the hydrolysis, the extraction and chromatographic analysis of selected polyphenols in the *Hypericum perforatum* samples (the flowers and the leaves).

25. M. Biesaga, U. Ochnik, K. Pyrżyńska, „Analysis of phenolic acids in fruits by HPLC with monolithic column” *J. Sep. Sci.*, 30, 2007, 2929–2934. IF=2,632

I declare that my contribution to this work is at the level of 70% and it lies in the optimization of the extraction and chromatographic analysis of the selected phenolic acids in fruits samples within the ripening period.

26. A. Osytek, M. Biesaga, K. Pyrżyńska, M. Szewczyńska „Quantification of some active compounds in air samples at pharmaceutical workplaces by HPLC”, *J. Biochem. Biophys. Meth.*, 70, 2008, 1283–1286. IF=1,994

I declare that my contribution to this work is at the level of 30% and it lies in the supervising and the helping of the optimization of the chromatographic analysis of the selected pharmaceutical compounds.

27. A. Michalkiewicz, M. Biesaga, K. Pyrżyńska, „Solid-phase extraction procedure for determination of phenolic acids and some flavonols in honey”, *J. Chromatogr. A*, 118, 2008, 18–24. IF=3,756

I declare that my contribution to this work is at the level of 70% and it lies in the optimization of the extraction and LC-UV-FLD and LC-MS/MS analysis of selected polyphenols in the honey samples.

28. M. Biesaga; K. Pyrżyńska, „Analytical Procedures for Determination of Quercetin and its Glycosides in Plant Material”, *Crit. Rev. Anal. Chem.*, 39, 2009, 95–107. IF=3.250

I declare that my contribution to this work is at the level of 55% and it lies in the scientific discussion on the idea of the review article and on the describing the problems including hydrolysis, extraction and chromatographic analysis of the quercetin and its glycosides.

29. M. Biesaga, U. Ochnik, K. Pyrzynska, „Fast analysis of prominent flavonoids in tomato using a monolithic column and isocratic HPLC”, *J. Sep. Sci.* 32, 2009, 2835–2840. IF=2,746  
I declare that my contribution to this work is at the level of 70% and it lies in the optimization of the extraction and the chromatographic analysis of the selected polyphenols in the tomato samples in the different ripening period.
30. K. Pyrzynska, M. Biesaga, „Analysis of phenolic acids and flavonoids in honey”, *TRAC Trends Anal. Chem.*, 28, 2009, 893–902. IF=6.546  
I declare that my contribution to this work is at the level of 50% and it lies in the scientific discussion on the idea of the review article and on the describing the problems including hydrolysis, extraction and chromatographic analysis of the phenolic acids.
31. M. Biesaga, K. Pyrzynska, „Liquid chromatography/tandem mass spectrometry studies of the phenolic compounds in honey”, *J. Chromatogr. A*, 1216, 2009, 6620–6626. IF=3,756  
I declare that my contribution to this work is at the level of 90% and it lies in the determination of the MS/MS detection, the extraction and chromatographic analysis of selected polyphenols in the honey samples.
32. A. Pekal, M. Biesaga, K. Pyrzynska, „Interaction of quercetin with copper ions: complexation, oxidation and reactivity towards radicals”, *Biometals*, 24, 2011, 41–49. IF=3,172  
I declare that my contribution to this work is at the level of 45% and it lies in the determination MS condition and analysis of MS spectra of quercetin, oxidized form of quercetin and its complex in methanolic solution.
33. N. Lopez-Martínez M. T. Colinas-León, C. B. Peña-Valdivia, Y. Salinas-Moreno, P. Fuentes-Montiel M. Biesaga, E. Zavaleta-Mejía, „Alterations in peroxidase activity and phenylpropanoid metabolism induced by *Nacobbus aberrans* Thorne and Allen”, 1994 in chilli (*Capsicum annum* L.) resistant to *Phytophthora capsici* CM334 Leo. *Plant and soil*, 338, 2011, 399–409. IF=2,517  
I declare that my contribution to this work is at the level of 10% and it lies in the discussion of the results of chromatographic analysis of chilli extracts.
34. M. Biesaga, „Influence of extraction methods on stability of flavonoids” *J. Chromatogr. A* 1218, 2011, 2505–2512. IF=4,194  
I declare that my contribution to this work is at the level of 100%.
35. A. Pękal, P. Drózdź, M. Biesaga, K. Pyrzynska, „Evaluation of the antioxidant properties of fruit and flavoured black teas”, *Eur. J. Nutr.*, 50, 2011, 681–688. IF=3,343  
I declare that my contribution to this work is at the level of 45% and it lies in the optimization of the chromatographic condition and LC-MS/MS analysis of selected polyphenols in the tea samples.
36. I. Degano, M. Biesaga, M. P. Colombini, M. Trojanowicz, „Historical and archaeological textiles: An insight on degradation products of wool and silk yarns”, *J. Chromatogr. A*, 1218, 2011, 5837–5847. IF=4.194

I declare that my contribution to this work is at the level of 30% and it lies in the optimization of the chromatographic condition of LC-MS/MS analysis of selected polyphenols.

