

# Linda Pattini

## Personal information

Date of birth: 3/7/1972.

Address: via Gen. C.A. Dalla Chiesa, 7 20082 Noviglio (Milan), Italy  
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## Position

Assistant Professor (Adjunct Professor) at Department of Electronics, Information and Bioengineering (DEIB), Politecnico di Milano (since 2011)

since 2003 to 2010: Research Fellow at the Bioengineering Department of Politecnico di Milano

## Education

Jan 2003

Ph.D. Degree in Bioengineering at Politecnico di Milano

Thesis: "Identification of mitochondrial proteins for the realization of a dedicated microarray".

Advisors: prof. Giorgio Casari (Vita-Salute San Raffaele University and Neurogenomics Unit, Division of Genetics and Cell Biology, San Raffaele Scientific Institute), prof. Sergio Cerutti (Politecnico di Milano – Dept. Bioengineering)

Jun 1999

Master degree in Biomedical Engineering at Politecnico di Milano

Thesis: "Single sweep analysis of auditory evoked potentials for the monitoring of critical subjects in intensive care".

Advisors: prof. Sergio Cerutti, prof. Luca Mainardi (Politecnico di Milano – Dept. Bioengineering)

## Attended courses

2006 – "Systems Biology Dynamics from Genes to Organisms" – McGill University, Montreal, Canada

2003 – "Advanced signal processing methods for measuring the complexity in biological systems" Summer school – University of Siena, Italy

2000 – "Advanced linkage" Intensive course – University of Pavia, Italy

## Research activity

Linda Pattini has autonomously developed competences in the wide field of Bioinformatics, Functional Genomics and Genome Medicine within the context of a research group devoted to biomedical signal processing.

Her expertise concern information bioengineering in genomics, proteomics and genetics: applied mathematics for computational biology, data mining techniques, statistics and algorithms for bioinformatics.

Main topics of her research projects encompass:

- data analysis and modelling in genetics, genomics and multi-omics for the characterization of molecular mechanisms of disease, the

identification of markers and distinctive molecular signatures and the evaluation of potential drug targets

- integrative bioinformatics to study gene functions and complex regulatory processes by analyzing information at different levels of organization, from genome and transcriptome to proteome and interactome (systems biology)
- systems biology in pharmacogenomics: characterization of drug mode of action and patient-specific sensitivity to pharmacological treatment in a precision medicine perspective
- pattern discovery and study of signals involved in the functional specification of molecular sequences. Computational methods for raw data analysis of high throughput experiments (next generation sequencing and mass spectrometry). Main fields of application: molecular oncology, neurodisorders.

Faculty of the *Biosignals-Bioimaging-Bioinformatics lab (B3LAB)* at the Bioengineering division of the Department of Electronics, Information and Bioengineering at Politecnico di Milano, she is responsible of the Bioinformatics research line.

Linda Pattini is currently coordinating a group of 6 people: one PhD student and five graduate students.

#### Teaching activity

- since a.y. 2015-2016 to present:  
***Bioinformatics and Functional Genomics***  
(Master degree in Biomedical Engineering - Politecnico di Milano) – 5 cts
- since a.y. 2009-2010 to a.y. 2014-2015:  
***Advanced data analysis for medicine and bioinformatics***  
(Master degree in Biomedical Engineering - Politecnico di Milano) – 5 cts
- since a.y. 2004-2005 to a.y. 2008-2009:  
***Computational Genomics***  
(Master degree in Biomedical Engineering - Politecnico di Milano) – 2.5 cts
- since a.y. 2009-2010 to present:  
***Bioinformatics***  
(Bachelor Degree in Medical and Pharmaceutical Biotechnology– University Vita-Salute San Raffaele) – 6 cts
- since a.y. 2015-2016 to present:  
***Elements of Medical Informatics***  
(Bachelor degree in Biomedical Engineering - Politecnico di Milano) – 3 cts

Practical lessons (since 2004 until 2011): *Fundamentals of Biomedical Signals*

**PhD Board membership**

Member of the PhD Programme Board in Bioengineering at Politecnico di Milano.

