Innovation in Nanotechnologies: From having fun in the lab to real products

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Nanotechnology comprises an enabling set of technologies that have impact in every important activity of humankind. In the last decades, significant advances took place in nanomaterials chemistry and engineering. A key progress is the development of novel nanomaterials with highly controlled structure, shapes, textures and porosities that can be processed as particles, thin films, composites or bulk gels. The advances in synthesis opened the path to applying these highly promising nanomaterials to technological development in many relevant fields such as health, energy and environmental applications.

One of the relevant features of nanotechnology is the fast translation from basic science made at the laboratory to advanced materials and processes that change our daily life, and that open new roads to advanced technologies that resemble magic. The other one is the limitless possibility of playing with matter, building new minuscule architectures that imitate Nature, and to exploit new phenomena. Imagination is the limit.

In this presentation, I will make a brief introduction to nanomaterials and nanotechnology, illustrating with examples of commercial products derived from high quality science such as automobile catalysts, COVID vaccines or TV screens (all of which derive from Nobel Prize-winning nanoscience). I will then show research examples of our laboratory, dedicated to build intelligent materials, particularly showing the full path from nanomaterials basic research to a commercial and regulated antibacterial coating. Time permitting, I will discuss the possibility of creating life-like animated systems using inanimate matter and some nano-tricks.