The presence of various organic compounds, such as personal care products, pharmaceutically active compounds, pesticides, and even hormones, so-called emerging contaminants (ECs), in the water systems is growing rapidly due to multiple uses of these substances in many branches of industry and everyday life. However, most of them are not fully converted and through the industrial, hospitals, households, and landfills effluent ECs might pass into various water bodies and are detected in the effluents of wastewater treatment plants. It should be emphasized that long-term contact with uncontrolled amounts of the emerging contaminants might seriously affect human health and aquatic environment leading to irreversible changes in it. Among others, of particular interest should be hormones, including estrogens, which are classified as highly cancerogenic and might induce mutations of endocrine system and disorders of reproductive system. As estrogens are resistant to biological and physicochemical treatment, recently used removal technologies suffer due to low efficiency, production of significant amounts of toxic wastes or application of hazardous reactants. **Therefore, evaluation and development of novel, eco-friendly and sustainable methodologies for effective removal of estrogens from water solutions, which is the main scientific objective of the presented project, is of high importance and has a high social impact due to challenging the problems directly related to the environmental protection. Within the frame of the project, novel composite electrospun materials, characterized by high stability and porosity will be synthesized, thoroughly characterized and used as supports for immobilization of enzymes from oxidoreductase group, which are capable for oxidation of numerous of phenolic compounds, including estrogens. Finally, produced biocatalytic systems will be applied for biodegradation of estrogens from model and real water solutions. Effect of process conditions on each of the processes planned to be carried out will be determined in order to optimize process parameters and, as a consequence persist the highest possible catalytic activity and operational stability of the immobilized enzymes. It should be added, that lack of data about effective production of electrospun-immobilized oxidoreductases and need for evaluation of efficient protocol for removal of estrogens from water solutions fully justifies the scientific problems aimed to be solved, explain the reason for undertaking these research issues and clearly indicate the novelty of the attempted study.** The presented project proposal is also of interdisciplinary character as borders such scientific areas as material science, biotechnology, chemical technology, and environmental protection and obtained data might provide new information and significantly enrich the current state of knowledge of each of the above-mentioned research disciplines. As a final result of the study, novel strategies for the synthesis of electrospun materials and immobilization of oxidoreductases within their use will be developed. Furthermore, efficient methodology, based on the produced biocatalytic systems, for removal of hazardous pollutants, such as estrogens from water solution will be evaluated, which will be the crucial and the most significant result of the project. Finally obtained data will provide novel and valuable knowledge related to the production and properties of the electrospun-made materials, application of a composite electropsun nanomaterials as support in enzyme immobilization and development of enzyme immobilization techniques for their use in environmental protection.