Doctorate of National Interest
RNA THERAPUETICS AND GENE THERAPY

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): Università degli Studi Magna Graecia di Catanzaro, Dipartimento di Medicina Sperimentale e Clinica

TUTOR: Prof. Giovanni Cuda

PROPOSED RESEARCH ACTIVITIES (max 300 words):
Project Title: Unraveling Disease Mechanisms in Neurodegeration and Identifying Drug Targets through Targeted Serum Proteomics

Serum proteomics has emerged as a powerful tool for understanding the underlying mechanisms of diseases and facilitating the identification of potential drug targets. This project aims to explore the potential of serum proteomics in unraveling disease mechanisms and identifying novel therapeutic targets. Analysis will be focused on patients suffering from neurodegenerative disorders, such as Parkinson Disease and other Parkinsonisms (Progressive Supranuclear Palsy, PSP). The collected data will be analyzed to highlight the specific mechanisms through which serum proteomics can provide insights into disease pathogenesis, progression, and treatment response. Additionally, the project will emphasize the vital role of serum proteomics in the identification of drug targets and its potential for personalized and precision medicine approaches.

Analysis of serum proteome will be conducted on two innovative platforms: i) Olink Signature Q100, based on a unique technology behind, namely the Proximity Extension Assay (PEA), an innovative dual recognition, DNA-coupled methodology providing exceptional readout specificity. PEA enables high multiplex, rapid throughput biomarker analysis without compromising on data quality; ii) Quanterix Simoa, a, flexible, robust, and ultra-sensitive immunoassay platform for measuring up to 10-plex biomarkers, whose capabilities are designed specifically to address many of today's unmet needs in many research areas.

We expect that the project's outcomes will contribute to the advancement of knowledge in this field and may pave the way for future research and development of serum proteomics-based diagnostic and therapeutic strategies in neurodegeneration.