

Curriculum Vitae

Ricardo Bettencourt da Silva

1. Personal Data

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| Name | Ricardo Jorge Neves Bettencourt da Silva |
| Birthdate | 12th August 1971 |
| Nationality | Portuguese |
| Email | rjsilva@fc.ul.pt |
| Website | http://webpages.fc.ul.pt/~rjsilva (http://mechem.rd.ciencias.ulisboa.pt/) |
| Researcher ID | E-1807-2012 |
| ORCID | 0000-0003-1990-3472 |
| Scopus Author ID | 6602772414 |

2. Education

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| Degree (3) | PhD in Analytical Chemistry |
| Institution | Faculty of Sciences of the University of Lisbon |
| Conclusion | 19 November 2004 |
| Supervisors | Prof. Dr. Maria Filomena G. F. C. Camões and Principal Researcher Júlia Ribeiro dos Santos |
| Thesis | Modelling the performance of complex analytical methods |
| Description | <i>Development of new approaches for the detailed evaluation of the uncertainty of complex measurements. First PhD in Metrology in Chemistry in Portugal. First detailed evaluation of the uncertainty of measurements of pesticide residues in foodstuffs.</i> |
| Mark | Maximum score |
| Degree (2) | Master in Food Quality Control and Toxicology |
| Institution | Faculty of Pharmacy of the University of Lisbon |
| Conclusion | 5 March 1998 |
| Supervisors | Prof. Dr. Maria Filomena G. F. C. Camões and Principal Researcher João Seabra e Barros |
| Thesis | Validation of the determination of metals in solid foodstuffs |
| Description | <i>Development, validation and detailed modelling of the uncertainty of measurements of metals in solid foodstuffs by atomic spectroscopy.</i> |
| Mark | Maximum score (thesis); 15 points (courses) |
| Degree (1) | Graduation in Chemistry |
| Institution | Faculty of Sciences of the University of Lisbon |
| Conclusion | 21 December 1993 |
| Supervisors | Prof. Dr. Maria Filomena G. F. C. Camões |
| Thesis | Part I: Flow injection analysis with potentiometric detection Part II: Capillary electrophoresis (co-supervised by Dr Henk Lauer; Lauerlabs, Emmen, NL) |
| Description | <i>Development and validation of a procedure for the measurement of silver ion in aqueous solutions by flow injection analysis with potentiometric detection. Development and validation of a procedure for the measurement of the ionic composition of drinking water by capillary electrophoresis with UV/Vis spectroscopic detection. Development of a flow cell for buffer regeneration or change in capillary electrophoresis.</i> |
| Mark | 14 points |

3. Professional experience

3.1. Main activity

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| Position (15) | Researcher |
| Institution | Environmental Biogeochemistry Group - Centro de Química Estrutural |
| Date | 1 January 2016 – (...) |
| Description | <i>Researcher in Examinology and Metrology in Chemistry. Examinology and metrology are the sciences of qualitative and quantitative determinations in chemistry, respectively.</i> |

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| Position (14) | Invited Professor |
| Institution | Chemistry and Biochemistry Department – Faculty of Sciences of the University of Lisbon |
| Date | 25 May 2015 – (...) |
| Description | <i>Invited chemistry Professor.</i> |
| Position (13) | Invited scientist of a financed project |
| Institution | Environmental Biogeochemistry Group - Centro de Química Estrutural (CQE) Analytical and Environmental Chemistry Group - Centre for Molecular Sciences and Materials (CCMM) |
| Date | 23 November 2014 – 23 May 2015 |
| Description | <i>Invited scientist of the FCT project EXPL/QEQ-QAN/0458/2013.</i> |
| Position (12) | Researcher and Assessor for the Accreditation of Laboratories |
| Institution | Independent contractor |
| Date | 16 June 2014 – 23 November 2014 |
| Description | <i>Independent contractor for research in Metrology and Examinology in chemistry, and for assessing the performance of accredited laboratories, following the ISO/IEC 17025 standard, for chemical tests.</i> |
| Position (11) | Researcher |
| Institution | Analytical and Environmental Chemistry Group - Centre for Molecular Sciences and Materials (CCMM) |
| Date | 15 June 2009 – 15 June 2014 |
| Description | <i>Contracted, by “FCT-Ciência 2008” programme, for developing research in Analytical Chemistry and Metrology in Chemistry.</i> |
| Position (10) | Invited Researcher to Technical Head of Laboratory |
| Institution | Pesticide Residues Laboratory – Institute for Biological Resources (Public service and official laboratory for the monitoring of pesticide residues in foodstuffs; Accredited by the National Accreditation Body) |
| Date | 15 December 2008 – 15 June 2009 |
| Description | <i>Researcher and analyst for the measurement of pesticide residues in foodstuffs. Technical head of the laboratory in the last month.</i> |
| Position (9) | Consultant, Trainer and Assessor for the Accreditation of Laboratories |
| Institution | Independent contractor |
| Date | 1 October – 14 December 2008 |
| Description | <i>Independent contractor for consulting, training and assessing the performance of accredited laboratories, following the ISO/IEC 17025 standard, for chemical tests.</i> |
| Position (8) | Researcher |
| Institution | Centre of Chemistry of Vila Real of the University of Trás-os-Montes and Alto Douro (UTAD) |
| Date | 3 March 2008 – 30 September 2008 |
| Description | <i>Contracted, by the “FCT-Ciência 2007” programme, for studying the photodegradation of organic compounds in ionizing radiation. The kinetics of parabens degradation by the radiation of low-pressure mercury lamps was studied after measuring lamp emission by actinometry.</i> |
| Position (7) | Analyst |
| Institution | Pesticide Residues Laboratory – General-Directorate of Crop Protection (DGPC) (Public service and official laboratory for the monitoring of pesticide residues in foodstuffs; Accredited by the National Accreditation Body) |
| Date | 26 May 1999 – 29 February 2008 |
| Description | <i>Measurement of pesticide residues in foodstuffs using multi-analyte and multi-matrix chromatographic methods (GC-μECD, GC-TOF-MS, GC-ITD-MS, HPLC-UV, GC-NPD and GC-FPD). Development and validation of the measurement procedures including the evaluation of the measurement uncertainty, development of strategies for tests quality control, development of software with automatic links with signals from instrumentation for routine analysis quality control, elaboration of technical procedures for the accreditation, development of LIMS platform, etc. The developed software is being used in the official monitoring since 2002. A new approach for the detailed evaluation of the uncertainty of pesticide residues measurements in foodstuffs was developed. Accreditation of the qualitative and quantitative analysis of 70 pesticide residues in foodstuffs of vegetable origin, in 25 minutes long runs, by GC-TOF-MS.</i> |

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| Position (6) | Head of the Quality Assurance System |
| Institution | Division for drinking water treatment and analysis – Municipal Services of Loures (Public Municipal Service) |
| Date | 26 April – 25 May 1999 |
| Description | <i>Elaborated a plan for the accreditation of the drinking water analysis laboratory.</i> |
| Position (5) | Analyst to Substitute of the Technical Head and Director of Laboratory |
| Institution | Controlab, Lda – Laboratory for Chemical, Physical and Biological Analysis (Private service laboratory and Training in Analytical Chemistry; Accredited by the National Accreditation Body) |
| Date | 2 September 1996 to 25 April 1999 |
| Description | <i>Elemental analysis of environmental samples, medicines, foodstuffs, etc. by atomic spectroscopy (AES-ICP, FAAS, FAES, CVAAS, HGAAS and ETAAS). Development and validation of the analytical methods including the evaluation of the measurement uncertainty, development of strategies for tests quality control and routine analysis. Substituted the Technical Head for four months and the Laboratory Director for three weeks in 1998.</i> |
| Position (4) | Trainee (short-term activity) |
| Institution | Regional Center for Agropharmaceutical Research of Anger (CREPA), France |
| Date | 1-12 July 1996 and 15 September-9 October 1997 |
| Description | <i>Measurements of pesticide residues in waters by capillary electrophoresis with the supervision of Prof. Dr Josette Fournier and Prof. Dr Maria Filomena G. F. C. Camões. Work financed by a protocol between JNICT (National Body for the Promotion of Research and Technology) and the French embassy in Portugal.</i> |
| Position (3) | Trainee to Analyst |
| Institution | Laboratory for Environmental and Quality Control Analysis (LAACQ) of the Institute for Engineering and Industrial Technology (INETI) (Public service and research laboratory; Accredited by the National Accreditation Body) |
| Date | 20 July 1994 – 30 June 1996 |
| Description | <i>Inorganic analysis of complex items (soils, minerals, alloys, foodstuffs, wastewaters, etc.) by atomic spectroscopy (FAAS, FAES, CVAAS and HGAAS) and classical methods of analysis. Development and validation of the measurement procedures including the evaluation of the measurement uncertainty, control charts implementation and routine analysis. Trainee activity financed by “9º Programa de Jovens Técnicos para a Indústria”. Contracted, as analyst, for the last five months.</i> |
| Position (2) | Trainee |
| Institution | Lauerlabs B.V., Emmen, The Netherlands (Producer of capillary electrophoresis instrumentation) |
| Date | 8 August 1993 – 31 January 1994 |
| Description | <i>Development of the second part of the graduation project in the laboratory for analytical applications and instrumentation development. Work financed by ACTIVE programme (Analytical Chemistry Turntable for Industry Visits and Education).</i> |
| Position (1) | Trainee |
| Institution | Centre of Electrochemistry and Kinetics of the University of Lisbon (CECUL) |
| Date | September 1993 – August 1993 |
| Description | <i>Development of the first part of the graduation project. Work financed by PRODEP (Programme for the Educational Development of Portugal).</i> |

3.2. Other activities

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| Role (15) | Co-coordinator of ForMEQ |
| Institution | Fórum Internacional para a Metrologia e Examinologia em Química (ForMEQ) (formeq.org) |
| Date | March 2019 – (...). |
| Description | <i>Co-coordinator of ForMEQ</i> |

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| Role (14) | Secretary of CITAC |
| Institution | Cooperation on International Traceability in Analytical Chemistry (CITAC) (www.citac.cc) |
| Date | April 2017 – (...). |
| Description | <i>Executive Secretary of CITAC</i> |
| Role (13) | Member of the Centro de Química Estrutural (CQE) |
| Institution | Centro de Química Estrutural |
| Date | January 2015 – (...). |
| Description | <i>Member of the Environmental Biogeochemistry Group - Centro de Química Estrutural.</i> |
| Role (12) | Member of the Study Group ‘Quality Assurance’ of EuCheMS |
| Institution | European Association for Chemical and Molecular Sciences (EuCheMS) |
| Date | November 2016 – (...). |
| Description | <i>Member of the Study Group ‘Quality Assurance’ of the Division of Analytical Chemistry of EuCheMS.</i> |
| Role (11) | Member of the working group ‘Eurachem-Portugal: Metrologia Química’/ ‘GT5: Química; Comissão Técnica RELACRE 04: Metrologia’ |
| Institution | RELACRE – Associação de Laboratórios Acreditados de Portugal |
| Date | July 2014 – (...). |
| Description | <i>Working group member.</i> |
| Role (10) | Member of the Centre for Molecular Sciences and Materials (CCMM) |
| Institution | Centre for Molecular Sciences and Materials |
| Date | June 2007 – December 2014. |
| Description | <i>Member of the Analytical and Environmental Chemistry Group. Member of the Executive Commission of CCMM between March 2012 and December 2014.</i> |
| Role (9) | Referee of Scientific Journals and Research Projects |
| Institution | Various |
| Date | 2004 – (...). |
| Description | <i>Analytica Chimica Acta, Elsevier: 55 manuscripts; Analytical letter, Taylor & Francis: 5 manuscripts; Analytical Methods, RSC: 3 manuscripts; Food Chemistry, Elsevier: 8 manuscripts; Environmental Engineering and Management Journal (Romania): One manuscript; International Journal of Environmental Analytical Chemistry, Taylor & Francis: 2 manuscripts; IUPAC project on Metrology in Chemistry: June 2011; Journal Accreditation and Quality Assurance, Springer: 43 manuscripts; Journal of Chromatography A: One manuscript; Journal of the Association of Official Analytical Chemists: 7 manuscripts; Journal of the Science of Food and Agriculture: One manuscript; Measurement, Elsevier: 6 manuscripts; Talanta - The International Journal of Pure and Applied Analytical Chemistry, Elsevier: 20 manuscripts; Water, MDPI: 2 manuscripts. Water, Air, & Soil Pollution, Springer: One manuscript</i> |
| Role (8) | Authorized TrainMiC® trainer and member of the Editorial Board |
| Institution | Institute for Reference Materials and Measurements (IRMM) |
| Date | 18 September 2007 – (...). |
| Description | <i>Authorised trainer of this European programme for lifelong learning on metrology in chemistry (www.trainmic.org) since 18 September 2007. Member of the TrainMiC Editorial Board since 2 February 2010. Responsible for the elaboration of the second edition of the TrainMiC module: “Uncertainty of Measurement Principles” (translated to 14 languages).</i> |

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| Role (7) | Member of Eurachem |
| Institution | Eurachem (Network of organisations in Europe having the objective of establishing a system for the international traceability of chemical measurements and the promotion of good quality practices) |
| Date | (1) August 2000 – March 2007; (2) May 2010 – (...) |
| Description | (1) <i>Secretariat support of the Eurachem Vice-Chair and Chair, Prof. M. Filomena Camões [August 2000-July 2004].</i> <i>Eurachem webmaster [March 2002 – March 2007]</i> (2) <i>National Representative since 28 May 2010</i> <i>Member of the Measurement Uncertainty and Traceability Working Group Since 26 May 2010</i> » <i>Editor of the following guide:</i> <i>R. Bettencourt da Silva, A. Williams (eds.), Eurachem/CITAC Guide: Setting and Using Target Uncertainty in Chemical Measurement, Eurachem 2015.</i> <i>Member of the Executive Committee since 24 May 2012</i> <i>Member of the Qualitative Analysis Working Group Since December 2012</i> » <i>Elected Chair of the working group since May 2017 (Re-elected May 2019)</i> |
| Role (6) | Member of Eurachem-Portugal |
| Institution | Eurachem-Portugal (Secretariat by RELACRE, Portuguese Association of Accredited Laboratories) |
| Date | June 2006 – (...) |
| Description | <i>Eurachem-Portugal aims at providing guidance for laboratories on the production of reliable analytical data.</i> <i>Member of Working Group 1 for the evaluation of measurement uncertainty.</i> <i>Webmaster of Eurachem-Portugal since August 2000 (www.eurachem.fc.ul.pt).</i> |
| Role (5) | Technical Assessor for the Accreditation of Chemical Tests |
| Institution | Portuguese Accreditation Body (Instituto Português de Acreditação, IPAC) |
| Date | May 2002 – (...) |
| Description | <i>Technical assessor for the accreditation of tests following the ISO/IEC 17025 standard. Assessment of laboratories for the analysis of inorganic and organic analytes in waters, foodstuffs, raw materials, products and residues of the industry, etc. Performed 172 audits from which 7 were first assessments. Auditing performance was praised by inspectors of the “European co-operation for Accreditation” in a Peer-evaluation of IPAC performed in 2004.</i> |
| Role (4) | Member of a Working Group for the Accreditation of Laboratories (03/WG/03/CHEM) |
| Institution | Portuguese Accreditation Body (Instituto Português de Acreditação, IPAC) |
| Date | April 2004 – (...). |
| Description | <i>The working group developed guidance of IPAC for the evaluation of the uncertainty of measurements in chemistry (Guide OGC007) and revised criteria for the assessment of other technical requirements of the ISO/IEC 17025 standard (Guide OGC002).</i> |
| Role (3) | Consultant for Testing Laboratories and Research Units |
| Institution | Independent contractor |
| Date | May 2002 – February 2008 |
| Description | <i>Consultant for the accreditation of testing laboratories, following ISO/IEC 17025 standard, and for the application of OCDE Principles of Good Laboratory Practice (GLP) in research units. Performed 16 internal audits of testing laboratories and 11 GLP inspections.</i> <i>Developed the following projects:</i> Project 1: <i>Pharmaceutical Studies Laboratory (LEF)(National Association of Pharmacies) [2002-2003]</i> <i>Consultancy on accreditation and GLP;</i> Project 2: <i>SAPEC-Agro (Pesticide Production Industry) [2003-2004] – Elaboration of technical documents, and preparation and participation in the first external GLP inspection;</i> Project 3: <i>Infarmed (National Authority of Medicines and Health Products, IP) – Consultancy for the accreditation of the “Laboratory of Pharmaceutical Chemistry” (LQF) [December 2004 – September 2006];</i> Project 4: <i>Infarmed – Consultancy for the accreditation of the “Laboratory of Pharmacopeia and Biopharmacy” (LQFTB) and the “Laboratory of Biology and Biotechnology” (LBIO) [July 2006 – March 2008];</i> Project 5: <i>DRARN (Regional Directorate for Environment and Natural Resources of Madeira)[June 2007-February 2008] – Consultancy for the accreditation of the Regional Pesticide Residues Laboratory.</i> |

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Project 6: RELACRE (Association of Accredited Laboratories) - Statistical treatment of results of a proficiency test on the analysis of textiles [September 2007].