37. B. Witkowski, M. Biesaga, T. Gierczak, „Proteinaceous binders identification in the works of art using ion-pairing free reversed-phase liquid chromatography coupled with tandem mass spectrometry”, *Anal. Methods*, 4, 2012, 1221–1228. IF=1.036

I declare that my contribution to this work is at the level of 30% and it lies in the optimization of the chromatographic condition and LC-MS/MS analysis of selected amino acids.

38. A. Pękal, P. Drózdź, M. Biesaga, K. Pyrzyńska, „Screening of the antioxidant properties and polyphenol composition of aromatised green tea infusions”, *J. Sci. Food Agric.*, 92, 2012, 2244–2249. IF=1,36

I declare that my contribution to this work is at the level of 45% and it lies in the optimization of the chromatographic condition and LC-MS/MS analysis of selected polyphenols in the tea samples.

39. A. Pękal, P. Drózdź, M. Biesaga, K. Pyrzyńska, „Polyphenolic content and comparative antioxidant capacity of flavoured black teas” *Int. J. Food Sci. Nutr.*, 63, 2012, 742–748. IF=1.151

I declare that my contribution to this work is at the level of 45% and it lies in the optimization of the chromatographic condition and LC-MS/MS analysis of selected polyphenols in the tea samples.

40. M. Biesaga, K. Pyrzyńska, „Stability of bioactive polyphenols from honey during different extraction methods”, *Food Chem.*, DOI 10.1016/j.foodchem.2012.07.095, 136, 2013, 46–54. IF=3.655

I declare that my contribution to this work is at the level of 90% and it lies in the optimization of the chromatographic condition of LC-MS/MS analysis and the determination the influence of extraction and matrix on the stability of the selected polyphenols in the honey samples.

## Chapters in monographs (in Polish)

1. M. Biesaga, E. Poboży, K. Pyrzyńska, *Nowoczesne techniki analityczne* (ed. M. Jarosz) „Połączenie analizy przepływowej z metodami chromatografii i elektroforyzy kapilarnej”, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 2006, 113–142.

I declare that my contribution to this work is at the level of 45% and it lies in the description of the hyphenation of flow injection analysis and HPLC.

2. M. Biesaga, *Flawonoidy i ich zastosowanie* (ed. Kopacz M.), „Różne metody detekcji w chromatograficznym oznaczaniu związków polifenolowych w próbkach żywności”, Oficyna Wydawnicza Politechniki Rzeszowskiej, Rzeszów 2010, str. 124–136.

I declare that my contribution to this work is at the level of 100%.

3. M. Biesaga, Chromatografia w praktyce (ed. A. Voekel, W. Wasiak), „Wykorzystanie LC-MS/MS do analizy związków polifenolowych w ekstraktach z próbek żywności”, Wydawnictwo Politechniki Poznańskiej Poznań 2011, str 43–52.

I declare that my contribution to this work is at the level of 100%.

4. M. Biesaga, Chromatografia w praktyce (ed. A. Voekel, W. Wasiak), „Wpływ metody ekstrakcji na stabilność związków polifenolowych”, Wydawnictwo Politechniki Poznańskiej Poznań, 2011, str 67–75.

I declare that my contribution to this work is at the level of 100%.

5. M. Biesaga, J.S. Jaworski, Chromatografia w praktyce (ed. A. Voekel, W. Wasiak), „Identyfikacja pigmentów melaniny w bisiorze z wykorzystaniem LC-MS/MS”, Wydawnictwo Politechniki Poznańskiej Poznań 2011, str 117–124.

I declare that my contribution to this work is at the level of 60% and it lies in the optimization of the LC-MS/MS analysis and extraction conditions of mealnine markers.

### Scientific articles for general public:

1. M. Biesaga „Zastosowanie porfiryńowych faz stacjonarnych”, *Analityka* 4, 2002, 13–19.

I declare that my contribution to this work is at the level of 100%.

2. M. Biesaga, M. Donten, J. Mail, A Wach, „Zastosowanie chromatografii cieczowej w badaniu tkanin archeologicznych”, *Kwartalnik Historii Kultury Materialnej*, LII(3), 2004, 331–339.

I declare that my contribution to this work is at the level of 70% and it lies in the optimization of the chromatographic condition and extraction and hydrolysis conditions of selected natural dyes.

3. M. Biesaga, M.L. Donten, M. Donten, *Badania tkanin archeologicznych z wykorzystaniem SEM-EDS i chromatografii cieczowej*, *Analityka*, 3, 2005, 4–10.

I declare that my contribution to this work is at the level of 40% and it lies in the optimization of the chromatographic condition analysis of selected polyphenols in the textiles.

