Gabriele Babini, PhD

Date of Birth: 20th of November 1987
Place of Birth: Lugo, (RA), Italy
Nationality: Italian
Email: gabriele.babini@unipv.it
Skype contact: gabriele.babini.portatile

Address:
Via Amendola 5
48010 Cotignola (RA), Italy
Mobile phone:
+39-3312584509

Post doc fellow at the University of Pavia.
Department of Physics.
Laboratory of Radiobiology and Radiation Biophysics
(PI: Prof. A. Ottolenghi - andrea.ottolenghi@unipv.it).
Via Bassi 6, I-27100, Pavia, Italy.
Phone: +39 0382 987906 (office)
+39 0382 987644 (lab)

Education

Degrees and diplomas

- **From November 2011 - January 2015**
  Selected as Ph.D. student at University of Pavia
  Thesis' title: "Systems radiation biology to unravel radiation-induced dysregulation of cellular pathways";
  Supervisor: Prof. Andrea Ottolenghi (University of Pavia)
  Working within the European Projects **EpiRadBio** and **DoReMi** and **INFN experiments "MERIDIAN"** and "**RADIOSTEM**".
  Topics of my research activity: cell signalling pathways, inflammatory pathway, modelling (stochastic and deterministic models), bioinformatics, high-throughput datasets analysis, pathway analysis.
  From December 2011: association to Nuclear Physics National Institute (**INFN**) as Ph.D. student

- **From October 2009 to September 2011**
  Two year Master Course (M.Sc.) in Physics ("Laurea Magistrale") at the University of Pavia (Italy) - Physics department.
  Thesis' title: "Evaluation of ionizing-radiation-perturbed proteic signaling within a systems radiation biology framework";
  Master degree obtained in September, 22nd, 2011 (110/110 cum laude)
  Supervisor: Prof. Andrea Ottolenghi (University of Pavia)
  1st Co-Supervisor: Dr. Luca Mariotti (University of Pavia)
  2nd Co-Supervisor: Dr. Donata Cappelletti (University of Pavia)
  From December 2010: association to Nuclear Physics National Institute (**INFN**)

- **From Sep. 2006 to Jul. 2009**
  First-level degree in Physics (Bachelor Degree) student at the University of Trieste (Italy) in the physics department.
  Thesis' title: "Review of stochastic models of damages to DNA after exposure to ionizing radiation";
  First-level degree obtained in July, 3rd, 2009 (110/110 cum laude)
  Supervisor: Prof. Edoardo Milotti (University of Trieste)

- **From Sep. 2001 to Jun. 2006**
  Liceo scientifico G.Ricci Curbastro Viale degli Orsini 6, 48022 Lugo (RA), Italy (scientific lyceum)
  Scientific-technological branch (Brocca experimentation)

"Maturità scientifica", Secondary school final exams mark: 100/100.

Schools and courses

- **From July 3rd to July 7th 2017**
  One week school on "Advances in Complex Systems", held in Como (Italy).
  School Directors: Dr. Mikko Alava (Aalto University, Finland), Dr. Caterina A. M. La Porta (University of Milan, Italy), Dr. Stefano Zapperi (University of Milan, Italy) and Dr. Alessandro Vespignani (Northeastern University, USA).

- **From May 12th to May 13th 2014**
  2 days course "Weighted network analysis", held in Leiden (The Netherlands).
  Instructor: Prof Steve Horvath, Department of Biostatistics, UCLA School of Public Health

- **From September 13th to September 15th 2012**
  3 days course "Introduzione ai modelli con equazioni strutturali" ("Introduction to structural equation models"), held in Pavia (Italy).
  Lead scientist: Prof. Mario Grassi.

- **From August 10th to August 19th 2012**
  WE-Heraeus International Physics School on "Ionizing Radiation and Protection of Man" held in Bad Honnef (Germany)
  Program committee: Prof. Dr. Werner Rühm (HMGU), Prof. Dr. Rolf Michel (Leibniz University Hannover), Prof. Dr. George Iliakis (University Duisburg-Essen)

- **From April 16th to April 27th 2012**
  Selected for the two weeks DoReMi training course on "CELOD: Cellular Effects of Low Doses and low dose-rates with focus on DNA damage and stress response" held at the Department of Genetics, Microbiology and Toxicology, Stockholm University (Svante Arrhenius väg 20C, 106 91 Stockholm, Sweden.)
  Lead scientist: Prof. Andrzej Wojcik

- **From June, 1st, 2011 to June, 25th, 2011**
  Selected for the **2011 NASA Space Radiation Summer School** at the U.S. Department of Energy's Brookhaven National Laboratory, Upton, New York.
  Scientific Directors: Dr. Dudley Goodhead and M. Sc. Linda Goodhead

- **February, 28th, 2011 to March, 11th, 2011**
  Selected for the two weeks DoReMi training course on "Molecular Radiation Carcinogenesis" at Department of Radiobiology, Helmholtz Zentrum München (German Research Center for Environmental Health,GmbH Ingolstädter Landstraße 1, D-85764, Neuherberg, Germany)
  Lead scientist: Prof. Mike Atkinson

- **From August, 2nd, 2010 to September, 24th, 2010**
  Selected for the **"HGS-HIRe Summer Student Program 2010" at GSI (Helmholtzzentrum für Schwerionenforschung) at Darmstadt (Germany) in the Biophysics Department**.
  Supervisor: Dr. Wilma Kraft-Weyrather (GSI – Darmstadt, Germany)

Awards and Fellowships

- Best poster prize for:

- **G. Babini**, D. Cappelletti, L. Mariotti, J. Morini, D. Alloni, A.Ottolenghi, "The complex dynamics of proteic signaling after different stimuli: an example of response after ionizing radiation", poster displayed at the International School "Ionizing Radiation and Protection of Man" held in Bad Honnef (Germany), 10-19 August 2012;
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- Young Investigator Award:

- Systems Biology 2011, Stockholm (Sweden), 16-18 October 2011
- 42nd European Radiation Research Society, Amsterdam (The Netherlands), 4-8 September 2016.

