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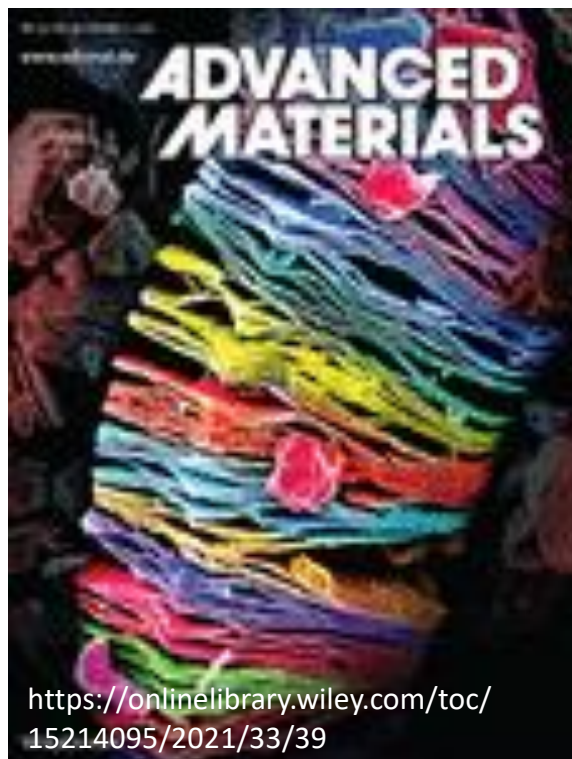
---- supported by the Erasmus+ JM program ----