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| Role (2) | Member of the Scientific Council of DGPC |
| Institution | General-Directorate of Crop Protection (DGPC) |
| Date | December 2004 – March 2008 |
| Description | <i>Member of the Scientific Consulting Body of DGPC.</i> |
| Role (1) | Expert of an Inspection of the Food and Veterinary Office |
| Institution | Food and Veterinary Office (FVO) of the European Commission |
| Date | 11-15 September 2006 (Romania) |
| Description | <i>FVO Mission 8120/2006 for the Control of Pesticides in Products of Vegetable origin in Romania. Participation in the mission for the assessment of laboratories involved in the monitoring of pesticide residues in foodstuffs and in the monitoring of pesticide formulations.</i> |

4. Financed R&D projects

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| Project (9) | UnipHied - Realisation of a Unified pH Scale (EURAMET 17FUN09) |
| Beneficiaries | Government Office of the Capital City Budapest (BKKH) Czech Metrology Institute (CMI) Danish Fundamental Metrology (DFM) Instituto Português da Qualidade (IPQ) Laboratoire National de Métrologie et D'Essai (LNE) Finnish Environment Institute (MIKES-SYKE) Physikalisch-Technische Bundesanstalt (PTB) Ulusal Metroloji Enstitüsü (UME) Albert-Ludwigs-Universität Freiburg (Germany) ANB Sensors Limited (United Kingdom) FCiências.ID - Associação para a Investigação e Desenvolvimento de Ciências (Portugal) Tartu Ülikool (Estonia) |
| Financing | EURAMET |
| Date | Started 2018 |
| Description | <i>pH is one of the most important chemical properties measured in both science and industry, playing a vital role in health, environmental studies, and material reprocessing. With potential to impact an extensive range of sectors, accurate analysis and monitoring of pH is essential. Due to theoretical and practical constraints, the comparison of pH between different media hasn't been possible and over the last century this has led to the formation of several incompatible pH scales. In 2010 the concept of a unified acidity scale, pHabs, was devised to overcome this issue, but it has proved challenging to implement. This project will put pHabs into practice by establishing a reliable and universally applicable procedure for measuring the acidity of any substance. It will also develop a validated set of calibration standards for a wide variety of media. In striving towards a practical and accurate unified pH scale, this project will support and strengthen EU manufacturing and innovation in industries from pharmaceuticals to petrochemicals and semiconductors.</i> |
| Project (8) | IUPAC/CITAC Guide for evaluation of risks of conformity assessment of a multicomponent material or object due to measurement uncertainty (IUPAC 2018-004-1-500) |
| Beneficiaries | Independent Consultant on Metrology, Ilya Kuselman Istituto Nazionale di Ricerca Metrologica, Italy School of Chemistry, Australia Faculty of Sciences of the University of Lisbon |
| Financing | International Union of Pure and Applied Chemistry |
| Date | Started July 2018 |
| Description | <i>To develop a joint IUPAC/CITAC guide for classification and quantification of risks of false decisions on conformity of a multicomponent material or object to specification or regulation limits of its chemical composition, due to measurement uncertainty. The guide will be helpful for improvement of understanding of consequences of measurement uncertainty and correct choice of methods for testing chemical composition of multicomponent materials and objects. The opportunity to work with CITAC and prepare a joint guide (as an IUPAC TR), will give the widest possible exposure to our work and justifies, in our opinion, the requested extension.</i> |

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| Project (7) | AQUIMar – Caracterização geral das áreas aquícolas para estabelecimento de culturas marinhas |
| Beneficiaries | Instituto Hidrográfico Faculty of Sciences of the University of Lisbon Centro de Ciências do Mar e do Ambiente Instituto Politécnico de Leiria Centro de Química Estrutural – Faculdade de Ciências da Universidade de Lisboa |
| Financing | Mar2020 |
| Date | 2018 - 2021 |
| Description | <i>Assessment of the feasibility of establishing new aquaculture units in Portugal.</i> |
| Project (6) | Risks of conformity assessment of a multicomponent material or object in relation to measurement uncertainty of its test results (IUPAC 2016-007-1-500) |
| Beneficiaries | Independent Consultant on Metrology, Ilya Kuselman Istituto Nazionale di Ricerca Metrologica, Italy School of Chemistry, Australia Faculty of Sciences of the University of Lisbon |
| Financing | International Union of Pure and Applied Chemistry |
| Date | 2016 – 2017 |
| Description | <i>Development of an approach for evaluation of the probability of false decisions in conformity assessment of a multicomponent material or object in relation to measurement uncertainty of chemical analysis results of a sample of the material or object. This probability, combining probabilities of false decisions concerning different components of the material or object, will characterize the sample conformity as a whole. The solution to this problem is important for understanding conformity assessment risks in food control, environmental control, customs control, clinical analysis, medicines control and other fields. Risks were estimated for cases where the concentration of components in the analysed sample are independent or correlated. Calculations were performed in R-ambient and using a user-friendly MS-Excel spreadsheets to allow the easy application of the developed tools.</i> |
| Project (5) | Development of a computational tool for the identification of pesticides in foodstuffs by mass spectrometry (EXPL/QEQ-QAN/0458/2013) |
| Beneficiaries | Faculty of Sciences of the University of Lisbon Principal Investigator: Ricardo J. N. Bettencourt da Silva |
| Financing | Foundation for Science and Technology (FCT) |
| Date | 2014 – 2015. |
| Description | <i>Development of a computational tool to define statistically sound criteria for the identification/examination of trace levels of pesticide residues in foodstuffs by LC-MS and GC-MS based on Monte Carlo simulations of ratios of characteristic and correlated signals. This tool is also used to estimate the uncertainty of the performed identifications/examinations. The definition of statistically sound criteria for relative retention times, RRT, and ratios of the abundance of ions, RA, of the mass spectrum of the analyte must be able to assess the not-normal distribution of these ratios. A user-friendly MS-Excel spreadsheet, based on Monte Carlo simulations of ratios of highly correlated variables, was developed to define criteria for the variation of RRT and RA. The selected confidence level of the confidence intervals defines the true positive results rate, TP. Another MS-Excel file was developed to simulate the signal noise of the analytical instrument and quantify the probability of the noise producing false positive results, i.e. the false positive results rate, FP. The identification/examination uncertainty was estimated by the Likelihood ratio, LR ($LR=TP/FP$), of the Bayes Theorem that estimates how more likely a positive result is true than false. Models of the variation of the LR with the level of analyte were developed to estimate the Limit of Examination; the lowest analyte level that can be identified in a conclusive way - i.e. with a LR not smaller than 10^6. These tools were successfully applied to the identification of trace levels of pesticide residues in foodstuffs.</i> |

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| Project (4) Metrology for ocean salinity and acidity (ENV05 OCEAN) | |
| Beneficiaries | National Metrology Institute of Germany (PTB) National Institute for Metrological Research of Italy (INRiM) Portuguese Institute for Quality (IPQ) Institute for Reference Materials and Measurements of the European Commission (IRMM) French National Laboratory for Metrology and Testing (LNE) Finnish Environment Institute (SYKE) Hungarian Trade Licensing Office of Hungary (MKEH) National Physical Laboratory of the United Kingdom (NPL) Slovak Institute of Metrology (SMU) University of Tartu (UT) University of Plymouth (UP) Faculty of Sciences of the University of Lisbon |
| Financing Date | European Metrology Programme for Innovation and Research (EMPIR) 2011 – 2014. |
| Description | <i>The project aimed at developing the metrological traceability to the SI system of measurements of the key variables salinity, pH, composition, and dissolved oxygen content of seawater which is mandatory to enable a common international basis for comparisons of long-term and widespread data in ocean observation.</i> |
| Project (3) ArsonCPU – Development of computational tools for arson detection with quantified reliability (PTDC/QUI-QUI/103566/2008) | |
| Beneficiaries | Faculty of Sciences of the University of Lisbon Portuguese Criminal Police (PJ) Faculty of Sciences and Technology of the New University of Lisbon Institute for Biological Resources |
| Financing Date | Foundation for Science and Technology (FCT) 2009 – 2012 |
| Description | <i>Development of a computational tool for the reliable identification/examination of the use of accelerants in arson, including the estimation of identification/examination uncertainty.</i> |
| Project (2) METROPEST – Metrological Quality of the Analysis of Pesticide Residues in Foodstuffs of Vegetable origin (POTCI/ACR/47587/2002) | |
| Beneficiaries | General-Directorate for Crop Protection Faculty of Sciences of the University of Lisbon |
| Financing Date | Foundation for Science and Technology (FCT) 2003 - 2006 |
| Description | <i>Development of a strategy for the international comparability of measurements of pesticide residues in foodstuffs of vegetable origin.</i> <i>This project involved defining strategies for the selection of representative matrices and analytes to simplify the validation of analytical methods and the quality control of analysis performed using multi-matrix and multi-analyte methods of analysis. This selection was based on the equivalence of the multivariate pattern of nutritional parameters of foodstuffs or physicochemical properties of analytes.</i> <i>It was also developed tools to estimate and correct relevant analyte losses in the analytical method to allow the comparability of measurements produced from sample treatments with different efficiency; i.e. associated with different analyte recovery.</i> |
| Project (1) Development of a quality assurance program for chemical tests based on the measurement uncertainty | |
| Beneficiary | Controlab, Lda – Laboratory for Chemical, Physical and Biological Analysis |
| Financing | Agency for Innovation S.A. (Agência da Inovação) Programme “Doutorados e Mestres para as Empresas” |
| Date | 1999 |
| Description | <i>Development of a quality assurance program for chemical tests based on analytical methods validation and routine analysis quality control supported by detailed measurement uncertainty evaluations.</i> <i>This innovative project aimed at evaluating the uncertainty of routine analysis results obtained at Controlab, Lda, to report that information to clients and use it in tests quality control.</i> |

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5. Scholarships

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| Scholarship (6) | PostDoc scholarship (SFRH/BPD/110186/2015) |
| Financing | Foundation for Science and Technology (FCT) |
| Date | 1 January 2016 (Start) |
| Description | <i>Title of the working programme: 'Objectivity and comparability of environmental measurements'.</i> |
| Scholarship (5) | PhD scholarship (SFRH/BD/10903/2002) |
| Financing | Foundation for Science and Technology (FCT) |
| Date | Attributed in 2002 |
| Description | <i>The scholarship was not accepted by the candidate since he had previously signed a work contract with DGPC.</i> |
| Scholarship (4) | Master scholarship - PRAXIS XXI (BM 6508/95) |
| Financing | JNICT (National Body for the Promotion of Research and Technology) |
| Date | 1 February 1996 – 31 January 1998 |
| Description | <i>Scholarship for completing the MSc.</i> |
| Scholarship (3) | 9º Programa de Jovens Técnicos para a Indústria |
| Financing | National Institute for Engineering and Technology |
| Date | 20 July 1994 – 31 January 1996 |
| Description | <i>Analytical work in the National Institute for Engineering and Technology (INETI)</i> |
| Scholarship (2) | ACTIVE (Analytical Chemistry Turntable for Industry Visits and Education) |
| Financing | European Union and Portuguese Government |
| Date | 8 August 1993 – 31 January 1994 |
| Description | <i>Second part of the graduation thesis performed at Lauerlabs B.V., The Netherlands</i> |
| Scholarship (1) | PRODEP (Programme for the Educational Development of Portugal) |
| Financing | European Union and Portuguese Government |
| Date | September 1992 – August 1993 |
| Description | <i>First part of the graduation thesis performed at CECUL.</i> |

6. Technical Collaboration in Projects and Reports

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| (16) | <i>Pesticide residue monitoring in foodstuffs of vegetable origin – 2005 – Portugal, DGPC-DSPF, PPA(LRP) - 02/07, DGPC, Oeiras, 2007.</i> |
| (15) | <i>Pesticide residue monitoring in foodstuffs of vegetable origin – 2004 – Portugal, Ed. DGPC, DGPC, Oeiras, 2005.</i> |
| (14) | <i>Pesticide residue monitoring in foodstuffs of vegetable origin – 2003 – Portugal, DGPC-DSPF, PPA(LRP) - 02/04, DGPC, Oeiras, 2004.</i> |
| (13) | <i>Pesticide residue monitoring in foodstuffs of vegetable origin – 2002 – Portugal, DGPC-DSPF, PPA(LRP) - 01/03, DGPC, Oeiras, 2003.</i> |
| (12) | <i>Pesticide residue monitoring in foodstuffs of vegetable origin – 2001 – Portugal, DGPC-DSPF, PPA(LRP) - 01/02, DGPC, Oeiras, 2002.</i> |
| (11) | <i>Pesticide residue monitoring in foodstuffs of vegetable origin – 2000 – Portugal, DGPC-DSPF, PPA(FR) - 04R/01, DGPC, Oeiras, 2001.</i> |
| (10) | <i>Pesticide residue monitoring in foodstuffs of vegetable origin – 1999 – Portugal, DGPC-DSPF, PPA(FR) - 03R/00, DGPC, Oeiras, 2000.</i> |
| (9) | <i>European Commission, Intercomparison Study of Two Multi-Residue Methods for the Enforcement of EU MRLs for Pesticides in Fruit, Vegetables and Grain. Phase IV: Intercomparison Study of Test Materials Containing Incurred Residues, Report EUR 19443 EN, 2001.</i> |
| (8) | <i>European Commission, Intercomparison Study of Two Multi-Residue Methods for the Enforcement of EU MRLs for Pesticides in Fruit, Vegetables and Grain. Phase III: Intercomparison Study of Test Materials Containing Incurred Residues, Report EUR 19306 EN, 2000.</i> |
| (7) | <i>Pesticide Residue Monitoring in Fruit, Vegetables and Cereals in Portugal 1999, DSPF, PPA(FR) - 03R/00, DGPC, Oeiras, 2000.</i> |

Curriculum Vitae

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- (6) Euromet Project “Traceability of pH measurements”, Physikalisch Technische Bundesanstalt, 1996: one month of collaboration with CECUL research team.
- (5) *Caracterização de Solos, Resíduos e Águas Subterrâneas - Companhia Industrial de Resinas Sintéticas - Cires, S. A., ITA N° 19/96, 1996.*
- (4) *Terras Provenientes da Calcinação de Lamas Residuais do Tanque OP-T8 (Crude), Relatório/LAACQ 05/96, 1996.*
- (3) *Lamas de ETAR da Instalação de Anodização e Lacagem - Estabelecimentos Manuel Ferreira, Lda. - Alumínios, Relatório/LAACQ 04/96, 1996.*
- (2) *Lamas Provenientes da Refinação de Açúcar Alcântara - Refinarias de Açúcar, S.A., Relatório/LAACQ 03/96, 1996.*
- (1) *Lamas Desidratadas da Resiquímica, Relatório/LAACQ 02/96, 1996.*

7. Complementary Education

- (26) *Iniciação à plataforma Moodle, E-Learning Lab, University of Lisbon, Lisbon, 21 and 27 September 2010.*
- (25) *Sensibilização em Comunicação Comportamental em Auditorias, IPAC, Caparica, 20 October 2007.*
- (24) *3rd TrainMiC Training New Trainers Event, Maribor, Slovenia, 17 e 18 September 2007.*
- (23) *National Experts Training on Pesticide Residues, FVO - European Commission, Grange, Irlanda, 13 and 14 March 2007.*
- (22) *Metodologias de Auditoria de Acreditação de Laboratórios – ISO/IEC 17025, IPAC, Caparica, 9 January 2006.*
- (21) *Equipamentos de segurança e procedimentos de emergência, DGPC, Oeiras, 24 May 2005.*
- (20) *Redução do risco no uso de produtos fitofarmacêuticos, DGPC, Oeiras, 4 May 2005.*
- (19) *Laboratory Information Management System (LIMS), Nautilus 2002 R1 – Instrument Integration Training Course, ThermoLabsystems, Oeiras, 13-16 December 2004.*
- (18) *Liderança e Gestão de Equipas, DGPC, Oeiras, 17 November 2004.*
- (17) *Gestão de Fornecedores em Laboratório, DGPC, Oeiras, 17 November 2004.*
- (16) *Princípios de Boas Práticas de Laboratório da OCDE, Laboratório de Estudos Farmacêuticos, Algés, 24 November 2003.*
- (15) *Laboratory Information Management System (LIMS), Nautilus 2002 R1 and Infomaker 8.0, ThermoLabsystems, Oeiras, 23-27 September 2002.*
- (14) *Application of Ultrasonics in Food Analysis, Central Science Laboratory, York, United Kingdom, 6 June 2001.*
- (13) *Ação de Sensibilização em Auditorias a Laboratórios para Auditores Técnicos, RELACRE, Lisbon, 2 May 2001.*
- (12) *Enquadramento da Área da Protecção das Culturas no III Quadro Comunitário de Apoio, DGPC, Lisbon, 26 October 2000.*
- (11) *A Europa e a Segurança Alimentar, Presidência Portuguesa da União Europeia, Lisbon, 19 April 2000.*
- (10) *Metrologia Aplicada, IBET, Oeiras, 6 April 2000.*
- (9) *Cromatografia em Fase Gasosa, Controlab Lda., Póvoa de Santa Iria, 16-18 July 1997.*
- (8) *Microbiologia Alimentar, Prof. Dr. Edmund Zootola (Minnesota University), Faculty of Pharmacy of the University of Lisbon, Lisbon, 11-15 November de 1996.*
- (7) *Cromatografia Iónica, Centro de Formação de Dias de Sousa Lda., Póvoa de Santa Iria, 25 October 1996.*
- (6) *Regressão Linear e Incerteza de Curvas de Calibração, ITA - LAACQ, Lisbon, 13 November 1995.*
- (5) *Sistemas de Incentivos às Empresas, INETI, Lisbon, 7 July 1994.*
- (4) *Qualidade, Higiene e Segurança, INETI, Lisbon, 6 July 1994.*
- (3) *MS/DOS, Windows, Word para Windows e Excel para Windows (1 week), Associação Industrial Portuguesa (AIP-COPRAI), Lisbon, 1994.*
- (2) *Capillary Electrophoresis - Theory and Applications, Hospital S. João do Porto, Oporto, 12-14 April 1994.*
- (1) *Dia dos Glicídios, Faculty of Sciences of the University of Lisbon, Lisbon, 7 May 1993.*

