

Emiliano Fratini

PERSONAL INFORMATION

Family name: **FRATINI**

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EDUCATION:

2024 **Corso “Managing Genetically Engineered Animals Through the Lens of the 4Rs**. Charles River.

2022 **Course “Biology and management of laboratory animals, Modules 3.1, 4, 5, 6.1, 7. DM 5 AGOSTO 2021 Rodents and Lagomorphs”**, Istituto Zooprofilattico Sperimentale della Lombardia e dell’Emilia-Romagna, Italia.

2022 **Course “Animal-Welfare Body: Training on specific tasks, Modules 25, 50, 51”**, Istituto Zooprofilattico Sperimentale della Lombardia e dell’Emilia-Romagna, Italia.

2022 **Course Basic elements for the researchers' approach to the use of animals for scientific purposes**, Istituto Zooprofilattico Sperimentale della Lombardia e dell’Emilia Romagna.

2022 **Basic course on the use of aquatic organisms for scientific purposes**, Istituto Zooprofilattico Sperimentale della Lombardia e dell’Emilia Romagna.

2021 **Course “Welfare and care of large animals used in scientific projects”**, Università di Pisa, Pisa, Italy.

2020 **Training course for the protection of laboratory animals in scientific research**, Università Cattolica del Sacro Cuore/Centro Ricerche Sperimentali, Rome, Italy.

2019 **Workshop “Technology in scientific research: a contribution to Reduction”**, Centro Europeo di Ricerca sul Cervello CERC, Rome, Italy.

2019 **Workshop “Zebrafish as a tool to investigate rare and genetic diseases: models, emerging techniques and regulation”**, Ospedale Pediatrico Bambino Gesù, Rome, Italy.

2019 **Course “Welfare of laboratory animals and alternative methodologies to animal experimentation”** Istituto Zooprofilattico Sperimentale / Regione Lazio, Rome, Italy.

2011 **PostDoc Training** under the supervision of Prof. Sykes at the Flinders University, Adelaide, South Australia.

2010 **Philosophiæ Doctor** at the Ph.D. school of “Roma Tre” University. Research was carried out in ENEA.

Thesis: **“Identification of Molecular process specific for low doses of high LET radiation in *in vivo*”**

mouse peripheral blood lymphocytes and skin tissue”.

2007 **Master’s Degree** 110(out of 110) with honors in Molecular and Cell Biology at the SMFN school of “Roma Tre” University.

Thesis: “**Polyamine Metabolism and cell differentiation**”.

2005 **Bachelor’s Degree** in Biology at the SMFN school of “Roma Tre” University.

Thesis: “**Aromatic Compound Metabolism**”.

CURRENT POSITIONS:

25/04/2023-Present: **Animal Welfare Officer, pursuant to article 20, sp 6, of D.lgs. n. 26/2014.** Italian National Agency for New Technology, Energy and Sustainable Economic Development (ENEA), SSPT- Division of Biotechnologies (BIOTEC), Roma, Italia.

06/09/2021-present: **Research Scientist.** Italian National Agency for New Technology, Energy and Sustainable Economic Development (ENEA), SSPT- Division of Biotechnologies (BIOTEC), Laboratory of RED biotechnologies, Rome, Italy.

WORK EXPERIENCES:

01/02/2021-04/09/2021: **External Collaborator.** Università Cattolica del Sacro Cuore (UCSC), Experimental Research Center, Rome, Italy.

Feb 2019-June 2021: **Subject expert (Molecular biology, Advanced molecular biology, Molecular biotechnologies).** Third University of Rome (Uniroma3), Rome, Italy.

Feb 2019-Jan 2021: **Research fellowship.** Third University of Rome (Uniroma3), Rome, Italy.

Oct 2014-Apr 2017: **Lieutenant Junior Grade.** Italian Navy/Coast Guard, Rome, Italy.

2013-2014: **Research fellowship** “Museo Storico della Fisica e Centro Studi e Ricerche Enrico Fermi” , Rome, Italy.

2011-2013 **Junior Grant** “Museo Storico della Fisica e Centro Studi e Ricerche Enrico Fermi” , Rome, Italy. This research belong to the In vitro-In vivo MURine coSmiC siLEnce experiment.

2007-2010 **PhD Fellowship** funded by Italian Space Agency (ASI) for research on the effects of the extreme conditions which the space environment present; clarifying, at cellular and molecular level, the main immune, genetic and metabolic alterations of organisms exposed to the space environment (in particular Radiation). This research belong to the **MOMA project**.

