



ALLA MAGNIFICA RETTRICE
DELL'UNIVERSITA' DEGLI STUDI DI MILANO

COD. ID: 7104

Il sottoscritto chiede di essere ammesso a partecipare alla selezione pubblica, per titoli ed esami, per il conferimento di un assegno di ricerca presso il **Dipartimento di Scienze Biomediche e Cliniche**

Responsabile scientifico: **Dr.ssa Serena Mazzucchelli**

CURRICULUM VITAE

INFORMAZIONI PERSONALI

Cognome	Schmidt
Nome	Tiziana Julia Nadjeschda

OCCUPAZIONE ATTUALE

Incarico	Struttura
Assegnista di ricerca	Nanomedicine and Molecular Biology Laboratory, Unità di Biologia cellulare e dello sviluppo, Dipartimento di Biologia, Università di Pisa, Italia

ISTRUZIONE E FORMAZIONE

Titolo	Corso di studi	Università	anno conseguimento titolo
Laurea Triennale	Scienze Biologiche	Università di Pisa	2017
Laurea Magistrale	Biological Sciences	University of Constance (Germany)	2019
Dottorato Di Ricerca	Biologia	Università di Pisa	2024



LINGUE STRANIERE CONOSCIUTE

lingue	livello di conoscenza
German	Native
English	Advanced
Italian	Advanced
Spanish	Intermediate

PREMI, RICONOSCIMENTI E BORSE DI STUDIO

anno	Descrizione premio
2025	Assegno di ricerca
2024	Assegno di ricerca
2020	Borsa di studio

ATTIVITÀ DI FORMAZIONE O DI RICERCA

01/2024 – Current: Research associate, Department of Biology, University of Pisa, Italy: Research activity relative to “Axon regeneration based on mechanical stimulation via bio-/nanotechnology”, within the Tuscany Health Ecosystem project (Spoke n.8 Biotechnologies and Imaging in Neuroscience), under the supervision of Prof.V.Raffa Nanomedicine and Molecular Biology lab.

- Set up and established Standard Operating Procedures (SOPs) for green chemistry-based nanoparticle functionalization
- Designed and validated fusion proteins for intracellular nanotransducer targeting, ensuring specificity and functionality
- Established and optimized cell culture protocols for neuronal and immortalized cell lines, advancing neuroregeneration studies
- Independently developed and refined experimental protocols for molecular and cellular applications
- Collaborated with cross-functional teams to integrate molecular biology methods into neuroregeneration frameworks
- Coordinated project meetings and tracked milestones, ensuring timely and successful project completion
- Mentored undergraduate and graduate students in cell culture, protein synthesis, and molecular biology techniques

02/2020-06/2024 Participation to European Research project, Department of Biology, University of Pisa, Italy: Research activity within the EU Horizon 2020 Project I-GENE (GA 862714), under the supervision of Prof.V.Raffa, Nanomedicine and Molecular Biology lab.

- Focused on the development and validation of nanotransducers for gene therapy, contributing to innovative approaches in targeted genetic treatments
- Recombinant fusion protein design and synthesis for controllable gene editing
- Conducted research within the framework of the Horizon 2020 I-Gene Project, aimed at advancing nanotechnology for biomedical applications
- Collaborated with interdisciplinary teams across Europe to achieve project milestones and deliverables
- Presented findings at project meetings and contributed to progress reports for the European Union



Research activity

11/2020-12/2023 Ph.D. Researcher, Department of Biology, University of Pisa, Italy: Research activity relative to: “Nanogenetics, Nanostructure for programming molecular mechanisms”. Ph.D. cycle XXXVI, under the supervision of Prof.V.Raffa, Nanomedicine and Molecular Biology lab.