Member of the examination committee for the PhD final dissertation defense at University of Padua – PhD School of Information Engineering (2014).

Member of the examination committee for the PhD final dissertation defense at University Vita-Salute San Raffaele – International PhD Course in Molecular Medicine (2018)

**Student supervision**

Linda Pattini supervised five PhD students, who are all currently employed in national and foreign research institutes or universities, working in the bioinformatics field and dozens of graduate students.

Awards and Acknowledgments:

- PhD thesis Prize at the Annual school of Bioengineering (2011) to Matteo Fumagalli: *“Analysis of signatures of natural selection in the human genome and association with susceptibility to infectious diseases”*.
- Fellowship granted by Politecnico di Milano to the graduate student Lucrezia Lorenzon to support her thesis project abroad (Imperial College of London): *“Using Convolutional Neural Networks to dissect the genetic basis of complex diseases”*.

**Referee and editorial activity**

Reviewer for the following international journals and conferences:

- BMC Bioinformatics
- BMC Genomics
- DNA and Cell Biology
- Physical Biology
- Engineering in Medicine and Biology Magazine
- Signal Image and Video Processing
- Bioinformatics
- Experimental Biology and Medicine
- IEEE Transactions on Biomedical Engineering
- IEEE Transactions on Knowledge and Data Engineering
- EURASIP Journal on Bioinformatics and Systems Biology
  
- ISMB (International Conference on Intelligent Systems for Molecular Biology)
- EMBC (Engineering in Medicine and Biology Society)

Associate Editor of *Frontiers in Genetics* and *Frontiers in Physiology* – Systems Biology section

**Scientific organizations**

BITS (Bioinformatics Italian Society) Full member

**Research projects evaluation**

Reviewer for national projects: MIUR – SIR, PRIN (both as a reviewer and as a rapporteur), Regional Project for “Regione Sardegna”.

**Committees for Appointment and Promotion**

Member of the evaluation committee at the competition launched by Centro Nazionale delle Ricerche (CNR) for the selection of a 3<sup>rd</sup> level Researcher (2017)

Member of the Committee for Appointment and Promotion at San Raffaele Scientific Institute for Staff Scientists of the Center for Translational Genomics and Bioinformatics (2015, 2016).

Member of evaluation committees for the selection of research fellows at Politecnico di Milano and Centro Nazionale delle Ricerche (CNR)

**Participation to research projects**

Collaborator of the project “Dissecting the role of hypoxia-inducible factors in distinct leukemia and leukemia cell populations” granted by AIRC (2013-2016)- a phd fellowship funded.

**FFABR**

MIUR support to research activity 2017 (3k euros)

**Peer reviewed publications**

h-index: 12, citations: 713 (source: Scopus)

*[numbers indicate selected publications]*

- Farinello D, Wozinska M, Lenti E, Genovese L, Bianchessi S, Migliori E, Sacchetti N, Di Lillo A, Bertilaccio MTS, de Lalla C, Valsecchi R, Bascones Gleave S, Lligé D, Scielzo C, Mauri L, Ciampa MG, Scarfò L, Bernardi R, Lazarevic D, Campo E, Gonzalez-Farre B; Bongiovanni L, Cerutti A, Ponzoni M,; Pattini L, Caligaris-Cappio F, Ghia P and Brendolan A. “A Retinoic Acid-dependent Stroma-Leukemia Crosstalk Promotes Chronic Lymphocytic Leukemia Progression”. *Nat Communications* (in press) IF 12.12 Q1