- Travel Award:

- from SIRR to attend the ICRR2015, Kyoto (Japan), 23-29 May 2015

- S.I.F. Fellowship, from Sep. 2006 to Jul. 2009

- Awarded from the Italian Physical Society (S.I.F.) for the "Scientific Degree Projects", for physics students, in September 2006 upon a national selection.
  Fellowship renewed in September 2007 and September 2008 due to meeting the grade requirements. Fellowship concluded with the Bachelor degree in July 2009.
  Attended the "one week summer school" organized for the winners of the fellowships by SIF, INDAM and SCI at the University of Perugia (Italy) both in 2007 and 2008

Publications

1. L. Mariotti, A. Bertolotti, E. Ranza, **G. Babini**, A. Ottolenghi, "Investigation of the mechanisms underpinning IL-6 cytokine release in bystander phenomena: the roles of radiation dose, radiation quality and specific ROS/RNS scavengers", **Int J Radiat Biol**. 2012 Oct;88(10):751-62. Epub 2012 Jul 24, http://www.tandfonline.com/doi/abs/10.3109/09553002.2012.703365.
2. **G. Babini**, J. Morini, G. Baiocco, L. Mariotti, A. Ottolenghi, "In vitro γ-ray-induced inflammatory response is dominated by culturing conditions rather than radiation exposures", ***Scientific Reports* 5**, 9343,doi:10.1038/srep09343(2015) (http://www.nature.com/srep/2015/150320/srep09343/full/srep09343.html);
3. **G. Babini**, M. Ugolini, J. Morini, G. Baiocco, L. Mariotti, P. Tabarelli de Fatis, M. Liotta, A. Ottolenghi, "Investigation of radiation-induced multilayered signaling response of the inflammatory pathway", **Radiat Prot Dosimetry** first published online April 15, 2015 doi:10.1093/rpd/ncv132 (http://rpd.oxfordjournals.org/content/166/1-4/157.short);
4. **G. Babini**, V. E. Bellinzona, J. Morini, L. Mariotti, K. Unger, A. Ottolenghi, "Mechanisms of the induction of apoptosis mediated by radiation-induced cytokine release", **Radiat Prot Dosimetry** first published online April 5, 2015 doi:10.1093/rpd/ncv133 (http://rpd.oxfordjournals.org/content/166/1-4/165);
5. G. Baiocco, D. Alloni, **G. Babini**, L. Mariotti, A. Ottolenghi, "Reaction mechanism interplay in determining the biological effectiveness of neutrons as a function of energy", **Radiat Prot Dosimetry** first published online April 5, 2015 doi:10.1093/rpd/ncv134 (http://rpd.oxfordjournals.org/content/166/1-4/316.abstract);
6. J. Morini, **G. Babini**, L. Mariotti, G. Baiocco, C. Maccario, A. Guertler, A. Minelli, M. Savio, U. Rößler, U. Kulka, A. Ottolenghi, C. Danesino, "Radiosensitivity in lymphoblastoid cell lines derived from Shwachman-diamond Syndrom patients", **Radiat Prot Dosimetry** first published online April 12, 2015 doi:10.1093/rpd/ncv152 (http://rpd.oxfordjournals.org/content/166/1-4/95.abstract);
7. D. Alloni, G. Baiocco, **G. Babini**, W. Friedland, L. Mariotti, A. Ottolenghi, "Energy dependence of carbon ions induced DNA damage complexity", **Radiation Protection dosimetry** first published online May 9, 2015, doi:10.1093/rpd/ncv292, (http://rpd.oxfordjournals.org/content/166/1-4/86.abstract).
8. M. Hauptmann, S. Haghdoost, M. Gomolka, H. Sarioglu, M. Ueffing, A. Dietz, U. Kulka, K. Unger, **G. Babini**, M. Harms-Ringdahl, A. Ottolenghi, S. Hornhardt, " Differential Response and Priming Dose Effect on the Proteome of Human Fibroblast and Stem Cells Induced by Exposure to Low Doses of Ionizing Radiation", **Radiation Research,** March 2016, (http://www.rrjournal.org/doi/abs/10.1667/RR14226.1).
9. M. Tanori, A. Casciati, F. Berardinelli, S. Leonardi, E. Pasquali, F. Antonelli, B. Tanno, P. Giardullo, A. Pannicelli, **G. Babini**, I. De Stefano, A. Sgura, M. Mancuso, A. Saran, S. Pazzaglia, "Synthetic Lethal Genetic Interactions between Rad54 and PARP-1 in Mouse Development and Oncogenesis", **Oncotarget**, July 2016,

(http://www.impactjournals.com/oncotarget/index.php?journal=oncotarget&page=article&op=view&path%5B%5D=10479&path%5B%5D=33110).