- Designed and synthesized distinct recombinant fusion proteins for prokaryotic (E. coli) and mammalian systems, optimizing yield and functionality
- Developed and validated workflows for protein purification using affinity chromatography (His-tagged systems) and characterization techniques
- Combined protein engineering with optogenetic CRISPR/Cas9 gene editing, creating precise tools for targeted gene modulation in cancer cell lines
- Bioengineered nanoparticles for intracellular delivery in neuronal regeneration studies and cancer cell line labeling
- Independently optimized protocols for protein synthesis, nanoparticle manufacturing and functionalization, blue light-stimulation, and intracellular targeting
- Supervised undergraduate and graduate students, guiding them in protein design and molecular biology projects

07/2023-10/2023 Research internship, Department of Biomedical Engineering, Eindhoven University, Netherlands: Nanoscopy for Nanomedicine Lab, under the supervision of Prof.L. Albertazzi.

- Design and development of distinct recombinant fusion proteins to serve as specific molecular probes for high-resolution microscopy applications and diagnostics

11/2022-12/2022 Research internship, Instituto de Nanociencia y Materiales de Aragón, Spain: under the supervision of Prof.Gerardo F. Goya.

- Optimized synthesis protocols to control particle size, surface properties, and magnetic characteristics of magnetic nanoparticles for specific biomedical uses

02/2020-10/2020 Research fellowship Department of Biology, University of Pisa, Italy: Research activity within the EU Horizon 2020 Project I-GENE (GA 862714), under the supervision of Prof.V.Raffa, Nanomedicine and Molecular Biology lab.

- Nanotransducers for gene editing
- Developed and optimized experimental protocols for nanotransducer-mediated CRISPR/Cas gene editing, focusing on its assembly, characterization and controlled gene modification

03/2019-08/2019 Experimental Master Thesis, Institute for Diabetes and Obesity, Helmholtz Centre Munich, Germany: Supervision of Prof.Dr.P.Pfluger, Unit of Neurobiology of diabetes.

- Investigated the impact of hypothalamic GPx7 depletion on gene and protein expression in KO and WT mice, focusing on metabolically important organs and inflammatory responses
- Analyzed the link between GPx7 deficiency and the development of metabolic syndrome through molecular and biochemical assays

10/2028-12/2018 Practical Internship, Institute for Diabetes and Obesity, Helmholtz Centre Munich, Germany: Supervision of Prof.P.Pfluger, Unit of Neurobiology of diabetes.

- Investigated the role of obesity-induced inflammation in the hypothalamus and its link to diabetes, focusing on signaling and molecular mechanisms

06/2018-07/2018 Practical Internship, Department of Biology, University of Constance, Germany: Supervision of Prof.Dr. Meyer, Unit of Molecular Evolution.

- Conducted phenotypic measurements for GWAS to assess genetic associations with morphological traits in Cichlid species

04/2018-06/2018 Practical Internship, Department of Biology, University of Constance, Germany: Supervision of Prof.Dr.Kleineidam/Prof.Dr.Galizia, Unit of Neurobiology.

- Investigated the role of sugar composition in the crop organ of Drosophila melanogaster as a sensor for regulating feeding behavior



01/2018-02/2018 Practical Internship, Department of Biology, University of Constance, Germany:
Supervision of Prof.Dr.Hauch, Unit of Cell Biology

- Studied the impact of quorum sensing derivatives of *Pseudomonas aeruginosa* on bacterial growth and cell viability using molecular and microbiological assays

09/2016-03/2017 Practical Internship, Department of Biology, University of Pisa, Italy: Supervision of Prof.R. Scarpato, Unit of Genetics.

- Assessment of cellular and genomic damage in systemic lupus erythematosus patient samples using biomolecular assays and genetic techniques

Technical Skills

Molecular Biology techniques

- CRISPR/Cas9 gene editing (design, optimization, and application)
- Extensive experience in recombinant protein design, synthesis, and purification in prokaryotic systems (*E. coli*) and mammalian expression systems (His-tagged proteins)
- Bacterial transformation, agar plate preparation, LB media preparation, microbial culturing, and colony screening
- Optimization of protein expression protocols to maximize yield and purity
- Molecular cloning (plasmid preparation, restriction digestion, and ligation)
- PCR, Quantitative real-time PCR (qPCR/RT-PCR), High-Resolution Melting (HRM) analysis, and luciferase reporter assays
- DNA/RNA extraction, purification, and quantitation from tissue and cultured cells
- Protein extraction and characterization in tissue and cell samples (Western Blot, Dot Blot, ELISA assays)
- SDS-PAGE and gel electrophoresis
- Protein quantification assays
- Nuclei isolation for epigenetic downstream analysis

