Aquaphotomics as emerging technology denominator

Roumiana Tsenkova
rtsen@kobe-u.ac.jp
Biomeasurement Technology Laboratory, Graduate School of Agricultural Science, Kobe University, 1-1, Rokkodai, Nada, 657-8501, Kobe, Japan

Aquaphotomics is a novel scientific discipline which utilizes water - light interaction at various frequeincies for understanding the structure-function relation of aqueous and bio-systems. [1]. The methodology is based on spectroscopy including near infrared spectroscopy which provides rapid, real time, cost-effective and completely non-destructive [2] analysis. Hence, in aquaphotomics water serves as a "collective matter and energy mirror" which offers insight into the state, dynamics and functionality of the system as a whole[1]. From this novel knowledge water is described as a possible "sensor" and "actuator" in any feedback control system.

An array of novel technology applications will be presented: from basic studies of aqueous solutions, biomolecules - water interaction, material science, bio compatibility etc., to complex applications in the fields of quality monitoring and functional changes through restructuring, including water, food, medicinal and cosmetic products, as well as in the fields of microbiology, plant biology, diagnostics and biomedical sciences [1,2].

[1] Tsenkova R. Aquaphotomics: Dynamic Spectroscopy of Aqueous and Biological Systems Describes Peculiarities of Water. J Near Infrared Spectrosc 2009; 17: 303–313

[2] Tsenkova R, Munćan J, Pollner B, Kovacs Z. Essentials of Aquaphotomics and Its Chemometrics Approaches. Front Chem 2018; 6: 363