4. J. Lange, E. Polubiec, M. Biesaga, „Wykorzystanie elektroforezy kapilarnej do oznaczania azotanów w próbkach żywności”, *Analityka*, 3, 2007, 4–7.

I declare that my contribution to this work is at the level of 30% and it lies in the supervizing of experimental research and scientific discussions.

5. A. Michalkiewicz, M. Biesaga, K. Pyrzyńska, *Nektar bogów – miód*, *Analityka*, 1, 2010, 24–27.

I declare that my contribution to this work is at the level of 70% and it lies in the optimization of the extraction and the chromatographic condition of selected polyphenols in the honey samples.

6. B. Witkowski, M. Biesaga, T. Gierczak, , Wykorzystanie metod chromatograficznych w analizie spoiw białkowych, *Analityka*, 4, 2010, 34–40.  
I declare that my contribution to this work is at the level of 30% and it lies in the optimization of the chromatographic condition MS/MS detection of selected amino acids.
7. M. Biesaga, *Krzem okiem chemika*, Delta, 7, 2012, 12–14.  
I declare that my contribution to this work is at the level of 100%.

#### International conferences:

1. Good Laboratory Practice – OECD Seminar , 12–15.10.92, Balatonfured, Węgry, oral presentation: „Implementation of Good Laboratory Practice in Poland”, M. Biesaga.
2. IX International Ion Chromatography Symposium, Reading, Great Britain, 16–19.09.96. poster: „Speciation of Anions Containing Chlorine by Ion Chromatography and Capillary Electrophoresis”, M. Biesaga, M. Kwiatkowska, M. Trojanowicz.
3. 10th International Symposium on High Performance Capillary Electrophoresis and Related Microscale Techniques, Kyoto, Japan 6–10.07.97, poster: „Chemical Speciation of Selected Elements by Capillary Electrophoresis” M. Trojanowicz, E. Poboży, W. Maruszak, B. Głód, M. Biesaga.
4. Euroanalysis 10, Basel, Switzerland 6–11.09.1998, oral presentation: „HPLC of Amino Acids and Peptides with Tetraphenylporphyrin Stationary Phases” M. Biesaga, M. Trojanowicz
5. XXII Scientific Symposium on Chromatographic Methods of Investigation of Organic Compounds, Katowice–Szczyrk 8–10.06.1998, poster: „Porphyrin stationary phases in HPLC of amino acids and peptides”, J. Orska, M. Biesaga, D. Fiertek, J. Izdebski, M. Trojanowicz.
6. XXIII Scientific Symposium on Chromatographic Methods of Investigation of Organic Compounds, Katowice–Szczyrk 9–11.06.1999, oral presentation: „Porphyrin stationary phases in HPLC”, M. Biesaga, M. Trojanowicz.
7. CEEPUS Summer School, Pecs, Hungary, 21–27. 05.2000, oral presentation: „Porphyrin stationary phases in HPLC of nucleosides and nucleotides” , M. Biesaga, F. Kilár, M. Trojanowicz.
8. XIII International Ion Chromatography Symposium, Nice, France, 11–14.09.2000, poster: „HPLC of anions with metalloporphyrin stationary phases”, M. Biesaga, E. Sałamaj, K. Pyrzyńska, M. Trojanowicz.
9. VII Polish Conference on Chromatography and XXV Scientific Symposium on Chromatographic Methods of Investigation of Organic Compounds, Katowice–Szczyrk, Poland, 5–8.06.2001, poster: „Application of porphyrin stationary phases in chromatographic separation of nucleosides and nucleotides”. M. Biesaga, F. Kilar, M. Trojanowicz.