Cell Culture & Cellular Techniques

- Isolation and culture of primary mouse embryonic neural cells (P0/P1)
- Management and expansion of primary, immortalized, and neuron-like cell lines
- Transfection methods (lipofection, electroporation, Amaxa Nucleofection) and viral transduction protocols
- Cell viability assays (e.g., MTT)
- Cell-based assays for functional studies (e.g., reporter assays, proliferation assays)
- Cryopreservation and maintenance of various cell lines
- Isolation and enrichment of specific cell populations (e.g., density gradient centrifugation)
- High-content imaging and analysis of live cells (e.g., fluorescence microscopy, confocal imaging)

Nanotechnology & Material Characterization

- Synthesis of magnetic iron oxide nanoparticles (MNPs)
- Functionalization and coating of distinct nanoparticles for biomedical applications
- Dynamic Light Scattering (DLS), Zeta potential analysis, FTIR, and UV-Vis spectroscopy
- Design and execution of nanoparticle-based cell treatment protocols
- Development of workflows for nanoparticle delivery and intracellular targeting

Microscopy & Imaging

- Confocal microscopy and advanced imaging techniques
- Scanning electron microscopy (SEM): sample preparation and analysis
- Skilled in cryosectioning fixed tissues using a cryostat for histological and imaging applications
- Immunohistochemical and histochemical staining techniques
- Preparation of immunohistochemistry specimens (cells and tissues)
- High-resolution microscopy for molecular and cellular analysis

Animal Models & Dissection Techniques

- Handling of distinct animal models (*Drosophila melanogaster*, *Mus musculus*, *Danio rerio*)
- Dissection of neuronal tissues (hippocampus, hypothalamus, cortex) and whole brain
- Dissection of non-neuronal tissues (liver, heart, muscle, pancreas, adrenal glands)



- Microinjection in zebrafish embryos and toxicity assessment in zebrafish larvae

Data Analysis & Bioinformatics

- Statistical analysis and data visualization (R, MATLAB, GraphPad Prism)
- Bioinformatics tools (BLAST, PrimerBlast, AlphaFold, Snapgene, Benchling, I-Tasser, HDOCK)
- Image analysis and graphic design (Fiji/ImageJ, BioRender)

Method Development & Technical Independence

- Independently design and optimize experimental protocols for molecular biology, cell culture, and imaging
- Build and customize laboratory devices to meet specific project requirements
- Proactively address technical challenges and improve workflow efficiency
- Develop reproducible and efficient methods for complex experimental setups

Laboratory Management

- Training and mentoring of laboratory staff and students
- Laboratory workflow optimization
- Resource management and ordering

ATTIVITÀ PROGETTUALE

Anno	Progetto
2025	"Axon regeneration using bio- and nanotechnology" (PNRR- Missione 4 "Istruzione e ricerca" Componente 2 "Progetti Tuscany Health Ecosystem (THE)" Affiliato Spoke n.8- Biotechnologies and imaging in neuroscience)
2024	"Axon regeneration using bio- and nanotechnology" (PNRR- Missione 4 "Istruzione e ricerca" Componente 2 "Progetti Tuscany Health Ecosystem (THE)" Affiliato Spoke n.8- Biotechnologies and imaging in neuroscience)
2020-23	FET OPEN EU Horizon 2020 project I-GENE, In-Vivo Gene Editing by NanotransducErs GA: 862714

