EUROPEAN CURRICULUM VITAE FORMAT

PERSONAL INFORMATION

Name **FICIARÀ ELEONORA**

WORK EXPERIENCE

• Feb 2022- Present
• University of Torino
• Post-Doc Researcher

Research fellowship "Application of artificial intelligence in neuroscience" (12 months)
Tutor Prof. C. Guiot

Department of Neuroscience "Rita Levi Montalcini", University of Torino, Torino, Italy
Research activities:
- Computational models for the study of biomarkers in neurodegenerative diseases: mathematical modeling for iron and amyloid beta trafficking across brain barriers, machine learning analysis for the prediction and classification of Alzheimer's disease and dementia.
- In silico nanomedicine: data analysis for the evaluation of physico-chemical properties and toxicity of nanovectors for novel therapy in neurodegenerative diseases.
- Knowledge of protocols for FAIR data and Open Science (i.e., Zenodo)

• Oct 2018- Feb 2022
• University of Torino
• PhD Candidate

PhD in Complex Systems for Life Sciences

Department of Neuroscience "Rita Levi Montalcini", University of Torino, Torino, Italy
Project Thesis: "Involvement of Iron in Brain Diseases: Computational Models for Innovative Diagnostic and Therapeutic Approaches"

- Machine Learning techniques and mathematical models for novel biomarkers in Alzheimer's disease: clustering analysis and classification methods to investigate role of iron in dementia.

- Mathematical modelling for MRI data (collaboration: Dr. F.Pizzagalli (Dep. of Neuroscience, UNITO; IGC, Keck School of Medicine of USC, USA) and Dr. V. Crespi (ISI, AI Division, USC, USA)): Markov models for the prediction of progression from Mild Cognitive Impairment to Alzheimer's Disease using MRI-based Cortical Features (based on ADNI database).

- Set up of a protocol for the measurement of iron in human cerebrospinal fluid samples using graphite furnace atomic absorption spectrometry (collaboration: Prof. O. Abollino, Dep. of Drug Science and Technology, UNITO).

- Computational models for novel theranostic nanovectors for application in tumors and neurodegenerative diseases (collaboration: Prof. R. Cavalli, Dep. of Drug Science and Technology, UNITO): evaluation of magnetic properties and toxicity of nanobubbles.

• June 2021
• Fondazione Italiana Fegato-ONLUS
• Stage

Visiting Researcher
on *"Fondazione Italiana Fegato–ONLUS*" AREA Science Park Basovizza, Trieste: studies on the toxicity of iron and nanobubbles in organotypic models of Parkinson's disease (Collaboration: Dr. Silvia Gazzin)

• March 2018
• MIUR
• Substitute Teaching

Substitute Teaching (Physics and Mathematics, Class A027, M.I.U.R.)
Liceo Scientifico, Istituto di Istruzione Superiore Savoia Benincasa, Ancona, Italy

• March – Dec 2017
• University of Torino
• Internship

Internship in Laboratory of Cellular and Molecular Angiogenesis (Prof.Luca Munaron)
Department of Life Sciences and Systems Biology, University of Torino, Torino, Italy.
Application of electrophysiological techniques (patch-clamp) on tumor endothelial cells and biophysical modelling of ion channels (analysis of currents based on statistical methods).

EDUCATION AND TRAINING

• Oct 2018 – Feb 2022 • University of Torino • PhD	**PhD in Complex Systems for Life Sciences** Department of Clinical and Biological Sciences, PhD School "Health and Life Sciences" University of Torino, Torino (Italy) Thesis: "Involvement of Iron in Brain Diseases: Computational Models for Innovative Diagnostic and Therapeutic Approaches" (Defence:18/02/2022); Tutor: Prof.Caterina Guiot (SSD FIS/07)
• May 2018 • University of Camerino	**Percorso Formativo 24 CFU, MIUR** University of Camerino, Camerino (MC), Italy
• Oct 2015 – Dec 2017 • University of Torino • Master's Degree	**Master's Degree in Physics (LM-17) University of Torino (TO) (Italy)** **110/110 honors** Thesis: "Analysis of purinergic P2X7R-related single-channel currents in tumor-derived human endothelial cells" Supervisor: Prof. Luca Munaron (SSD BIO/09)
• Oct 2011 – Dec 2014 • University of Camerino • Bachelor's Degree	**Bachelor's Degree in Physics (L-30) University of Camerino (MC) (Italy)** **110/110** Thesis: "Una teoria cinetica dei gas granulari" Supervisor: Prof. Umberto Bettolo Marconi

