



## SEE - MAPPING THE SKIN-IMMUNE INTERACTIONS OF NOVEL 2D MATERIALS: MXENES

Two-dimensional (2D) transition metal carbides/carbonitrides (MXenes), discovered by the outgoing phase Supervisor, Yury Gogotsi (H-index = 160), at Drexel University (USA), have stepped into the limelight of 2D materials (2DMs). Within the SEE project, the Fellow, Dr. Laura Fusco, will learn to produce and characterize MXenes from the most recognized leader in the field. SEE will provide a thorough evaluation of the skin impact and possible immunomodulation of a wide variety of MXenes. No study has investigated at the same time and on a large scale these key aspects for MXene safety and effective use as bioelectronics or biomedical tools applied to the skin. The outstanding peculiar scientific expertise of the Fellow, relying on the characterization of 2DM effects at the skin level depending on their physicochemical properties, will be essential to achieve the project goals. The European Fellow Supervisors, Bengt Fadeel and Lucia G. Delogu, among the most influential scientists in the field of nano-immunology and toxicology, will contribute to the Fellow training by employing the most cutting edge high-dimensional technologies at the single-cell level (e.g. CyTOF, Rhapsody and Hyperion) and pioneering cell-cell analysis systems (e.g. LIPSTIC approach) in this context. The Fellow will also explore the commercial applicability of her results during a secondment at the revolutionist biotech company Fluidigm Corporation. Within SEE, the Fellow will introduce her own novel concept of “Nano-SkinImmunity-by-design”, where the analysis of the cutaneous effects when designing MXenes (and 2DMs) will not only be relevant for their safety, but will also turn them into active tools for cutaneous applications endowed of immune properties, tailorable adjusting their physicochemical profile. By exploring these crucial aspects, SEE aims at incising the strategic field of MXenes and 2DMs as well as their role in biomedicine and nanotechnology at European level and beyond.

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**Department:** Department of Biomedical Sciences

**Coordinator:** Università degli Studi di Padova (Italy)

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**Find out more:** <https://cordis.europa.eu/project/id/101029140>