1. Ponente M, Campanini L, Cuttano R, Piunti A, Delledonne GA, Coltella N, Valsecchi R, Villa A, Cavallaro U, Pattini L, Doglioni C, Bernardi R. "PML promotes metastasis of triple-negative breast cancer through transcriptional regulation of HIF1A target genes". *JCI Insight*. 2017 Feb 23;2(4):e87380. doi: 10.1172/jci.insight.87380. PMID: 28239645  
*ISI (founded in 2016)*
2. Bolis M, Garattini E, Paroni G, Zanetti A, Kurosaki M, Castrignanò T, Garattini SK, Biancardi F, Barzago MM, Gianni' M, Terao M, Pattini L\*, Fratelli M\*. "Network-guided modeling allows tumor-type independent prediction of sensitivity to all-trans-retinoic acid". *Ann Oncol*. 2017 Mar 1;28(3):611-621. doi: 10.1093/annonc/mdw660. PMID: 27993792 (\*co-last authorship)  
*IF 11.85 Q1*
3. Mannarino L, Paracchini L, Craparotta I, Romano M, Marchini S, Gatta R, Erba E, Clivio L, Romualdi C, D'Incalci M, Beltrame L, Pattini L. "A systems biology approach to investigate the mechanism of action of trabectedin in a model of myelomonocytic leukemia". *Pharmacogenomics J*. 2018 Jan;18(1):56-63. doi: 10.1038/tpj.2016.76. Epub 2016 Dec 13. PMID: 27958379  
*IF 3.81 Q1*
- Pelosi G, Pattini L, Morana G, Fabbri A, Faccineto A, Fazio N, Valeri B, Sonzogni A. "Grading lung neuroendocrine tumors: Controversies in search of a solution". *Histol Histopathol*. 2017 Mar;32(3):223-241. doi: 10.14670/HH-11-822. Epub 2016 Sep 15. Review. PMID: 27628949  
*IF 2.02 Q2*
- Migliavacca J, Percio S, Valsecchi R, Ferrero E, Spinelli A, Ponzoni M, Tresoldi C, Pattini L, Bernardi R, Coltella N. "Hypoxia inducible factor-1 $\alpha$  regulates a pro-invasive phenotype in acute monocytic leukemia". *Oncotarget*. 2016 Aug 16;7(33):53540-53557. doi: 10.18632/oncotarget.10660. PMID: 27447550  
*IF 5.17 Q1*
4. Ghirotto S, Tassi F, Barbujani G, Pattini L, Hayward C, Vollenweider P, Bochud M, Rampoldi L, Devuyst O. "The Uromodulin Gene Locus Shows Evidence of Pathogen Adaptation through Human Evolution". *J Am Soc Nephrol*. 2016 Oct;27(10):2983-2996. Epub 2016 Mar 10. PMID: 26966016  
*IF 8.96 Q1*
5. Centritto F, Paroni G, Bolis M, Garattini SK, Kurosaki M, Barzago MM, Zanetti A, Fisher JN, Scott MF, Pattini L, Lupi M, Ubezio P, Piccotti F, Zambelli A, Rizzo P, Gianni' M, Fratelli M, Terao M, Garattini E. "Cellular and molecular determinants of all-trans retinoic acid sensitivity in breast cancer: Luminal phenotype and RAR $\alpha$  expression". *EMBO Mol Med*. 2015. ul;7(7):950-72. doi: 10.15252/emmm.201404670. PMID: 25888236  
*IF 9.25 Q1*

Braida D, Guerini FR, Ponzoni L, Corradini I, De Astis S, Pattini L, Bolognesi E, Benfante R, Fornasari D, Chiappedi M, Ghezzi A, Clerici M, Matteoli M, Sala M. "Association between SNAP-25 gene polymorphisms and cognition in autism: functional consequences and potential therapeutic strategies". *Transl Psychiatry*. 2015. Jan 27;5:e500. doi: 10.1038/tp.2014.136. PMID: 25629685

IF 4.73 Q1

6. Percio S, Coltella N, Grisanti S, Bernardi R, Pattini L. "A HIF-1 network reveals characteristics of epithelial-mesenchymal transition in acute promyelocytic leukemia". *Genome Med*. 2014. Dec 1;6(12):84. doi: 10.1186/s13073-014-0084-4. eCollection 2014. PMID: 25452766