---- supported by the Horizon 2020 program ----

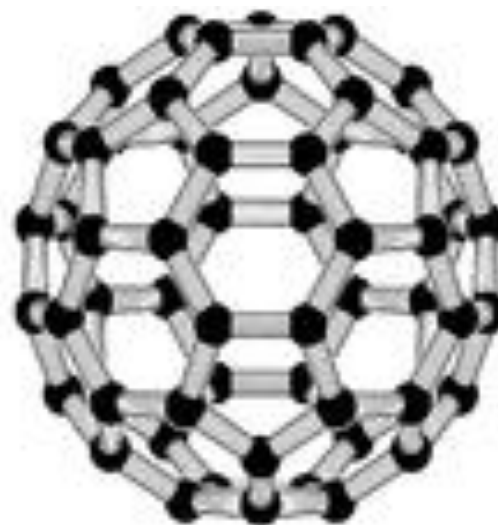




# НОВІ НАНОМАТЕРІАЛИ: ПРОБЛЕМИ ТА ПЕРСПЕКТИВИ ВИКОРИСТАННЯ У БІОЛОГІЇ ТА МЕДИЦИНІ



<https://onlinelibrary.wiley.com/toc/15214095/2021/33/39>



Jean Monnet Programme



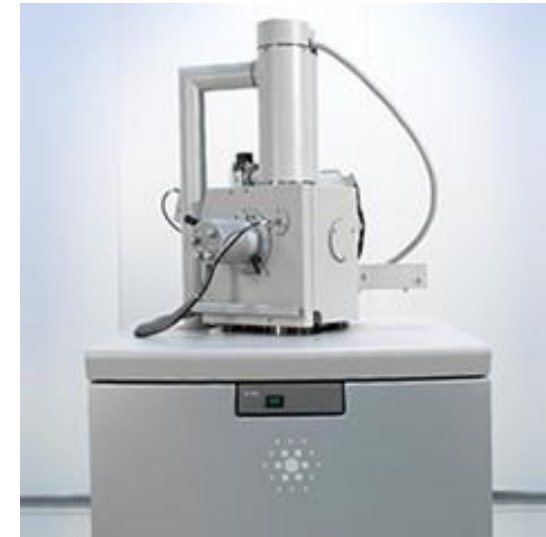
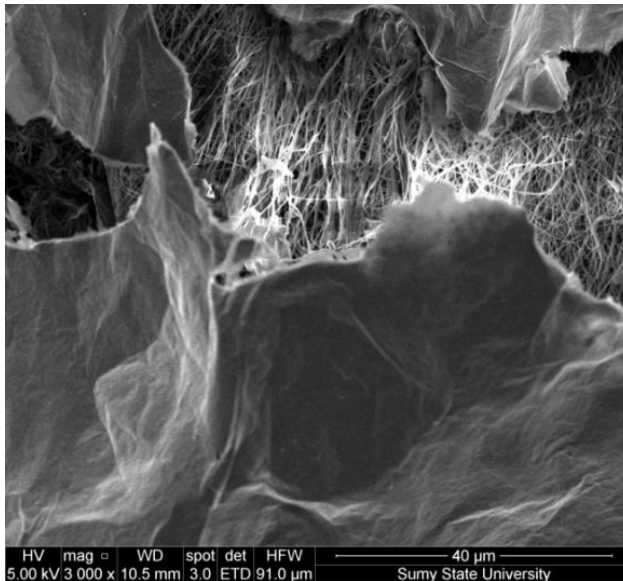
---- supported by the Erasmus+ JM program ----  
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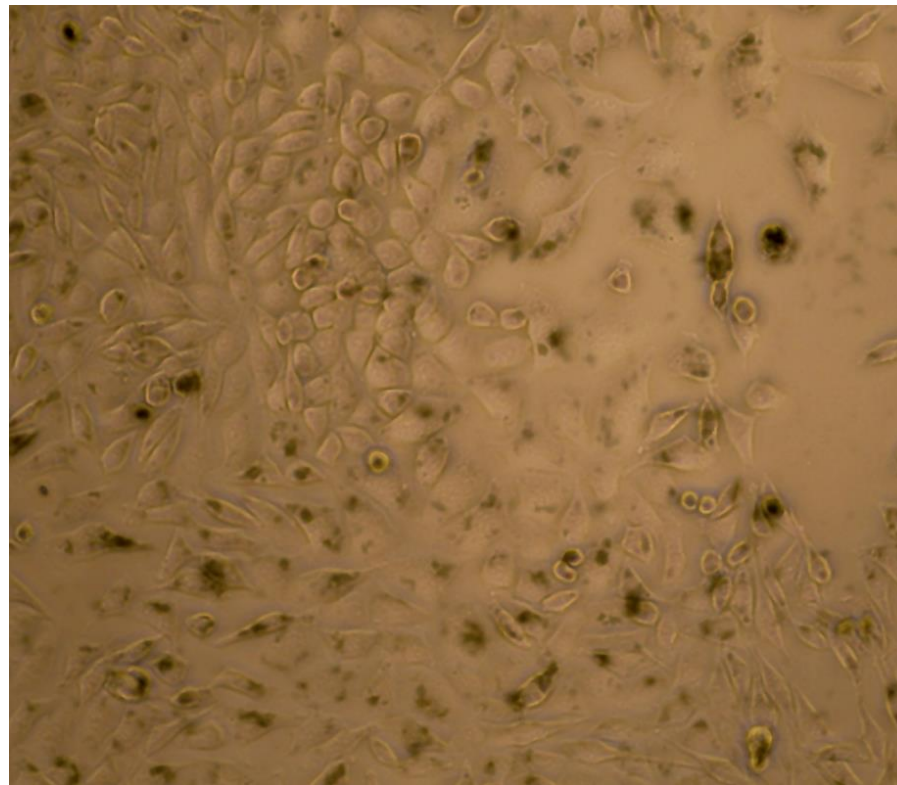
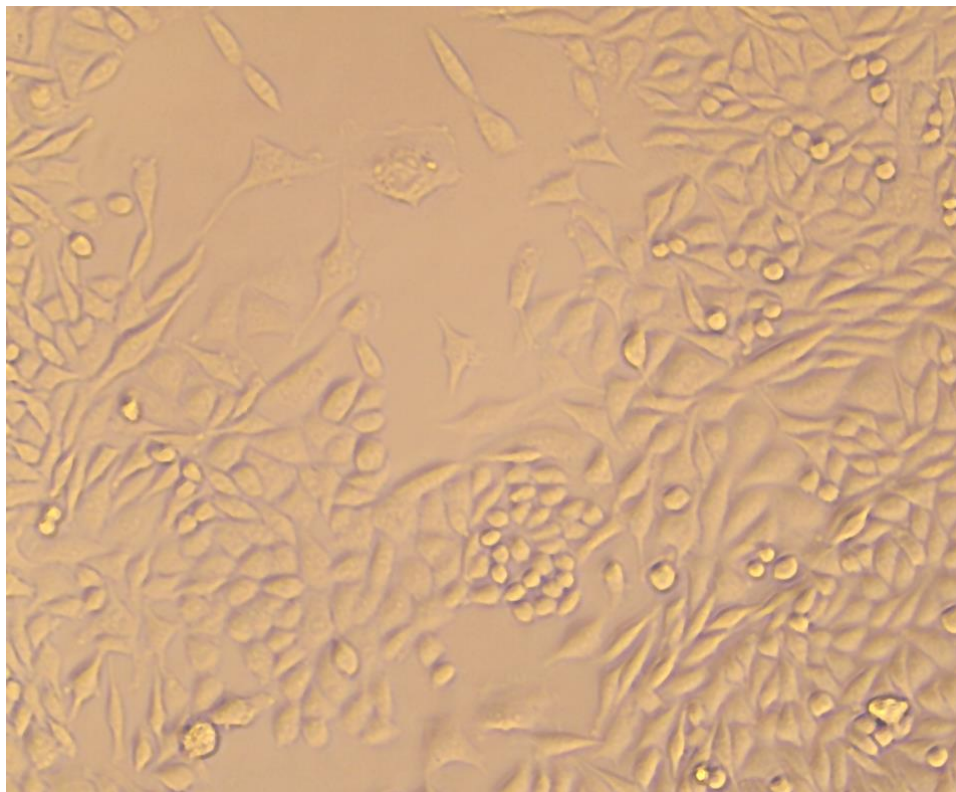
# Biomedical Research Center