10. I. De Stefano, P. Giardullo, B. Tanno, S. Leonardi, E. Pasquali, **G. Babini**, A. Saran, M. Mancuso, "Nonlinear Radiation Cataract Induction Using the Radiosensitive Ptch1$^{+/-}$ Mouse Model", **Radiation Research**, Online ahead of print, August 2016, (http://www.rrjournal.org/doi/abs/10.1667/RR14440.1).
11. B. Tanno, **G. Babini**, S. Leonardi, P. Giardullo, I. De Stefano, E. Pasquali, A. Ottolenghi, M. J. Atkinson, A. Saran, M. Mancuso, "*Ex vivo* miRNome analysis in *Ptch1*$^{+/-}$ cerebellum granule cells reveals a subset of miRNAs involved in radiation-induced medulloblastoma", **Oncotarget,** September 2016 (http://www.impactjournals.com/oncotarget/index.php?journal=oncotarget&page=article&op=view&path%5B%5D=11938&path%5B%5D=37792)
12. G. Baiocco, S. Barbieri, **G. Babini**, J. Morini, D. Alloni, W. Friedland, P. Kundrát, E. Schmitt, M. Puchalska, L. Sihver, A. Ottolenghi "The origin of neutron biological effectiveness as a function of energy" **Scientific Reports**, 34033 (2016) doi:10.1038/srep34033 (2016), (http://www.nature.com/articles/srep34033).
13. J. Morini, **G. Babini**, S. Barbieri, G. Baiocco, A. Ottolenghi, "The interplay between radioresistant caco-2 cells and the immune system increases epithelial layer Permeability and alters signaling Protein spectrum", Frontiers in Immunology, 8:223, (2017), doi:10.3389/fimmu.2017.00223. (http://journal.frontiersin.org/article/10.3389/fimmu.2017.00223/full).
14. I. De Stefano, P. Giardullo, B. Tanno, S. Leonardi, E. Pasquali, **G. Babini**, A. Saran, M.T. Mancuso, The role of the Shh signaling pathway in radio-induced cataractogenesis, Acta Opthalmologica, 95(S259), (2017), DOI: 10.1111/j.1755-3768.2017.03683, (http://onlinelibrary.wiley.com/doi/10.1111/j.1755-3768.2017.03683/full)
15. G. Baiocco, S. Barbieri, **G. Babini**, J. Morini, W. Friedland, P. Kundrát, E. Schmitt, M. Puchalska, U. Giesen, R. Nolte, A. Ottolenghi, "At the physics-biology interface: the neutron affair", Radiation Protection Dosimetry, pp. 1-4 (2017), doi:10.1093/rpd/ncx222, (https://academic.oup.com/rpd/article-abstract/4560562).
16. S. Leonardi, M. Buttarelli, I. De Stefano, G. Ferrandina , M. Petrillo, **G. Babini**, G. Scambia, C. Marino, M. Mancuso, D. Gallo, "The relevance of Prelamin A and RAD51 as molecular biomarkers in cervical cancer", Oncotarget, p1-12, October 2017, (http://www.impactjournals.com/oncotarget/index.php?journal=oncotarget&page=article&op=view&path[]=21686&path[]=68838).
17. B. Tanno, S. Leonardi, **G. Babini**, P. Giardullo, I. De Stefano, E. Pasquali, A. Saran, M. Mancuso, "Nanog-driven cell-reprogramming and self-renewal maintenance in Ptch1$^{+/-}$ granule cell precursors after radiation injury", Scientific Reports, 7:14238, 1-11, (2017), doi:10.1038/s41598-017-14506-6, (https://www.nature.com/articles/s41598-017-14506-6).
18. S. Plumitallo, L. Ruiz-Llorente, C. Langa, J. Morini, **G. Babini**, D. Cappelletti, L. Scelsi, A. Greco, C. Danesino, C. Bernabeu, C. Olivieri, "Functional analysis of a novel ENG variant in a patient with hereditary hemorrhagic telangiectasia (HHT) identifies a new Sp1 binding-site", Gene, Vol. 647, 85-92, (2018), doi: 10.1016/j.gene.2018.01.007, (https://www.sciencedirect.com/science/article/pii/S0378111918300076).
19. **G. Babini**, J. Morini, S. Barbieri, G. Baiocco, G. B. Ivaldi, M. Liotta, P. Tabarelli de Fatis, A. Ottolenghi, "A Co-culture Method to Investigate the Crosstalk Between X-ray Irradiated Caco-2 Cells and PBMC", Journal of Visualized Experiments, Issue 131, (2018), doi: 10.3791/56908, (https://www.jove.com/video/56908/).

Skills and knowledges

Languages:

- Italian: Native speaker;,
- English: Advanced, *Certificate in Advanced English (CAE) – Council of Europe Level C1 (ESOL Cambridge) in June 2006.*

Team working or autonomously working.

Tutoring experiences with students (both co-supervising thesis and giving lectures/talks - see below "Teaching experiences")

Public speaking (see below "Abstracts and participation to congresses and workshops")

Biological Experiments:

- Cell culturing;
- ELISA assay;
- Flowcytometry;
- Immunofluorescence;
- Western Blotting;

Data analysis:

- Statistical analysis of big datasets (omics studies)
- Network analysis of single or multi-layered omics datasets (Cytoscape, Ingenuity Pathway Analysis, etc).

Modelling:

- Monte Carlo codes: MCNP ("Simulation in Biophysics field" 20 hours course), PHITS;
- Differential equations : MATLAB (used since my master thesis), Mathematica (used in my bachelor thesis for analysis of three-states models);

Programming:

- LabView (20-hours course at University of Trieste);
- Fortran 77 (40-hours course at University of Trieste);
- Gnuplot (data analysis for laboratory courses in Pavia).
- R software (for "-Omics" dataset statistical analysis and pathway analysis in radiation biology during my PhD project and during my Postdoc)

Abstracts and participation to congresses and workshops (The underlined Author presented the work**).**
Poster (P) or Oral presentation (O) - (Name of who presented the work**):**