TEACHING ACTIVITY

• Oct 2019 - Present • Azienda Ospedaliero-Universitaria, Città della Salute e Scienza di Torino • Didactic Collaborator	**Didactic Collaborator for modules: "Fisica Medica", "Fisica 1" and "Fisica Applicata"** (CdL Professioni Sanitarie, Scuola di Medicina, Polo di Torino: Dietistica, Infermieristica, Fisioterapia, Logopedia, Tecniche Audiometriche, Tecniche Audioprotesiche, Igiene Dentale, Tecniche di Neurofisiopatologia, Tecniche di Radiologia Medica, per Immagini e Radioterapia)

PERSONAL SKILLS AND COMPETENCES

MADRELINGUA	**ITALIANA**
OTHER LANGUAGE	**INGLESE: B2**
SOCIAL SKILLS AND COMPETENCES	During my research activity I developed a strong ability to work in team and in multidisciplinary activities. I am a proactive person, positive in sharing and proposing ideas. I also took part in several scientific dissemination activities for citizens and non-expert public.
ORGANIZATIONAL SKILLS AND COMPETENCES	I developed skills in the analysis of complex data in multidisciplinary applications, especially in biomedical field. In particular, I actively took part in planning scientific projects and related publications in scientific journals.
TECHNICAL SKILLS AND COMPETENCES	• Excellent knowledge of Python, R, Excel • Good knowledge of MATLAB, SPSS, ImageJ • Basic experience in confocal and fluorescence microscopy, cell cultures.
DRIVING LICENSE	Patente B

ADDITIONAL INFORMATION

PUBLIC ENGAGEMENT AND SCIENTIFIC DISSEMINATION ACTIVITIES

• Progetto Vicini "La Scienza per la Città al Valentino" (16-20 Novembre 2022), Università di Torino, Dipartimento di Neuroscienze Rita Levi Montalcini, sezione di Fisiologia, Corso Raffaello 30; dissemination activities on nanomedicine for high school students.

• Festival della Scienza "Fermhamente" 2022, Fermo (FM): school didactic laboratory: "Matematica e Connessioni: un'introduzione alla teoria dei grafi"; https://www.fermhamente.it/medie-ficiara ; conference "Connessioni e cervello: dalle reti neurali fisiche a quelle artificiali" https://www.fermhamente.it/super-ficiara8b6940f3

• FameLab2022 "Talking Science" Ancona https://www.youtube.com/watch?v=QAspQvXWI9M; topic: "Nanomedicine"

• Festival della Scienza "Fermhamente" 2021, Fermo (FM). "La nanomedicina: piccole particelle per affrontare grandi sfide" https://www.youtube.com/watch?v=bxJBOQOadlE; conference "La "nano" rivoluzione della medicina: come e cosa può cambiare?"

CERTIFICATIONS AND PRIZES

• Certificates of attendance FAD-IZSLER (Istituto Zooprofilattico Sperimentale della Lombardia e dell'Emilia Romagna):

1)"LEGISLAZIONE NAZIONALE ED ETICA LIVELLO 1, MODULI 1 E 2, DM 5 AGOSTO 2021"

2) "BIOLOGIA E GESTIONE DEGLI ANIMALI DA LABORATORIO, MODULI 3.1, 4, 5, 6.1, 7. DM 5 AGOSTO 2021 RODITORI E LAGOMORFI"

3)" ETICA E CONCEZIONE DEI PROGETTI, MODULI 9, 10, 11, DM 5 AGOSTO 2021"

• Prize for Best Communications, 106° Congresso Nazionale Società Italiana Fisica 2020 "Potential Therapeutic Use of Magnetic Nanocarriers in Brain Tumors" https://www.sif.it/riviste/sif/ncc/econtents/2021/044/04-05/article/25

• Certificate "Big Data, Genes and Medicine" – The State University of New York - Coursera

• Certificate "Complete Tensorflow 2 and Keras Deep Learning Bootcamp" – Udemy

• 2nd Winter School on Machine Learning, WISMAL 2020: Neural Network Design, Clustering Analysis, Multi-target Prediction, Deep Learning

• "EUROPIN Summer School on Drug Design" 2021 University of Vienna

• Certificate of Attendance "Basic of Project Writing", "Horizon Europe and Project Writing"- University of Torino

• Certificate of Attendance "Open Science and FAIR Data", University of Torino

CONFERENCES

1.Oral presentation,105° National Congress of Physics Italian Society (SIF) 2019 (23-27 September, Gran Sasso Science Institute, L'Aquila, Italia) "Iron content in Cerebrospinal Fluid (CSF) as novel biomarker for early diagnosis of dementia"

2. Poster Communication, 2nd Brainstorming Research Assembly for Young Neuroscientist BRAYN 2019 (14-16 November, Milano, Italy) "Iron content in Cerebrospinal Fluid (CSF) as novel biomarker for early diagnosis of Alzheimer's Disease"

