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Post-doc
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Temporary professor
Bachelor's degree in Biomedical Laboratory Techniques
University of Verona

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Education:

- 18 March 2011: Master degree in Astrophysics and Cosmology, Alma Mater Studiorum – University of Bologna.
- 26 April 2016: PhD in Nanotechnologies and Nanostructured Materials for Biomedical Applications, University of Verona.

Scientific activity:

Since January 2012 conducts activity in the MRI sequence optimization and data analysis. In particular imaging and data analysis have been applied to preclinical models of Multiple Sclerosis (MS), Amyotrophic Lateral Sclerosis (ALS) and Down Syndrome (DS), as well as clinical studies with patients affected by Bipolar Disorder (BD), mild Traumatic Brain Injuries (mTBI), brain tumor, breast tumor and ex-vivo characterization of peripheral neuropathy. A comprehensive list of MR sequences and data analysis tools that have been deeply investigates is reported below.

- Optimization of MRI sequences with clinical and preclinical imager (Bruker 4.7T, Bruker 7T e Philips Ingenia 1.5T):
  - Echo Planar Imaging (EPI)
  - Diffusion MRI (dMRI)
  - T1 & T2 mapping
  - Multi exponential T2 mapping (MET2)
  - Dynamic contrast enhanced MRI (DCE-MRI)
- MRI data analysis (MatLab, FSL, Mrtrix):
  - Resting state functional MRI (rsfMRI)
  - Morphometry
  - Voxel Based Morphometry (VBM)
  - DTI and dMRI
  - Tract Based Spatial Statistics
  - Intra Voxel Incoherent Motion (IVIM)
  - DCE-MRI
  - Multi exponential signal decay (myelin water imaging, MWI)

Scientific collaborations:

- Dr. Paolo Farace, Protontherapy unit of Azienda Provinciale per i Servizi Sanitari (Trento, Italy): characterization of radiation induced alterations to NAWM with MET2 and DTI and imaging of brain glioma.
- Prof. Guido Cavaletti, University of Milano Bicocca (Milan, Italy), Experimental Neurology Unit: characterization with dMRI techniques of chemotheray induced alterations to peripheral nerves.
- Prof. Paolo Brambilla, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico (Milan, Italy), Department of Neuroscience and Mental Health: rsfMRI in bipolar disorder.
- Dr. Nicolau Beckman, Novartis Institutes for BioMedical Research, Analytical Sciences & Imaging (Basel, Switzerland): support for the setup of rsfMRI sequence and data analysis.
- Prof. Pasquina Marzola, University of Verona, "*Validation of rsfMRI as innovative biomarker for disease progression in an experimental model of multiple sclerosis*", rsfMRI protocol set-up and data analysis, project financed by Fondazione Italiana Sclerosi Multipla (FISM), https://www.aism.it/gli_studi_sostenuti_con_il_bando_fism_2019.

Scientific and professional experiences:

- January 2012 - March 2012: stage at the MRI Lab of the University of Verona, under the lead of Prof. Pasquina Marzola.
- 01/04/2012 - 30/06/2012: scholarship at the MRI lab of the University of Verona, under the lead of Prof. Pasquina Marzola.
- 01/07/2012 - 31/12/2012: research grant at the MRI lab of the University of Verona, under the lead of Prof. Pasquina Marzola.
- 01/07/2013 - 31/12/2015: PhD scholarship in Nanotechnologies and Nanostructured Materials for Biomedical

Applications at the University of Verona, Phd supervisor Prof. Pasquina Marzola.

- 01/01/2015 - 30/06/2015: exchange student at École Polytechnique Fédérale de Lausanne (Switzerland, electrical engineering department, signal processing lab) under the lead of Prof. Jean-Philippe Thiran.
- 01/05/2016 - 30/04/2018: Post-doc at the MRI lab of the University of Verona, under the lead of Prof. Pasquina Marzola.
- 01/05/2018 - 31/12/2018: research assistant at the MRI lab of the University of Verona, under the lead of Prof. Pasquina Marzola.
- 01/05/2018 – 30/04/2020: post-doc at the Protontherapy Unit, Azienda Provinciale per i Servizi Sanitari (APSS), Trento, under the lead of Dott. Paolo Farace.
- 01/05/2020 – now: Post-doc at the Department of Neurosciences, Biomedicine and Movement Sciences of the University of Verona, under the lead of Prof. Stefano Tamburin.