1. **G. Babini**, D. Cappelletti, D. Alloni, L. Mariotti, D. Volpi, A. Ottolenghi, "*Evaluation of NF-kB signaling in a possible bystander effect scenario"*, 14th International Congress of Radiation Research", Warsaw (Poland), 28 August - 1 September 2011 (P);
2. L. Mariotti, D. Cappelletti, D. Alloni, **G. Babini**, D. Volpi, A. Ottolenghi, *"Investigation of signaling perturbation in cells exposed at low doses of ionizing radiation",* 14th International Congress of Radiation Research, Warsaw (Poland), 28 August - 1 September, 2011 (P);
3. **G. Babini**, *"Ionizing-radiation perturbed proteic signaling: a systems radiation biology approach"*, National Congress of the Physics Italian Society (SIF), L'Aquila (Italy), 26-30 September, 2011 (O);
4. **G. Babini,** L. Mariotti, D. Cappelletti, D. Alloni, A. Ottolenghi**.** *"A systems radiation biology approach for understanding the complex dynamics of NF-kB pathway and its perturbation"*, Systems Biology 2011, Stockholm (Sweden), 16-18 October 2011 (O);
5. **G. Babini**, D. Cappelletti, D. Alloni, L. Mariotti, A. Ottolenghi, *"NF-kB pathway and its perturbation: a systems radiation biology approach"*, Third MELODI Workshop Rome (Italy), 2 - 4 November 2011 (P);
6. D. Cappelletti, **G. Babini**, L. Mariotti, J. Morini, A. Ottolenghi, *"Cytokines' cascades after low dose gamma irradiation"*, Third MELODI Workshop, Rome (Italy), 2 - 4 November 2011(P);
7. A. Ottolenghi, D. Alloni, **G. Babini**, D. Cappelletti, W. Friedland, L. Mariotti, *"The EURATOM. Early events relevant for biological damage"*, Third MELODI Workshop, Rome (Italy), 2 - 4 November 2011 (P);

8. **G. Babini**, D. Cappelletti, L. Mariotti, J. Morini, A. Ottolenghi, *"Perturbation of intercellular signalling: modelling approaches and characterization of the experimental system",* Second contractors meeting EpiRadBio, Sevilla (Spain), 9-11 January 2012(O);
9. A. Ottolenghi, D. Alloni, **G. Babini**, D. Cappelletti, L. Mariotti, J. Morini, D. Scannicchio, V. Smyth, K. R. Trott, *"Initial radiation damage events (the track structure approach)"*, ANDANTE Kickoff meeting, Pavia (Italy), 25-26 January 2012 (O);
10. **G. Babini**, L. Mariotti, D. Cappelletti, J. Morini, D. Alloni, F. Lisciandro, L. D'Ercole, A. Ottolenghi, *"The effect of ionizing radiations exposure on the inflammatory response: the example of the NF-kB pathway",* invited talk at the 39th COSPAR Scientific Assembly held in Mysore (Karnataka India), 14-22 July 2012(O);
11. **G. Babini**, D. Cappelletti, L. Mariotti, J. Morini, D. Alloni, A.Ottolenghi, "The complex dynamics of proteic signaling after different stimuli: an example of response after ionizing radiation", poster displayed at the International School "Ionizing Radiation and Protection of Man" held in Bad Honnef (Germany), 10-19 August 2012(P);
12. L. Mariotti, A. Bertolotti, E. Ranza, **G. Babini**, D. Cappelletti, J.Morini, A. Ottolenghi, *"Modeling and experiments to study radiation perturbed signaling pathways*", 5th International Systems Radiation Biology Workshop, Oxford (UK), 3rd-5th September 2012(O);
13. L. Mariotti, A. Bertolotti, E. Ranza, **G. Babini**, D. Cappelletti, A. Ottolenghi, "Trying to unravel the bystander effects puzzle: a systematic study of cytokine pathways under different radiation exposures", 58th Annual Meeting of the Radiation Research Society, San Juan (Puerto Rico), 30 September – 3 October 2012(P);
14. L. Mariotti**, G.Babini,** J. Morini, D. Cappelletti, A. Ottolenghi, "Perturbation of intercellular signalling: modelling approaches and characterization of the experimental system", Third contractors meeting EpiRadBio, Eze Village (Nice, France), 9-11 October 2012 (O);
15. **G.Babini,** D. Alloni, D. Cappelletti, L. Mariotti, J. Morini, A. Ottolenghi, "Evaluation of the NF-kB pathway dynamics after exposure to gamma radiation", oral presentation at the European Radiation Research congress, Vietri sul Mare (Italy), 15-19 October 2012 (O).
16. **G.Babini**, M. Hauptmann, "Phase-shifts in responses and processes at high/low doses and dose rates", DoReMi 2nd Periodic Meeting, Institut Curie, Paris (France), 22-24 January 2013 (O);
17. **G. Babini**, K. Unger, M. Hauptmann, S. Haghdoost, H. Sarioglu, A. Guertler, U. Roessler, U. Kulka, M. Kulka, M. Harms-Ringdahl, S. Hornhardt, M. Gomolka, A. Ottolenghi, "Pathway analysis techniques to study proteomic data from low dose/low-dose-rate irradiated cells", DoReMi 2nd Periodic Meeting, Institut Curie, Paris (France), 22-24 January 2013 (P);
18. L. Mariotti, A. Bertolotti, E. Ranza, **G. Babini**, A. Ottolenghi, "Influence of oxidative stress and different radiation quality exposure on cytokine release", DoReMi 2nd Periodic Meeting, Institut Curie, Paris (France), 22-24 January 2013 (P);
19. M. Hauptmann, S. Haghdoost, H. Sarioglu, A. Guertler, S. Hornhardt, U. Roessler, U. Kulka, **G. Babini**, A. Ottolenghi, M. Harms-Ringdahl, K. Unger, M. Gomolka, "Differential response of the proteome induced by exposure to low-dose ionizing radiation (IR) using different dose rates and doses in human fibroblast cells", 2nd International Radiation Proteomics Workshop, Munchen (Germany), 30-31 January 2013 (O);
20. **G. Babini**, V. E. Bellinzona, L. Mariotti, J. Morini, D. Cappelletti, P. Tabarelli, M. Liotta, K. Unger, A. Ottolenghi, "Study of extra- and intra- cellular effects of low dose irradiation in a co-culture setup", 40th European Radiation Research congress, Dublin (Ireland), 1-5 September 2013 (O);
21. J. Morini, M. Ugolini, **G. Babini**, D. Cappelletti, L. Mariotti, C. Maccario, M. Liotta, P. Tabarelli, A. Minelli, M. Savio, A. Ottolenghi, C. Danesino, "Effect of x-rays on DNA repair pathways in lymphoblastoid cell lines derived from Shwachman-Diamond Syndrome patients", 40th European Radiation Research congress, Dublin (Ireland), 1-5 September 2013 (P);
22. A. Ottolenghi, D. Alloni, **G. Babini**, G. Baiocco, L. Mariotti, "From early events to biological damage: the radiation quality issue", XCIX Congresso Nazionale SIF, Trieste (Italy), 23 - 27 Settembre 2013 (O);
23. M. Ugolini, **G. Babini**, G. Baiocco, D. Cappelletti, L. Mariotti, J. Morini, A. Ottolenghi, "Perturbation of intra- and extra- cellular signaling cascades by ionizing radiation and environmental stress", XCIX Congresso Nazionale SIF, Trieste (Italy), 23 - 27 Settembre 2013 (O);