8. Teaching Experience

8.1. Professional Schools

| School | Escola Profissional da Indústria Química |
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| Course (year) | (1) Métodos Instrumentais de Análise, 3 rd year (1994/95) (2) Química Analítica, 1 st year (1994/95) |
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Curriculum Vitae

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8.2. Universities

8.2.1. Courses and lectures

| Faculty (15) | Faculty of Sciences of the University of Lisbon |
|--------------------|---|
| Description | Various graduations and masters courses |
| Course (year/date) | Master in Chemistry and/or Technological Chemistry: <i>Academic year 2009/10 (1st Semester):</i> (1) <i>Metrologia Química (Lectures and exercises): 25 h;</i> (2) <i>Qualidade em Análise Química (Lectures and exercises): 17.5 h;</i> <i>Academic year 2010/11 (1st Semester):</i> (1) <i>Qualidade em Análise Química (Lectures and exercises): 17.5 h;</i> (2) <i>Redes Neurais e Quimiometria (Lectures and Computational exercises): 7.5 h;</i> (3) <i>Métodos Avançados de Análise (Lecture and laboratory practical: Espectroscopia Atômica): 3.5 h;</i> <i>Academic year 2011/12 (1st Semester):</i> (1) <i>Qualidade em Análise Química (Lectures and exercises): 31.5 h (Course responsible; Lectures both in English and in Portuguese);</i> <i>Academic year 2011/12 (2nd Semester):</i> (1) <i>Química do Meio Aquático (Lectures and laboratory practical): 5 h;</i> <i>Academic year 2012/13 (1st Semester):</i> (1) <i>Qualidade em Análise Química (Lectures and exercises): 31.5 h;</i> (2) <i>Redes Neurais e Quimiometria (Lectures and Computational exercises): 7.0 h;</i> <i>Academic year 2012/13 (2nd Semester):</i> (1) <i>Química do Meio Aquático (Lectures): 2 h;</i> <i>Academic year 2013/14 (1st Semester):</i> (1) <i>Qualidade em Análise Química (Lectures and exercises): 35 h (Lectures both in English and in Portuguese)</i> (2) <i>Redes Neurais e Quimiometria (Lectures and Computational exercises): 14 h;</i> <i>Academic year 2013/14 (2nd Semester):</i> (1) <i>Química do Meio Aquático (Lectures): 2 h;</i> <i>Academic year 2014/15 (1st Semester):</i> (1) <i>Qualidade em Análise Química (Lectures and exercises): 35 h;</i> (2) <i>Redes Neurais e Quimiometria (Lectures and Computational exercises): 14 h;</i> <i>Academic year 2014/15 (2nd Semester):</i> (1) <i>Química do Meio Aquático (Lectures): 2 h;</i> <i>Academic year 2015/16 (1st Semester):</i> (1) <i>Qualidade em Análise Química (Lectures and exercises): 30 h;</i> (2) <i>Métodos Avançados de Análise (Lecture and laboratory practical: Espectroscopia Atômica): 3.5 h;</i> <i>Academic year 2015/16 (2nd Semester):</i> (1) <i>Química do Meio Aquático (Lectures): 2 h;</i> <i>Academic year 2016/17 (1st Semester):</i> (1) <i>Métodos Avançados de Análise (Lecture and laboratory practical: Espectroscopia Atômica): 3.5 h;</i> <i>Academic year 2016/17 (2nd Semester):</i> (1) <i>Análise Química Forense (Lectures and Computational exercises): 7 h;</i> (2) <i>Química do Meio Aquático (Lectures): 3 h;</i> <i>Academic year 2017/18 (1st Semester):</i> (1) <i>Qualidade em Análise Química (Lectures and exercises): 30 h;</i> (2) <i>Métodos Avançados de Análise (Lecture and laboratory practical: Espectroscopia Atômica): 3.5 h;</i> <i>Academic year 2017/18 (2nd Semester):</i> (1) <i>Análise Química Forense (Lectures and Computational exercises): 10.5 h;</i> (2) <i>Metrologia e Examinologia em Química (Lectures, laboratory practicals and exercises): 40 h (Course responsible);</i> <i>Academic year 2018/19 (1st Semester):</i> (1) <i>Qualidade em Análise Química (Lectures and exercises): 30 h;</i> (2) <i>Métodos Avançados de Análise (Lecture and laboratory practical: Espectroscopia Atômica): 3.5 h;</i> |

Academic year 2018/19 (2nd Semester):

(1) *Análise Química Forense (Lectures and Computational exercises): 10.5 h;*

Academic year 2019/20 (1st Semester):

(1) *Qualidade em Análise Química (Lectures and exercises): Planned 30 h;*

(2) *Métodos Avançados de Análise (Lecture and laboratory practical: Espectroscopia Atômica): Planned: 3.5 h;*

(3) *Análise Química Ambiental: Planned: 10.5 h;*

Master in “Modelação Molecular; Mestrado em Química Inorgânica Biomédica - Aplicações em Diagnóstico e Terapia”:

Academic year 2009/10 (2nd Semester):

(1) *Avaliação da Incerteza da Medição (Lectures): 5 h;*

Graduation in Chemistry and/or Technological Chemistry:

Academic year 2009/10 (1st Semester):

(1) *Qualidade, Ambiente e Segurança (Lecture): 2 h;*

Academic year 2010/11 (2nd Semester):

(1) *Química Analítica I (Lectures and exercises): 51 h;*

Academic year 2012/13 (2nd Semester):

(1) *Perspectivas em Investigação e Desenvolvimento (Lecture): 1 h;*

Academic year 2013/14 (2nd Semester):

(1) *Perspectivas em Investigação e Desenvolvimento (Lecture): 1 h;*

(2) *Metrologia Química (Lectures and exercises): 42 h;*

Academic year 2014/15 (2nd Semester):

(1) *Perspectivas em Investigação e Desenvolvimento (Lecture): 1 h;*

(2) *Metrologia Química (Lectures and exercises): 42 h;*

Academic year 2015/16 (2nd Semester):

(1) *Perspectivas em Investigação e Desenvolvimento (Lecture): 1 h;*

(2) *Metrologia Química (Lectures and exercises): 25 h;*

Academic year 2016/17 (2nd Semester):

(1) *Perspectivas em Investigação e Desenvolvimento (Lecture): 1 h;*

(2) *Metrologia Química (Lectures and exercises): 25 h (Course responsible);*

Academic year 2017/18 (2nd Semester):

(1) *Perspectivas em Investigação e Desenvolvimento (Lecture): 1 h;*

Academic year 2018/19 (2nd Semester):

(1) *Perspectivas em Investigação e Desenvolvimento (Lecture): 1 h;*

(2) *Metrologia Química (Lectures and exercises): 25 h;*

Graduation in Energy and Environmental Engineering and Meteorology, Oceanography and Geophysics:

Academic year 2009/10 (1st Semester):

(1) *Química Geral (laboratory practicals): 48 h;*

Academic year 2010/11 (2nd Semester):

(2) *Introdução à análise química (laboratory practicals and exercises): 44 h;*

Academic year 2011/12 (2nd Semester):

(1) *Introdução à análise química (laboratory practicals and exercises): 44 h;*

Academic year 2012/13 (2nd Semester):

(1) *Introdução à análise química (laboratory practicals and exercises): 44 h;*

Academic year 2013/14 (2nd Semester):

(1) *Introdução à análise química (laboratory practicals and exercises): 44 h;*

Metrology in Chemistry

Academic year 2011/12 (2nd Semester):

(1) *Metrology in Chemistry: Erasmus students Paulina Bigus e Barbara Zaremba: 10 h (April).*

Master in Marine Sciences

Academic year 2011/12 (2nd Semester):

(1) *Química do Meio Aquático (Lectures and laboratory practical): 5 h.*

Academic year 2012/13 (2nd Semester):

(1) *Química do Meio Aquático (Lecture): 2 h;*

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Academic year 2013/14 (2nd Semester):

(1) Química do Meio Aquático (Lecture): 2 h;

Academic year 2014/15 (2nd Semester):

(1) Química do Meio Aquático (Lecture): 2 h;

Academic year 2015/16 (2nd Semester):

(1) Química do Meio Aquático (Lecture): 2 h;

Academic year 2016/17 (2nd Semester):

(1) Química do Meio Aquático (Lecture): 2 h.

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| Faculty (14) | Erasmus Mundus - Master Course in Chemical Innovation and Regulation (EMMC-ChIR) |
| Description | Consortium of 4 Universities of 4 European countries. |
| Course (year/date) | <i>Module: Estimation of Uncertainty in Chemical Analysis (10 h)</i> <i>(1) Faro (Portugal): 6-10 March 2017.</i> |
| Faculty (13) | State University of São Paulo (UNESP) Faculdade de Ciências Farmacêuticas de Araraquara |
| Description | Pós-Graduação em Alimentos e Nutrição |
| Course (year/date) | <i>(1) Incerteza da Medição em Química (17 October 2016, 4 h).</i> |
| Faculty (12) | State University of São Paulo (UNESP) Instituto de Química de Araraquara |
| Description | Pós-Graduação em Química |
| Course (year/date) | <i>(1) Incerteza da Medição em Química (13 October 2016, 4 h).</i> |
| Faculty (11) | State University of São Paulo (UNESP) Instituto de Biociências, Letras e Ciências Exatas de São José do Rio Preto |
| Description | Pós-Graduação em Química |
| Course (year/date) | <i>(1) Incerteza em Análises Químicas – Abordagens Alternativas da Incerteza de Medições em Química (12-15 October 2016, 16 h).</i> |
| Faculty (10) | State University of São Paulo (UNESP) Instituto de Biociências, Letras e Ciências Exatas de São José do Rio Preto |
| Description | Pós-Graduação em Química |
| Course (year/date) | <i>(1) Metrologia aplicada a Química Analítica (25-29 November 2013, 25 h).</i> |
| Faculty (9) | State University of São Paulo (UNESP) Instituto de Química de Araraquara |
| Description | Pós-Graduação em Química |
| Course (year/date) | <i>(1) A importância da Metrologia em Química no mercado e no meio acadêmico (21 November 2013, 3.5 h).</i> |
| Faculty (8) | State University of São Paulo (UNESP) Faculdade de Ciências Farmacêuticas de Araraquara |
| Description | Pós-Graduação em Alimentos e Nutrição |
| Course (year/date) | <i>(1) Aspectos importantes na validação de métodos analíticos e na transferência para a rotina (18 November 2013, 3.5 h).</i> |
| Faculty (7) | Faculty of Pharmacy of the University of Lisbon |
| Description | Mestrado de Controlo de Qualidade e Toxicologia de Alimentos |
| Course (year/date) | <i>(3) Controlo da Qualidade da Medição (17 May 2012, 4h);</i> <i>(2) Avaliação da incerteza da medição em Análises Químicas (19 May 2011, 3h);</i> <i>(1) Avaliação da incerteza da medição em Análises Químicas (14 May 2010, 4 h).</i> |
| Faculty (6) | Euromaster Measurement Science in Chemistry |
| Description | Consortium of 9 Universities of 7 European countries. Master accredited by ECTNA (“European Chemistry Thematic Network Association”). Participation in the examination. |
| Course (year/date) | Summer School on Measurement Science in Chemistry <i>Alternative Approaches for the Quantification of Measurement Uncertainty (7 h)</i> <i>(1) Celje (Slovenia): 9 August 2008;</i> <i>(2) Blagoevgrad (Bulgaria): 8 July 2009;</i> <i>(3) Lepanina (Estonia): 24 July 2010;</i> |

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(4) Poznań (Poland): 18 and 19 July 2011.
Principles of the evaluation of the measurement uncertainty (3.5 h)
 (1) Fátima (Portugal): 20 July 2012 (Member of the organisation committee);
 (2) Lyon (France): 13 July 2013;
 (3) Casablanca (Morocco): 1 August 2014.
Internal Quality Control, External Quality Control and Interlaboratory Comparisons
 (1) Casablanca (Morocco): 3 August 2014 (3.5 h);
 (2) Pulawy (Poland): 18 July 2015 (3.5 h).
 (3) Antwerp (Belgium): 16 July 2016 (3.5 h)
 (4) Druskininkai (Lithuania): 15 July 2017 (5 h)
 (5) Tallinn (Estonia): 13 July 2018 (5 h)
 (6) Lyon (France): 13 July 2019 (5h)
Compliance assessment
 (1) Antwerp (Belgium): 13 July 2016 (4 h)
 (2) Druskininkai (Lithuania): 13 July 2017 (3.5 h)
 (3) Tallinn (Estonia): 12 July 2018 (3.5 h)
 (4) Lyon (France): 13 July 2019 (3.5h)
Exercises on the evaluation of the measurement uncertainty
 (1) Druskininkai (Lithuania): 12 July 2017 (3.5 h)
 (2) Tallinn (Estonia): 11 July 2018 (2 h)
Principles and exercises on the evaluation of the measurement uncertainty
 (1) Lyon (France): 13 July 2019 (4.5h)

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| Faculty (5) | Erasmus Mundus - European Master in Quality in Analytical Laboratories (EMQAL) |
| Description | Consortium of 5 Universities of 4 European countries. |
| Course (year/date) | <i>Module: Introduction to Measurement Uncertainty</i> (10-12.5 h) <i>Module: Uncertainty Measurement in Chemical Tests</i> (10-12.5h) (1) Faro (Portugal): 20, 21, 27 and 28 March 2009; (2) Gdansk (Poland): 15-18 and 22-25 March 2010; (3) Barcelona (Spain): 21-24 February and 28 February-3 March 2011; (4) Faro (Portugal): 20-22 and 27-29 February 2012. (5) Cádiz (Spain): 6-8 and 11-13 March 2013. (6) Barcelona (Spain): 5-7 and 10-11 March 2014; (7) Bergen (Norway): 13-16 April 2015; <i>Module: Measurement Uncertainty Evaluation (merging of previous modules)</i> (10 h) (1) Gdansk (Poland): 29 February-3 March 2016; (2) Faro (Portugal): 6-10 March 2017; (3) Cádiz (Spain): 12-15 March 2018. |
| Faculty (4) | Université libre de Bruxelles |
| Description | Lecture for PhD students |
| Course (year/date) | How important can pragmatic measurement uncertainty evaluations be? (Brussels, 22 March 2011, 0.5 h) |
| Faculty (3) | University of Trás-os-Montes e Alto Douro |
| Course (year/date) | (1) Avaliação de laboratórios de ensaios químicos: Experiência no acompanhamento de processos de acreditação como auditor técnico do IPAC, Licenciatura em "Ciência Alimentar" (5 March 2009, 2 h). |
| Faculty (2) | Independent University |
| Description | Post-graduation "Organisation and Management of Laboratories and Quality Systems" |
| Course (year/date) | (1) Lecture "Gas-chromatography" [Academic year 2003-2004]; (2) Lecturer and responsible of the course "Statistical methods" [Academic year 2003-2004]. |
| Faculty (1) | Faculty of Science of the University of Lisbon (Invited Lectures) |
| Course (year/date) | (6) <i>Metrologia em Química, Mestrado em Química para o Ensino</i> (19 May 2003, 2 h); (5) <i>Estimativa da Incerteza Associada a Etapas Analíticas de Transferência de Massa, Mestrado em Química Analítica Aplicada</i> (27 November 2000, 2 h); (4) <i>Expressão de Resultados com Incerteza, Mestrado em Química Analítica Aplicada</i> (31 October 2000; 2h); (3) <i>Electroforese Capilar, Mestrado em Electroquímica Aplicada - Ramo de Ambiente</i> (17 November 1999, 2 h); (2) <i>Electroforese Capilar, Mestrado em Electroquímica Aplicada - Ramo de Electroanálise</i> (May 1999, 2 h); (1) <i>Expressão de Resultados com Incerteza, Mestrado em Electroquímica Aplicada</i> (16-17 Dec. 1998, 4 h). |

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8.2.2. Supervisions

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| Faculty(31) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | PhD in Chemistry |
| Student | Carlos Borges |
| Date | Started in September 2019 |
| Description | <i>Thesis: "Avaliação metrológica otimizada e geoquímica de tendências em sistemas estuarinos e oceânicos".</i> |
| Mark | On going at the Hydrographic Institute of the Portuguese Navy. |
| Faculty(30) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | PhD in Chemistry |
| Student | Vanessa Moreira Morgado |
| Date | Started in January 2019 |
| Description | <i>Thesis: "Avaliação de riscos, tendências e estratégias de mitigação da contaminação de microplásticos no meio marinho".</i> |
| Mark | On going at the Hydrographic Institute of the Portuguese Navy. |
| Faculty(29) | Faculty of Physical Education and Sport – Lusofona University (Co-supervisor) |
| Degree | PhD in Physical Education and Sports |
| Student | António Júlio Vitorino Nunes |
| Date | Started in 2016 |
| Description | <i>Thesis: "Detecção de doping no desporto através de alterações hematológicas multivariadas: Desafios Examinológicos e Jurídicos".</i> |
| Mark | On going at the Portuguese Anti-Doping Authority (Submitted for final assessment) |
| Faculty(28) | Instituto de Química – Universidade de São Paulo Faculdade de Ciências da Universidade de Lisboa Instituto Hidrográfico da Marinha Portuguesa |
| Degree | Post-doctoral in Chemistry |
| Student | Tony Dadamos |
| Date | Started in October 2018 |
| Description | Marine Protection - Bayesian assessments for the optimization of the sampling uncertainty in the monitoring of contaminants in the marine environment to anticipate relevant threats |
| Mark | On going. |
| Faculty(27) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | BSc in Chemistry |
| Student | Ariely Bastos Cardoso |
| Date | Started in January 2019 |
| Description | <i>Thesis: "Determinação do teor médio de fósforo total numa área alargada do rio Tejo - Desenvolvimento de procedimento baseado em cromatografia iónica e avaliação da incerteza</i> |
| Mark | On going (Submitted for final assessment) |
| Faculty(26) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Chemistry |
| Student | Tânia Filipa Rodrigues Cordeiro |
| Date | Started in September 2018 |
| Description | <i>Thesis: "Identificação de substâncias dopantes em fluidos biológicos de atletas por LC-MS: Definição de critérios de identificação e avaliação da incerteza do exame". Work conducted at the 'Laboratório de Análises de Dopagem' (Doping Analysis Laboratory).</i> |
| Mark | On going (Submitted for final assessment) |
| Faculty(25) | Faculty of Sciences of the University of Lisbon |
| Degree | Training on the evaluation of the measurement uncertainty for a PhD in Analytical Chemistry |
| Student | María del Rocío Mateos Medina (Universidad de Alcalá) |
| Date | September 2018 – December 2018 |
| Description | Training on the top-down and bottom-up evaluation of the measurement uncertainty |
| Mark | Successfully completed with publications. |

