



DIRNANO - Directing the immune response through designed nanomaterials

DIRNANO provides a highly integrated and interdisciplinary training of next-generation Early Stage Researchers (ESRs) at the interface of nanopharmaceutical bioengineering and its translation on preclinical and human immunology.

DIRNANO will develop biocompatible nanopharmaceuticals with either “super”-stealth or immune-specific behavior for cancer immunotherapy and vaccination by mapping nanoparticle-immune interactions through two core approaches: 1) inception of novel surface engineering approaches, based on new organic polymers, zwitterionic lipids and conjugation chemistry strategies, 2) engineering of host or microbial-derived modulators of innate immunity (e.g. complement system).

DIRNANO team comprises internationally renowned scientists and industrialists at the forefront of nanoengineering, pharmaceutical sciences, molecular biosciences, commerce and business, thereby generating a unique pan-European macro-environment for interdisciplinary training of ESRs at the highest international level. Through participation of industrial partners, we will furnish ESRs with in-demand industrial and business skills, including process manufacturing, reproducibility and regulatory challenges, intellectual property and commercialization strategies.

DIRNANO will lead to rational engineering of broader libraries of NPs with tunable immune-modulating functions. The combinatorial analysis of new nanomaterial core-coat scaffolds will improve temporal and spatial understanding of biomaterial-innate immune interactions at the molecular level, thereby filling the void in overcoming adverse reactions to nanopharmaceuticals injection. DIRNANO will drive future development of small molecules and biologics-based nanopharmaceuticals through a “low-risk-high gain” perspective and within the context of personalized therapies and precision medicine. As such, DIRNANO, will extensively contribute to European science, education and socioeconomics value, skill retention and brain-gain.

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