24. V.E. Bellinzona, **G. Babini**, L. Mariotti, J. Morini, D. Cappelletti, K. Unger, A. Ottolenghi, "Radiation induced modulation of gene expression profiles in coculture conditions",XCIX Congresso Nazionale SIF, Trieste (Italy), 23 - 27 Settembre 2013 (O);
25. **G. Babini**, V. E. Bellinzona, J. Morini, L. G. Mariotti, K. Unger, A. Ottolenghi, "Study of the mechanisms underpinning the intercellular induction of apoptosis in a co-colture experiment", MICROS 2013 - 16th International Symposium on Microdosimetry, Treviso (Italy), 20-25 October 2013 (P);
26. **G. Babini**, M. Ugolini, J. Morini, G. Baiocco, L. G. Mariotti, P. Tabarelli, M. Liotta, A. Ottolenghi, "Investigation of radiation-induced multilayered signaling response of the inflammatory pathway", MICROS 2013 - 16th International Symposium on Microdosimetry, Treviso (Italy), 20-25 October 2013 (O);
27. D. Alloni, G. Baiocco, **G. Babini**, W. Friedland, L. G. Mariotti, A. Ottolenghi, "Energy dependence of carbon ions induced DNA damage complexity" , MICROS 2013 - 16th International Symposium on Microdosimetry, Treviso (Italy), 20-25 October 2013 (P);
28. G. Baiocco, D. Alloni, **G. Babini**, L. G. Mariotti, A. Ottolenghi, "Reaction mechanism interplay in determining the biological effectiveness of neutrons as a function of energy", MICROS 2013 - 16th International Symposium on Microdosimetry, Treviso (Italy), 20-25 October 2013 (P);
29. J. Morini, **G. Babini**, M. Ferrari, C. Maccario, L. G. Mariotti,A. Minelli, M. Savio, A. Guertler, U. Kulka, U. Roessler, A. Ottolenghi, C. Danesino, "Radiosensitivity and dna damage repair in lymphoblastoid cell lines derived from Shwachman-Diamond Syndrome patients", MICROS 2013 - 16th International Symposium on Microdosimetry, Treviso (Italy), 20-25 October 2013 (P);
30. **G.Babini**, L.G. Mariotti, A. Ottolenghi, " An integrated experimental/theoretical approach to try to unravel the complex non-linear dynamics of the inflammatory pathway", DoReMi workshop on "Low dose radiation effects on the immune system: current knowledge and future perspectives", Budapest, Hungary November 5-7, 2013 (O).
31. **G.Babini**, "Task 5.1 – Phase shifts: proteomics", DoReMi 3rd Periodic Meeting, Munchen (Germany), July 8-10, 2014 (O);
32. **G. Babini**, L. G. Mariotti, M. Siragusa, J. Morini, G. Baiocco, M. Liotta, P. Tabarelli de Fatis, A. Ottolenghi, "May the inflammatory response be considered as an example of non-DNA-damage driven system?", 41st Annual Meeting of the European Radiation Research Society, Rhodes (Greece), 14-19 September 2014 (P);
33. J. Morini, **G. Babini**, L. G. Mariotti, G. Baiocco, L. Nacci, C. Maccario, M. Liotta, P. Tabarelli de Fatis, A. Minelli, M. Savio, A. Ottolenghi, C. Danesino, "Effect of ionizing radiation exposure on proliferation and cell cycle distribution in cells derived from Shwachman-Diamond Syndrome affected patients", 41st Annual Meeting of the European Radiation Research Society, Rhodes (Greece), 14-19 September 2014 (P).
34. G. Baiocco, D. Alloni, **G. Babini**, L. G. Mariotti, J. Morini, E. Schmitt, P. Kundràt, W. Friedland, A. Ottolenghi, "Tracing back the physical origin of neutron biological effectiveness", 6th International MELODI Workshop, PRBB - Barcelona (Spain), 7-9 October 2014 (P);
35. **G. Babini**, J. Morini, L. Mariotti, M. Siragusa, G. Baiocco, M. Liotta, P. Tabarelli de Fatis, A. Ottolenghi, "Studio in vitro della perturbazione indotta dalla radiazione sulla risposta infiammatoria", XVI Convegno SIRR, Pavia (Italy), 7-8 November 2014 (O);
36. G. Baiocco, D. Alloni, **G. Babini**, L. G. Mariotti, J. Morini, E. Schmitt, P. Kundràt, W. Friedland, A. Ottolenghi, "Caratterizzazione dell'origine fisica dell'efficacia biologica dei neutroni", XVI Convegno SIRR, Pavia (Italy), 7-8 November 2014 (O);
37. J. Morini, **G. Babini**, G. Baiocco, L. Nacci, C. Maccario, M. Liotta, P. Tabarelli de Fatis, A. Minelli, M. Savio, A. Ottolenghi, C. Danesino, "Effetto dell'esposizione a raggi X sulla proliferazione e sul ciclo cellulare in cellule linfoblastoidi derivate da pazienti affetti da sindrome di Shwachman-Diamond", XVI Convegno SIRR, Pavia (Italy), 7-8 November 2014 (O);
38. **G. Babini**, J. Morini, G. Baiocco, L. Mariotti, A. Ottolenghi, "UniPv Contribution to WP2.3", EpiRadBio Final contractors meeting, Regensburg (Germany), 24-25 March 2015 (O);
39. **G. Babini**, J. Morini, G. Baiocco, A. Ottolenghi, "Radiation-induced inflammatory response in in vitro fibroblasts is overshadowed by their response to culturing conditions", ICRR 2015 - 15° International Congress for Radiation Research, Kyoto (Japan), 23-29 May 2015 (P);

