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EDITORIAL

Pollutant toxic ions and molecules. A global pollution problem: trends in detection and protection

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How long is it going to take humans to realise they are poisoning till death the only planet they know that can sustain life?

That the planet is dying is well known by politics, by those who should take action.

Why action is not taken is a mystery or perhaps no. Some examples are given next, which are well known by the research community and are well documented in literature.

Mercury in rainfall has been controlled during the past 20 years in the USA. Levels have increased in many sites reflecting an increment in the emissions originated from coal-burning power plants (Schure 2016). The most toxic species of mercury, methyl mercury, has been noticed recently as present in the waters of California's coast at levels 17 times higher than normal ones when the elephant seals shed their outermost layer of skin and hair (Cossabon 2015). Guess where this mercury comes from. Astonished by this? Then you will think twice before eating tuna as methyl mercury levels are increasing at an unbelievable rate of 3.8 % per year just in this fish.

Emerging contaminants (Petrie 2015) are generally defined as any synthetic or naturally occurring chemical or microorganism that becomes considered as contaminant due to their increasing levels in the environment, which ultimately are considered a threat to humans. Rivers, many of them sources of drinking water, are being transformed in pharmaceuticals, literally. Thus, bupropion, carbamazepine, citalopram, fluoxetine, gabapentin, lamotrigine and venlafaxine which are included in the categories of antidepressants, anti-seizure compounds and mood stabilisers were found in the rivers of Minnesota (Writer 2016). Soon, the easiest way to take a coffee will be to drink a glass of water of the nearest river, as caffeine has spread so quickly, at ppb levels in some cases [4]. Even better, pain is going to become a meaningless word, as levels of molecules such as diclophenac in drinking water have grown steadily during the last years (Richardson and Kimura 2016).

Emerging nanomaterials (Gong et al. 2015; Oliveira 2015), cracking problems (Kurtzman 2016), and mining contaminations (Giripunje 2015) are other biggest issues to be resolved.

We, the scientific community, have two main responsibilities with our society. The first one deals with our capability to develop new methodologies to detect and monitor not only well known but also new contaminants. The communities we are living in are expecting from us an effort directed towards making a safer world—our duty. The second one deals with our ability to deliver ways to clean the divine liquid, the water, from the poisons our way of living drain on it slowly but constantly.

As it was written above, we are killing right now the forthcoming generations, and this is not a dramatic fantasy

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originated in the mad mind of a researcher. It is an inconvenient truth, scientifically proven.

The first International Caparica Conference on Pollutant Toxic Ions and Molecules, PTIM2015 was addressed to enrol brilliant minds working in any way within the fields of detecting, controlling, removing or making pollutant toxic ions and molecules. The plenary speakers Joao Crespo (Portugal); Vito Lippolis (Italy); José Gomez-Ariza (Spain); Manuel Miró-Llado (Spain); Julia Ljibimova (USA) as well as the Keynote speakers, Wayne Jones (USA), Graça Neves (Portugal); Andrea Bencini (Italy); Mario Diniz (Portugal); Gerald Zagury (Canada); Jose Santana-Rodríguez (Spain); Irene C Lo (Hong-Kong) and 185 participants shown during the conference their most important results about *A Global Pollution Problem: Trends in Detection and Protection.*

The collection of papers presented in this special issue is the result of the effort the scientific community is doing for saving the world for the generations to come. We would like to thank all the contributors as well as the editor-in-chief of the Environmental Science and Pollution Research Journal, professor Philippe Garrigues and the Springer editorial team for allowing us to launch this special issue.

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Carlos Lodeiro graduated in Chemistry in 1995 and received his PhD in chemistry in 1999 by the University of Santiago de Compostela, Spain. In 1999, he moved to the University NOVA of Lisbon (UNL) in Portugal as European Marie Curie post-doctoral researcher in a project concerning molecular devices and machines, and in 2004, he became a fellow researcher and invited assistant lecturer at the REQUIMTE-CQFB, Chemistry Department (UNL). In 2009, Dr. Lodeiro moved to the University of Vigo, Faculty of Sciences of Ourense (FCOU), Spain, as IPP (Isidro Parga Pondal) researcher-lecturer. Since 2012, he is assistant Professor at the Chemistry Department UCIBIO-REQUIMTE Laboratory in the Faculty of Science and Technology, University NOVA of Lisbon. Dr. Lodeiro is a Fellow of the Royal Society of Chemistry since 2014 and member of the Portuguese Chemistry Society. Presently, he is a co-head of the BIOSCOPE research group and Co-CEO of the PROTEOMASS Scientific Society. His research interest comprises (i) physical-organic and physical-inorganic chemistry of fluorescence chemosensors, (ii) nanoparticles and applications, (iii) supramolecular analytical proteomics, (iv) onco and nanoproteomics. C. Lodeiro is an author or co-author of close to 200 manuscripts, 1 patent, 15 book chapters and 20 books as co-editor.

José Luis Capelo received his PhD in Chemistry in 2002 by the University of Vigo (Spain). In 2002, he moved to the Instituto Superior Técnico de Lisboa (Portugal) as post-doc, and in 2004, he was appointed Fellow Researcher at REQUIMTE, Laboratory associated to the Chemistry Department of the New University of Lisbon. In 2009, he moved to the University of Vigo at Ourense Campus (Spain), where he works as Fellow Researcher and Lecturer. Since 2012, Dr. Capelo is assistant Professor at the Chemistry Department UCIBIO-REQUIMTE Laboratory in the Faculty of Science and Technology, University NOVA of Lisbon. Dr. Capelo is a Fellow of the Royal Society of Chemistry and member of the Portuguese Chemistry Society. Presently he is a co-head of the BIOSCOPE research group and Co-CEO of the PROTEOMASS Scientific Society. J. L. Capelo has developed research on the following topics: (i) quantification of metal and

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Her scientific interests are focused in (i) synthesis of new bio-inspired emissive peptide as fluorescence chemosensors, (ii) supramolecular chemistry (photophysics and photochemistry), (iii) their multifunctional applications in vitro (solution and solid studies) and in vivo (cell imaging studies) and (iv) synthesis of new emissive nanomaterials, as quantum dots and silica for biomarker discovery in biological samples.

Elisabete Oliveira graduated, in 2006, in Applied Chemistry from FCT-University Nova of Lisbon, Portugal, in 2007 obtained a Master in Biotechnology and completed a PhD degree in Biotechnology in 2010, at the same university. In 2013, she obtained a second PhD degree in "Food Science and Technology" by Science Faculty of Ourense Campus in the University of Vigo, Spain. E. Oliveira is an author or co-author of more 55 papers in international peer review journals, 5 book chapters and 3 books. In 2008, E. Oliveira received the prize in Creativity and Quality in Research Activity in sensors area, attributed by Calouste Gulbenkian Foundation, Portugal, and in 2016 the L'Oreal Medal Woman's in Science, Portugal. She spent research periods in national institutions (University of Minho; University of Trás-os-Montes and Alto Douro, Portugal) and international institutions (Chemistry department, University of Bologna, Italy and University of Vigo, Spain).

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