10. IUPAC International Congress on Analytical Sciences 2001, Tokyo, Japan, 6–10.08.2001, lecture: „Chromatographic application of porphyrins”, M. Trojanowicz, M. Biesaga, J.Orska-Gawryś.
11. North European Symposium for archaeological textiles , Łódź 8–10.05.2002, poster: „Chromatographic studies on natural dyes used in Coptic textiles”, J. Orska-Gawryś, I. Surowiec, M. Biesaga, K. Urbańska-Walczak, B. Szostek, J. Kehl, M. Trojanowicz.
12. North European Symposium for archaeological textiles , Łódź 8–10.05.2002, oral presentation: „Chromatographic studies on natural dyes used in Coptic textiles”, J. Orska-Gawryś, I. Surowiec, M. Biesaga, K. Urbańska-Walczak, B. Szostek, J. Kehl, M. Trojanowicz.
13. 5th EC Conference Cultural Heritage Research: a Pan-European challenge, Kraków 16–18.05.02, poster: „Chromatographic studies on natural dyes used in Coptic textiles”, J. Orska-Gawryś, I. Surowiec, M. Biesaga, K. Urbańska-Walczak, B. Szostek, J. Kehl, M. Trojanowicz.
14. 24th International Symposium on Chromatography, Leipzig, Germany, 15.09 – 20.09.2002, poster: „Ion chromatography with preliminary preconcentration step for determination of inorganic selenium species” ,M. Biesaga, P. Wójcik, K. Pyrzyńska.
15. XXVII Scientific Symposium on Chromatographic Methods of Investigation of Organic Compounds”, Szczyrk, 4–6.06.2003, poster „HPLC determination of chlorophenols and phenoxy acid herbicides with SPE preconcentration”, M. Biesaga, A. Jankowska, K. Pyrzyńska, P. Drzewicz, M. Trojanowicz.
16. XXVII Scientific Symposium on Chromatographic Methods of Investigation of Organic Compounds”, Szczyrk, 4–6.06.2003, poster: „Chromatographic analysis of inorganic selenium species with SPE preconcentration”, M. Biesaga, P. Wójcik, K. Pyrzyńska.
17. 2nd Conference on Ion Analysis 24–26.02 2003 Berlin (Germany), poster: „IC-IC coupling for the trace determination of chloride, sulphate and phosphate in concentrated nitric acid”, N. Schmidt, M. Biesaga, A. Seubert.
18. CEEPUS Summer School – 5th International Symposium and Course Teaching and Learning Analytical and Bioanalytical Monitoring Methods” 31.05–07.06.2004 Sofia, Bulgaria, poster: „Determination of flavonoids, chlorogenic and caffeic acids in apple and pear samples using HPLC”, E. Korom, M. Biesaga, M. Trojanowicz, L. Gy. Szabo, F. Kilar, A. Farkas.
19. Ceepus Summer School – 5th International Symposium and Course Teaching and Learning Analytical and Bioanalytical Monitoring Methods” 31.05 – 07.06.2004 Sofia, Bulgaria, poster: „Determination of phenoxy acid herbicides using HPLC with SPE”, Anna Jankowska, Magdalena Biesaga, Krystyna Pyrzyńska, Przemysław Drzewicz, Marek Trojanowicz.
20. EMC 2004 XIII European Microscopy Congress, Andwerpia, Belgia 22–27.08.2004, poster: „SEM and EDS applied in the conservation process of ancient papyrus and investigation of Middle Age fabrics”,M.L. Donten, M. Biesaga, M. Doten, B. Wagner.

21. XXVIII Scientific Symposium on Chromatographic Methods of Investigation of Organic Compounds, Katowice–Szczyrk, Poland, 7–9.06.2004, poster: „Chromatographic separation of chlorophenoxy acid herbicides and their radiolytic degradation products in water samples”, M. Biesaga, A. Jankowska, K. Pyrzyńska, P. Drzewicz, M. Trojanowicz.
22. XXVIII Scientific Symposium on Chromatographic Methods of Investigation of Organic Compounds, Katowice–Szczyrk, Poland, 7–9.06.2004, poster: „Chromatographic identification of natural dyes extracted from plants and archaeological textiles”, M. Biesaga, A. Wach, K. Pyrzyńska.
23. 4th AACD Congress 29.09–3.10 2004, Kusadasi-Aydin, Turkey, poster: „Chromatographic identification of natural dyes extracted from plants and archaeological textiles”, M. Biesaga, A. Wach, K. Pyrzyńska.
24. Ceepus Summer School – 6th International Symposium and Course Teaching and Learning Analytical and Bioanalytical Monitoring Methods” 29.05 – 4.06.2005 Praga, Czechy, lecture: „Column switching or multi-dimensional LC for determination of trace anion impurities in concentrated HNO<sub>3</sub>”, M. Biesaga, N. Schmidt, A. Seubert.
25. 29th International Symposium on High Performance Liquid Phase Separation and Related Techniques 26.06–30.06.2005 Stockholm, Sweden, poster: „The acidic hydrolysis and extraction processes of natural dyes from plants and ancient textiles”, M. Biesaga, A. Wach, K. Pyrzyńska, M. Donten, J. Maik.
26. 29th International Symposium on High Performance Liquid Phase Separation and Related Techniques 26.06–30.06.2005 Stockholm, Sweden, poster: „Chromatographic investigation of radiolytic degradation products of chlorophenoxy acid herbicides”, M. Biesaga, A. Stafiej, K. Pyrzyńska, P. Drzewicz, M. Trojanowicz.
27. The Jubilee XXX Symposium on Chromatographic Methods of Investigation the Organic Compounds, Katowice–Szczyrk, Poland, 12–14.06.2006, poster: „Determination of hydroxyurea and (RS)-N-[(1-etylopirolidyn-2-ylo)-metyl]-2-metoxy-5-sulfamoilo-benzamide in the workplace air in pharmaceutical industry by HPLC”, M. Biesaga, K. Pyrzyńska, A. Osytek, M. Szewczyńska.
28. The Jubilee XXX Symposium on Chromatographic Methods of Investigation the Organic Compounds, Katowice–Szczyrk, Poland, 12–14.06.2006, poster: „Polyphenolic content in fruits during ripening process”, M. Biesaga, U. Ochnik, K. Pyrzyńska.
29. The International Congress on Analytical Sciences (ICAS–2006) Moskwa, Rosja, 25–30.05.2006, poster: „Determination of quercetin in some food and herbal samples”, K. Pyrzyńska, M. Biesaga, A. Wach.
30. The International Congress on Analytical Sciences (ICAS–2006) Moskwa, Rosja, 25–30.05.2006 poster: „The evaluation of carbon nanotubes as a sorbent for some herbicides”, K. Pyrzyńska, A. Stafiej, M. Biesaga.
31. Ceepus Summer School – 7th International Symposium and Summer School of Bioanalysis 10.06–15.06.2007 Pecs, Hungary, lecture: „Determination of