Teaching:

- A.Y.2013-2014: academic tutor in Physics for Computer Science and Biotechnology at the University of Verona.
- A.Y.2015-2016: academic tutor in Physics for Applied Mathematics, Computer Science and Biotechnology at the University of Verona.
- Tandem Project lecturer for the University of Verona, physics and mathematics, years: 2014-2016-2017-2018-2019.
- Lecturer for the University of Verona, physics and mathematics, for the preparation of the admission test at the Medicine and Surgery faculty, years: 2016-2017-2018-2019.
- 2018 – now: temporary professor for the bachelor's degree in Biomedical Laboratory Techniques, unit of physical sciences and statistics.
- Thesis co-supervisor:
  - A.Y. 2015-2016: *"Ottimizzazione e validazione sperimentale della sequenza DWI per lo studio del tessuto adiposo"*, Ilaria Gobbo, VR383715. Bachelor's degree in Radiology Techniques for Imaging and Radiotherapy University of Verona.
  - A.Y. 2017-2018: *"Estrazione di caratteristiche quantitative da immagini MRI"*, Edoardo Pieropan, VR399604. Bachelor's degree in Computer science, University of Verona.
  - A.Y. 2018-2019 "O*ttimizzazione della pipeline di analisi di dati rsfmri acquisiti su modello sperimentale di sclerosi laterale amiotrofica*", Alessandro Mainente, VR366350. Master's degree in Bioinformatics and Medical Biotechnology, University of Verona.
  - A.Y. 2019-2020 "*Procedure for quality assurance of multicomponent T2 MRI relaxivity by a biomimetic phantom*", Nicola Bianchi, 198534. Master's degree in Physics, University of Trento.

Publications:

- *Physical properties of the nuclear region in Seyfert galaxies derived from observations with European VLBI Network.* ***Bontempi P.***, Giroletti M., Panessa F., Orienti M., Doi A. (2012). ***Monthly Notices of the Royal Astronomical Society, Volume 426, Issue 1, pp. 588-594 (10/2012).***
- *Pancreatic cancer growth using magnetic resonance and bioluminescence imaging.* Ritelli R., Ngalani Ngaleu R., Bontempi P., Dandrea M., Nicolato E., Boschi F., Fiorini S., Calderan L., Scarpa A., Marzola P. (2015). ***Magnetic Resonance Imaging, 2015 Jun;33(5):592-9.***
- *Functional Magnetic Resonance Imaging of Rats with Experimental Autoimmune Encephalomyelitis Reveals Brain Cortex Remodeling.* Tambalo S., Peruzzotti-Jametti l., Rigolio L., Fiorini S., Bontempi P., Mallucci G., Marmiroli P., Sbarbati A., Cavaletti G., Pluchino S., Marzola P. (2015). ***Journal of Neuroscience, 2015 Jul 8;35(27):10088-100.***
- *Magnetic Resonance Imaging of USPIO-labeled exosomes form stem cells: a new method to obtain labeled exosomes.* Busato, A., Bonafede R., Bontempi P., Scambi I., Schiaffino L., Malatesta M., Benati D., Sbarbati A., Mariotti R., Marzola P. (2016). ***International Journal of Nanomedicine, 2016 Jun 1;11:2481-90.***
- *MRI reveals therapeutical efficacy of stem cells: An experimental study on the SOD1(G93A) animal model.* ***Bontempi P.***, Busato A., Bonafede R., Scambi I., Schiaffino L., Sbarbati A., Mariotti R., Marzola P. (2016). ***Magnetic Resonance in Medicine.***
- *Labeling and Magnetic Resonance Imaging of Exosomes Isolated from Adipose Stem Cells.* Busato A., Bonafede R., Bontempi P., Scambi I., Schiaffino L., Benati D., Malatesta M., Sbarbati A., Marzola P., Mariotti R. ***Current Protocols in Cell Biology.***
- *SERRS/MRI multimodal contrast agent based on naked Au nanoparticles functionalized with a Gd(III) loaded PEG polymer for tumor imaging and localized hyperthermia.* Meneghetti M., Litti L., Rivato N., Fracasso G., Bontempi P., Nicolato E., Marzola P., Venzo A., Colombatti M., Gobbo M. (2017). ***Nanoscale, 2018 Jan 18;10(3):1272-1278.***
- *Central nervous system microbleeds predict structural integrity by DTI in the late phase after mild traumatic brain injury: a longitudinal study with a one-year follow-up.* Studerus-Germann, A. M., Engel D. C., Bontempi P., Thiran J. P., Daducci A., Romascano D., von Ow D., Hildebrandt G., Gautschi O. P. (2017). ***Neurologia I Neurochirurgia Polska, 2018 Nov - Dec;52(6):710-719.***

