AEROGALNITE AS A BIOMIMETIC ELECTRONIC NANOMATERIAL FOR MULTIFUNCTIONAL APPLICATIONS

Ion TIGINYANU[1,2]

[1]*Technical University of Moldova, bd. Stefan cel Mare 168, Chisinau, Republic of Moldova*
[2]*Academy of Sciences of Moldova, Chisinau, Republic of Moldova*

We report on fabrication of three-dimensional architectures based on GaN micro-tubular structures (the so-called Aerogalnite or Aero-GaN) with nanoscopic thin walls which exhibit dual hydrophobic-hydrophilic behaviour. The micro-tubular structures are shown to self-organize when interacting with water to mimic the formation and functions of a cell membrane. Self-organization processes result in the formation of stretchable and self-healing waterproof rafts with impressive cargo capabilities (cargo up to 500 times heavier than the floating raft [1]). Along with this, we demonstrate self-propelled liquid marbles with exceptional mechanical robustness which may find applications as bioreactors for scalable *in vitro* cell growth. The physical properties of the new material based on three-dimensional GaN architectures will be presented in the context of its prospects for biomimetic applications in nano/microfluidics, biomedicine, microrobotics, electronics etc.

The work is supported under the grant NanoMedTwin (Horizon-2020).

References

1. I. Tiginyanu *et al* Nano Energy, Vol. 56, pp. 759-769 (2019).