- Phenolic Compounds in Food Using HPLC with UV and Mass Spectrometry Detections, M. Biesaga.
32. 25th LC/MS Montreux Symposium, 12–14. 11. 2008, poster: „Determination of phenolic compounds in food samples by HPLC – MS/MS” M. Biesaga, K. Pyrzyńska.
  33. 25th LC/MS Montreux Symposium 12–14. 11. 2008, poster: „Historical and archaeological textiles: an insight on degradation products of wool yarns” I. Degano, M. Biesaga, M. P. Colombini, M. Trojanowicz.
  34. 3rd Congress of European Microbiologists – FEMS 2009, Geteborg, Szwecja 28.06–2.07.2009, poster: „GLCNAC deacetylases in listeria monocytogenes play an essential role in the physiological functions of the bacterial cell wall” M. Popowska, M. Biesaga, Z. Markiewicz
  35. BaltChem 2009, International Young Chemists’ Conference, Warszawa (Polska), 2–5 kwietnia 2009, poster: Chemical methods of surface modification for visualization of organic inclusions in biogenic minerals, M. Gugąła, J. Stolarski, P. Krysiński, M. Biesaga, M. Mazur.
  36. Eurofood XVI, „Translating food chemistry into health benefits”, Gdańsk 6 – 8.07.2011, poster: „ Evaluation of antioxidant properties of fruit and flavored black teas”, A. Pękal, P. Drózd, M. Biesaga, K. Pyrzyńska.

#### National Conferences:

1. V Polska Konferencja Chemii Analitycznej, Gdańsk, Wrzesień 1995, poster: „Zastosowanie chromatografii jonowej do specjacji fosforu w kąpielach galwanicznych”, M. Biesaga, M. Trojanowicz.
2. VI Polska Konferencja Chemii Analitycznej, Gliwice, 9–14.07.2000, poster: „Zastosowanie kolumn porfiryńowych w chromatografii anionów”, M. Biesaga, E. Sałamaj, K. Pyrzyńska, M. Trojanowicz.
3. IV Konferencja: Flawonoidy i ich zastosowanie Rzeszów 26–27.05.2002, poster: „Chromatograficzne badania barwników naturalnych stosowanych w tkaninach koptyjskich”, I. Surowiec, J. Orska-Gawryś, M. Biesaga, M. Trojanowicz, M. Hutta, R. Halko, K. Urbaniak Walczak.
4. Zastosowanie metod AAS, ICP-IES, ICP-MS w analizie środowiskowej Warszawa, 17–18 .11.2003, oral presentation: Zastosowanie wysokosprawnej chromatografii cieczowej w specjacji, M. Biesaga, E. Poboży.
5. III Sympozium „Analiza Chemiczna w ochronie zabytków” Warszawa, 12.12.2003, lecture: Wykorzystanie chromatografii cieczowej i mikroskopii elektronowej do badania tkanin archeologicznych”, M. Biesaga, M. Donten, M. Donten.
6. CEMERA „Analiza specjacyjna – problem materiałów odniesienia” 17.02.2004, lecture: „Problemy w analizie specjacyjnej selenu”, M. Biesaga, K. Pyrzyńska.
7. I Warszawskie Seminarium Doktorantów Chemików, 14.05.2004 Warszawa, poster: “Determination of phenoxy acid herbicides using HPLC with