Recent Research activity:

ENEA:

- **SEAWAVE and DISCOVER Projects**
- Research project manager **Biological control of some tick species by means of hymenopteran parasitoids of the genus Ixodiphagus spp.** Authorization n° 242/2022-PR
- Responsible for carrying out the experiments in the project **Maintenance of mouse lines**

susceptible or resistant to some skin carcinogens. Authorization n° 194/2022-PR

- **Identification of Molecular process specific for low doses of high LET radiation in *in vivo* mouse peripheral blood lymphocytes and skin tissue.**

Rome TRE University:

- **CANBBIO and Italia-USA collaboration Projects**
- **Polyamine Metabolism and cell differentiation.**

“Centro FERMI” and ISS:

- **MUSCLE and Cosmic Silence Projects**

Publication:

2024 Tanno, B.; Fratini, E.; Leonardi, S.; Novelli, F.; Pisano, V.; Mancuso, M.; Pazzaglia, S. *Dissecting the Impact of Genetic Background on Oncogenic Response to Radiation Exposure in the Ptch1+/- Mouse Model*. Cells 2024, 13, 1912. <https://doi.org/10.3390/cells13221912>

2024 Riccieri, A.; Spagoni, L.; Li, M.; Franchini, P.; Rossi, M.N.; Fratini, E.; Cervelli, M.; Bologna, M.A.; Mancini, E. *Comparative genomics provides insights into molecular adaptation to hypermetamorphosis and cantharidin metabolism in blister beetles (Coleoptera: Meloidae)*. Integrative Zoology 00, 1–14. <https://doi.org/10.1111/1749-4877.12819>

2024 Iakovidis, S.; Leonardi, S.; Fratini, E.; Pazzaglia, S.; Mancuso M. and Samaras, T. *Murine Skin Dosimetry Under Millimeter Wave Exposure*. IEEE Journal of Microwaves, vol. 4, no. 2, pp. 204-212, April 2024, doi: 10.1109/JMW.2023.3345133.

2024 Giovannini, D.; Antonelli, F.; Casciati, A.; De Angelis, C.; Astorino, M.D.; Bazzano, G.; Fratini, E.; Ampollini, A.; Vadrucci, M.; Cisbani, E.; Nenzi, P.; Picardi, L.; Saran, A.; Marino, C.; Mancuso, M.; Ronsivalle, C.; Pazzaglia, S. *Comparing the effects of irradiation with protons or photons on neonatal mouse brain: Apoptosis, oncogenesis and hippocampal alterations*. Radiotherapy and Oncology, 2024, 195, 110267. <https://doi.org/10.1016/j.radonc.2024.110267>.

2023 Vitali, R.; Palone, F.; De Stefano, I.; Fiorente, C.; Novelli, F.; Pasquali, E.; Fratini, E.; Tanori, M.; Leonardi, S.; Tanno, B.; et al. *Characterization of Early and Late Damage in a Mouse Model of Pelvic Radiation Disease*. Int. J. Mol. Sci. 2023, 24, 8800. <https://doi.org/10.3390/ijms24108800>

2023 Varzi, V.; Fratini, E.; Falconieri, M.; Giovannini, D.; Cemmi, A.; Scifo, J.; Di Sarcina, I.; Aprà, P.; Sturari, S.; Mino, L.; et al. *Nanodiamond Effects on Cancer Cell Radiosensitivity: The Interplay between Their Chemical/Physical Characteristics and the Irradiation Energy*. Int. J. Mol. Sci. 2023, 24, 16622. <https://doi.org/10.3390/ijms242316622>

2023 Giovannini D., De Angelis C. Astorino M.D., Fratini E., Cisbani E., Bazzano G., Ampollini A., Piccinini M., Nichelatti E., Trinca E., Nenzi P., Mancuso M., Picardi L., Marino C., Ronsivalle C. and Pazzaglia S. *In Vivo Radiobiological Investigations with the TOP-IMPLART Proton Beam on a Medulloblastoma Mouse Model*. Int. J. Mol. Sci. 2023, 24, 8281. <https://doi.org/10.3390/ijms24098281>

2023 Tanori, M.; Pitaro, M.; Fratini, E.; Colantoni, E.; Amoresano, A.; Celentano, S.; Chiaramonte, B.; Mancuso, M. *Safety in Rats of a Novel Nasal Spray Formulation for the Prevention of Airborne Viral*

Infections. Pharmaceutics 2023, 15, 591. <https://doi.org/10.3390/pharmaceutics15020591>

2022 Fratini E., Rossi M.N., Spagoni L., Ricciari A., Mancini E., Polticelli F., Bologna M.A., Mariottini P. and Cervelli M. *Molecular Characterization of Kunitz-Type Protease Inhibitors from Blister Beetles (Coleoptera, Meloidae)*. *Biomolecules* 2022, 12, 988. <https://doi.org/10.3390/biom12070988>