40. G. Baiocco, D. Alloni, **G. Babini,** J. Morini, E. Schmitt, P. Kundrat, W. Friedland, A. Ottolenghi, "A comprehensive modeling approach to shed light on the physical origin of neutron biological effectiveness", ICRR 2015 - 15° International Congress for Radiation Research, Kyoto (Japan), 23-29 May 2015 (P).
41. **G. Babini**, J. Morini, G. Baiocco, A. Ottolenghi. Radiation-induced inflammatory pathway may be biased or covered by culturing procedures in in vitro models. 7th MELODI Workshop, Munich (Germany), 9-11 November 2015 (P);
42. J. Morini, **G. Babini**, F. Barbaro, A. Solari, G. Baiocco, M. Liotta, P. Tabarelli de Fatis, D. Alloni, R. Chignola, E. Milotti, A. Ottolenghi. Radiation-induced perturbations in an in vitro epithelial layer of CaCo-2 cells co-cultured with human PBMC. 7th MELODI Workshop, Munich (Germany), 9-11 November 2015 (P);
43. **G. Babini,** "Task 7.3 – Feasibility study towards a systems biology approach of radiation response of the endothelium - modelling results", DoReMi task 7.3 Workshop, Munich (Germany), 12 November 2015 (O);
44. A. Ottolenghi, D. Alloni, **G. Babini**, G. Baiocco, J. Morini, D. Scannicchio, V. Smyth. Research on radiation quality and hadron therapy: where are we? What is to be done?. Technical Meeting (TM), Radiobiology of Charged Particle Therapy (RBPT) IAEA Headquarters, VIC, Vienna (Austria) 11-13 November 2015 (O).
45. **G. Babini,** "A systems radiation biology approach to integrate and model datasets on different endpoints", 4th and Final contractor meeting DoReMi, Budapest (Hungary), 8-10 December 2015(O);
46. G. Baiocco, S. Barbieri, **G. Babini**, J. Morini, D. Alloni, W. Friedland, P. Kundrát, E. Schmitt, M. Puchalska, L. Sihver, A. Ottolenghi. Neutron induced DNA damage using transport and track structure calculations. Final DoReMi meeting, Budapest (Hungary), 8-10 December 2015 (P).
47. A. Ottolenghi, D. Alloni, **G. Babini**, G. Baiocco, L. Mariotti, J. Morini, V. Smyth, W. Friedland, P. Kundrat, E. Schmitt, S. Tapio, A. Sriharshan, Z. Barjaktarovic, M. Aichler, M. Tschöp. DoReMi research on Mitochondria - The INITIUM project (Track structures and initial events: an integrated approach to assess the issue of radiation quality dependence). DoReMi workshop Mitochondria and Radiation, Munich (Germany), 14-15 December 2015 (O);
48. M.Mancuso, **G.Babini** and B. Tanno, "miRNome analysis highlights the radiosensitivity of Ptch1+/- mice", Final contractor meeting DarkRisk, Rome (Italy), 8-9 February 2016 (O);
49. G. Baiocco, S. Barbieri, **G. Babini**, J. Morini, D. Alloni, W. Friedland, P. Kundrát, E. Schmitt, M. Puchalska, L. Sihver, A. Ottolenghi. Neutron induced DNA damage using transport and track structure calculations. EURADOS Annual Meeting - AM2016, Milan (Italy), 8-11 February 2016 (O);
50. J. Morini, **G. Babini**, L. Nacci, C. Maccario, A. Minelli, M. Savio, A. Guertler, U. Rößler, M. Gomolka, U. Kulka, A. Ottolenghi, C. Danesino. Radiosensitivity and DNA damage repair in lymphoblastoid cell lines derived from Shwachman-Diamond syndrome patients. 8th International Congress on Shwachman-Diamond Syndrome, Verona (Italy), 17-20 April 2016 (P);
51. J. Morini, **G. Babini**, L. Nacci, G. Baiocco, A. Minelli, M. Savio, A. Ottolenghi, C. Danesino. Proliferation and cell cycle modifications in lymphoblastoid cell lines from SDS patients after Xray exposure. 8th International Congress on Shwachman-Diamond Syndrome, Verona (Italy), 17-20 April 2016 (P);
52. **G. Babini,** "Measurements of radiation-perturbed intra- and extra- cellular signalling cascades in CaCo-2 cells co-cultured with PBMCs", 42nd European Radiation Research Society, Amsterdam (The Netherlands), 4-8 September 2016 (O);
53. **G. Babini**, J. Morini, G. Baiocco, M. Liotta, P. Tabarelli de Fatis, D. Alloni, R. Chignola, E. Milotti, A. Ottolenghi, "Measurements of radiation-perturbed intra- and extra- cellular signalling cascades in CaCo-2 cells co-cultured with PBMCs", 42nd European Radiation Research Society, Amsterdam (The Netherlands), 4-8 September 2016 (P);