3. 2nd Winter School on Machine Learning, WISMAL, (7-12 January 2020) University of Groeningen, University of Twente, Universidad de Las Palmas de Gran Canaria

4. Poster Communication, 2nd International Conference on Nanomaterials Applied to Life Sciences NALS 2020 (29-31 January, Madrid, Spain) "SPION decorated Nanobubbles as drug-delivering theranostic agent"

5. Poster Communication, Advances in Alzheimer's and Parkinson's Therapies AAT-AD/PD™ Focus Meeting 2020 (2-5 April, Vienna, Austria) "Iron Concentration in Cerebrospinal Fluid and Serum as Novel Biomarker during Progression of Dementia"

6. Oral Presentation, International Conference of the IEEE Engineering in Medicine and Biology Society 2020 (20-24 July 2020, Montreal, Canada) "A mathematical model for the evaluation of iron transport across the blood-cerebrospinal fluid barrier in neurodegenerative diseases" (Publication of Proceeding)

7. Oral presentation,106° National Congress of Physics Italian Society (SIF) 2020 (14-18 September "Potential Therapeutic Use of Magnetic Nanocarriers in Brain Tumors" (Prize for Best Communications, Publication in "Il Nuovo Cimento - Colloquia and Communications in Physics")

8. Speaker, SmartConf2020(https://events.vfu.bg/smartconf_2020/,3-5 December, Varna Free University Chernorizets Hrabar, Bulgaria) Presentation "A Machine Learning Approach to Alzheimer's Disease Diagnosis"

9. Poster Communication, Advances in Alzheimer's and Parkinson's Therapies AAT-AD/PD™ Focus Meeting 2021 (9-14 March, Barcelona) "Multifunctional Theranostic Platform Counteracting Iron-induced Oxidative Stresses in Alzheimer's Disease Brain''

10. Oral Presentation, International Conference of the IEEE International Symposium on Biomedical Imaging (ISBI) 2021 (13-16 April 2021, Nice, France) "Predicting Progression from Mild Cognitive Impairment to Alzheimer's Disease using MRI-based Cortical Features and a Two-State Markov Model"

11. "EUROPIN Summer School on Drug Design "(Virtual 13-17 September 2021) University of Vienna

12. Invited Speaker,107° National Congress of Physics Italian Society (SIF) 2021 (13-17 September) "A multi-state Markov model predicting progression from mild cognitive impairment to Alzheimer's disease using MRI-based cortical features"

13. Oral Presentation "A Compartmental Model for the Iron Trafficking Across the Blood- Brain Barriers in Neurodegenerative Diseases", 43rd Annual International Conference of the IEEE Engineering in Medicine and Biology Society (1-5 November 2021, Virtual) (Publication of Proceeding)

14. Oral Presentation "CEREBRO-SPINAL FLUID: HOW INVESTIGATING OUR BRAIN-DUSTBIN CAN HELP TO FIGHT NEURODEGENERATION" BIOLOGICAL FLUIDS & FLOWS, 31MARCH – 1 APRIL, 2022, CAMBRIDGE, UK https://sites.google.com/view/tjp80/home

15. Participation International Conference on Nanomaterials applied to Life Sciences NALS 2022 (27-29 April 2022), Santander, Spain

16. Oral Presentation "Three-compartmental model for the iron passage through the blood brain barrier" Models in Population Dynamics, Ecology and Evolution (MPDEE) Torino, Italy - June 13-17, 2022

17. Poster Presentation "Nanoinnovation 2022" Roma (19-23 September 2022) "Nano-theranostic chelating agents: an innovative approach to regulate intracellular iron in brain" PS.28 on https://www.nanoinnovation2022.eu/home/index.php/programme/posters/poster-session

PUBLICATIONS

https://orcid.org/0000- 001-7986-0553 **Publications as First/ Co-first Author**

[1] Ficiarà, E.; Stura, I.; Guiot, C. "Iron Transport across Brain Barriers: Model and Numerical Parameter Estimation" Mathematics 2022, 10, 4461. https://doi.org/10.3390/math10234461

[2] Ficiarà, E.; Stura, I.; Guiot, C. "Iron Deposition in Brain: Does Aging Matter?" International Journal of Molecular Science. 2022, 23, 10018. https://doi.org/10.3390/ijms231710018

[3] Ficiarà E.*, Munir Z.*, Boschi S., Caligiuri M.E., Guiot C. "Alteration of Iron Concentration in Alzheimer's Disease as a Possible Diagnostic Biomarker Unveiling Ferroptosis" International Journal of Molecular Science 2021, 22(9), 4479; https://doi.org/10.3390/ijms22094479