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| Faculty(24) | Faculty of Sciences of the University of Lisbon |
| Degree | Post-doctoral in Chemistry |
| Student | Prof. Felipe Rebello Lourenço (Universidade de São Paulo) |
| Date | December 2017 – July 2018 |
| Description | <i>Thesis: "Using measurement uncertainty in performance evaluation of analytical methods".</i> |
| Mark | Successfully completed with publications. |
| Faculty(23) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Chemistry |
| Student | Luís Gonçalo Brás Gomes |
| Date | 17 October 2018 |
| Description | <i>Thesis: "Determination of partition coefficients between passive samplers and the aquatic environment for trace levels of organic pollutants". Work conducted at the Research Centre for Toxic Compounds in the Environment of the Faculty of Science of Masaryk University.</i> |
| Mark | 19 points. |
| Faculty(22) | Universidade Estadual Paulista (Co-supervisor) |
| Degree | PhD in Chemistry |
| Student | Tony Rogério de Lima Dadamos (First PhD in the campus of São José do Rio Preto of UNESP) |
| Date | 24 January 2018 |
| Description | <i>Thesis: "Desenvolvimento, otimização, validação e comparação de diferentes abordagens para a avaliação da incerteza na determinação eletroquímica de ácido úrico em soro".</i> |
| Mark | Maximum Score (Ricardo Bettencourt da Silva was the President of the Jury) |
| Faculty(21) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Chemistry |
| Student | José Narciso |
| Date | 20 October 2017 |
| Description | <i>Thesis: "Estimativa e Otimização da Incerteza em Análises Qualitativas: Identificação de substâncias dopantes em matrizes biológicas". Work conducted at the 'Laboratório de Análises de Dopagem' (Doping Analysis Laboratory).</i> |
| Mark | 20 points (Maximum Score) |
| Faculty(20) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Chemistry |
| Student | Vanessa Moreira Morgado |
| Date | 31 July 2017 |
| Description | <i>Thesis: "Comparação de abordagens de avaliação da incerteza da medição de metais em sedimentos". Work conducted at the Instituto Hidrográfico (Hydrographic Institute).</i> |
| Mark | 20 points (Maximum Score) |
| Faculty(19) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | BSc in Chemistry |
| Student | Tânia Luísa Pereira Marques Simões |
| Date | 6 July 2017 |
| Description | <i>Thesis: "Desenvolvimenmt de uma metodologia de purificação para a determinação simultânea de PAH, PCB e pesticidas em sedimentos". Work conducted at the Instituto Hidrográfico (Hydrographic Institute).</i> |
| Mark | 19 points |
| Faculty(18) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | BSc in Chemistry |
| Student | Ana Rita Figueira |
| Date | 29 July 2016 |
| Description | <i>Thesis: "Validação da determinação de ião fosfatos em águas por cromatografia iónica".</i> |
| Mark | 17 points |

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Ricardo Bettencourt da Silva

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| Faculty(17) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | BSc in Chemistry |
| Student | Iryna Rehan |
| Date | 26 July 2016 |
| Description | <i>Thesis: "Avaliação da qualidade dos calibradores em quantificações instrumentais". Work conducted at the Instituto Hidrográfico (Hydrographic Institute).</i> |
| Mark | 19 points |
| Faculty(16) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | PhD in Chemistry |
| Student | Pedro Alexandre dos Santos Salgueiro |
| Date | 25 July 2016 |
| Description | <i>Thesis: "Desenvolvimento de modelos quimiométricos com fiabilidade examinológica conhecida para a previsão de acelerantes de combustão em amostras de resíduos de incêndios".</i> |
| Mark | Maximum score (Aprovado com Distinção e Louvor) |
| Faculty(15) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Chemistry |
| Student | Rui Cordeiro |
| Date | 16 October 2015 |
| Description | <i>Thesis: "Implementação, validação e controlo da qualidade da determinação de metais em águas naturais, de consumo humano e residuais por ICP-OES". Work conducted at the EDP-Electricidade de Portugal (company of the energy sector).</i> |
| Mark | 19 points (maximum of 20 points) |
| Faculty(14) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Chemistry |
| Student | Ana Cecília Rocha |
| Date | 15 September 2015 |
| Description | <i>Thesis: "Validação e controlo da qualidade da identificação e quantificação de corantes em alimentos por HPLC-UV/Vis". Work conducted at the ASAE (Economic and Food Safety Authority).</i> |
| Mark | 19 points (maximum of 20 points) |
| Faculty(13) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | BSc in Chemistry |
| Student | Luís Gonçalo Brás Gomes |
| Date | 23 July 2015 |
| Description | <i>Thesis: "Validação da determinação de metais em sedimentos por espectrometria de absorção atómica com chama". Work conducted at the Instituto Hidrográfico.</i> |
| Mark | 19 points (maximum of 20 points) |
| Faculty(12) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Chemistry |
| Student | Rudi Lopes |
| Date | 5 November 2014 |
| Description | <i>Thesis: "Validação da Quantificação de Catinonas por ^1H qNMR em drogas com efeitos psicoativos".</i> |
| Mark | 18 points (maximum of 20 points) |
| Faculty(11) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | BSc in Chemistry |
| Student | Joana Filipa da Silva Pereira |
| Date | 26 September 2014 |
| Description | <i>Thesis: "Validação da quantificação de alguns componentes iónicos da água do mar por cromatografia iónica com deteção UV-VIS".</i> |
| Mark | 16 points (maximum of 20 points) |

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| Faculty(10) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | BSc in Chemistry |
| Student | Nuno Figueiredo da Silva Rosa |
| Date | 12 September 2014 |
| Description | <i>Thesis: "Optimização da quantificação da eficiência da fotodegradação catalítica de uma solução de azul de metileno".</i> |
| Mark | 18 points (maximum of 20 points) |
| Faculty(9) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Chemistry |
| Student | Joana Filipa Palmeira Rodrigues |
| Date | 7 December 2012 |
| Description | <i>Thesis: "Optimização da incerteza da determinação, por cromatografia iónica, da composição maioritária e vestigial de soluções salinas".</i> |
| Mark | 19 points (maximum of 20 points) |
| Faculty(8) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Chemistry |
| Student | Beatriz Tavares da Silva Flores Brasil |
| Date | 5 December 2012 |
| Description | <i>Thesis: "Implementação e validação de uma metodologia para a detecção e quantificação de substâncias explosivas inorgânicas". Work conducted at the Portuguese Criminal Police (PJ).</i> |
| Mark | 19 points (maximum of 20 points) |
| Faculty(7) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Chemistry |
| Student | Ana de Pina Garcia Correia |
| Date | 4 December 2012 |
| Description | <i>Thesis: "Desenvolvimento de modelos metroológicos detalhados da determinação de metais pesados em correctivos orgânicos". Work conducted at the Portuguese Ministry of Agriculture and Sea (MAM-INIAV).</i> |
| Mark | 19 points (maximum of 20 points) |
| Faculty(6) | Faculty of Sciences of the University of Lisbon (Supervisor) |
| Degree | Erasmus Project (Master graduation) |
| Student | Iuliia Demchuk |
| Date | January 2012 |
| Description | <i>Project: "Assessment of the metrological performance of the identification and quantification of food dyes in aqueous solutions".</i> |
| Mark | 18 points (maximum of 20 points) |
| Faculty (5) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Technological Chemistry |
| Student | Daniel Mendes Silveira |
| Date | 23 September 2011 |
| Description | <i>Thesis: "Implementação e validação de identificação e quantificação de agentes lacrimogéneos em armas de defesa pessoal". Work conducted at the Portuguese Criminal Police (PJ).</i> |
| Mark | 19 points (maximum of 20 points) |
| Faculty (4) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | BSc in Chemistry |
| Student | Alejandro Arias Fachado |
| Date | 27 July 2011 |
| Description | <i>Thesis: "Desenvolvimento de um modelo de medição detalhado para a determinação da composição iónica da fracção de aerossóis atmosféricos solúvel em água, por cromatografia iónica" (Erasmus programme).</i> |
| Mark | 19 points (maximum of 20 points) |

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| Faculty (3) | Faculty of Sciences of the University of Lisbon (Co-supervisor) |
| Degree | MSc in Chemistry |
| Student | Alexandra Maria Emídio Viana da Silva |
| Date | 4 May 2010 |
| Description | <i>Thesis: "Avaliação e optimização da incerteza associada ao cálculo da eficiência de remoção da carência química de oxigénio numa estação de tratamento de águas residuais".</i> |
| Mark | 18 points (maximum of 20 points) |
| Faculty (2) | University of Trás-os-Montes e Alto Douro (Co-supervisor) |
| Degree | MSc in Environmental Technologies |
| Student | Sara Inês Paredes Prada |
| Date | 22 January 2010 |
| Description | <i>Thesis: "Determinação do Rendimento Quântico da Fotodegradação do Butilparabeno com Radiação UV".</i> |
| Mark | 17 points (maximum of 20 points) |
| Faculty (1) | Technical University of Lisbon |
| Degree | MSc in Food Sciences and Engineering |
| Student | Fernanda Vilarinho |
| Date | 28 September 2007 |
| Description | <i>Thesis "Validação da Determinação de Resíduos de Pesticidas em Produtos Transformados de Origem Vegetal para Alimentação Infantil"</i> |
| Mark | Maximum score |
| 8.2.3. Academic juries | |
| Faculty (14) | Universidade de Aveiro |
| Degree | MSc in Chemistry |
| Student | Cristina Dara Velho Rodrigues |
| Date | 25 July 2019 |
| Description | <i>Thesis: "Medicamentos genéricos contêm mais impurezas" (Arguente Principal).</i> |
| Faculty (13) | Universidade de Lisboa |
| Degree | MSc in Chemistry |
| Student | Mónica Sofia Soares Antunes |
| Date | 20 November 2018 |
| Description | <i>Thesis: "Desenvolvimento de Novas Metodologias Analíticas para a Identificação de Novas Substâncias Psicoativas em Matrizes Biológicas" (Arguente Principal).</i> |
| Faculty (12) | University of Aveiro |
| Degree | MSc in Chemistry |
| Student | Nathalie Gaspar Ferreira |
| Date | 26 July 2016 |
| Description | <i>Thesis: "Validation of a method for metal analysis in fish by inductively coupled plasma techniques" (Arguente Principal).</i> |
| Faculty (11) | New University of Lisbon |
| Degree | PhD Thesis Plan Proposal |
| Student | Ana Rita Lourinho Ferreira |
| Date | 26 July 2016 |
| Description | <i>Thesis: "Electrokinetic removal of emerging contaminants from effluent and soil for agricultural use"</i> |
| Faculty (10) | University of Aveiro |
| Degree | MSc in Chemistry |
| Student | César Rafael Marques Tavares |
| Date | 22 December 2015 |
| Description | <i>Thesis: "Desenvolvimento e validação de um método analítico para quantificação multielementar em cabelo humano por ICP no LCA" (Arguente Principal).</i> |

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|--------------------|---|
| Faculty (9) | University of Aveiro |
| Degree | MSc in Chemistry |
| Student | Ana Teresa Marques de Matos |
| Date | 22 December 2015 |
| Description | <i>Thesis: "Implementação de melhorias na quantificação de metais em água de empresa A. Logos" (Arguente Principal).</i> |
| Faculty (8) | University of Aveiro |
| Degree | MSc in Chemistry |
| Student | Pedro Tiago Silva Pinto |
| Date | 24 July 2015 |
| Description | <i>Thesis: "Implementação de melhorias nos requisitos de gestão e técnicos do LCA" (Arguente Principal).</i> |
| Faculty (7) | University of Aveiro |
| Degree | MSc in Chemistry |
| Student | Ana Filipa Costa |
| Date | 24 July 2014 |
| Description | <i>Thesis: "Quantificação de mercúrio em água de consumo: validação do método na Luságua" (Arguente Principal).</i> |
| Faculty (6) | University of Aveiro |
| Degree | MSc in Chemistry |
| Student | Tatiana Pereira Valente |
| Date | 24 July 2014 |
| Description | <i>Thesis: "Implementação da acreditação flexível global no LCA" (Arguente Principal).</i> |
| Faculty (5) | University of Aveiro |
| Degree | MSc in Environmental Engineering |
| Student | Ricardo Pinto |
| Date | 21 December 2010 |
| Description | <i>Thesis: "Aplicação de sensores em processos de medida de misturas gasosas" (Departamento de Ambiente e Ordenamento) (Arguente Principal).</i> |
| Faculty (4) | High Institute of Engineering of Lisbon (ISEL) |
| Degree | MSc in Chemical Engineering |
| Student | Hugo Carapinha |
| Date | 17 December 2010 |
| Description | <i>Thesis: "Implementação e validação de uma metodologia analítica forense para a detecção/identificação de explosivos orgânicos" (Arguente Principal).</i> |
| Faculty (3) | Faculty of Science of the University of Lisbon |
| Degree | PhD in Chemistry |
| Student | Maria Graça Leitão Dias |
| Date | 26 January 2010 |
| Description | <i>Thesis: "Contributo para a caracterização fitoquímica de frutos e produtos hortícolas portugueses" (Arguente).</i> |
| Faculty (2) | Faculty of Sciences of the University of Lisbon |
| Degree | MSc in Technological Chemistry |
| Student | Daniel Mendes Silveira |
| Date | June 2009 |
| Description | <i>Thesis: "Acidez atmosférica" (Arguente Principal).</i> |
| Faculty (1) | Faculty of Sciences of the University of Lisbon |
| Degree | MSc in Chemistry |
| Student | Maria Clara Figueira de Oliveira Candeias |
| Date | 17 December 2008 |
| Description | <i>Thesis: "Qualidade Analítica na Indústria da Pasta e Papel" (Arguente Principal).</i> |

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8.3. Training and Training Courses