## Medical Institute of Sumy State University

- Cell culture laboratory
- Microbiological laboratory
- ELISA laboratory
- Chemical and toxicological laboratory







**ZMB**

Zentrum für Medizinische Biotechnologie  
Center of Medical Biotechnology



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Programme





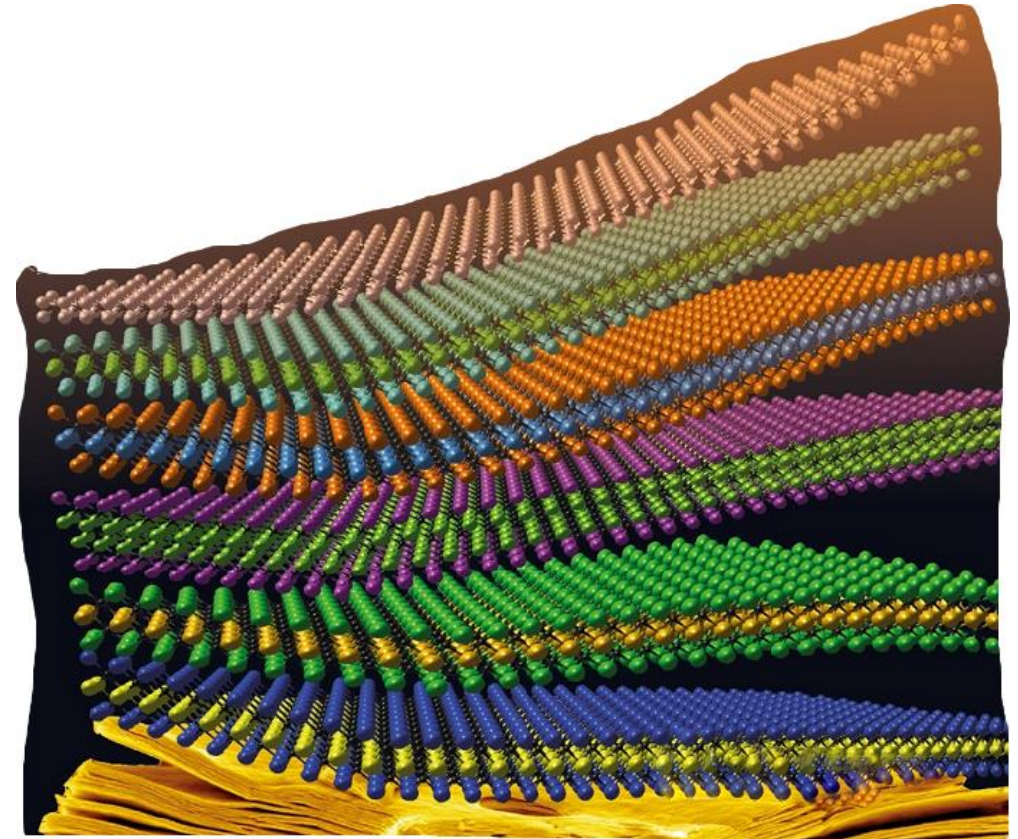
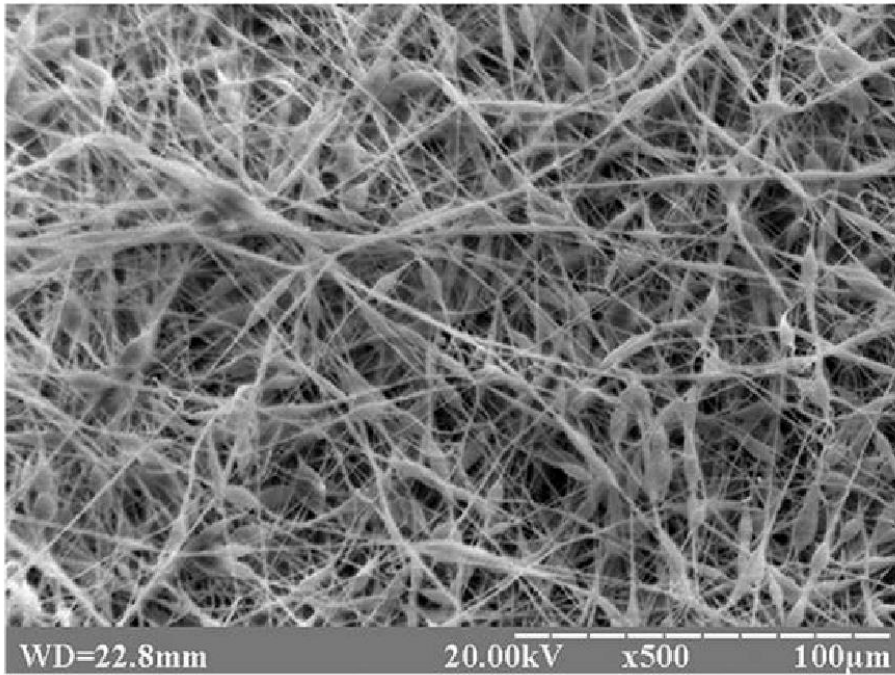


