Berger, O., Yoskovitz, E., Adler-Abramovich, L., Gazit, E. Spectral transition in bio-inspired self-assembled peptide nucleic acid photonic crystals. ***Adv. Mater.***; 2016: 28, 2195 **Selected for the cover of the journal.**

Abstract: The intrinsic properties of guanine allow it to form multiple non-covalent interactions including electrostatic interactions, hydrogen bonds, hydrophobic interactions, and aromatic stacking. Recent studies revealed that guanine-containing short sequences of peptide nucleic acids (PNAs), synthetic nucleic acid analogues with an amide backbone, can also self-assemble into ordered structures with unique optical properties. These observations prompted us to examine whether PNA monomers can also undergo a process of self-association and organization into supramolecular assemblies, as it had previously been shown that even a single amino acid can self-assemble into fibrils with well-ordered electron diffraction. Commercially available organic small molecule presented in this study can serve as an appropriate substitute for the materials commonly used in the formation of photonic structures and include metals and semiconductors or polymers such as polystyrene and poly-(methyl methacrylate) (PMMA). The new bio-inspired photonic architecture could be a promising platform for applications such as surface enhanced Raman scattering (SERS), diffraction gratings, sensors, and optical coatings. The environmentally friendly nature of this system also makes it attractive for the paints and cosmetics industries as an additive to various products to provide a shimmering luster.