

Assoc. Prof. Dr. Esma Yenel Demir is an academic at Konya Technical University, Türkiye, with extensive multidisciplinary expertise in materials chemistry, nanomaterials, optoelectronics, photovoltaics, and radiation technologies. She received her B.Sc. (2009) and M.Sc. (2012) in Chemistry from Selçuk University, focusing on quantum dot-based hybrid solar cells, followed by a Ph.D. in Nanotechnology and Advanced Materials (2018) specializing in sepiolite scaffold-based, high-efficiency perovskite solar cells. Currently, she conducts her academic and teaching activities within the Nuclear Technology and Radiation Safety Program under the Department of Electricity and Energy at Konya Technical University. Her research program focuses on the rational design, synthesis, and interface engineering of functional nanomaterials for next-generation optoelectronic and energy devices. Key research vectors include: **Perovskite Photovoltaics & Interface Passivation:** Developing high-efficiency, durable perovskite solar cells using novel scaffold layers, interface modification agents, and additive engineering strategies. Notably, she is a co-inventor of patented technologies incorporating natural sepiolite minerals as functional scaffold architectures in both inverted and conventional solar cell geometries. **Optoelectronic Devices & Quantum Dots:** Synthesizing colloidal nanocrystals (e.g., CdS, CdSeS quantum dots), organic–inorganic hybrids, and conducting polymer composites for photodiodes, Schottky barrier photodetectors, and hybrid LEDs. **Polyoxometalates (POMs) & Functional Molecular Materials:** Engineering transition-metal-based POM interlayers (W-, Mo-, Co-, and Ni-based) and ruthenium(II)/diazfluorene complexes to optimize charge transport and photoresponsivity in silicon- and Schottky-type photodetectors. **Sustainable & Bio-Derived Nanomaterials:** Exploring clay-mineral-reinforced matrices, biopolymers (such as shellac-clay composites for organic field-effect transistors [OFETs]), and natural scaffolds for visible-light-driven photocatalytic hydrogen evolution. Dr. Yenel Demir has led and contributed to multiple high-profile research grants funded by the Scientific and Technological Research Council of Türkiye (TÜBİTAK 1001, 1002) and European Cooperation in Science and Technology (COST) actions. She actively supervises graduate theses addressing stability, performance, and environmental safety in emerging solar cells and functional clay composites. Her findings appear in leading peer-reviewed journals—such as *Scientific Reports*, *International Journal of Hydrogen Energy*, *Advanced Materials Interfaces*, *Journal of Materials Chemistry*, *Journal of Materials Science: Materials in Electronics*, and *Turkish Journal of Chemistry*—as well as international academic volumes published by Wiley.

