

## Editorial

# Nanocomposites for Engineering Applications

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Advanced polymer-based nanocomposite materials have gained popularity for wide engineering applications with improving virtually all types of products and commercialization of products that exploit their unique mechanical, thermal, and electrical properties. However, these properties present new challenges to understand, predict, and manage potential adverse effects, such as toxicity impacts exposure to human lives and environment. Thus, widespread applications of nanomaterials induce enormous potentials positively and negatively for human exposure and environmental release. Federal budget also emphasizes these implications and it is expected that the total annual budget for various sectors from the National Nanotechnology Initiatives will increase substantially in the coming years.

The applications of nanostructure resins for biological applications have been conducted in vitro and in vivo environments in research in the past few years. The evaluation involved how the resins can bond for biocompatibility to bone for repair after breaking, teeth for filling, other various types of tissues for wound healing, and so on. Natural and synthetic polymeric materials have been found to be suitable for tissue engineering applications. For an example, silk (like cocoon or spider) fiber /biodegradable polymer biocomposites have been used for tissue engineering (scaffolding) for bone repair. Many researches have also demonstrated the use of nano structural materials as reinforcements, such as nano apatite, nanoclay, and nanofibers (polymer-based or carbon nanotubes) to enhance the mechanical properties and thermal stability of bio compatible polymers for artificial joints and scaffolding. Tissue engineering is one such aspect that utilizes both engineering and life science disciplines to either maintain existing tissue structures or to enable tissue

growth. Furthermore, tissue-engineered organs can be used in testing procedures, reducing or eliminating the need for animal subjects. Nano biotechnology is an interdisciplinary field resulting from the interfaces between biotechnology, materials science, and nanotechnology.

This special issue “Nanocomposites for Engineering Applications” covers a wide range of papers contributed by authors around the world on the nanocomposites and their structural and mechanical properties. This aim is to provide a platform for scientists and researchers to exchange and share ideas and findings in the field.

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