54. L. Nacci, J. Morini, **G. Babini**, M. Cipolli, A. Minelli, C. Danesino " Shwachman-Diamond Syndrome: Whole Exome Sequencing as a tool to investigate the clinical variability and the prognosis of the disease", EMBO course on "Targeted NGS in patients with cancer, mendelian or complex diseases, Krakow (Poland), 19-23 September 2016 (P);
55. S. Plumitallo, C. Langa Poza, L. Ruiz Llorente, J. Morini, **G. Babini**, D. Cappelletti, C. Bernabeu, L. Scelsi, A. Greco, C. Danesino, C. Olivieri. Sequencing analysis reveals an ENG variant that affects Sp1 binding site in a Patient with Hereditary Haemorrhagic Telangiectasia (HHT). EMBO Course on "Targeted NGS in patients with cancer, mendelian or complex diseases", Krakow (Poland), 19-23 September 2016 (P).
56. P. Giardullo, B. Tanno, **G. Babini**, S. Leonardi, I. De Stefano, E. Pasquali, A. Ottolenghi, C. Marino, A. Saran and M. Mancuso, "I miRNA come biomarcatori di esposizione alle radiazioni", XVII Convegno Nazionale SIRR 2016, Trento (Italy) 25-27 September 2016 (O);
57. S. Plumitallo, C. Langa Poza, L. Luiz Llorente, J. Morini, **G. Babini**, D. Cappelletti, C. Bernabeu, L. Scelsi, A. Greco, C. Danesino, C. Olivieri, "Functional analysis of a novel ENG variant in a patient with Hereditary Haemorrhagic Telangiectasia (HHT) identifies a new Sp1 binding site", XVII Congresso Nazionale AIBG. Cagliari (Italy), 30 September - 1 October 2016 (P);
58. **G. Babini** and A. Ottolenghi, "Report on bioinformatic analysis and mathematical modelling within the SOPRANO project", SOPRANO final meeting, Madrid (Spain), 17-18 October 2016 (O)
59. **G. Babini**, "Crosstalk between radio-resistant colorectal adenocarcinoma Caco-2 cells and the immune system", Workshop on Radiation effects on the immune system: an updated state of the art and future research needs, Budapest (Hungary), 7-9 March, 2017 (O);
60. **G. Babini**, "Data integration and systems biology approaches in radiobiology", Workshop on synergies of Strategic Research Agendas of EURAMED, MELODI and EURADOS, Helsinki (Finland), 19-20 April 2017 (O);
61. **G. Babini**, "Bioinformatics, CRESCO platform to manage data", LDLensRad Kick-off Meeting, Oxford (UK), 23-24 May 2017 (O);
62. S. Plumitallo, M. Grasso, F. Pagella, **G. Babini**, G. Spinozzi, J. Morini, M.A. Denti, C. Tinelli, C. Danesino, V. Del Vescovo, C. Olivieri, " Circulating microRNAs in Hereditary Hemorrhagic Telangiectasia: preliminary results identify significant differences among patients", 12° International HHT scientific conference, Dubrovnik (Croatia), 8-11 June 2017 (P);
63. S. Plumitallo, L. Ruiz-Llorente, C. Langa, J. Morini, **G. Babini**, D. Cappelletti, L. Scelsi, A. Greco, C. Danesino, C. Bernabeu, C. Olivieri,"Functional analysis of a novel ENG variant in a patient with Hereditary Hemorrhagic Telangiectasia (HHT) and Pulmonary Arterial Hypertension (PAH) identifies a new Sp1 binding-site", 12° International HHT scientific conference, Dubrovnik (Croatia), 8-11 June 2017 (P).
64. A. Ottolenghi, **G. Babini**, G. Baiocco, S. Barbieri, J. Morini, "From track structure to systems biology: "How many roads must a man walk down …"", ERRS and GBS 2017, Essen (Germany), 17-21 September 2017 (O);
65. S. Barbieri, **G. Babini**, G. Baiocco, J. Morini, W. Friedland, M. Buonanno, D.J. Brenner, A. Ottolenghi, "Track-structure simulation of g-H2AX foci and comparison with experimental results: unravelling the role of radiation quality", ERRS and GBS 2017, Essen (Germany), 17-21 September 2017 (P);
66. I. De Stefano, P. Giardullo, B. Tanno, S. Leonardi, E. Pasquali, **G. Babini**, A. Saran, M.T. Mancuso**, "**The role of the Shh signaling pathway in radio-induced cataractogenesis", 2017 European Association for Vision and Eye Research Conference, Nice (France), 27-30 September 2017 (O).

Teaching experiences:

Lectures on "radiobiology - DNA targeted and non-DNA-targeted effects" and "systems radiation biology" given at the course **Ionizing Radiation and Biological Structures: Theory and Applications** *("Modeling radiation effects from initial physical events")* held in Pavia, May 23 - June 3, 2016. Lead Scientist: Prof. A. Ottolenghi.