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- (62) *The evaluation of the measurement uncertainty in the PT schemes from the point of view of suppliers and participants*, PTConf 2018 – International Proficiency Testing Conference, Oradea (Romania), 10-13 September 2019.
-
- (61) *Utilização da incerteza da medição em avaliações de conformidade*, 3º Congresso Brasileiro de Qualidade em Laboratórios (Congresso on-line), 25-29 Março 2019.
-
- (60) *A Two-Day Training Course – Critical Issue of the accreditation standards – ISO/IEC 17025:2017 and ISO 15189:2012 (Eurachem)*(Presented topics: (1) Uncertainty from sampling; (2) The use of a decision rule; (3) Target uncertainty), Nicosia (Cyprus), 21-22 February 2019 (4h).
-
- (59) *Gestão de risco em avaliações de conformidade: Utilização da incerteza da medição em avaliações de conformidade*, ULS – Guarda, 8 November 2018 (3h)
-
- (58) *Estatística Aplicada e Laboratórios de Ensaio*, General Electric, Setúbal, 6 Junho 2018 (7h)
-
- (57) *Utilização da incerteza da medição em avaliações de conformidade*, 2º Congresso Brasileiro de Qualidade em Laboratórios (Congresso on-line), 20 Abril 2018.
-
- (56) *Estimativa da incerteza em métodos quantitativos e qualitativos – Treinamento Internacional: Validação de Métodos (ISO/IEC 17025)*, Instituto Biológico, São Paulo (Brazil) (5h30), 22 January 2018.
-
- (55) *Incerteza de Medição: Princípios (TrainMiC course – Introdução à Metrologia Química)*, FCUL - Lisbon (3 h), 11 December 2017.
-
- (54) *Implementação, Validação e Controlo da Qualidade da Identificação de Compostos por GC-MS e LC-MS*, RELACRE – Lisbon (14 h), 13-14 November 2017.
-
- (53) *Avaliação da Incerteza de Medições em Química*, Centro Tecnológico do Calçado de Portugal (14 h), 26 e 27 October 2017.
-
- (52) *TrainMiC Course, Measurement uncertainty: Principles and approaches to the evaluation of the measurement uncertainty - TrainMiC® - The evaluation of the measurement uncertainty with focus on the instrumental methods of analysis as well as with focus on the PT results*, PTConf 2018 – International Proficiency Testing Conference, Cluj Napoca (Romania), 6 October 2017 (5 h).
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- (51) *Abordagem “top-down” intralaboratorial de avaliação da incerteza da medição*, Bureau Veritas, Lisbon, 17 February 2017 (8h)
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- (50) *Implementação, Validação e Controlo da Qualidade da Identificação de Compostos por GC-MS e LC-MS*, RELACRE – Lisbon (14 h), 7-8 November 2016.
-
- (49) *Incerteza de Medição: Abordagens para Avaliação (TrainMiC course – Introdução à Metrologia Química)*, IPMA - Algés (1.5 h), 25 October 2016.
-
- (48) *Validação, Controlo da Qualidade e Avaliação da Incerteza de Medições em Química*, Instituto Hidrográfico – Lisbon (77 h), 13 and 27 April, 25 May, 7 July, 1 September, 20 September and 2 November 2016, and 12 and 16 January, 19 April and 31 October 2017.
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- (47) *Abordagens Alternativas de Avaliação da Incerteza de Medições em Química*, AIM - Iberol, Alhandra (14 h), 28 e 29 September 2016.
-
- (46) *Validação, Controlo da Qualidade e Avaliação da Incerteza de Medições em Química*, (Trainee: Yelda Gultekin) – Lisbon (14 h), 11 and 18 March 2016.
-
- (45) *Abordagens Alternativas de Avaliação da Incerteza de Medições em Química*, AIM – Lisbon (14 h), 14-15 January 2016.
-
- (44) *Validação, Incerteza e Controlo da Qualidade de Resultados (Pós-graduação em Gestão de Laboratórios)*, ISQ – Oeiras (28 h), 9, 16 and 23 January 2016.
-
- (43) (i) *Incerteza de Medição: Princípios* and (ii) *Exemplo de aplicação: Determinação, por espectrofotometria, de fósforo reactivo em águas naturais (SMEWW 4500-P D) (TrainMiC course – Introdução à Metrologia Química)*, FCUL - Lisbon (5.5 h), 23-24 November 2015.
-
- (42) *Incerteza de Medição: Princípios (TrainMiC course – Introdução à Metrologia Química)*, FCUL - Lisbon (3 h), 24-25 November 2014.
-
- (41) (i) *Incerteza de Medição: Princípios*, (ii) *Incerteza de Medição: Abordagens para Avaliação* and (iii) *Exemplo de aplicação: Determinação, por espectrofotometria, de fósforo reactivo em águas naturais (SMEWW 4500-P D) (TrainMiC course – Introdução à Metrologia Química)*, FCUL - Lisbon (6.5 h), 24-25 October 2013.
-
- (40) (i) *Incerteza de Medição: Princípios*, (ii) *Incerteza de Medição: Abordagens para Avaliação* and (iii) *Exemplo de aplicação: Determinação, por espectrofotometria, de fósforo reactivo em águas naturais (SMEWW 4500-P D) (TrainMiC course – Introdução à Metrologia Química)*, ASAE - Lisbon (6.5 h), 22-24 November 2012.
-
- (39) (i) *Incerteza de Medição: Abordagens para Avaliação* and (ii) *Exemplo de aplicação: Determinação, por espectrofotometria, de fósforo reactivo em águas naturais (SMEWW 4500-P D) (TrainMiC course – Introdução à Metrologia Química)*, LNEG - Lisbon (4 h), 28 July 2011.
-
- (38) (i) *Incerteza de Medição: Princípios*, (ii) *Incerteza de Medição: Abordagens para Avaliação* and (iii) *Exemplo de aplicação: Determinação, por espectrofotometria, de fósforo reactivo em águas naturais (SMEWW 4500-P D) (TrainMiC course – Introdução à Metrologia Química)*, Portucel - Setúbal (6 h), 30 June and 1 July 2011.
-
- (37) *Ferramentas de controlo da qualidade analítica*, Infarmed - Lisbon (7 h), 25 January 2011.
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- (36) *Ferramentas de controlo da qualidade analítica*, IBET - Oeiras (14 h), 28 June and 5 July 2010.
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- (35) (i) *Incerteza de Medição: Princípios*, (ii) *Incerteza de Medição: Abordagens para Avaliação* and (iii) *Exemplo de aplicação: Determinação, por espectrofotometria, de fósforo reactivo em águas naturais (SMEWW 4500-P D) (TrainMiC course – Introdução à Metrologia Química)*, FCUL - Lisbon (6 h), 28 May 2010.
- (34) *Uncertainty of measurement: Principles – Training material presentation*, Workshop Training New Trainers, TnT (TrainMiC), Geel, Belgium (0.5 h) 27 March 2010.
- (33) *Requisitos Técnicos da Norma ISO/IEC 17025:2005*, Direcção Regional de Agricultura e Desenvolvimento Rural da Região Autónoma da Madeira - Funchal (3.5 h), 5 November 2009.
- (32) *Incerteza de Resultados de Medições (TrainMiC course – Introdução à Metrologia Química)*, Empresa Pública de Águas Livres (EPAL) - Vale da Pedra (1.5 h), 12 and 13 February 2009.
- (31) *Incerteza de Resultados de Medições (TrainMiC course – Introdução à Metrologia Química)*, FCUL - Lisbon (1.5 h), 13 and 14 November 2008.
- (30) *Curso de Espectrometria de Emissão Atómica com Plasma (ICP) – Da teoria à prática*, Specanalítica Lda. - Carcavelos (21 h), 10-12 November 2008.
- (29) *Incerteza de Resultados de Medições (TrainMiC course – Introdução à Metrologia Química)*, Instituto Politécnico de Tomar (1.5 h), 8 and 9 May 2008.
- (28) *Cromatografia de Fase Gasosa – Princípios Básicos*, Universidade de Trás-os-Montes e Alto Douro (4 h), 17 March 2008.
- (27) *Ferramentas de Controlo da Qualidade para Ensaios Físico-Químicos*, Direcção Regional de Agricultura e Desenvolvimento Rural da Região Autónoma da Madeira – Camacha (14 h), 12 and 13 February 2008.
- (26) *Quantificação da Incerteza em Ensaios Físico-Químicos*, IBET - Oeiras (24 h), 9-11 January and 8 February 2008.
- (25) *Cromatografia de Fase Gasosa – Princípios e Aplicações*, Air Liquide - Agueda (21 h), 18-20 December 2007.
- (24) *Quantificação da Incerteza em Análise Químicas – Princípios e Exemplos* and *Ferramentas de Controlo da Qualidade*, Aqualab – Laboratório Clínico e de Saúde Pública Lda. - Albufeira (14 h), 23-24 November 2007.
- (23) *Ferramentas de Controlo da Qualidade para Ensaios Físico-Químicos*, Specanalítica Lda. – Carcavelos (14 h), 21-22 November 2007.
- (22) *Incerteza de Resultados de Medições (TrainMiC course – Introdução à Metrologia Química)*, IPQ - Caparica (1.5 h), 15 and 16 November 2007.
- (21) *Incertezas nas Análises Químicas – Abordagens Alternativas*, Direcção Regional de Agricultura e Desenvolvimento Rural da Região Autónoma da Madeira – Camacha (28 h) 9, 10, 12 and 13 July 2007.
- (20) *Análise de Resíduos de Pesticidas em Alimentos de Origem Vegetal por GC-TOF/MS – Validação de métodos e controlo da qualidade dos ensaios*, DGPC (5 h), 27 July 2007 [Financed by a protocol between “Ministério da Agricultura, Pecuária e Abastecimento da República Federativa do Brasil” and “Ministério da Agricultura, Desenvolvimento Rural e das Pescas de Portugal”; Trainees: 9 analysts of Brazilian laboratories].
- (19) *Incertezas nas Análises Químicas – Abordagens Alternativas*, DGPC (19 h), 19, 20 and 27 July 2007 [Financed by a protocol between “Ministério da Agricultura, Pecuária e Abastecimento da República Federativa do Brasil” and “Ministério da Agricultura, Desenvolvimento Rural e das Pescas de Portugal”; Trainees: 9 analysts of Brazilian laboratories].
- (18) *Seleção e Interpretação de Resultados de Ensaios Interlaboratoriais*, Specanalítica Lda. - Carcavelos (7 h), 2 July 2007.
- (17) *Quantificação da Incerteza em Laboratórios Acreditados: Ensaios Físico-Químicos*, Specanalítica Lda. - Carcavelos (21 h), 26-28 March 2007.
- (16) *Estatística Aplicada a Laboratórios de Ensaio*, INETI – Lisbon (35 h), 9, 10, 13, 20 and 21 November 2006.
- (15) *Introdução ao conceito de Incerteza da Medição*, Infarmed - Lisbon (4 h), 24 October 2006.
- (14|2) *Estatística Aplicada a Laboratórios de Ensaio*, RELACRE - Lisbon (Two courses of 35 h):
- 16-20 October 2006;
- 8 a 12 de Outubro de 2007.
- (13) *Validação de Métodos e Quantificação da Incerteza em Ensaios Químicos*, CIRES - Estarreja (14 h), 5-6 September 2006.
- (12) *Validação de Métodos Analíticos com vista à Acreditação de acordo com a Norma ISO/IEC 17025*, Medinfar - Amadora (7 h) 25 November 2005.
- (11) *Incertezas nas Análises Químicas – Princípios e Abordagens Alternativas*, DGPC - Oeiras (14 h), 18-19 July 2005.
- (10) *Requisitos Técnicos da Norma ISO/IEC 17025:2005*, Medinfar - Amadora (7 h), 14-15 July 2005.
- (9|2) *Análise de Resíduos de Pesticidas em Alimentos de Origem Vegetal*, DGPC - Oeiras (Two courses of 16 h) [Two trainees]:
- Tiago S. Branco, 2004.
- Célia Bento, 2004.
- (8) *Incertezas nas Análises Químicas – Princípios e Abordagens Alternativas*, Casa de Saúde de S. Mateus - Viseu (7 h), 26 and 27 November 2004.
- (7|5) *Incertezas nas Análises Químicas – Abordagens Alternativas*, RELACRE - Lisbon (Five training courses of 21 h):
- 27-28 September and 2 November 2004.
- 21-22 de Março and 20 May 2005.
- 27-29 March 2006.
- 29-31 May 2007.
- 14-16 de Abril de 2010

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(6) *Estatística Aplicada a Laboratórios de Análise*, Direcção-Regional de Agricultura do Algarve - Faro (14 h), 20 and 21 November 2003.

(5) *Análise de Resíduos de Pesticidas em Alimentos de Origem Vegetal*, DGPC - Oeiras (40 h) [Trainee: Mr. Alberto Andrade, Heinz-Portugal], 2002.

(4) *Aplicação de Estatística à Química Analítica*, DGPC - Oeiras (8 h), 5 and 21 April 2000.

(3) *Expressão de Resultados com Incerteza*, Controlab Lda. – Póvoa de Santa Iria (21 h), 18-20 March 1998.

(2|5) *Espectrometria de Absorção Atómica*, Controlab Lda. – Povoia de Santa Iria (Five training courses of 21 h):

- 16-18 April 1997;
- 22-24 April 1998;
- 22-23 June 1998;
- 25-26 June 1998;
- 2-4 December 1998.

(1|2) *Instrumentação de Espectrometria de Absorção Atómica com Chama*, INETI - Lisbon (Two training courses of 7h):

- Trainee: Eng.º Luís Sousa, Instituto dos Materiais de Produção (IMP-INETI), 1994;
- Trainee: Eng.º Nuno Silva, Centro Tecnológico das Indústrias do Couro, 1995

9. Workshops and Scientific Meetings

(104) *PT Conf 2019 – International Proficiency Testing Conference*, Oradea (Romania) 10-13 September 2019.

(103) *4th Meeting of the CQUL – Chemistry: Sharing the future*, Lisbon (Portugal) 16-19 July 2019.

(102) *CQE Days – 2019 Spring Meeting*, Lisbon (Portugal), 30-31 May 2019.

(101) Eurachem Workshop “Validation of targeted and non-targeted methods of analysis”, Tartu (Estonia) 20-21 May 2019.

(100) *34th CITAC Members' Meeting and Workshop*, Paris (France) 13 April 2019.

(99) *Isranalytica 2019*, Tel Aviv (Israel) 22-23 January 2019.

(98) *Pre Conference Satellite Event – Isranalytica 2019, Quality of Test Results for Conformity Assessment of a Chemical Composition: What is Good and What is Bad?*, Ramat Gan (Israel), 21 January 2019.

(97) *CONFMET 2018 – Conferência Nacional da SPMET – Em constante evolução o Sistema Internacional de Unidades*, Caparica (Portugal), 28-29 November 2018.

(96) *Seminário: A Importância da Qualidade nas Instituições*, Aveiro (Portugal), 19 September 2018.

(95) *V Iberoamerican Congress of Laboratories - Conformity Assessment*, Lisboa (Portugal) 17-19 October 2018.

(94) *Eurachem Scientific Workshop – Data – Quality, Analysis and Integrity*, Dublin (Ireland) 14-15 May 2018.

(93) *33th CITAC Members' Meeting and Workshop*, Paris (France) 21 April 2018

(92) *Analítica 2018*, Oporto (Portugal) 26-27 March 2018.

(91) *Eurachem Working Groups “Measurement Uncertainty & Traceability” and “Qualitative Analysis and Testing” Meetings*, London (England), 22-23 November 2017

(90) *7.º Encontro Nacional da SPMet – As medições para os transportes*, Lisbon (Portugal) 17 November 2017.

(89) *A Master Class for those train staff from accredited laboratories*, Caparica (Portugal), 24-26 September 2017 (Organisation Committee Member)

(88) *6th International Proficiency Testing Conference*, Cluj Napoca (Romania), 4-6 October 2017.

(87) *Eurachem General Assembly 2017*, Nicosia (Cyprus), 1-2 June 2017: Participation as national delegate.

(86) *Eurachem Executive Committee Meeting*, Nicosia (Cyprus), 1 and 2 June 2017.

(85) *Eurachem Working Groups “Measurement Uncertainty & Traceability” and “Qualitative Analysis and Testing” Meetings*, Nicosia (Cyprus), 31 May 2017.

(84) *Eurachem Workshop: Uncertainty in Qualitative and Quantitative Analysis*, Nicosia (Cyprus), 29-30 May 2017 (Scientific Committee Member).

(83) *Isranalytica 2017*, Tel Aviv (Israel), 24-25 January 2017.

(82) *Pre-conference International Workshop – Validation of test methods, Human Errors and Measurement Uncertainty of Results*, Tel Aviv (Israel), 23 January 2017.

(81) *CONFMET 2016 - Conferência Nacional da SPMet - As Medições Num Mundo Dinâmico*, Évora (Portugal), 17-18 November 2016.

(80) *Workshop Qualidade dos Resultados de Medição*, Caparica (Portugal), 27 October 2016.

(79) *Eurachem Executive Committee Meeting*, Prague (Czech Republic), 6-7 October 2016.

(78) *Master Class Quality Assurance in Analytical Measurements*, Zagreb (Croatia), 9-11 June 2016.

(77) *Analítica 2016 - 8th Meeting of the Analytical Chemistry Division*, Lisbon (Portugal), 6-7 June 2016.
(Member of the Organisation Committee)

(76) *Dia aberto IPQ - Dia Mundial da Metrologia*, Caparica (Portugal), 20 May 2016.

(75) *Eurachem General Assembly 2016*, Gent (Belgium), 12-13 May 2016: Participation as national delegate.

(74) *Eurachem Executive Committee Meeting*, Gent (Belgium), 12 and 13 May 2016.