- preconcentration by solid-phase extraction”, A. Jankowska, M. Biesaga, K. Pyrzyńska, P. Drzewicz, M. Trojanowicz
8. IV Ogólnopolskie sympozjum – Analiza Przepływowa, 21–22.10.2004 Kraków, poster: „Chromatograficzne oznaczanie herbicydów fenoksykwasowych z zastosowaniem ekstrakcji do fazy stałej”, A. Jankowska, M. Biesaga, K. Pyrzyńska
  9. VII Konferencja Chemii Analitycznej, Toruń 3–7.07.2005, poster: „Chromatograficzne oznaczanie herbicydów fenoksykwasowych oraz produktów ich radiolitycznej degradacji” M. Biesaga, A. Stafiej, K. Pyrzyńska, P. Drzewicz, M. Trojanowicz.
  10. VII Konferencja Chemii Analitycznej, Toruń 3–7.07.2005, poster: „Procesy ekstrakcji i hydrolizy kwasowej naturalnych barwników z roślin oraz tkanin archeologicznych”, M. Biesaga, A. Wach, M. Donten, K. Pyrzyńska, J. Maik.
  11. XV Poznańskie konwersatorium analityczne – Nowoczesne metody przygotowania próbek i oznaczania śladowych ilości pierwiastków, Poznań, 20–21.04.2006, poster: „Wykorzystanie nanorurek węglowych jako sorbentów dla wybranych herbicydów”, K. Pyrzyńska, A. Stafiej, M. Biesaga.
  12. VII Konferencja Chromatograficzna Chromatografia i techniki pokrewne a zdrowie człowieka, Białystok, 10–13.09.2006, poster: „Oznaczanie hydroksymocznika na stanowisku pracy w przemyśle farmaceutycznym”, M. Galwas, M. Posniak, A. Osytek, M. Biesaga, K. Pyrzyńska.
  13. Analityczne zastosowanie chromatografii cieczowej, Warszawa 19–20.10.2006, lecture: Oznaczanie związków fenolowych w żywności”, M. Biesaga, K. Pyrzyńska.
  14. Analityczne zastosowanie chromatografii cieczowej, Warszawa, 19–20.10.2006, poster: „Procesy ekstrakcji i hydrolizy ziela dziurawca pospolitego (*Hypericum perforatum*)”, M. Biesaga, A. Stafiej, K. Pyrzyńska.
  15. Selen-pierwiastek ważny dla zdrowia, fascynujący dla badacza, Warszawa, 21.04.2007, poster „Chromatografia jonowa nieorganicznych anionów selenu” P. Wójcik, M. Biesaga, K. Pyrzyńska.
  16. Techniki informatyczne w nauczaniu chemii na poziomie szkoły wyższej 18.06.07 Kraków 18.06.2007, lecture: „Wykorzystanie platformy e-learningowej moodle do zajęć z chromatografii cieczowej”, M. Biesaga.
  17. II Konferencja: Analityczne zastosowanie chromatografii cieczowej, Warszawa, 18–19.10.2007, poster: „Oznaczanie kwasów fenolowych w owocach śliwki w okresie dojrzewania”, M. Biesaga, U. Ochnik, K. Pyrzyńska.
  18. III Konferencja: Analityczne zastosowanie chromatografii cieczowej, Warszawa, 23–24.10.2008, oral presentation „Chromatograficzne oznaczanie związków polifenolowych w próbkach żywności z różnymi metodami detekcji”, M. Biesaga, K. Pyrzyńska.
  19. Chromatografia jonowa – nowoczesna metoda oznaczania anionów i kationów w wodach i ściekach, Zabrze, 21–22.04.2009, lecture: „Oznaczanie śladowych zanieczyszczeń w kwasach”, M. Biesaga.