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# НОВІ НАНОМАТЕРІАЛИ

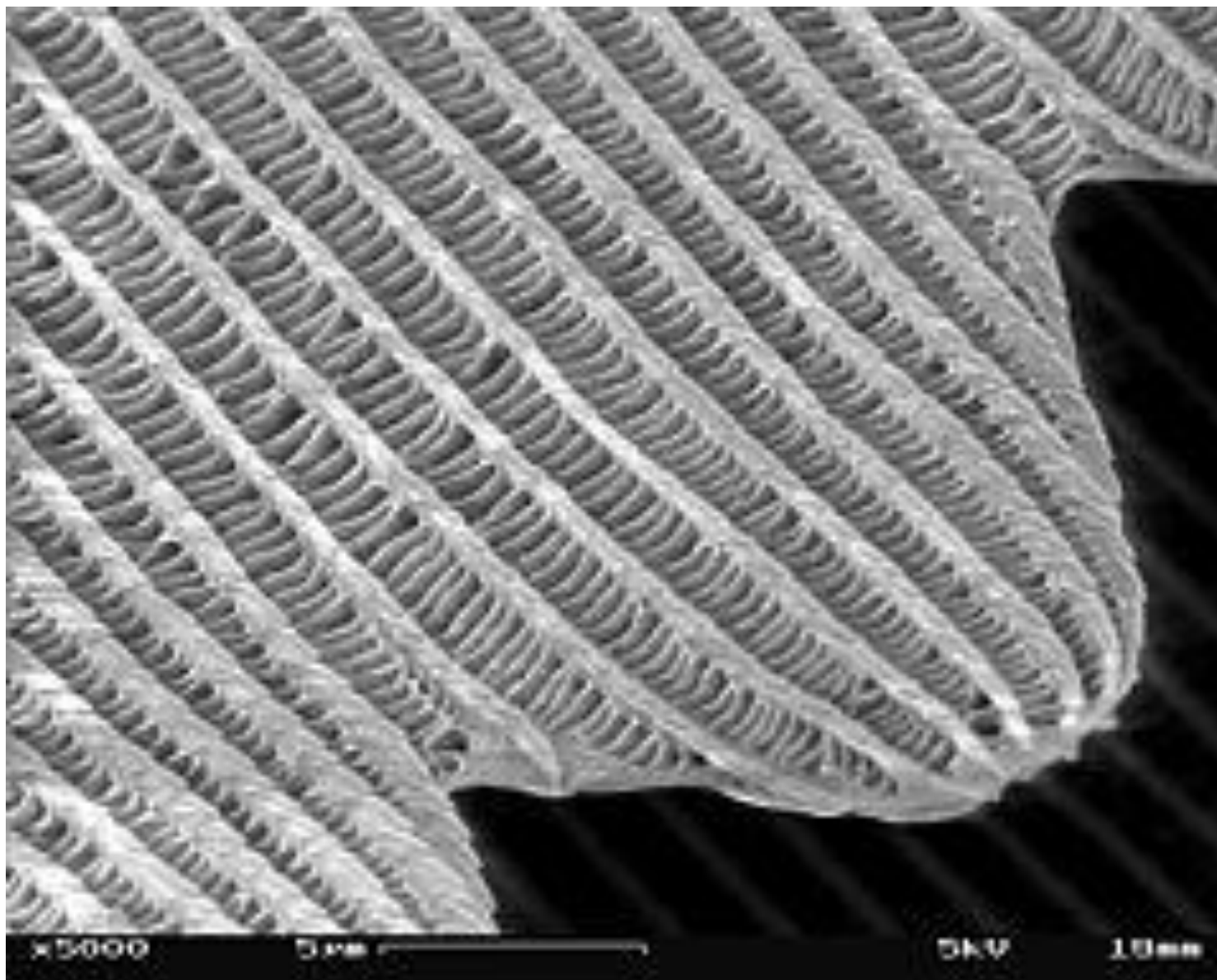


Nanofiber picture courtesy of **M. Pogorielov et al. 2018**, In vitro degradation and in vivo toxicity of NanoMatrix3D<sup>®</sup> polycaprolactone and poly(lactic acid) nanofibrous scaffolds. J Biomed Mater Res A 106(8):2200-2212.

MXene picture courtesy of **B. Anasori & Y. Gogotsi (Ed.)**, 2D Metal Carbides and Nitrides (MXenes). Springer 2019.











