

**Green nanotribology and sustainable nanotribology in the frame of the global challenges  
for humankind**

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Current nanotribology is analyzed regarding its potential to go green as well as sustainable, and promises and possible pitfalls of such approaches are presented.

Green nanotribology is sustainable technology dealing with friction, wear and lubrication of interacting surfaces in relative motion at the nanometer scale. Green nanotribology includes biomimetic tribological nanotechnology, sustainable control of friction, wear and lubrication on the nanoscale, environmental aspects of nanoscale lubrication layers, environmental aspects of nanotechnological surface modification techniques and nanotribological aspects of green applications such as artificial photosynthesis. Green nanotribology shall be able to provide technical support to preservation of resource and energy and to propel the society forward towards sustainability.

Green nanotribology aspects comprising nanostructured surfaces, nanoagents and nanoprocesses are dealt with in the light of three questions:

How can processes get greener with nanotribology?

How can we prevent that such processes turn worse because of adverse chemical reactions?

How can we prevent that the resulting green nanotribology is not only pseudo-green and negative impact on the environment and biology is only translated to other layers?

Various biological systems, structures and processes, where green nanotribology is omnipresent, are introduced as best practice examples to address the above questions and establish a path towards sustainable green nanotribology.

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## **Speaker's Biodata**

Prof. Ille C. Gebeshuber

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Prof. Ille has been in Malaysia since 2008. She is Life Member of MYRTRIBOS and works at the Institute of Microengineering and Nanoelectronics at UKM. She is Professor of Physics, and expert in tribology, nanotechnology and biomimetics. Biomimetics means learning from living nature for human applications. In Austria, Prof. Ille has a permanent post at the Vienna University of Technology, and is member of the strategy board of the Austrian Center of Competence for Tribology, a major research institution with more than 150 academically trained tribologists. Green Tribology is a matter of high interest for Prof. Ille, since she concentrates in her work on large-scale approaches to address the global challenges for humankind, and Green Tribology can provide major contributions to this challenging task.