- *Easy formulation of liposomal doxorubicin modified with a bombesin peptide analogue for selective targeting of GRP receptors overexpressed by cancer cells.* Accardo A., Mannucci S., Nicolato E., Vurro F., Diaferia C., Bontempi P., Marzola P., Morelli G. (2019). **Drug Delivery and Translational Research, 2019 Feb;9(1):215-226.**
- *Heterogeneous Enhancement Pattern in DCE-MRI reveals the morphology of normal lymph nodes: an experimental study*. Bontempi P., Busato A., Conti G., Della Sala S.W., Marzola P., Farace P. ***Contrast Media & Molecuar Imaging, 2019 Apr 4;2019:4096706.***
- *The motor cortex of the sheep: laminar organization, projections and diffusion tensor imaging of the intracranial pyramidal and extrapyramidal tracts.* Peruffo A., Corain L., Centelleghe C., Grisan E., Graic JM., Bontempi P., Grandis A., Cozzi B. ***Brain Structure & Function, 2019 Jun;224(5):1933-1946.***
- *Slow versus fast rewarming after deep hypothermic circulatory arrest: effects on neuroinflammation and cerebral edema.* Linardi D., Walpoth B., Mani R., Murari A., Tessari M., Hoxha S., Anderloni M., DecimoI., Dolci S., Nicolato E., Bontempi P., Merigo F., Luciani G.B., Faggian G., Rungatscher A. ***European Journal of Cardio-Thoracic Surgery, 2020 May 14;ezaa143.***
- *A smaller olfactory bulb in a mouse model of Down syndrome.* ***Bontempi P.***, Cisterna B., Malatesta M., Nicolato E., Mucignat C., Zancanaro C. ***Acta Neurobiologiae Experimentalis (manuscript accepted).***
- *Resting state networks activity in euthymic Bipolar.* ***Bontempi P.***, Bellani M., Zovetti N., Rossetti M., Perlini C., Dusi N., Squarcina L., Marinelli V., Zoccatelli G., Alessandrini F., Ciceri E., Sbarbati A., Brambilla P.. ***Bipolar Disorders, 2020 Mar 25***.
- *ASC-exosomes ameliorate the disease progression in SOD1(G93A) murine model underlining their potential therapeutic use in human ALS.* Bonafede R., Turano E., Scambi I., Busato A., **Bontempi P.**, Virla F., Schiaffino L., Marzola P., Bonetti B, Mariotti R. ***International Journal of Molecular Sciences, Int J Mol Sc,. 2020 May 21;21(10):3651.***
- *Default Mode Network activity in Bipolar Disorder.* Zovetti N., Rossetti M.G., Perlini C., Maggioni E., **Bontempi P.**, Bellani M., Brambilla P. ***Epidemiol Psychiatr Sci., 2020; 29: e166.***
- *Quantitative multicomponent t2 relaxivity relaxation showed greater sensitivity than flair imaging to detect subtle alterations at the periphery of lower grade gliomas.* **Bontempi P.**, Rozzanigo U., Amelio D., Scartoni D., Amichetti M., Farace P., ***(manuscript submitted to Frontiers in Oncology).***

Conferences:

- *"Fisica & Medicina. Verso un futuro di integrazione", Trento 6-8 November 2014.* Oral presentation: *"Functional magnetic resonance imaging reveals brain cortex remodeling in a rat model of chronic multiple sclerosis"*. Tambalo S., Peruzzotti-Jametti l., Rigolio L., Fiorini S., Bontempi P., Mallucci G., Marmiroli P., Sbarbati A., Cavaletti G., Pluchino S., Marzola P.
- *"ISMRM, Italian Chapter", Verona 16-17 April 2015.* Oral presentation: *"Imaging biomarkers for Amyotrophic Lateral Sclerosis: an experimental study in the G93ASOD1 animal model"*. Bontempi P., Busato A., Bonafede R., Scambi I., Sbarbati A., Mariotti R., Marzola P.
- *"ISMRM, Italian Chapter", Bologna 4-5 February 2016.* Two posters: *"Magnetic resonance imaging reveals adipose-derived mesenchymal stem cells efficacy in the amyotrophic lateral sclerosis murine model"*. Bontempi P., Busato A., Bonafede R., Scambi I, Schiaffino L., Sbarbati A., Mariotti R., Marzola P.; and *"Magnetic Resonance Imaging of USPIO-labeled exosomes from stem cells: a new method to obtain labeled exosomes"*. Busato A., Bonafede R., Bontempi P., Scambi I., Schiaffino L., Benati D., Malatesta M., Sbarbati A., Marzola P., Mariotti R.
- *"ESMRMB", Barcellona, Spain, 29 September - 2 October 2016.* Poster: *Magnetic resonance imaging reveals adipose-derived mesenchymal stem cells efficacy in the amyotrophic lateral sclerosis murine model.* Bontempi P., Busato A., Bonafede R., Scambi I, Schiaffino L., Sbarbati A., Mariotti R., Marzola P.
- *"SIF", Trento, 13 September 2017.* Oral presentation: *Labeling of exosomes by Ultrasmall Superparamagnetic Iron Oxide (USPIOs) Nanoparticles for visualization by MRI.* Bontempi P., Busato A., Bonafede R., Scambi I., Schiaffino L., Benati D., Malatesta M., Sbarbati A., Mariotti R., Marzola P.
- *"ISMRM, Italian Chapter", Padova 10-11 May 2018.* Oral presentation*: "Increased functional connectivity in the SOD1(G93A) animal model of Amyotrophic Lateral Sclerosis: a rsfMRI study at 4.7T".* Bontempi P., Busato A., Bonafede R., Podda R., Scambi I., Sbarbati A., Mariotti R., Marzola P.

Verona, 24/02/2021 Pietro Bontempi