## Organic Nanoparticles



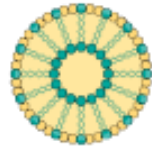
Polymeric nanosphere



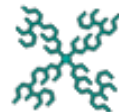
Polymeric nanocapsule



Polymeric micelle



Liposome

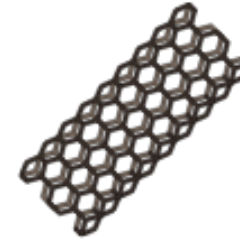


Dendrimer

## Inorganic Nanoparticles



Mesoporous silica nanoparticle



Carbon nanotube



Iron oxide nanoparticle



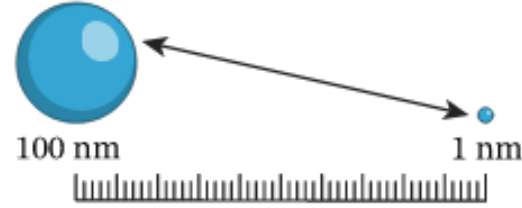
Gold nanoparticle



Quantum dot

Nanoparticles

Size



Shape



Star



Cube



Sphere



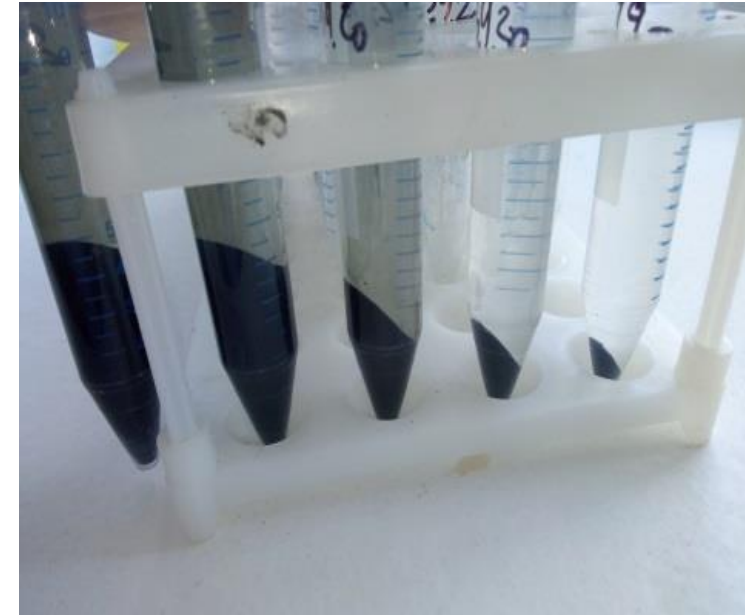
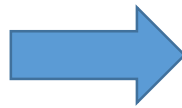
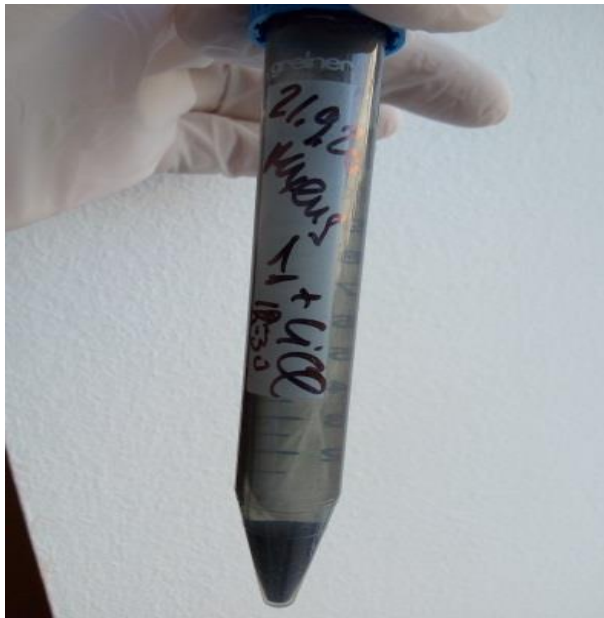
Plate