Lectures on "radiobiology" and "systems radiation biology" given at the course **Ionizing Radiation and Biological Structures: Theory and Applications** *("Modeling radiation effects from initial physical events")* held in Pavia, June 1 - June 12, 2015. Lead Scientist: Prof. A. Ottolenghi.

Online lecture on **"Radiation biophysics: from initial events to cellular effects"** for the preparation of students for the course "Radiation Biology for Medical Physicists" held at University of Pavia, Physics Dept., 13th-18th April 2015. Lead Scientist: Prof. A. Ottolenghi.

Lectures on "systems radiation biology" given at the course **Ionizing Radiation and Biological Structures: Theory and Applications** *("Modeling radiation effects from initial physical events")* to be held in Pavia, May 26- June 6, 2014. Lead Scientist: Prof. A. Ottolenghi.

"Perturbation of intracellular signaling pathways induced by ionizing radiation: temporal dynamics and dose dependence" – "Perturbazione di pathways di segnalazione intracellulari indotta da radiazioni ionizzanti: dinamiche temporali e dipendenze dalla dose", Martina Ugolini, Thesis for "Laurea magistrale in Fisica" (Master in Physics - University of Pavia) A. A. 2012-2013, October 2013 (Supervisor: Prof. Andrea Ottolenghi, Co-supervisors: **Gabriele Babini,** Jacopo Morini)

"Non targeted effects induced by low dose γ-rays: implications for anti and pro carcinogenesis"- "Effetti non targeted indotti da basse dosi di radiazioni γ: implicazioni per anti e pro carcinogenesi", Valentina Elettra Bellinzona, Thesis for "Laurea magistrale in Fisica" (Master in Physics - University of Pavia) A. A. 2012-2013, October 2013 (Supervisor: Prof. Andrea Ottolenghi, Co-supervisors: **Gabriele Babini,** Kristian Unger [Helmholtz Zentrum Munchen, Germany])

Lectures at the course **Ionizing Radiation and Biological Structures: Theory and Applications** *("Modeling radiation effects from initial physical events")* held in Pavia, May 27- June 7, 2013. Lead Scientist: Prof. A. Ottolenghi.

Co-supervisor of Marco Cobianchi's bachelor laurea thesis: "Studio multiscala dell'effetto bystander indotto da radiazioni ionizzanti" (English title: "**Multi-scale analysis of radiation-induced bystander effect**"), Academic year 2011-2012, University of Pavia (Supervisor: Prof. Andrea Ottolenghi).

10 hours lectures at the "Università per Adulti – Comprensorio di Lugo di Romagna" ("University for Adults - Area of Lugo di Romagna") within the project "Giovani e Adulti insieme al Computer" ("Young people and Adults together at the computer"), May 2005.

Previous Research Activities.

From November 2010 to September 2011

My master thesis project (supervisor: ***Prof. Andrea Ottolenghi – University of Pavia***) investigated the mechanisms of radiation-induced bystander effect. In particular the idea was the study of the role of radiation in modulating the release of the factors involved in the transmission of the damage from the irradiated cells to the bystander ones. The project was carried out within an integrated theoretical/experimental approach.
These studies were carried out using ELISA Assay (Enzyme-Linked ImmunoSorbent Assay) on the media of irradiated cells, and after my experience as summer student at GSI, we tested suitable protocols to study some of the previous aspects with flowcytometry.
The theoretical part of my project was about modeling cellular and sub-cellular processes involved in bystander effects, in particular the NF-kB pathway temporal dynamics with a system of ordinary differential

equations, with the goal of better understanding radiation-induced biological effects in the cells and to help in the design of possible future experimental studies.
The master thesis started was mainly involved with the **INFN Experiment "TENORE".**

From March 2009 to May 2009: stage at "ELETTRA synchrotron" in Trieste (Italy).
The aim of this training period was data analysis in order to understand dependence of absorption coefficients on different X-rays' energies. This stage was under the supervision of ***Prof.ssa Renata Longo (University of Trieste)*** and was within the project "**SYRMEP** (SYnchrotron Radiation for MEdical Physics)". This beamline has been designed by Synchrotron Trieste, in cooperation with the University of Trieste and the INFN, for research in medical diagnostic radiology.

From April 2009 to July 2009:
Bachelor thesis at University of Trieste (supervisor: ***Prof. Edoardo Milotti – University of Trieste***)
The aim of the thesis was the review of stochastic models of damage to DNA caused by ionizing radiation.
The activity was focused on the already existing models, with the aim of highlighting pros and cons of the model assumptions and their implementation.
This thesis work is part of VBL (Virtual Biophysics Lab) which is a computational project to develop a basic numerical model of tumour spheroids.

Personal Information

- European Driving Licence (Type B) since 2006

- Hobbies:

- sports: regularly training canoeing/kayaking in the Ticino river in Pavia and kitesurf/wakeboard at the seaside. Swimming at competitive levels from 8 to 14 years old, tennis and basketball in teams but without competitions. During my free time I like team sports with friends such as indoor football (winter) or beach tennis in double team (summer).

- **volunteering**: I regularly actively take part in my hometown's festivals cooking traditional meals of my region but I've also worked as a waiter when necessary. Incomes are given to: Local non-profit associations (e.g. to buy defibrillators for my hometown), world-wide known non-profit associations (e.g. Emergency), research associations (e.g. Associazione Italiana Leucemia - AIL - Italian Association for Leukemia), or to support local political parties work.

- **travel and discover new places far from the chaos of the city**: trekking and cycling are nice ways to escape from the city and relax.

Pavia, 17 February 2018