[4] Ficiarà E., D'Agata F., Argenziano M., Cavalli R., Guiot C. "Potential therapeutic use of magnetic nanocarriers in brain tumors" Nuovo Cimento della Societa Italiana di Fisica C 2021, 44(4-5), 131. DOI: 10.1393/ncc/i2021-21131-5 https://www.sif.it/riviste/sif/ncc/econtents/2021/044/04-05/article/25

[5] Ansari S.A.*, Ficiarà E.*, D'Agata F., Cavalli R., Nasi L., Casoli F., Albertini F., Guiot C. "Step-by-Step Design of New Theranostic Nanoformulations: Multifunctional Nanovectors for Radio-Chemo-Hyperthermic Therapy under Physical Targeting" Molecules 2021, 26(15), 4591 https://www.mdpi.com/1420-3049/26/15/4591

[6] Ficiarà E., D'Agata F., Priano L., Cattaldo S., Mauro A., Guiot C. "A Compartmental Model for the Iron Trafficking Across the Blood- Brain Barriers in Neurodegenerative Diseases" 2021 43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC), 2021, pp. 4200-4203, doi: 10.1109/EMBC46164.2021.9629893.

[7] Ficiarà E., Crespi V., Gadewar S, Thomopoulos S., Boyd J., Thompson P.M., Jahanshad N., F. Pizzagalli, and the Alzheimer's Disease Neuroimaging Initiative "Predicting Progression from Mild Cognitive Impairment to Alzheimer's Disease using MRI-based Cortical Features and a Two-State Markov Model" 2021 IEEE 18th International Symposium on Biomedical Imaging (ISBI), 2021, pp. 1145-1149, doi: 10.1109/ISBI48211.2021.9434143.

[8] Ficiarà E., Boschi S., Ansari S., D'Agata F., Abollino O., Caroppo P., Di Fede G., Indaco A., Rainero I., and Guiot C. Machine Learning Profiling of Alzheimer's Disease Patients Based on Current Cerebrospinal Fluid Markers and Iron Content in Biofluids", Frontiers in Aging Neuroscience, 2021 https://doi.org/10.3389/fnagi.2021.607858

[9] Ficiarà E., D'Agata F., Ansari S., Boschi S., Rainero I., Priano L., Cattaldo S., Abollino O., Cavalli R. and Guiot C. "A Mathematical Model for the Evaluation of Iron Transport Across the Blood-Cerebrospinal Fluid Barrier in Neurodegenerative Diseases", 2020 42nd Ann. Int. Conf. IEEE Eng. Med. Biol., pp. 2270-2273, 10.1109/EMBC44109.2020.9175988

[10] Ficiarà E.*, Ansari S*, Argenziano M., Cangemi L., Monge C.,Cavalli R. and D'Agata F. "Beyond Oncological Hyperthermia: Physically Drivable Magnetic Nanobubbles as Novel Multipurpose Theranostic Carriers in the Central Nervous System" Molecules 2020, 25(9), 2104; https://doi.org/10.3390/molecules25092104 .

[11] Ansari S.*, Ficiarà E.*, Ruffinatti F.A., Stura I., Argenziano M., Abollino O., Cavalli R., Guiot C. and D'Agata F. "Magnetic Iron Oxide Nanoparticles: Synthesis, Characterization and Functionalization for Biomedical Applications in the Central Nervous System." Materials (Basel). 2019 Feb 2;12(3). https://www.mdpi.com/1996-1944/12/3/465

Other publications:

[12] Robella M., De Simone M., Berchialla P., Argenziano M., Borsano A., Ansari S., Abollino O., Ficiarà E., Cinquegrana A., Cavalli R. and Vaira M. "A phase I dose escalation study of oxaliplatin, cisplatin and doxorubicin applied as PIPAC in patients with peritoneal carcinomatosis" Cancers 2021, 13(5), 1060 https://www.mdpi.com/2072-6694/13/5/1060

[13] Munir Z., Banche G., Cavallo L., Mandras N., Roana J., Pertusio R., Ficiarà E., Cavalli R. and Guiot C. Exploitation of the Antibacterial Properties of Photoactivated Curcumin as 'Green' Tool for Food Preservation. Int. J. Mol. Sci. 2022, 23, 2600.https://doi.org/10.3390/ijms23052600

[14] UniToBrain Dataset; Gava U., D'Agata F., Bennink E., Tartaglione E., Perlo D., Vernone A., Bertolino F., Ficiarà E., Cicerale A., Pizzagalli F., Guiot C., Grangetto M., Bergui M., DOI:10.5281/zenodo.5109415.

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