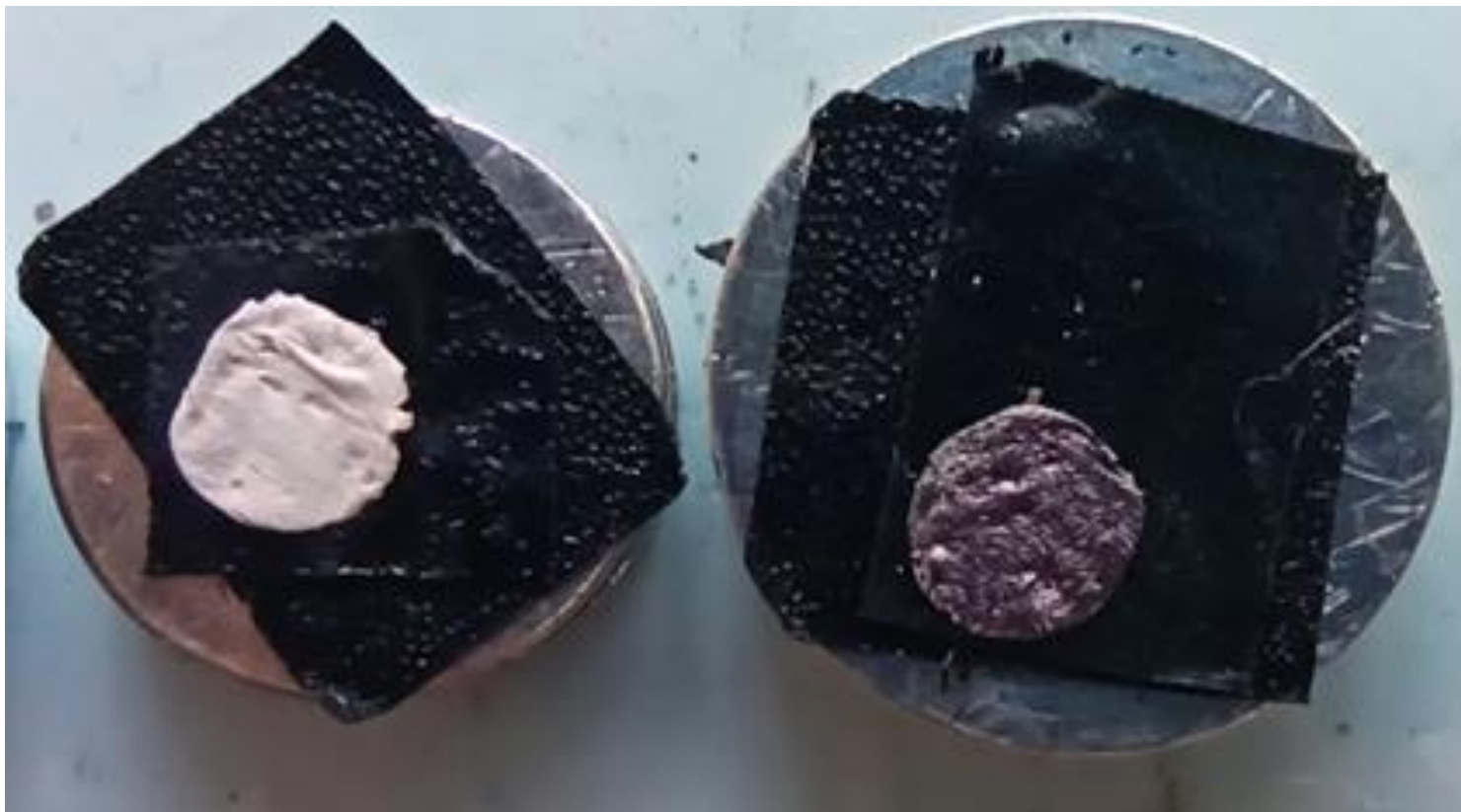


Rod



## Delamination of MXenes: segregation of multilayered MXenes into single layer flakes







PCL – MX20

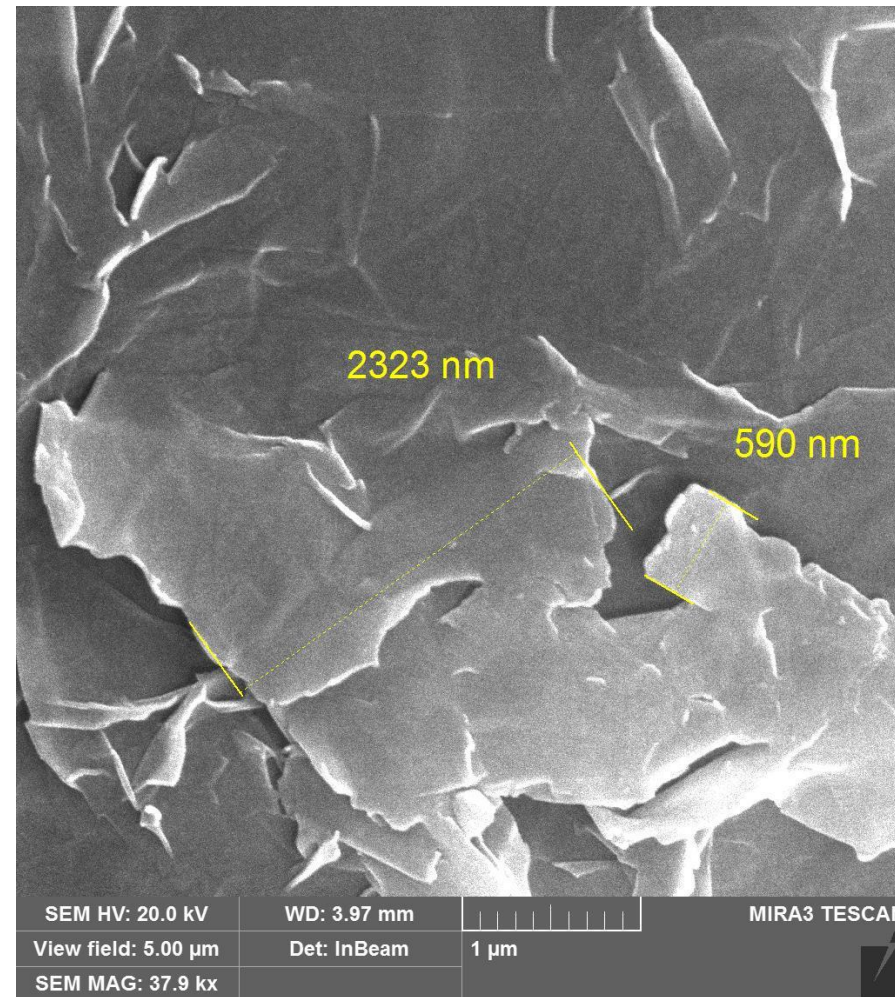
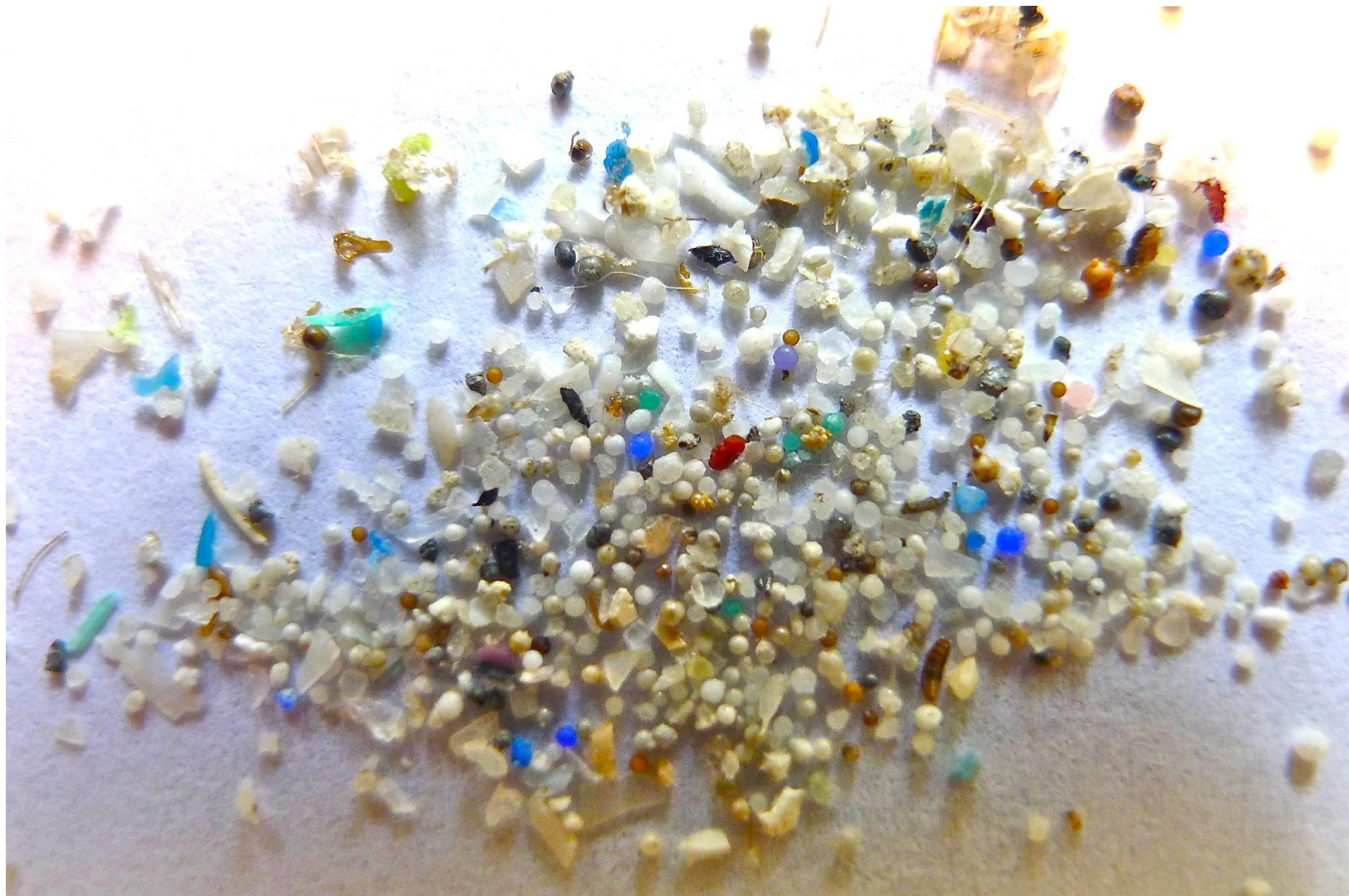


Image courtesy of MRC









**Wish you  
very successful  
experiments with new  
nanomaterials!**



Jean Monnet  
Programme



KIITOS  
DĚKUJI  
ДЯКУЮ  
СПАСИБО  
THANK YOU  
DANKE SCHÖN  
MUITO OBRIGADO