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- (73) *Eurachem Working Groups “Measurement Uncertainty & Traceability” and “Qualitative Analysis and Testing” Meetings*, Gent (Belgium), 11 May 2016.
- (72) *Eurachem workshop - Method Validation in Analytical Science: Current Practices and Future Challenges*, Gent (Belgium), 9-10 May 2016.
- (71) *XVI Congresso Latino - Americano de Cromatografia*, Lisbon (Portugal), 5-9 de January 2016.
- (70) *Workshop “Incertezas em Ensaios Físico-Químicos”: Determinação, Validação e Uso da Incerteza*, RELACRE – Lisbon (Portugal), 25 November 2015.
- (69) *Eurachem Executive Committee Meeting 2015*, Graz (Austria), 25 September 2015.
- (68) *Eurachem General Assembly 2015*, Warsaw (Poland), 28 May 2015: Participation as national delegate.
- (67) *Eurachem Working Groups “Measurement Uncertainty & Traceability” and “Qualitative Analysis and Testing” Meetings 2015*, Warsaw (Poland), 27 May 2015.
- (66) *Eurachem Executive Committee Meeting 2015*, Warsaw (Poland), 26 and 28 May 2015.
- (65) *Pittcon 2015*, New Orleans (USA), 8-12 March 2015.
- (64) *Marine Chemistry Working Group Meeting - International Council for the Exploration of the Sea (ICES)*, Lisbon (Portugal) - Instituto Hidrográfico, 3 March 2015.
- (63) *CQE Young Researchers Day*, IST – Lisbon (Portugal), 1 December 2014.
- (62) *Workshop “Avaliação da Incerteza em Ensaios Químicos – Simplificar adequando ao uso”*, ISQ – Oeiras (Portugal), 27 November 2014.
- (61) *ChemForum*, IST – Lisbon (Portugal), 12 November 2014.
- (60) *Workshop “Metrology for ocean salinity and acidity”*, PTB – Berlin (Germany), 16-17 June 2014.
- (59) *Eurachem General Assembly 2014*, Lisbon (Portugal), 22-23 May 2013: Participation as national delegate.
- (58) *Eurachem Working Group “Measurement Uncertainty & Traceability” Meeting 2014*, Lisbon (Portugal), 21-22 May 2014.
- (57) *Eurachem Workshop on Quality in Analytical Measurements*, Lisbon (Portugal), 19-21 May 2014.
(Organisation of the event - member of the Scientific and Organisation Committees)
- (56) *Eurachem Executive Committee 2014*, Lisbon (Portugal), 18 and 23 May 2013.
- (55) *Workshop “SPQ – Analítica 2014”*, Coimbra (Portugal), 14-15 April 2014.
- (54) *Workshop “Metrologia em Química e Qualidade – Impactos da Metrologia em Química na Academia e no Mercado”*, Workshop of the Association of Former UNESP Students, Instituto de Biociências, Letras e Ciências Exatas de São José do Rio Preto - São José do Rio Preto (Brazil), 22 November 2013.
- (53) *Joint IMEKO TC8, TC23 and TC24 Symposium on Traceability in Chemical, Food and Nutrition Measurements*, INSA – Lisbon (Portugal), 22-25 September 2013.
- (52) *2nd Middle Eastern and Mediterranean Sea Region Countries Mass Spectrometry Workshop – MASSA 2013*, Siena (Italy), 30 June – 4 July 2013.
- (51) *EMRP Workshop “Call for proposals for Joint Research Projects and associated Researcher Excellence Grants”*, PTB – Berlin (Germany), 24-25 June 2013.
- (50) *Eurachem General Assembly 2013*, Espoo (Finland), 23-24 May 2013: Participation as national delegate.
- (49) *Eurachem Working Group “Measurement Uncertainty & Traceability” Meeting 2013*, Espoo (Finland), 22 May 2013.
- (48) *Eurachem Workshop “Quality Assurance of Measurements from Field to Laboratory”*, Espoo (Finland), 20-21 May 2013.
- (47) *Eurachem Executive Committee 2013*, Espoo (Finland), 19 and 24 May 2013.
- (46) *5º Encontro Nacional SPMET – Medir com Segurança*, Coimbra (Portugal), 8 Novembro 2012.
- (45) *Key Challenges in Internal Quality Control*, Berlin (Germany), 10-11 October 2012.
(Member of the Scientific Committee)
- (44) *Eurachem General Assembly 2012*, Berlin (Germany), 24-25 May 2012: Participation as national delegate.
(Nominated member of the Executive Committee)
- (43) *Eurachem Working Group “Measurement Uncertainty & Traceability” Meeting 2012*, Berlin (Germany), 23 May 2012.
- (42) *Eurachem/CITAC workshop “Validation, Traceability and Measurement Uncertainty - Challenges for the 21st Century’s analysts”*, Berlin (Germany), 21-22 May 2012.
(Member of the Scientific Committee)
- (41) *4º Encontro Nacional da SPMet, Metrologia – Suporte da Competitividade na Indústria*, ISQ – Oeiras (Portugal), 11 November 2011.
- (40) *Eurachem Working Group “Measurement Uncertainty & Traceability” Meeting 2011*, Lisbon (Portugal), 8 June 2013.
- (39) *Eurachem/CITAC workshop “Recent developments in measurement uncertainty”*, Lisbon (Portugal), 6-7 June 2011.
(Organisation of the event - member of the Scientific and Organisation Committees)
- (38) *Eurachem General Assembly 2011*, Moscow (Russia), 26-27 May 2011: Participation as national delegate.
- (37) *Eurachem Working Group “Measurement Uncertainty & Traceability” Meeting 2011*, Moscow (Russia), 25 May 2011.
- (36) *Key quality assurance challenges for analytical measurements*, Moscow (Russia), 23-24 May 2011.
- (35) *CONFMET2010 - Medições na Ciência e na Tecnologia*, Lisbon (Portugal), 4-5 November 2010.
(Chair of sessions “Medições na Ciência e na Tecnologia” and “Comparabilidade das Medições em Química”)
(Member of the Scientific Committee)

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- (34) *Eurachem Working Group “Measurement Uncertainty & Traceability” Meeting 2010*, Copenhagen (Denmark), 27 May 2010.
- (33) *Analytical results for decisions!*, Copenhagen (Denmark), 25-26 May 2010.
- (32) *TrainMiC Editorial Board Meeting*, IRMM, Geel (Belgium), 27 March 2010.
- (31) *TrainMiC Training of New Trainers*, IRMM, Geel (Belgium), 25-26 March 2010.
- (30) *TrainMiC Convention*, Celje (Slovenia), 11-14 January 2009.
(Awarded training content produced by the Portuguese TrainMiC team)
- (29) *2nd AcadeMiC Summer School on Education in Metrology in Chemistry*, Promoted by the “European Commission Joint Research Centre”, Krakow (Poland), 23-26 June 2007.
- (28) *METCHEM Meeting 2007 – Technical Committee Plenary Meeting*, IPQ – Caparica (Portugal), 8-9 February 2007.
- (27) *Debate: Incertezas em Análise Química*, RELACRE – Lisbon (Portugal), 7 November 2006.
- (26) *6th European Pesticide Residues Workshop*, Corfu (Greece), 21-25 May 2006.
- (25) *AcadeMiC - Summer School on Education in Metrology in Chemistry*, Promoted by the “European Commission Joint Research Centre”; Rogaska Slatina (Slovenia), 6-9 de July de 2005.
(Signatory of the “Rogaška declaration” related to teaching Metrology in Chemistry at Universities)
- (24) *1º Conferência Nacional da Sociedade Portuguesa de Metrologia – “Medir Mais e Melhor”*, Lisbon (Portugal), 28-29 November 2005.
- (23) *Análítica 2005*, Coimbra (Portugal), 27 e 28 October 2005.
- (22) *Debate: Incertezas em Análise Química*, RELACRE – Lisbon (Portugal), 18 October 2005.
- (21) *1º Encontro Nacional da Sociedade Portuguesa de Metrologia*, Caparica (Portugal), 30 November 2004.
- (20) *Euroanalysis XIII*, Salamanca (Spain), 5-10 September 2004.
- (19) *5th European Pesticide Residues Workshop*, Stockholm (Sweden), 13-16 June 2004.
- (18) *Análítica 2003 – 3º Encontro de Química Analítica*, Oporto (Portugal), 18-19 November 2003.
- (17) *Economics Issues of Mediterranean Laboratories*, Lisbon (Portugal), 12 November 2002.
- (16) *6º Seminário Relacre – Factores de Competitividade dos Laboratórios*, Lisbon (Portugal), 11-12 November 2002.
- (15) *4th European Pesticide Residues Workshop*, Rome (Italy), 28-31 May 2002.
- (14) *Análítica 2001 - 3º Encontro Nacional de Química Analítica*, ISEL (Lisbon), 8-9 November 2001.
- (13) *Eurolab/ Eurachem Workshop on Sampling*, Lisbon (Portugal) 5-6 November 2001.
(Chair of “Statistical Tools for all Sampling Purposes” session)
- (12) *1º Congresso Ibero-Americano de Laboratórios*, Lisbon (Portugal), 11-12 October 2001.
- (11) *First Joint Meeting of the Analytical Division of American Chemical Society and Federation of European Chemical Societies on Education in Analytical Chemistry*, Cordoba (Spain), 14-15 September 2001.
- (10) *5º Encontro de Química dos Alimentos da Sociedade Portuguesa de Química*, Oporto (Portugal), 8-11 May 2001.
- (9) *Euroanalysis XI*, Lisbon (Portugal), 3-9 September 2000.
(Participation financed by Elsevier Science B.V.)
- (8) *3rd European Pesticide Residues Workshop*, York (England), 3-5 July 2000.
(Participation financed by FCT (Fundo de Apoio à Comunidade Científica))
- (7) *Identificação de Acções que Melhorem a Infra-estrutura Metrológica em Química em Espanha, Itália, Irlanda e Portugal*, Sesimbra (Portugal), 15-16 June 1998.
- (6) *XI Encontro Galego Português de Química*, Ferrol (Spain), 26-28 November 1997.
- (5) *1st Euroconference on Environmental Analytical Chemistry*, Neusiedl am See (Austria), 11-17 October 1997.
(Participation financed by the programme “Training and Mobility of Researchers”)
- (4) *Choix de Solvants pour l’Extraction, la Purification et l’Analyse de Résidus de Pesticides*, Angers (France), 6-9 October 1997.
- (3) *Measurement Uncertainty in Chemical Analysis - Current Practice and Future Directions*, Berlin (Germany), 29-30 September 1997.
- (2) *EUCO-CC2 Second European Conference on Computational Chemistry*, UL – Lisbon (Portugal), 2-6 September 1997.
(Participation financed by the European Union)
- (1) *XV Encontro Nacional da Sociedade Portuguesa de Química*, UA – Aveiro (Portugal), 1996.

10. Communications

10.1. Poster Communications (P99 to P1)

P99 – G. B. Gomes, V. Morgado, R. J. N. Bettencourt da Silva, C. Palma, Preliminary data on the polymer type identification from estuarine environmental samples, *µMED – International Conference on Microplastic Pollution in the Mediterranean Sea*, Capri (Italy), 15-18 September 2019.

P98 – A. Cardoso, C. Oliveira, R. J. N. Bettencourt da Silva, Validation and uncertainty evaluation of total phosphorus variation in a large Tagus river area, *XXVI Encontro Nacional da SPQ*, Oporto (Portugal), 24-16 July 2019.

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P97 – V. Morgado, C. Palma, R. J. N. Bettencourt da Silva, Microplastics in the marine environment: Raise awareness and challenges, CQE Days – 2019 Spring Meeting, Lisbon (Portugal), 30-31 May 2019.

P96 – R. J. N. Bettencourt da Silva, Extracting more information from research in chemistry: The multidisciplinary evaluation of data uncertainty, CQE Days – 2019 Spring Meeting, Lisbon (Portugal), 30-31 May 2019.

P95 – C. Borges, C. Palma, R. J. N. Bettencourt da Silva, Otimização da incerteza de amostragem – Aplicação ao sistema estuarino do rio Tejo, CONFMET 2018 – Conferência Nacional da SPMET – Em constante evolução o Sistema Internacional de Unidades, Caparica (Portugal), 28-29 November 2018.

P94 – F. Lourenço, R. J. N. Bettencourt da Silva, Risk of false conformity decisions when measurement results are metrologically correlated – A case study from pharmaceutical industry, V Iberoamerican Congress of Laboratories – Conformity Assessment, Lisboa (Portugal), 17-19 October 2018.

P93 – Eurachem Executive Committee: V. Barwick, R. J. N. Bettencourt da Silva, B. Brookman, E. Bulska, S. L. Ellison, B. Magnusson, D. Milde, M. Patriarca, M. H. Ramsey, L. Sibbesen, E. Totu, K. Tsimillis, I. Vercruysse, W. Wegscheider, Eurachem: a focus for analytical chemistry in Europe, Eurachem Scientific Workshop – Data – Quality, Analysis and Integrity, Dublin (Ireland), 14-15 May 2018.

P92 – F. Lourenço, R. J. N. Bettencourt da Silva, Using measurement uncertainty to assess the fitness for purpose of analytical procedures used in pharmaceutical industries, Eurachem Scientific Workshop – Data – Quality, Analysis and Integrity, Dublin (Ireland), 14-15 May 2018.

P91 – C. Palma, V. Morgado, R. J. N. Bettencourt da Silva, Evaluation of matrix effects, Eurachem Scientific Workshop – Data – Quality, Analysis and Integrity, Dublin (Ireland), 14-15 May 2018.

P90 – T. Dadamos, A. Damaceno, F. Fertonani, R. J. N. Bettencourt da Silva, A new metrological treatment of the calibration data of the cumulative standard addition method, Eurachem Scientific Workshop – Data – Quality, Analysis and Integrity, Dublin (Ireland), 14-15 May 2018.

P89 – V. Morgado, C. Palma, R. J. N. Bettencourt da Silva, Quantification of the uncertainty of partition coefficients between passive samplers and water, 10th International Passive Sampling Workshop (IPSW), Dublin (Ireland), 9-11 May 2018.

P88 – J. Narciso, S. Luz, R. J. N. Bettencourt da Silva, Uncertainty of examination/ qualitative analysis results: Identification of doping agents in urine by GC-MS/MS, 36th Manfred Donike Workshop – International Workshop for Doping Analytics, Cologne (Germany), 22-24 April 2018.

P87 – B. Anes, C. Oliveira, R. J. N. Bettencourt da Silva, M. F. Camões, Total hardness in seawater samples of the Portuguese coast, Analítica 2018, Oporto (Portugal), 26-27 March 2018.

P86 – T. R. L. Dadamos, A. J. Damaceno, F. L. Fertonani, R. J. N. Bettencourt da Silva, Cumulative Standard Addition Method for Electrochemical Measurements of Biological Fluids, Analítica 2018, Oporto (Portugal), 26-27 March 2018.

P85 – B. Anes, C. M. Oliveira, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Uncertainty of Alkalinity measurement values, METROSEA – Metrology for the sea, Naples (Italy), 11-13 October 2017. (Prize: The best poster)

P84 – V. Morgado, C. Palma, R. J. N. Bettencourt da Silva, Validation of heavy metals determination in marine sediments: A comparison of uncertainty evaluation approaches, XXV Encontro Nacional da Sociedade Portuguesa de Química, Lisbon (Portugal), 16-19 July 2017.

P83 – V. Morgado, C. Palma, R. J. N. Bettencourt da Silva, Validation of heavy metals determination in marine sediments: A comparison of uncertainty evaluation approaches, Eurachem Workshop: Uncertainty in Qualitative and Quantitative Analysis, Nicosia (Cyprus), 29-30 May 2017. (Prize: The best poster)

P82 – I. Rehan, C. Palma, R. J. N. Bettencourt da Silva, Assessment of calibrators quality: Determination of chromium in marine sediments by atomic spectroscopy, Eurachem Workshop: Uncertainty in Qualitative and Quantitative Analysis, Nicosia (Cyprus), 29-30 May 2017.

P81 – T. R. L. Dadamos, A. J. Damasceno, R. J. N. Bettencourt da Silva, F. L. Fertonani, Utilização de Simulações de Monte Carlo para o cálculo da incerteza da medição eletroquímica de ácido úrico em amostras de plasma, XXI Simpósio Brasileiro de Eletroquímica e Eletroanalítica, Natal (Brazil), 17-21 April 2017.

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P80 – R. J. N. Bettencourt da Silva, Setting identification criteria of trace levels of compounds in complex matrices by GC-MS with 96 % true-positive and 0.00001 % false-positive results rates, Isranalytica 2017, Tel Aviv (Israel), 24-25 January 2017.

P79 – R. M. S. Cordeiro, C. M. G. Rosa, R. J. N. Bettencourt da Silva, Measurements recovery evaluation from the analysis of independent reference materials: Analysis of different samples with native quantity spiked at different levels, Isranalytica 2017, Tel Aviv (Israel), 24-25 January 2017.

P78 – M. F. G. F. C. Camões, B. Anes, C. Oliveira, R. J. N. Bettencourt da Silva, Traceability of the pH of seawater – Steps Forward, Analítica 2016 – 8th Meeting of the Analytical Chemistry Division, Lisbon (Portugal), 6-7 June 2016.

P77 – L. G. Gomes, C. Palma, A. Gama, M. Valença, R. J. N. Bettencourt da Silva, Validation of Chromium Determination in Marine Sediments: Comparison of Top-Down Uncertainty Evaluations, Analítica 2016 – 8th Meeting of the Analytical Chemistry Division, Lisbon (Portugal), 6-7 June 2016.

P76 – C. Oliveira, R. Wójcicka, M. F. G. F. C. Camões, R. J. N. Bettencourt da Silva, Tutorial and Spreadsheet for the Evaluation of Least-Squares Calibrations, Analítica 2016 – 8th Meeting of the Analytical Chemistry Division, Lisbon (Portugal), 6-7 June 2016.

P75 – N. F. Rosa, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, O. Monteiro, Optimisation of Methylene Blue Depletion Quantification in Photodegradation Studies, Analítica 2016 – 8th Meeting of the Analytical Chemistry Division, Lisbon (Portugal), 6-7 June 2016.

P74 – P. Fernandes, N. Barros, M. F. G. F. C. Camões, R. J. N. Bettencourt da Silva, Setting statistically sound criteria for mass spectrum ions abundance ratio using a user-friendly Excel file, EPRW2016 – 11th European Pesticide Residue Workshop, Limassol (Cyprus), 24 May – 27 May 2016.

P73 – W. Wegscheider, V. Barwick, R. J. N. Bettencourt da Silva, B. Brookman, E. Bulska, S. L. Ellison, B. Magnusson, D. Milde, M. Patriarca, A. Rachetti, M. H. Ramsey, L. Sibbesen, E. E. Totu, K. Tsimillis, I. Vercruysse, A. Williams, Eurachem: A Focus for Analytical Chemistry in Europe, Eurachem workshop – Method Validation in Analytical Science: Current Practices and Future Challenges, Gent (Belgium), 9-10 May 2016.

P72 – R. J. N. Bettencourt da Silva, User-Friendly Tutorial and Spreadsheet for the Bottom-up Evaluation of Least-Squares Calibrations, Eurachem workshop – Method Validation in Analytical Science: Current Practices and Future Challenges, Gent (Belgium), 9-10 May 2016.

P71 – R. J. N. Bettencourt da Silva, Examination Criteria and Uncertainty of Trace Levels of Organic Compounds in Complex Matrices by GC-MS, Eurachem workshop – Method Validation in Analytical Science: Current Practices and Future Challenges, Gent (Belgium), 9-10 May 2016.

P70 – R. J. N. Bettencourt da Silva, Tutorial and Spreadsheets for Designing Valid Least-Squares Calibrations, 9º Encontro Nacional de Cromatografia/ XVI Congresso Latino-Americano de Cromatografia, Lisboa (Portugal), 5-9 de January 2016.