20. IV Konferencja: Analityczne zastosowanie chromatografii cieczowej, Warszawa, 15–16.10.2009, lecture: „Wykorzystanie HPLC do oznaczania flawonoidów w żywności modyfikowanej genetycznie”, T. Gilevska, M. Biesaga,
21. VIII Konferencja „Flawonoidy i ich zastosowanie” 20–21.05.2010 Polańczyk Zdrój, lecture: „Metody detekcji w chromatograficznym oznaczaniu flawonoidów w próbkach żywności”, M. Biesaga.
22. VIII Polska Konferencja Chemii Analitycznej, Kraków 4–9.07.2010, lecture: „Oznaczanie bioflawonoidów w próbkach żywności”, M. Biesaga.
23. VIII Polska Konferencja Analityczna, Kraków 4–9.07.2010, oral presentation: „Zdolności antyutleniające ekstraktów z różnych rodzajów herbat”, A. Pękal, P. Drózdź, M. Biesaga, K. Pyrzyńska.
24. V Konferencja: Analityczne zastosowanie chromatografii cieczowej, Warszawa, 14–15.10.2010, lecture: „Metody ekstrakcji bioflawonoidów”, M. Biesaga.
25. V Konferencja: Analityczne zastosowanie chromatografii cieczowej, Warszawa, 14–15.10.2010, poster: „Biopolifenole w ekstraktach herbat”, A. Pękal, P. Drózdź, M. Biesaga, K. Pyrzyńska.
26. IX Konferencja Chromatograficzna, Poznań 26–29.06.2011, oral presentation: „Wykorzystanie LC-MS/MS do analizy związków polifenolowych w ekstraktach z próbek żywności”, M. Biesaga.
27. IX Konferencja Chromatograficzna, Poznań 26–29.06.2011, poster: „Wpływ metody ekstrakcji na stabilność związków polifenolowych”, M. Biesaga.
28. IX Konferencja Chromatograficzna, Poznań 26–29.06.2011, poster: „Identyfikacja pigmentów melaniny w bisiorze z wykorzystaniem LC-MS”, M. Biesaga, J.S. Jaworski.
29. VI Konferencja „Analityczne zastosowania chromatografii cieczowej” Warszawa 20–21.10.2011, poster: „Ekstrakcja związków polifenolowych z materiału roślinnego”, K. Czaplicka, M. Biesaga, K. Pyrzyńska.
30. VI Konferencja „Analityczne zastosowania chromatografii cieczowej” Warszawa 20–21.10.2011, poster: „Porównanie metod HPLC z detekcją EC i LC-MS/MS w oznaczaniu fizjologicznego stężenia kwasu liponowego w osoczu krwi”, M. Marszał, M. Biesaga.
31. IX Konferencja „Flawonoidy i ich zastosowanie” Polańczyk Zdrój 9–11.05.2012, lecture: „Wykorzystanie kolumn HILIC w analizie flawonoidów”, A. Sentkowska, K. Pyrzyńska, M. Biesaga.
32. IX Konferencja „Flawonoidy i ich zastosowanie” Polańczyk Zdrój 9–11.05.2012, poster: „Wpływ rozpuszczalnika próbki na retencję flawonoidów w chromatografii HILIC”, A. Sentkowska, K. Pyrzyńska, M. Biesaga.
33. IX Konferencja „Flawonoidy i ich zastosowanie” Polańczyk Zdrój 9–11.05.2012, poster: „Identyfikacja flawonoidów w propolisie”, M. Biesaga, K. Dąbrowska.
34. IX Konferencja „Flawonoidy i ich zastosowanie” Polańczyk Zdrój 9–11.05.2012, lecture: „Metody ekstrakcji a trwałość flawonoidów”, M. Biesaga.

35. IX Konferencja „Flawonoidy i ich zastosowanie” Polańczyk Zdrój 9–11.05.2012, poster: „Reakcje kompleksowania i utleniania kwercetyny w obecności Cu(II)”, A. Pękal, K. Pyrzyńska, M. Biesaga.

### Patents:

1. K. Dowbor, M. Szelaḡowski, M. Biesaga, W. Bielawska, D. Szawaryn, „Sposób utleniania hydrochinonu w alkalicznych roztworach wodnych podczas odsiarczania gazu” P – 143567.
2. K. Dowbor, I. Kroenke, S. Ermich, M. Szelaḡowski, M. Biesaga, W. Bielawska, E. Pruszyńska, J. Pasynekiewicz, „Sposób usuwania siarkowodoru z gazów nie zawierających tlenu w postaci cząsteczkowej” P – 145675.

### Expertise and preparation of analytical procedures for the industry (in Polish)

1. Analiza roztworów zawierających 2,2'-(hydroxyimino)bis-ethanesulfonic acid, disodium salt (BESHA) – dla DJChem Chemicals Poland Spółka akcyjna (2003)
2. Identyfikacja produktów syntezy preparatów farmaceutycznych – współpraca z firmą Adamed (2007)
3. Identyfikacja produktów syntezy fragmentów RNA, dr Jacek Jemielity – współpraca z Zakładem Biofizyki UW (2008).
4. Oznaczanie kompleksów rodu – współpraca z prof. dr hab. Aleksandrem Bilewiczem, Instytut Chemii i Techniki Jądrowej (ICHTJ) (2008).
5. Identyfikacja składu próbek polimerów – we współpracy z Instytutem Ciężkiej Syntezy Organicznej „Blachownia”, dr inż. Renata Kulesza – (2007–2011)
6. Identyfikacja wybranych produktów degradacji polimerów poliuretanowych pod wpływem enzymów – współpraca z Wydziałem Inżynierii Materiałowej PW (2006–2008)
7. Identyfikacja i oznaczanie muropeptydów – współpraca z dr Magdaleną Popowska z Pracowni Mikrobiologii Wydziału Biologii UW, (2008–2009).
8. Identyfikacja struktury barwników – Zakład Biochemii UMCS Lublin (2009).
9. Identyfikacja produktów degradacji leków – współpraca z Uniwersytetem Medycznym w Białymstoku (2009).
10. Identyfikacja profilu zanieczyszczeń leków syntetycznych i suplementów diety – US Pharmacia (2010)
11. Identyfikacja zanieczyszczeń pestycydów mocznikowych – Instytut Przemysłu Organicznego(2009–2011)