2022 Muzzi M., Mancini E., Fratini E., Cervelli M., Gasperi T., Mariottini P., Persichini T., Bologna M.A., Di Giulio A. *Male Accessory Glands of Blister Beetles and Cantharidin Release: A Comparative Ultrastructural Analysis*. *Insects* 2022, 13, 132. <https://doi.org/10.3390/insects13020132>

2021 Fratini E, Salvemini M, Lombardo F, Muzzi M, Molfini M, Gisondi S, Roma E, D'Ezio V, Persichini T, Gasperi T, Mariottini P, Di Giulio A, Bologna MA, Cervelli M and Mancini E (2021) *Unraveling the role of male reproductive tract and haemolymph in cantharidinexuding Lydus trimaculatus and Mylabris variabilis (Coleoptera: Meloidae): a comparative transcriptomics approach*. *BMC Genomics* (2021) 22:808 <https://doi.org/10.1186/s12864-021-08118-8>

2021 Licursi V, Wang W, Di Nisio E, Cammarata FP, Acquaviva R, Russo G, Manti L, Cestelli Guidi M, Fratini E, Kamel G, Amendola R, Pisciotta P & Negri R *Transcriptional modulations induced by proton irradiation in mice skin in function of adsorbed dose and distance*, *Journal of Radiation Research and Applied Sciences*, (2021) 14:1, 260-270, DOI: 10.1080/16878507.2021.1949675

2020 Muzzi M, Di Giulio A, Mancini E, Fratini E, Cervelli M, Gasperi T, Mariottini P, Persichini T, Bologna MA. *The male reproductive accessory glands of the blister beetle Meloe proscarabaeus Linnaeus, 1758 (Coleoptera: Meloidae): Anatomy and ultrastructure of the cantharidin-storing organs*. *Arthropod Struct Dev.* (2020) 59: 100980.

2019 Fratini E, Cervelli M, Mariottini P, Kanamori Y, Amendola R and Agostinelli E. *Link between spermine oxidase and apoptosis antagonizing transcription factor: A new pathway in neuroblastoma* *International Journal of Oncology* (2019) 55: 1149-1156.

2019 Leonetti A, Baroli G, Fratini E, Pietropaoli S, Marcoli M, Mariottini Paolo, Cervelli M. *Epileptic seizures and oxidative stress in a mouse model over-expressing spermine oxidase*. *Amino Acids*

2015 I. Pecchia, V. Dini, L. Ricci-Vitiani, M. Biffoni, M. Balduzzi, E. Fratini, M. Belli, A. Campa, G. Esposito, G. Cirrone, F. Romano, C. Stancampiano, F. Pelacchi, R. Pallini and M. A. Tabocchini. *Glioblastoma stem cells: radiobiological response to ionizing radiation of different qualities*. *Radiation Protection Dosimetry* (2015), Vol. 166, No. 1-4, pp. 374-378

2015 E. Fratini, C. Carbone, D. Capece, G. Esposito, G. Simone, M.A. Tabocchini, M. Tomasi, M. Belli and L. Satta. *Low radiation environment affects the development of protection mechanisms in V79 cells*. *Radiation and Environmental Biophysics* (2015) 54:183-194

2014 E. Fratini and R. Amendola. *Caves and other subsurface environments in the future exploration of Mars: the absence of natural background radiation as biology concern*. *Rend. Fis. Acc. Lincei Dic.* DOI: 10.1007/s12210-013-0270-0.

2014 V. Licursi, E. Fratini, B. Benassi, M. Cestelli-Guidi, C. Consales, A. Marcelli, C. Mirri, R. Negri, R. Amendola. *A proposed integrated systems approach to the radiation biology of cosmic interest: biophysics and molecular characterization of tissues irradiated with 14 MeV neutrons*. *Rend. Fis. Acc. Lincei*

2014 M. Cestelli Guidi, C. Mirri, E. Fratini, V. Licursi, A. Marcelli. *FT-IR imaging spectroscopy as a complementary analytical technique to monitor lipids as biomarkers to high-LET (linear energy transfer) radiation*. *Rend. Fis. Acc. Lincei*

2013 R. Amendola, M. Cervelli, G. Tempera, E. Fratini, L. Varesio, P. Mariottini, E. Agostinelli. *Spermine metabolism and radiation-derived reactive oxygen species for future therapeutic implications in cancer: an additive or adaptive response*. Amino acids Sept 2013 DOI: <http://dx.doi.org/10.1007/s00726-013-1579-9>

2013 R. Amendola, M. Cervelli, E. Fratini, D.E. Sallustio, G. Tempera, T. Ueshima, P. Mariottini, E. Agostinelli. *Reactive oxygen species spermine metabolites generated from amine oxidases and radiation represent a therapeutic gain in cancer treatments*. International Journal of Oncology Sept. 2013; 43(3):813-20