P69 – J. Rodrigues, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, C. M. Oliveira, Designing valid and optimised standard addition calibrations: Application to the determination of anions in seawater, XXIV Encontro Nacional da Sociedade Portuguesa de Química, Coimbra (Portugal), 1-3 July 2015.

P68 – P. A. S. Salgueiro, C. M. F. S. Borges, J. Aires-de-Sousa, D. A. R. S. Latino, R. P. Fartaria, R. J. N. Bettencourt da Silva, Chemometric arson detection with quantified uncertainty, Pittcon 2015, New Orleans (USA), 8-12 March 2015.

P67 – R. J. N. Bettencourt da Silva, Tutorials and spreadsheets for designing valid least squares calibrations, Pittcon 2015, New Orleans (USA), 8-12 March 2015.

P66 – R. J. N. Bettencourt da Silva, A. Williams, Setting the target (Maximum admissible) measurement uncertainty for different analytical goals, Pittcon 2015, New Orleans (USA), 8-12 March 2015.

P65 – N. Rosa, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, O. C. Monteiro, Optimisation of the uncertainty of the quantification of the photodegradation of methylene blue, Pittcon 2015, New Orleans (USA), 8-12 March 2015.

P64 – R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Uncertainty of the identification of trace levels of pesticides in foodstuffs, Pittcon 2015, New Orleans (USA), 8-12 March 2015.

Curriculum Vitae

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P63 – B. Anes, R. J. N. Bettencourt da Silva, H. F. P. Martins, M. F. Camões, Assessment of the compatibility of mean activity coefficients estimated experimentally and by Pitzer equations, Eurachem Workshop on Quality in Analytical Measurements, Lisbon (Portugal), 19-21 May 2014.

P62 – N. Rosa, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, O. C. Monteiro, Optimisation of the efficiency gain quantification of the catalytic photodegradation of methylene blue, Eurachem Workshop on Quality in Analytical Measurements, Lisbon (Portugal), 19-21 May 2014.

P61 – R. Lopes, M. J. Villa Brito, H. Gaspar, R. J. N. Bettencourt da Silva, Validation of the quantification of Cathinones in “plant feeders” by ¹H qNMR, Eurachem Workshop on Quality in Analytical Measurements, Lisbon (Portugal), 19-21 May 2014.

P60 – A. S. Lopes, M. Gómez, R. J. N. Bettencourt da Silva, H. Gaspar, Validation of the quantification of Mitragynine in Kratom by HPLC-DAD, Eurachem Workshop on Quality in Analytical Measurements, Lisbon (Portugal), 19-21 May 2014.

P59 – S. Luz, T. Santos, R. J. N. Bettencourt da Silva, Performance of the method EN 12396-1 with the introduction of minor modifications – versus the criteria of SANCO 12571/2013 for quantitative determinations, Eurachem Workshop on Quality in Analytical Measurements, Lisbon (Portugal), 19-21 May 2014.

P58 – A. G. Correia, R. J. N. Bettencourt da Silva, F. Pedra, M. J. Nunes, Assessment of the determination of heavy metals in organic soil improvers by ICP-OES, Workshop “SPQ – Analítica 2014”, Coimbra (Portugal), 14-15 April 2014.

P57 – R. J. N. Bettencourt da Silva, D. M. Silveira, M. F. G. F. C. Camões, C. M. F. Borges, P. A. S. Salgueiro, Validation and evaluation of the uncertainty of examinations/identifications performed by GC-MS, Workshop “SPQ – Analítica 2014”, Coimbra (Portugal), 14-15 April 2014.

P56 – R. J. N. Bettencourt da Silva, Setting target measurement uncertainty in foodstuff analysis, Joint IMEKO TC8, TC23 and TC24 Symposium on Traceability in Chemical, Food and Nutrition Measurements, Lisbon (Portugal), 22-25 September 2013.

P55 – C. M. Oliveira, M. F. G. F. C. Camões, P. Bigus, A. A. Fachado, R. J. N. Bettencourt da Silva, Validation of atmospheric aerosols sampling in equivalent fractions, 1st Iberian Meeting on Aerosol Science and Technology, Évora (Portugal), 1-3 July 2013

P54 – J. Aires-de-Sousa, P. A. S. Salgueiro, D. A. R. S. Latino, R. P. Fartaria, R. J. N. Bettencourt da Silva, C. M. F. S. Borges, Machine Learning Classification of Neat and Burnt Ignitable Liquids for Arson Detection, 8th Colloquium Chemiometricum Mediterraneum (CCM VIII 2013), Bevagna (Italy), 30 June-4 July 2013.

P53 – P. A. S. Salgueiro, C. M. F. S. Borges, J. Aires-de-Sousa, D. A. R. S. Latino, R. P. Fartaria, R. J. N. Bettencourt da Silva, Evaluation of the uncertainty of arson detection by mass spectrometry assisted with machine learning tools, 2nd Middle Eastern and Mediterranean Sea Region Countries Mass Spectrometry Workshop – MASSA 2013, Siena (Italy), 30 June-4 July 2013.

P52 – C. M. Oliveira, C. Oliveira, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Comparison of two atmospheric aerosol samplers, 14th EuCheMS International Conference on Chemistry and the Environment (ICCE 2013), Barcelona (Spain), 25-28 June 2013.

P51 – J. Rodrigues, C. Oliveira, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Otimização da incerteza da medição da composição iónica de água do mar, Simpósio de Ciências Marinhas 2013, Lisbon (Portugal), 17-18 June 2013.

P50 – A. Arias, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, C. Oliveira, Sampling uncertainty in the determination of the ionic composition of the water-soluble fraction of atmospheric aerosols, Eurachem Workshop: Quality Assurance of Measurements from Field to Laboratory, Espoo (Finland), 20-21 May 2013.

P49 – P. A. S. Salgueiro, C. M. F. S. Borges, J. Aires-de-Sousa, D. A. R. S. Latino, R. P. Fartaria, Ricardo J. N. Bettencourt da Silva, Validation of the conservation of fire debris samples for the identification of ignitable liquid residues, Eurachem Workshop: Quality Assurance of Measurements from Field to Laboratory, Espoo (Finland), 20-21 May 2013.

P48 – A. G. Correia, R. J. N. Bettencourt da Silva, F. Pedra, M. J. Nunes, Avaliação do desempenho do procedimento de medição de metais pesados em corretivos orgânicos e lamas de depuração, 5º Encontro Nacional SPMET – Medir com Segurança, Coimbra (Portugal), 8 November 2012.

P47 – J. Rodrigues, C. Oliveira, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Ionic Composition of Seawater – Internal Quality Control of Standard Addition Method Calibrations, Key Challenges in Internal Quality Control, Berlin (Germany), 10-11 October 2012.

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P46 – B. Brasil, R. J. N. Bettencourt Silva, M. F. G. F. C. Camões, P. A. S. Salgueiro, Internal Quality Control of Explosive Substances Identification by Ion Chromatography, Key Challenges in Internal Quality Control, Berlin (Germany), 10-11 October 2012.

P45 – A. G. Correia, R. J. N. Bettencourt da Silva, F. Pedra, M. J. Nunes, Internal quality control of the measurement of heavy metals in organic soil improvers and urban sewage sludges, Key Challenges in Internal Quality Control, Berlin (Germany), 10-11 October 2012.

P44 – P. A. S. Salgueiro, J. Aires-de-Sousa, A. M. D. Carvalho, C. M. F. S. Borges, R. J. N. Bettencourt da Silva, Quality control procedure for fire debris analysis, Key Challenges in Internal Quality Control, Berlin (Germany), 10-11 October 2012.

P43 – R. J. N. Bettencourt da Silva, C. Oliveira, M. F. G. F. C. Camões, Selecção de matrizes representativas para simplificação da validação da análise de resíduos de pesticidas em vegetais, 11º Encontro de Química dos Alimentos, Bragança (Portugal), 16-19 September 2012.

P42 – M. F. G. F. C. Camões, A. Arias, R. J. N. Bettencourt da Silva, C. Oliveira, Desenvolvimento de um modelo de medição detalhada para a avaliação, por Cromatografia Iónica, da fracção solúvel em água de aerossóis atmosféricos, 1st International Congress on Metrology – METROCOL I, Bogotá (Colombia), 13-15 August 2012.

P41 – A. G. Correia, R. J. N. Bettencourt da Silva, F. Pedra, M. J. Nunes, Avaliação do desempenho da determinação de metais pesados em corretivos orgânicos e lamas, II Encontro em Técnicas de Caracterização e Análise Química, Braga (Portugal), 8 June 2012.

P40 – R. J. N. Bettencourt da Silva, A. Arias Fachado, M. F. G. F. C. Camões, Comparison of the output of various methods and software for the combination of uncertainty components – Determination of the Chemical Oxygen Demand in wastewaters, Eurachem/CITAC workshop “Validation, Traceability and Measurement Uncertainty – Challenges for the 21st Century’s analysts”, Berlin (Germany), May 2012.

P39 – J. Rodrigues, C. Oliveira, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Optimização da incerteza da determinação, por cromatografia iónica, da composição maioritária e vestigial de soluções salinas, 7º Encontro Nacional de Cromatografia, Oporto (Portugal), 9-11 January 2012.

P38 – B. Brasil, M. F. G. F. C. Camões, R. J. N. Bettencourt Silva, P. A. S. Salgueiro, Validação da identificação e detecção de substâncias explosivas inorgânicas por cromatografia iónica, 7º Encontro Nacional de Cromatografia, Oporto (Portugal), 9-11 January 2012.

P37 – A. Arias, R. J. N. Bettencourt da Silva, C. Oliveira, M. F. G. F. C. Camões, Avaliação da incerteza da amostragem e das etapas analíticas da determinação da composição iónica da fracção solúvel em água de aerossóis atmosféricos por cromatografia iónica, 7º Encontro Nacional de Cromatografia, Oporto (Portugal), 9-11 January 2012.

P36 – P. A. S. Salgueiro, R. J. N. Bettencourt da Silva, J. M. Aires de Sousa, A. M. F. M. B. R. Monteiro, A. M. D. Carvalho, C. M. F. S. Borges, Validação metrológica de técnica de padrão interno desenvolvida para a detecção de acelerantes de combustão em resíduos de incêndios por GC-MS, 4º Encontro Nacional da SPMet, “Metrologia – Suporte da Competitividade na Indústria”, Oeiras (Portugal), 11 November 2011.

P35 – H. A. Q. Carapinha, P. A. S. Salgueiro, R. J. N. Bettencourt da Silva, M. J. de Matos, Development of a statistically sound strategy for the identification of explosive residues by HPLC, 19th IAFS (International Association of Forensic Sciences) World Meeting, Funchal (Portugal), 14-17 September 2011.

P34 – D. M. Silveira, P. A. S. Salgueiro, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Development of an analytical method and metrological model for the qualitative and quantitative analysis of tear-gas weapons, 19th IAFS (International Association of Forensic Sciences) World Meeting, Funchal (Portugal), 14-17 September 2011.

P33 – P. A. S. Salgueiro, R. J. N. Bettencourt da Silva, J. Aires-de-Sousa, A. M. F. M. B. R. Monteiro, A. M. D. Carvalho, C. M. F. S. Borges, New approach for arson detection with a metrological evaluation, 19th IAFS (International Association of Forensic Sciences) World Meeting, Funchal (Portugal), 14-17 September 2011.

P32 – R. J. N. Bettencourt da Silva, P. M. V. B. F. Dias, M. F. G. F. C. Camões, Multivariate Analysis of Pesticide Residues in Foodstuffs of Plant Origin – Selection of Representative Analytes, EUROanalysis16 “Challenges in Modern Analytical Chemistry”, Belgrade (Serbia), 11-15 September 2011.

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P31 – B. Anes, M. F. G. F. C. Camões, R. J. N. Bettencourt da Silva, Chemical Oxygen Demand – evaluation of interferences and measurement uncertainty, Eurachem/CITAC workshop “Recent developments in measurement uncertainty”, Lisbon (Portugal), 6-7 June 2011.

P30 – A. Silva, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Detailed Evaluation of the Uncertainty for the Determination of Chemical Oxygen Demand in wastewater, Eurachem/CITAC workshop “Recent developments in measurement uncertainty”, Lisbon (Portugal), 6-7 June 2011.

P29 – A. Arias, C. Oliveira, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Development of a detailed measurement model for the assessment of atmospheric aerosols water soluble fraction by Ion Chromatography, Eurachem/CITAC workshop “Recent developments in measurement uncertainty”, Lisbon (Portugal), 6-7 June 2011.

P28 – D. M. Silveira, P. A. S. Salgueiro, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Development of metrological models for the quantitative or semi-quantitative GC-MS assessment of the compliance of tear gas weapons with legislation, Eurachem/CITAC workshop “Recent developments in measurement uncertainty”, Lisbon (Portugal), 6-7 June 2011.

P27 – P. A. S. Salgueiro, A. M. F. M. B. R. Monteiro, R. J. N. Bettencourt da Silva, J. M. Aires Sousa, A. M. D. Carvalho, C. M. F. S. Borges, Quality control of the detection and characterization of ignitable liquid residues by GC-MS, 4th Portuguese Mass Spectrometry Meeting (MS2010), Lisbon (Portugal), 13-15 December 2010.

P26 – M. F. G. F. C. Camões, R. J. N. Bettencourt da Silva, Introducing Chemical Metrology – Quality of Analytical Results, International Conference on Chemical Education (ICCE), Taipei (China), 8-13 August 2010.

P25 – R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Comparability of Results of Measurements of Pesticide Residues in Foodstuffs, 15º Encontro Nacional de Química Analítica e 3º Congresso Iberoamericano de Química Analítica, Salvador (Brazil), 18-21 October 2009.

P24 – M. F. G. F. C. Camões, M. J. G. Lito, R. J. N. Bettencourt da Silva, C. Oliveira, N. Gros, Controlo da qualidade de soluções de citrato de sódio para fins analíticos – abordagem experimental e metrológica, 15º Encontro Nacional de Química Analítica e 3º Congresso Iberoamericano de Química Analítica, Salvador (Brazil), 18-21 October 2009.

P23 – N. Gros, M. F. G. F. C. Camões, R. J. N. Bettencourt da Silva, Critical evaluation of uncertainty contributions for simultaneous ion chromatographic determination of minor and major ions in seawater, 21st International Ion Chromatography Symposium (IICS 2009), Dublin (Ireland), 21-24 September 2009.

P22 – R. J. N. Bettencourt da Silva, Teaching MiC to Accredited Laboratories Staff Members – Experience in Portugal, 2nd AcadeMiC Summer School on Education in Metrology in Chemistry, Wieliczka (Poland), 23-26 May 2007.

P21 – R. J. N. Bettencourt da Silva, A. Ribeiro, H. Figueiredo, M. J. Lino, J. R. Santos, M. F. G. F. C. Camões, Selection of Representative Commodities and Representative Pesticides using Analytical Data, 6th European Pesticide Residues Workshop, Corfu (Greece), 21-25 May 2006.

P20 – R. J. N. Bettencourt da Silva, J. R. Santos, T. Coelho, P. V. Boas Dias, R. Vieira, M. F. G. F. C. Camões, Supporting the Selection of Representative Commodities and Representative Pesticides using Multivariate Analysis, 6th European Pesticide Residues Workshop, Corfu (Greece), 21-25 May 2006.

P19 – R. J. N. Bettencourt da Silva, J. R. Santos, M. F. G. F. C. Camões, Traceability of Measurements in Pesticide Residues Analysis of Foodstuffs, International Workshop: Combining and Reporting Analytical Results the Role of (Metrological) Traceability and (Measurement) Uncertainty for Comparing Analytical Results, Rome (Italy), 6-8 March 2006.

P18 – R. J. N. Bettencourt da Silva, J. R. Santos, M. F. G. F. C. Camões, Nova Terminologia para as Abordagens usadas na Quantificação da Incerteza de Medições Químicas, 1º Conferência Nacional da Sociedade Portuguesa de Metrologia – Medir Mais e Melhor, Lisbon (Portugal), 28 e 29 November 2005.

P17 – R. J. N. Bettencourt da Silva, J. R. Santos, M. F. G. F. C. Camões, Traceability of Measurements in Pesticide Residues Analysis of Foodstuffs, 5th European Pesticide Residues Workshop, Stockholm (Sweden), 13-16 June 2004.

P16 – R. J. N. Bettencourt da Silva, J. R. Santos, M. F. G. F. C. Camões, Measurement Uncertainty: a tool for Validation, Euroanalysis XII, Dortmund (Germany), 8-13 September 2002.

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P15 – R. J. N. Bettencourt da Silva, J. R. Santos, M. F. G. F. C. Camões, Measurement Uncertainty: Getting to the bottom, Workshop on Measurement Traceability and Uncertainty in Analytical Chemistry – Meeting the requirements of ISO/IEC 17025, Luzern (Switzerland), 16-18 June 2002.

P14 – R. J. N. Bettencourt da Silva, J. R. Santos, M. F. G. F. C. Camões, Routine Measurement Uncertainty Quantification in Pesticide Residues Analysis, 4th European Pesticide Residues Workshop, Rome (Italy), 28-31 May 2002.

P13 – R. J. N. Bettencourt da Silva, J. R. Santos, M. F. G. F. C. Camões, Comparison of Analytical Method Performance for Spiked and Incurred Residues, 4th European Pesticide Residues Workshop, Rome (Italy), 28-31 May 2002.