12. Identyfikacja produktów syntezy stabilizatora kauczuku dla firmy Synthos Dwory Sp. z o.o. (2010–2011).



## 7. Citations of the publications of Dr Magdalena Biesaga

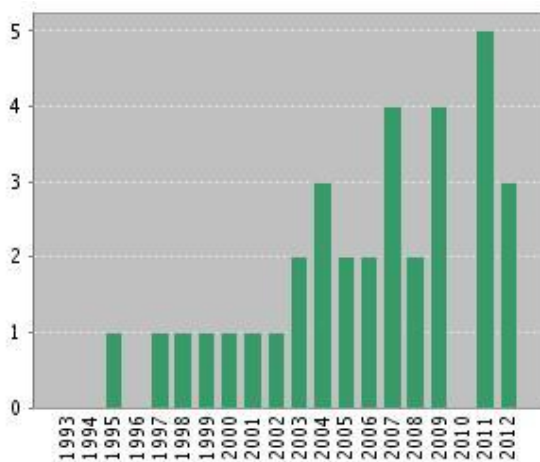
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Citation Report

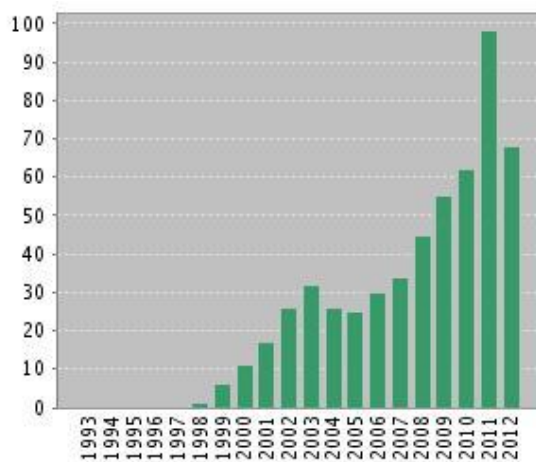
Author=(Biesaga M)  
Timespan=All Years.

This report reflects citations to source items indexed within All Databases.

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H-index:	11

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## 8. Ph.D. diploma

RZECZPOSPOLITA POLSKA

UNIwersYTET WARSZAWSKI

Wydział Chemii

# DYPLOM

Magdalena Biesaga

URODZONA DNIA 22 kwietnia 1959 R.  
w Warszawie

NA PODSTAWIE PRZEDSTAWIONEJ ROZPRAWY DOKTORSKIEJ  
POD TYTUŁEM „Zastosowanie porfiryńowych faz stacjo-  
narynych w HPLC”

ORAZ PO ZŁOŻENIU PRZEPISANYCH EGZAMINÓW UZYSKAŁA  
STOPIEŃ NAUKOWY

DOKTORA

nauk chemicznych w zakresie chemii

NADANY UCHWAŁĄ RADY Wydziału Chemii  
Uniwersytetu Warszawskiego

Z DNIA 29 czerwca 2001 R.

PROMOTOREM W PRZEWODZIE DOKTORSKIM BYŁ

prof. dr hab. Marek Trojanowicz

RECENZENTAMI W PRZEWODZIE DOKTORSKIM BYLI

prof. dr hab. Renata Bilwicz

prof. dr hab. Walenty Szczepaniak

Warszawa, 6 lutego 2002 R.

DZIEKAN




prof. dr hab. Stanisław Głąb

NR 7188



REKTOR



prof. dr hab. Piotr Węglęński

SPECJALISTA  
WYDZIAŁU CHEMII UW  
Mariania Zapala  
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MBies

## 9. Co-authors' declarations for their contribution to the formation of publications – a summary

Article	Authors				
20. [IV]	M. Biesaga	A. Wach	M. Donten	J. Maik	K. Pyrzyńska
	60%	10%	10%	5%	15%
22. [V]	A.Wach	K. Pyrzyńska	M. Biesaga		
	10%	20%	70%		
24. [III]	M.Biesaga	A.Stafiej	K. Pyrzyńska		
	70%	10%	20%		
25. [I]	M.Biesaga	U.Ochnik	K.Pyrzyńska		
	70%	10%	20%		
27. [VII]	A.Michalkiewicz	M. Biesaga	K. Pyrzyńska		
	10%	70%	20%		
28. [VI]	M.Biesaga	K. Pyrzyńska			
	55%	45%			
29. [II]	M. Biesaga	U. Ochnik	K. Pyrzyńska		
	70%	10%	20%		
30. [IX]	K. Pyrzyńska	M. Biesaga			
	50%	50%			
31. [VIII]	M. Biesaga	K. Pyrzyńska			
	90%	10%			
32. [XIII]	A. Pękal	M. Biesaga	K. Pyrzyńska		
	30%	45%	25%		
34. [X]	M. Biesaga				
	100%				
38. [XII]	A. Pękal	P. Drózdź	M. Biesaga	K. Pyrzyńska	
	15%	10%	45%	30%	
40. [XI]	M. Biesaga	K. Pyrzyńska			
	90%	10%			

Numbers in brackets are the numbers of these articles cited in thesis presented in the separated annex