CONGRESSI, CONVEGNI E SEMINARI

Data	Titolo	Sede
10/09/2024-12/09/2024	"Illuminating the future of gene editing", Poster presentation	4th Optogenetic Technologies and Applications" conference; Boston (MA), USA
19/03/2024-20/02/2024	"Illuminating the future of gene editing", Poster presentation	Advanced Therapies 2024" conference, London UK
07/02/2023-08/02/2023	"Nanogenetic design of a photo-activatable Split Cas9 for in vivo delivery and gene editing". Poster presentation	"CRISPR in Drug Discovery 2023" conference, Oxford UK
17/12/2021	"Talking about CRISPR": The future of genome editing. Part of the organization committee, Content creator and	Virtual event



	moderator	
10/2021-12/2021	“Protezione degli animali utilizzati a fini scientifici”. Attendee	Online seminar, University of Pisa
30/11/2021-03/12/2021	Practical workshop on advanced microscopy (6th NIC@IIT). Attendee	ITT, Centre for Human Technologies, Genova, Italy
11/11/2021-13/11/2021	I-GENE Training school: “How can nanomedicine be used for precise genome editing? “. Content organization, Lecture preparation	Virtual event, University of Pisa
04/10/2021-07/10/2021	EMBO workshop Axons 2021: Structure and function. Attendee	Virtual event
01/10/2021-03/10/2021	4th International conference on CRISPR technologies. Attendee	Virtual event
19/07/2021-21/07/2021	Virtual International Mammalian Synthetic Biology Workshop. Attendee	Virtual event
28/06/2021-01/07/2021	I-GENE Summer school: Nanomedicine for gene therapy. Attendee	Virtual event
11/11/2019-12/11/2019	Workshop on Image J processing. Attendee	Bioimaging Centre, University of Constance (Germany)
October 2018	Hands-on and theoretical course, <i>Mus musculus</i> welfare and handling	Helmholtz Centre Munich, Germany

PUBBLICAZIONI

Articoli su riviste
Effects of Metal Oxide Nanoparticles in Zebrafish. d'Amora M, Schmidt TJN, Konstantinidou S, Raffa V, De Angelis F, Tantussi F. <i>Oxid Med Cell Longev</i> . 2022 Feb 4;2022:3313016. doi: 10.1155/2022/3313016. PMID: 35154565; PMCID: PMC8837465.
CRISPR/Cas9 in the era of nanomedicine and synthetic biology. Schmidt TJN, Berarducci B, Konstantinidou S, Raffa V. <i>Drug Discov Today</i> . 2022 Sep 27:103375. doi: 10.1016/j.drudis.2022.103375. Epub ahead of print. PMID: 36174966.
A Transfection-Free Approach of Gene Editing via a gold-based nanoformulation of the Cas9 protein. Konstantinidou S, Lindstaedt A, Schmidt TJN, Nocilla F, Maltinti G, Rocco MA, Landi E, De Carli A, Crucitta S, Lai M, Pistello M, Cappello V, Witt D, Gabellini C, Barski P, Raffa V. <i>bioRxiv</i> 2024.07.09.602746; doi: https://doi.org/10.1101/2024.07.09.602746 .
Force-mediated microtubule stabilization induces global nuclear remodelling in neurons. Falconieri A, Da Palmata L, Cappello V, Schmidt TJN, Folino P, Storti B, Bizzarri R, Raffa V. Submitted.
Hypothalamic ablation of glutathione peroxidase 7 drives systemic glucose intolerance. Schriever SC,



Pfuhmann K, Schmidt TJN, Baumgart E, Harrison L, Baumann P, Buday K, Kabra DG, Conrad M, Tschöp MH, Pfluger PT. Intended journal: Diabetes, in preparation.
Toll-like receptor 4 deletion from Nkx2.1-positive hypothalamic neurons does not affect systemic glucose and energy homeostasis. Schriever SC, Baumgart E, Schmidt TJN, Martinovich K, Pfuhmann K, Divanovich S, Pfluger PT. Intended journal: Neuroinflammation, in preparation.
Bioengineered magnetic nanotransducers for targeted subcellular mechanotransduction and sustained neuroregenerative activation. Schmidt TJN <i>et. al.</i> In preparation.
Precision Gene Editing Using a Nanoswitch-Enhanced Optogenetic Split Cas9 System. Schmidt TJN <i>et. al.</i> In preparation.