P12 – R. J. N. Bettencourt da Silva, J. R. Santos, M. F. G. F. C. Camões, Determination of pesticide residues in products of vegetable origin – Expression of Results with Uncertainty, 5º Encontro de Química dos Alimentos, Oporto (Portugal), 8-11 May 2001.

P11 – R. J. N. Bettencourt da Silva, H. Figueiredo, J. R. Santos, M. F. G. F. C. Camões, Quality control and expression of results with uncertainty in routine analysis – Determination of pesticides in apples, Euroanalysis XI, Lisbon (Portugal), 3-8 September 2000.

P10 – R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Routine determination of metals in water by ICP-AES – quality control and expression of results with uncertainty, Euroanalysis XI, Lisbon (Portugal), 3-8 September 2000.

P9 – M. J. Lino, A. Ribeiro, R. J. N. Bettencourt da Silva, J. R. Santos, Unit-to-unit variation of methamidophos residues in sweet peppers sampled from the market, 3rd European Pesticide Residues Workshop, York (United Kingdom), 3-5 July 2000. (Participation financed by FCT)

P8 – R. J. N. Bettencourt da Silva, H. Figueiredo, J. R. Santos, M. F. G. F. C. Camões, Application of a friendly methodology to the expression of pesticide residue results with uncertainty, 3rd European Pesticide Residues Workshop, York (United Kingdom), 3-5 July 2000. (Participation financed by FCT)

P7 – R. J. N. Bettencourt da Silva, H. Figueiredo, J. R. Santos, M. F. G. F. C. Camões, Expression of results with uncertainty for the determination of pesticides in vegetables – “Bottom-up” approach, 3rd European Pesticide Residues Workshop, York (United Kingdom), 3-5 July 2000. (Participation financed by FCT)

P6 – R. J. N. Bettencourt da Silva, A. P. S. Coimbra, N. F. M. V. Santos, M. F. G. F. C. Camões, Estimation of the measurement uncertainty in analytical methods supported by low efficiency steps – Determination of PAH/s in water, Euroanalysis X, Basel (Switzerland), 6-11 September 1998.

P5 – R. J. N. Bettencourt da Silva, N. Bouillaud, S. Lelievre, J. Taglioni, J. Fournier, M. F. G. F. C. Camões, Analyse de traces de pesticides par électrophorèse capillaire, Workshop: Choix de Solvants pour l'Extraction, la Purification et l'Analyse de Résidus de Pesticides, Anger (France), September 1997.

P4 – R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, J. Seabra e Barros, Validation and uncertainty evaluation of AAS analytical data, Second Eurachem Workshop: Measurement Uncertainty in Chemical Analysis – Current Practice and Future Directions, Berlin (Germany), 29-30 September 1997.

P3 – R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, J. Seabra e Barros, Worksheet for analytical methods validation and uncertainty estimation, EUCO-CC2 Second European Conference on Computational Chemistry, Lisbon (Portugal), 2-6 September 1997.

P2 – R. J. N. Bettencourt da Silva, M. A. Trancoso, J. Seabra e Barros, Incertezas de calibração em espectrometria de absorção atómica, XV Encontro Nacional da Sociedade Portuguesa de Química, Oporto (Portugal), 22-25 Maio 1996.

P1 – R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Efeito tampão para a separação de aniões em electroforese capilar, XIV Encontro Nacional da Sociedade Portuguesa de Química, Aveiro (Portugal), 5-8 Abril 1994.

10.2. Invited Lectures (I45 to I1)

I45 – I. Kuselman, F. Pennecchi, R. J. N. Bettencourt da Silva, D. B. Hibbert, How many shades of gray are in conformity assessment due to measurement uncertainty?, IV International Scientific and Technical Conference – Metrology of Physicochemical Measurements, Suzdal (Russia), 17-19 September 2019.

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- I44 – C. Palma, V. Morgado, R. J. N. Bettencourt da Silva, Modelling the variation of measurement uncertainty with the measured value from proficiency test results, PT Conf 2019 – International Proficiency Testing Conference, Oradea (Romania), 10-13 September 2019.
- I43 – R. J. N. Bettencourt da Silva, Extracting more information from research in chemistry, 4th Meeting of the CQUL – Chemistry: Sharing the future, Lisbon (Portugal), 16-19 July 2019.
- I42 – R. J. N. Bettencourt da Silva, Traceability and uncertainty of qualitative target and non-target Analysis, Eurachem Workshop “Validation of targeted and non-targeted methods of analysis”, Tartu (Estonia), 20-21 May 2019.
- I41 – I. Kuselman, F. Pennechi, R. J. N. Bettencourt da Silva, D. B. Hibbert, E. Anchutina, Risks in Conformity Assessment of a PtRh Alloy due to Measurement Uncertainty, Isranalytica 2019, Tel Aviv (Israel), 22-23 January 2019.
- I40 – F. Pennechi, I. Kuselman, R. J. N. Bettencourt da Silva, D. B. Hibbert, Evaluation of risks in conformity assessment of multicomponent materials or objects, Isranalytica 2019, Tel Aviv (Israel), 22-23 January 2019.
- I39 – R. J. N. Bettencourt da Silva, C. Borges, C. Palma, Evaluation and optimisation of estuarine sampling uncertainty, Isranalytica 2019, Tel Aviv (Israel), 22-23 January 2019.
- I38 – R. J. N. Bettencourt da Silva, A. Williams, Setting data requirements, Pre Conference Satellite Event – Isranalytica 2019, Quality of Test Results for Conformity Assessment of a Chemical Composition: What is Good and What is Bad?, Ramat Gan (Israel), 21 January 2019.
- I37 – R. J. N. Bettencourt da Silva, Tutorial (1h): Avaliação “top-down” da incerteza de medição com ponderação da correção de efeitos sistemáticos, CONFMET 2018 – Conferência Nacional da SPMET – Em constante evolução o Sistema Internacional de Unidades, Caparica (Portugal), 28-29 November 2018.
- I36 – R. J. N. Bettencourt da Silva, A importância da incerteza nos resultados, Seminário: A Importância da Qualidade nas Instituições, Aveiro (Portugal), 19 September 2018.
- I35 – I. Kuselman, F. Pennechi, R. J. N. Bettencourt da Silva, B. Hibbert, Risks of a false decision on conformity of a multicomponent material and quality of chemical analytical results, Eurachem Scientific Workshop – Data – Quality, Analysis and Integrity, Dublin (Ireland), 14-15 May 2018.
- I34 – R. J. N. Bettencourt da Silva, A. Williams, Setting data requirements, Eurachem Scientific Workshop – Data – Quality, Analysis and Integrity, Dublin (Ireland), 14-15 May 2018.
- I33 – R. J. N. Bettencourt da Silva, C. Palma, Measurement uncertainty evaluation based on proficiency test results: Algorithms and limitations, 6th International Proficiency Testing Conference, Cluj Napoca (Romania), 4-6 October 2017.
- I32 – R. J. N. Bettencourt da Silva, Traceability and uncertainty in qualitative analysis, Eurachem Workshop: Uncertainty in Qualitative and Quantitative Analysis, Nicosia (Cyprus), 29-30 May 2017.
- I31 – R. J. N. Bettencourt da Silva, Setting and Using Target Uncertainty in Chemical Measurement, Pre-conference International Workshop – Validation of Test Methods, Human Errors and Measurement Uncertainty of Results, Tel Aviv (Israel), 23 January 2017.
- I30 – R. J. N. Bettencourt da Silva, Qualidade e Comparabilidade dos resultados de medição, Workshop Qualidade dos Resultados de Medição, Caparica (Portugal), 27 October 2016.
- I29 – R. J. N. Bettencourt da Silva, Incerteza da Medição em Química (5 h), Workshop: Estimativa de incerteza visando validação de métodos analíticos, Instituto Biológico, São Paulo (Brasil), 19 October 2016.
- I28 – R. J. N. Bettencourt da Silva, A Democratização da Metrologia, Dia aberto IPQ – Dia Mundial da Metrologia, Caparica (Portugal), 20 May 2016.
- I27 – R. J. N. Bettencourt da Silva, Definição e uso de uma incerteza alvo/incerteza máxima admissível, Workshop “Incertezas em Ensaios Físico-Químicos: Determinação, Validação e Uso da Incerteza”, Lisbon (Portugal), 25 November 2015.
- I26 – R. J. N. Bettencourt da Silva, Abordagem “passo a passo”: Dificuldades e omissões da Norma ISO 8466 para calibrações pelo método dos mínimos quadrados, Workshop “Incertezas em Ensaios Físico-Químicos: Determinação, Validação e Uso da Incerteza”, Lisbon (Portugal), 25 November 2015.

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I25 – R. J. N. Bettencourt da Silva, Abordagem EURACHEM: Avaliação da incerteza da recuperação média de analito estimada através da fortificação de diferentes amostras com analito nativo, Workshop "Incertezas em Ensaios Físico-Químicos: Determinação, Validação e Uso da Incerteza", Lisbon (Portugal), 25 November 2015.

I24 – R. J. N. Bettencourt da Silva, Relevance and approaches for the evaluation of the measurement uncertainty, Marine Chemistry Working Group (MCWG) of the International Council for the Exploration of the Sea (ICES), Lisbon (Portugal), 3 March 2015.

I23 – R. J. N. Bettencourt da Silva, Research in Metrology and Examining in Chemistry, CQE Young Researchers Day, Lisbon (Portugal), 1 December 2014.

I22 – R. J. N. Bettencourt da Silva, Definição e uso da incerteza alvo em ensaios químicos, Workshop "Avaliação da Incerteza em Ensaios Químicos – Simplificar adequando ao uso", Oeiras (Portugal), 27 November 2014.

I21 – R. J. N. Bettencourt da Silva, Metrology in Chemistry: Better measuring to known more!, ChemForum, Lisbon (Portugal), 12 November 2014.

I20 – B. Anes, R. J. N. Bettencourt da Silva, M. Filomena G. F. C. Camões, Compatibility of mean activity coefficients estimated experimentally and by Pitzer equations, Workshop "Metrology for ocean salinity and acidity", Berlin (Germany), 16-17 June 2014.

I19 – R. J. N. Bettencourt da Silva, Setting the measurement requirement, Eurachem Workshop on Quality in Analytical Measurements, Lisbon, 19-21 May 2014.

I18 – R. J. N. Bettencourt da Silva, Analytical performance models for measurement uncertainty optimization, Workshop "SPQ – Analítica 2014", Coimbra (Portugal), 14-15 April 2014.

I17 – R. J. N. Bettencourt da Silva, A importância da Metrologia Química no mercado e no meio académico, Workshop "Metrologia em Química e Qualidade – Impactos da Metrologia em Química na Academia e no Mercado", Workshop of Former UNESP students association, Instituto de Biociências, Letras e Ciências Exatas, São José do Rio Preto (Brazil), 22 November 2013.

I16 – R. J. N. Bettencourt da Silva, A importância da Metrologia Química no mercado e no meio académico, 1º Ciclo de Palestras do Centro de Ciências Agrárias da Universidade Federal de São Carlos (UFSCar), São Carlos (Brazil), 18 November 2013.

I15 – R. J. N. Bettencourt da Silva, Alternative approaches for the evaluation of the uncertainty of food measurements (Key lecture), Joint IMEKO TC8, TC23 and TC24 Symposium on Traceability in Chemical, Food and Nutrition Measurements, Lisbon (Portugal), 22-25 September 2013.

I14 – R. J. N. Bettencourt da Silva, D. Silveira, M. F. Camões, P. A. S. Salgueiro, Internal Quality Control for qualitative tests: Identification of the active substance in tear gas weapons, Key Challenges in Internal Quality Control, Berlin (Germany), 10-11 October 2012.

I13 – R. J. N. Bettencourt da Silva, Translating customers' needs to method validation requirements the link to performance criteria, Eurachem/CITAC workshop "Validation, Traceability and Measurement Uncertainty – Challenges for the 21st Century's analysts", Berlin (Germany), May 2012.

I12 – R. J. N. Bettencourt da Silva, Uncertainty and metrological traceability, Eurachem/CITAC workshop "Recent developments in measurement uncertainty", Lisbon (Portugal), June 2011.

I11 – R. J. N. Bettencourt da Silva, Como varia a incerteza com a concentração? – Abordagens Simplificadas, Workshop "Debate: Incertezas em Análise Química", Lisbon (Portugal), November 2006.

I10 – R. J. N. Bettencourt da Silva, Guide to the Evaluation of Measurement Uncertainty for Quantitative Test Results – Apresentação do Guia da Eurolab, Workshop "Debate: Incertezas em Análise Química", Lisbon (Portugal), November 2006.

I9 – R. J. N. Bettencourt da Silva, Novas Metodologias de Cálculo de Incertezas em Análise Química, Workshop "Debate: Incertezas em Análise Química", Lisbon (Portugal), November 2005.

I8 – R. J. N. Bettencourt da Silva, Júlia R. Santos, M. Filomena G. F. C. Camões, Routine Analysis: Management of costs & reliability, Euroanalysis XIII, Salamanca (Spain), September 2004.

I7 – R. J. N. Bettencourt da Silva, J. R. Santos, M. F. G. F. C. Camões, Evaluation of Method Recovery in the Analysis of Pesticide Residues in Oranges, 5th European Pesticide Residues Workshop, Stockholm (Sweden), June 2004.

I6 – L. Alder, A. Andersson, R. J. N. Bettencourt da Silva, A. Di Muccio, G. Jamet, A. de Kok, S. Reynolds, A. Valverde-Garcia, Measurement Uncertainty in Pesticide Residue Analysis – Concepts used in EU Member States, 5th European Pesticide Residues Workshop, Stockholm (Sweden), June 2004.

I5 – R. J. N. Bettencourt da Silva, Approaches for the Quantification of the Measurement Uncertainty, 5th European Pesticide Residue Workshop, Stockholm (Sweden), June 2004.

I4 – R. J. N. Bettencourt da Silva, J. R. Santos, M. F. G. F. C. Camões, Uncertainty Estimates for Routine Instrumental Analysis, Workshop on Quality Assurance in Testing Laboratories, Nicosia (Cyprus), 14-15 May 2002.

I3 – J. R. Santos, R. J. N. Bettencourt da Silva, Problemática da Análise de Resíduos de Pesticidas em Frutos e Hortícolas – Abordagem para a Validação Interna de Métodos Multi-Resíduos e Cálculo de Incertezas, 2º Congresso Ibérico de Laboratórios, Madrid (Spain), 16-17 October 2000.

I2 – R. J. N. Bettencourt da Silva, H. Figueiredo, J. R. Santos, M. F. G. F. C. Camões, Estimation of Analytical Method Recovery Performance Aiming at the Expression of Results with Reliable Uncertainty – Determination of pesticides in apples, Euroanalysis XI, Lisbon (Portugal), September 2000.

I1 – J. Seabra e Barros, R. J. N. Bettencourt da Silva, Z. Melo, M. J. S. Nunes, M. A. Trancoso, M. J. Cruz, M. T. Vilhena, Análise Química de Resíduos e Efluentes Industriais – Parte I – Determinação da Composição Química de Resíduos Sólidos, Seminário “Gestão e Valorização dos Resíduos e Efluentes Industriais”, Lisboa (Portugal), 1996.

10.3. Oral Communications (O59 to O1)

O59 – B. Anes, C. Oliveira, R. J. N. Bettencourt da Silva, M. F. G. F. C. Camões, Characterization of Seawaters by Ion Chromatography – Comparison of ionic patterns and balances, 2019 IMEKO TC-19 International Workshop on Metrology for the sea, Genova (Italy), 3-5 October 2019.

O58 – R. Mateos, M. S. Andrés, A. Pascual, C. Oliveira, R. J. N. Bettencourt da Silva, Top-down evaluation of measurements based on calibrators subject to sample preparation: Determination of contaminants in natural water, CONFMET 2018 – Conferência Nacional da SPMET – Em constante evolução o Sistema Internacional de Unidades, Caparica (Portugal), 28-29 November 2018.

O57 – M. Barros, D. Ferreira, C. Oliveira, R. J. N. Bettencourt da Silva, Quantificação da incerteza da determinação visual do ponto final de uma titulação, CONFMET 2018 – Conferência Nacional da SPMET – Em constante evolução o Sistema Internacional de Unidades, Caparica (Portugal), 28-29 November 2018.

O56 – R. J. N. Bettencourt da Silva, F. Pennechi, D. B. Hibbert, I. Kuselman, Bayesian evaluation of risks of false decisions on conformity of a multicomponent material or object due to measurement uncertainty – User-friendly spreadsheet, V Iberoamerican Congress of Laboratories – Conformity Assessment, Lisboa (Portugal) 17-19 October 2018.

O55 – I. Kuselman, F. Pennechi, R. J. N. Bettencourt da Silva, D. B. Hibbert, Conformity assessment of multicomponent materials – who and why takes risks?, III International Scientific Conference – Reference Materials in Measurement and Technology, Ekaterinburg (Russia), 11-14 September 2018.

O54 – F. Pennechi, I. Kuselman, R. J. N. Bettencourt da Silva, Brynn Hibbert, Bayesian Models for Evaluation of Risks in Conformity Assessment of Multicomponent Materials or Objects, ENBIS – European Network for Business and Industrial Statistics 2018, Nancy (France), 4 September 2018.

O53 – P. C. Santos, A. C. Rocha, R. J. N. Bettencourt da Silva, C. Palma, Validação da Metodologia para a Determinação de Compostos Organoclorados em amostras sólidas por Cromatografia de fase Gasosa com Detetor de Captura de Elétrons, Jornadas de Engenharia Hidrográfica 2018, Lisboa (Portugal), 19-21 June 2018.

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