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**Biomimetic systems for water harvesting: structure and surface properties of polymer fibers**

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Water harvesting is one of the most critical issues in current research, as the water resources are continually shrinking. One of the unconventional ways to collect water are fog collectors, which designs can be improved by incorporating a large surface area that can be obtained with electrospun polymer fibers [1]. Following the biomimicking spider webs, we successfully translated the similar hydrophobic properties to an electrospun network of fibers. The novelty of this approach lays in obtaining similar macroscale roughness parameters, responsible here for wetting contact angles, due to the substitution of spider silk bundles with individual wrinkled electrospun fibers [2]. Our methods open new creative solutions for manufacturing anti-wetting surfaces without any chemical modification of fibers surfaces.

References:

1. U. Stachewicz, R.J. Bailey, H. Zhang, C.A. Stone, C.R. Willis, A.H. Barber, *Wetting hierarchy in oleophobic 3D electrospun nanofiber networks*, ACS Appl. Mater. Interf. 4 (2015), 16645–16652.
2. P.K. Szewczyk, J. Knapczyk-Korczak, D.P. Ura, S. Metwally, A. Gruszczyński, U. Stachewicz, *Biomimicking wetting properties of spider web from *Linothele megatheloides* with electrospun fibers*, Materials Letters, 233(2018), 211-214

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