ALTRE INFORMAZIONI

<u>Academic activity</u>
<u>Honorary fellowships</u>
<ul style="list-style-type: none">- <u>18/05/2023 - 17/05/2026</u>: Molecular Biology & Microbiology, Department of Biology, University of Pisa, Italy- <u>18/05/2023 - 13/12/2026</u>: Advanced Molecular Biology (WBO-LM), Department of Biology, University of Pisa, Italy- <u>17/01/2021 - 16/01/2024</u>: Nanomedicine, Nanotechnology for Neurosciences, Molecular Biology (Advanced), Department of Biology, University of Pisa, Italy
<u>Teaching support</u>
<ul style="list-style-type: none">- <u>01/11/2020- on-going</u>: Mentoring of undergraduate students- training and orienting laboratory activities, support and assistance in the writing of the experimental thesis- <u>Academic Year 2024/25</u>: Co-teacher in the course of Prof. C.Gabellini, Department of Biology, University of Pisa, Italy; Molecular Biology course, bachelor's degree Biological Sciences (069EE), front lectures (16 hours), laboratory course teaching activity- <u>Academic Year 2024/25</u>: Co-teacher in the course of Prof.V.Raffa, Department of Biology, University of Pisa, Italy; Molecular Biology and microbiology course, bachelor's degree Biotechnology (004FE), front lectures (12 hours), laboratory course teaching activity- <u>Academic Year 2022/23</u>: Teaching assistant to the laboratory course of Prof. C.Gabellini, Department of Biology, University of Pisa, Italy; Molecular Biology, bachelor's degree; laboratory teaching course activity, sample preparation and experimental handling (Fellowship for 40 hours)- <u>Academic Year 2021/22</u>: Supporting assistant to the laboratory course of Prof. C.Gabellini, Department of Biology, University of Pisa, Italy; Molecular Biology, sample preparation and experimental handling- <u>Academic Year 2021/22</u>: Supporting assistant to the laboratory course of Prof. V.Raffa, Department of Biology, University of Pisa, Italy; Nanomedicine course (Magnetic nanoparticle synthesis)- <u>Academic Year 2021/22</u>: Teaching assistant to the chair Prof.U.Borello, Department of Biology, University of Pisa, Italy; Cytology and Histology (bachelor's degree of Biological Sciences, University of Pisa), (Fellowship for 20 hours)
<u>Communication and interpersonal skills</u>
<u>Responsibility & Reliability</u>
<ul style="list-style-type: none">- Strong sense of responsibility and accountability- Independent working style with a strong determination to solve problems and meet deadlines- High reliability, patience, and endurance in achieving goals- Flexible and punctual, with excellent time and stress management skills- Maintaining control and calm in unexpected situations or under pressure



Organizational & Management Skills

- Proven ability to coordinate, plan, and manage projects effectively
- Good organizational skills developed during laboratory work and part-time jobs
- Skilled in problem-solving and optimization of processes
- Quick adaptability to unforeseen developments with a focus on innovative solutions
- Development of novel ideas and perspectives to tackle challenges creatively

Communication & Interpersonal Skills

- Highly social and adept at forming interpersonal relationships
- Strong contact and communication skills, acquired through research and part-time jobs
- Excellent teamwork skills with motivation and initiative to drive collaborative success
- Experience in national and international collaboration with diverse working groups
- Open for feedback, suggestions, and constructive criticism to improve performance

Multicultural Adaptability

- Great adaptability in multicultural environments, respecting individual needs
- Propensity for exchange and collaboration with diverse teams at international levels
- Willingness to travel and relocate nationally or internationally as required
- Enthusiastic and willing to participate in advanced training and technical courses

Le dichiarazioni rese nel presente curriculum sono da ritenersi rilasciate ai sensi degli artt. 46 e 47 del DPR n. 445/2000.

Il presente curriculum, non contiene dati sensibili e dati giudiziari di cui all'art. 4, comma 1, lettere d) ed e) del D.Lgs. 30.6.2003 n. 196.

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Si prega pertanto di **NON FIRMARE** il presente modello.

Luogo e data: Pisa, 23/01/2025