

PNRR Missione 4, Componente 2, Investimento 1.4 “Potenziamento strutture di ricerca e creazione di "campioni nazionali di R&S" su alcune Key Enabling Technologies”
Iniziativa finanziata dall'Unione europea — NextGenerationEU.

National Center for Gene Therapy and Drugs based on RNA Technology
Sviluppo di terapia genica e farmaci con tecnologia a RNA

Codice progetto MUR: **CN00000041** – CUP UNINA: **E63C22000940007**

Doctorate of National Interest
RNA THERAPEUTICS AND GENE THERAPY

TITLE OF THE RESEARCH PROJECT

Molecular engineering and microfluidic-assisted preparation of RNA-loaded functional and targeted nanoparticles

SELECT ONE OF THE FOLLOWING RESEARCH AREA:

- ☐ Mechanisms of Diseases and Drug Target Identification
- ☒ Design and Delivery of New Gene Therapy and RNA-Based Medicines
- ☐ Validation and Safety In Preclinical and Clinical Studies

LOCATION OF THE RESEARCH ACTIVITY (INSTITUTION/DEPARTMENT):

Istituto Italiano di Tecnologia, Centre for Convergent Technologies (CCT), Genova

TUTOR:

Prof. Nicola Tirelli

PROPOSED RESEARCH ACTIVITIES (max 300 words):

The project will focus on:

- A) the molecular engineering of nanoparticle surfaces with ligands for surface receptors (over)expressed in tumor cells. Two different platforms of nanoparticles will be employed: ‘dummy’ nanoparticles to study the influence of surface chemistry on the processes of cell uptake and internalization, hyaluronic acid-based nanoparticles to implement on RNA-loaded nanoparticles the strategies first tried on ‘dummy’ nanoparticles.
- B) the development of nanoprecipitation/assembly methods for the nanoparticles above, which allow their preparation in microfluidic chips and in operator-independent fashion. This phase includes a collaboration with the group of Prof. Maffettone at the University of Naples.