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Editorial

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Editorial

As section editor of the Henry Journal of Nanoscience, Nanomedicine and Nanobiology it is my honour and pleasure to wish the journal a bright and successful future.

Nanoscience is a fascinating field, because on the small scale of nanometres various scientific fields merge, and synergistic effects take place. Researchers who are working in nanoscience, and perhaps even more so in nanomedicine and nanobiology, where the additional sparkle of life lightens up research, and where complex systems and interactions, sometimes even consciousness, come into the game, know about the necessities to establish deep and also broad knowledge. These fields are form of art. In my case for example, I started out as a physics engineer, who has always been in love with biology. So, I started to investigate microorganisms and living single cells with scanning probe microscopy techniques with unprecedented resolution. Representative examples are the first ever investigations of protein-protein interaction in real time on the single molecule level, which we did in Paul Hansma's biophysics laboratory at the University of California in Santa Barbara [1]. The biomolecules of our interest are so-called heat-shock proteins – they serve as little protein repair machines in microorganisms, but also people and animals. Amazingly, their "invention" was such a breakthrough, that - although it did not happen at a common ancestor, but much later in the temporal history of life, these molecules crossed over to other biological kingdoms via horizontal gene transfer [2,3] - teaching us about amazing complexities far beyond imagination in certain cases, and leaving us humble and happy that we can investigate, understand, and apply such systems.

It is always good to give chance a chance in scientific investigations. Once, we looked at the stiffness of student blood cells – and realized that the erythrocytes of one donor had highly unusual stiffness values in our nanomechanical investigations of the cell wall. He was finally diagnosed with a rare case of diabetes – and our atomic force microscope had successfully served as a nano diagnostic tool [4].

Materials, structures and processes of organisms on the nanoscale can yield important input for the development of new, potentially disruptive technologies for a better future. By investigating structural properties of butterfly wings from butterflies who died from natural causes in the butterfly house in Vienna we developed a method with which the micro- and nanostructures of the biological template can be transferred to a master stamp, which can then subsequently be used to functionalize surfaces with water repellent, self-cleaning and colouring properties [5]. Based on the principle 'structure rather than material' such approaches may contribute to change our ways of thinking, and lead to a new way of production of goods for human use that is based on smartly structured benign materials that can easily be reused, recycled or serve as food or fertilizer. Along the same lines is the development of insect repellents based on grape or plum waxes that – rather than using potentially toxic chemicals – work because of the physical characteristics of their micro- and nanostructures that selectively repel certain species and are not harmful to other insects, bees or butterflies, and which can even be eaten by children [6].

As a section editor I am excited about the current and future papers published in the Henry Journal of Nanoscience, Nanomedicine and Nanobiology and I wish the authors as well as the scientific and administrative staff all the best, for a bright future for all of us.

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