

# Editorial Preface

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This is a second year of publication journey for our Journal of Nanotoxicology and Nanomedicine. It is my pleasure to announce the next issue of the journal, second volume in 2017 publication year. The Journal of Nanotoxicology and Nanomedicine is still a new journal, which publishes papers in the field of nanoscience, toxicology of nanomaterials and nanomedicine, managed by IGI Global Publisher.

The journal is growing up and offers publications via thorough and authoritative reviews, focus articles, perspectives on cutting-edge research, and discussions of topics that provide distinctive views about the nanoscience in relation to toxicological and environmental research, as well as biomedical applications. The article summaries for the current issue are given below, next to the Preface.

In this issue the journal also presents a section listing “hot” patents, i.e. recently issued nanomedicine and nanotechnology related patents, which may be at the time of issue the only public domain source of scientific details in this area. The coverage features patents and published patent applications in high-interest areas with a brief description and link to the source.

I invite you to submit your late-breaking research to the journal. On behalf of the Editorial Board, I sincerely hope that you enjoy this issue of the journal and that you feel motivated to consider this journal as essential reading for keeping up-to-date with the current research.

In addition, I would like to thank all who kindly contributed their papers for this issue and the editors of the Journal of Nanotoxicology and Nanomedicine for their kind help and co-operation. We are also indebted to the Journal of Nanotoxicology and Nanomedicine editorial office at IGI Global and the publishing and production teams for their assistance in preparation and publication of this issue.

## ARTICLE SUMMARIES

The articles in this issue focus on the following themes:

In the first article, authors Karolina Jagiello, Anita Sosnowska, Alicja Mikolajczyk, and Tomasz Puzyn presented a review on nanomaterials in medical devices and current situation with the safety associated with these materials. This review gives a brief description of the existing regulations related to biomaterials safety that needs to be considered before their introduction into EU market. Authors concluded that the

risk analysis should include two characteristics: probability of occurrence of harm and severity. Authors indicated that identified user-related harm should be reduced by managing the risk. Additionally, the review presents an overview of engineered biomaterials (EBMs), which in combination with nanoscale components have shown promises in Advanced Therapy Medicinal Products and Medical Devices. Authors discuss recent challenges, objectives and perspectives in risk assessment and risk management of Advanced Therapy Medicinal Products and Medical Devices composed of nanobiomaterials.

In the second article, authors Dane Hogoboom, Yulun Han and Dmitri Kilin discuss a computational study they performed, based on *ab initio* molecular dynamics (AIMD) applied for investigation of the combustion reaction of nano-droplets of a specific toxic rocket fuel, hydrazine ( $\text{N}_2\text{H}_4$ ), where dinitrogen tetroxide ( $\text{N}_2\text{O}_4$ ) was used as an oxidant. Authors built an atomic model that consists of 1:1 ratio of  $\text{N}_2\text{H}_4$  and  $\text{N}_2\text{O}_4$  molecules. The modeling process simulates nano-droplets of fuel and oxidizer injected into the combustion chamber and experience collision, mixture, and chemical interaction. The AIMD simulation of chemical reaction of fuel and oxidizer is performed under the initial conditions of high temperature and pressure. Thus, in the AIMD trajectory, authors observed several energetically favorable products such as NO,  $\text{NO}_2$ , and  $\text{H}_2\text{O}$ . Based on the performed simulation study, authors proposed the mechanism for the formation of  $\text{H}_2\text{O}$  and formation of other toxic and non-toxic products.

In the last article of this issue, authors James Jorum Owuor, Florence Oloo, Japheth Kibet Ngetich, Mwaiwa Kivunzya, Wesley Nyaigoti Omwoyo, and Jeremiah Waweru Gathirwa discussed a study that provides a comparison of freeze and spray drying to obtain primaquine-loaded solid lipid nanoparticles (SLN). Authors examined the spray drying and freeze drying of various nanosized solid lipid nanoparticles and the physicochemical attributes of the acquired particles. Thus, primaquine loaded solid lipid nanoparticles dried by the two strategies was examined. Authors characterized particles by size, drug loading, encapsulation efficiency and surface morphology, then considered the *in vitro* and kinetic drug discharge models. It was concluded that preparation parameters have no impact on the molecule morphology and properties, and the main parameter deciding the molecule attributes in the drug substance of the nanoparticle, either the spraying or the freezing technique of drying. Also, it was concluded that the drug release profile of spray dried SLN is superior to that of the freeze dried SLN.

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