2013 E. Fratini, M. Balduzzi, F. Antonelli, E. Sorrentino, G. Esposito, G. Cuttone, F. Romano, V.Dini, G. Simone, M. Belli, A. Campa, M. A. Tabocchini. *Comparison of the Biological Effectiveness of 45 MeV C-Ions and γ -Rays in Inducing Early and Late Effects in Normal Human Primary Fibroblasts*. AIP Conference Proceedings 1530,197-204 (2013); doi: 10.1063/1.4812923

2012 E. Fratini and D. Capece. *Dalle basse dosi al «Silenzio Cosmico»: nuove evidenze degli effetti delle radiazioni ionizzanti per la salute*. Il Nuovo Saggiatore Vol. 28, anno 2012, no. 5-6.

2012 D. Capece and E. Fratini. *The use of pKZ1 mouse chromosomal inversion assay to study biological effects of environmental background radiation*. The European Physical Journal Plus, Volume 127, Number 4, 37, DOI: 10.1140/epjp/i2012-12037-7.

2012 M. Cestelli Guidi, C. Mirri, E. Fratini, V. Licursi, R. Negri, A. Marcelli, R. Amendola. *In vivo skin leptin modulation after 14 MeV neutron irradiation: a molecular and FT-IR spectroscopic study*. Anal Bioanal Chem. 2012 Sep;404(5):1317-26. doi: 10.1007/s00216-012-6018-3.

2011 E. Fratini, V. Licursi, M. Artibani, K. Kobos, P. Colautti, R. Negri and R. Amendola. *Dose-dependent Onset of Regenerative Program in Neutron Irradiated Mouse Skin*. Plos One, vol. 6; p. e19242 -1-e19242 -12, ISSN: 1932-6203, doi: 10.1371/journal.pone.0019242

2010 M. Cervelli, G. Bellavia, E. Fratini, R. Amendola, F. Polticelli, M. Barba, R. Federico, F. Signore, G. Gucciardo, R. Grillo, P. M. Woster, R. A. Casero, Jr., and P. Mariottini. *Spermine oxidase (SMO) activity in breast tumor tissues and biochemical analysis of the anticancer spermine analogues BENSpm and CPENSpm*. BMC Cancer. 14;10:555.

2009 Cervelli, E. Fratini, R. Amendola, M. Bianchi, E. Signori, E. Ferraro, A. Lisi, R. Federico, L. Marcocci and P. Mariottini. *Increased spermine oxidase (SMO) activity as a novel differentiation marker of myogenic C2C12 cells*. Int. J. Biochem. Cell. Biol. 41:934-944.

2009 R. Amendola, M. Cervelli, E. Fratini, F. Polticelli, D.E. Sallustio and P. Mariottini. *Spermine Metabolism and Anticancer Therapy*. Current Cancer Drug Target, 9(2), 118-130.

Oral Communication:

2014 E. Fratini, M. Fischietti, G. Simone, E. Alesse, F. Zazzeroni, P. Sykes, L. Satta, M.A. Tabocchini. *Expression of genes involved in the protection from Natural Environmental Ionizing Radiation induced oxidative stress: Recent results on in vitro pKZ1 mouse hybridoma cells*. 41st Annual Meeting of the European Radiation Research Society, Rodes, GR 14-19 September 2014

2012 E. Fratini. *Does biochemistry of living matter depends on environmental radiation? Yeast to human cells at the LNGS*. ASPERA Underground Synergies with Astro-Particle Physics Workshop Durham, UK, 18-19 December 2012.

2012 E. Fratini, D. Capece, L. Satta, G. Simone, M.A. Tabocchini. *The LNGS underground facility for biological experiments in reduced radiation environment*. 39th Annual Meeting of the European Radiation Research Society Vietri sul Mare, Italy, 15-19 October 2012

2011 E. Fratini, M. Balduzzi, F. Antonelli, G. Esposito, V. Dini, G. Simone, M. Belli, A. Campa, M. A. Tabocchini. *Micronuclei Induction by Carbon Ions in Directly Irradiated and in Bystander AG01522 Normal Human Primary Fibroblasts*. Third International MELODI Workshop November 2-4, Rome, Italy

2009 E. Fratini, D. E. Sallustio, M. Angelone, E. Pasquali, M. Pillon, F. Chiani, V. Licursi, M.T. Mancuso, R. Negri, R. Amandola. *Differential keratins activation after in vivo skin 14 MeV neutron irradiation at variable doses*. IV Congresso nazionale ISSBB "Un mondo senza gravità" Santa Margherita Ligure, 31 Marzo - 2 Aprile 2009.