IF 7.07 Q1

7. Pattini L, Sassi R, Cerutti S. "Dissecting heart failure through the multiscale approach of systems medicine". *IEEE Trans Biomed Eng* 2014. Sep;25(9):2729-40. doi: 10.1093/cercor/bhu070. Epub 2014 Apr 15. PMID: 24735673

IF 3.57 Q1

- Coltella N, Percio S, Valsecchi R, Cuttano R, Guarnerio J, Ponzoni M, Pandolfi PP, Melillo G, Pattini L, Bernardi R. "HIF factors cooperate with PML-RARA to promote acute promyelocytic leukemia progression and relapse". *EMBO Mol Med* 2014. May;6(5):640-50. doi: 10.1002/emmm.201303065. PMID: 24711541

IF 9.25 Q1

- Rusconi F, Paganini L, Braida D, Ponzoni L, Toffolo E, Maroli A, Landsberger N, Bedogni F, Turco E, Pattini L, Altruda F, De Biasi S, Sala M, Battaglioli E. "LSD1 Neurospecific Alternative Splicing Controls Neuronal Excitability in Mouse Models of Epilepsy". *Cereb Cortex* 2014. Sep;25(9):2729-40. doi: 10.1093/cercor/bhu070. Epub 2014 Apr 15. PMID: 24735673

IF 6.56 Q1

- Menna E, Zambetti S, Morini R, Donzelli A, Disanza A, Calvigioni D, Braida D, Nicolini C, Orlando M, Fossati G, Cristina Regondi M, Pattini L, Frassoni C, Francolini M, Scita G, Sala M, Fahnstock M, Matteoli M. "Eps8 controls dendritic spine density and synaptic plasticity through its actin-capping activity". *EMBO J*. 2013. un 12;32(12):1730-44. doi: 10.1038/emboj.2013.107. Epub 2013 May 17. PMID: 23685357

IF 9.79 Q1

8. Kurosaki M, Bolis M, Fratelli M, Barzago MM, Pattini L, Perretta G, Terao M, Garattini E. "Structure and evolution of vertebrate aldehyde oxidases: from gene duplication to gene suppression". *Cell Mol Life Sci*. 2012. May;70(10):1807-30. doi: 10.1007/s00018-012-1229-5. Epub 2012 Dec 21. PMID: 23263164

IF 5.78 Q1

- Corradini I, Donzelli A, Antonucci F, Welzl H, Loos M, Martucci R, De Astis S, Pattini L, Inverardi F, Wolfer D, Caleo M, Bozzi Y, Verderio C, Frassoni C, Braida D, Clerici M, Lipp HP, Sala M, Matteoli M. "Epileptiform Activity and Cognitive Deficits in SNAP-25+/- Mice are Normalized by Antiepileptic Drugs". *Cereb Cortex*. 2012. Feb;24(2):364-76. doi: 10.1093/cercor/bhs316. Epub 2012 Oct 12. PMID: 23064108  
IF 6.56 Q1
- 9. Fumagalli M, Sironi M, Pozzoli U, Ferrer-Admettla A, Pattini L, Nielsen R, "Signatures of environmental genetic adaptation pinpoints pathogens as the main selective pressure through human evolution". *Plos Genetics* 2011. Nov;7(11):e1002355. doi: 10.1371/journal.pgen.1002355. Epub 2011 Nov 3. PMID: 22072984  
IF 6.10 Q1
- Pattini L, Bertacco R, Candiani G, Masseroli M and Servi S. "Trends in biomedical engineering: focus on Genomics and Proteomics". *JABB* 2011. May-Aug;9(2):98-108. doi: 10.5301/JABB.2011.8564. Review. PMID: 22065387  
IF 1.16 Q3
- 10. Ballardini R, Benevento M, Arrigoni G, Pattini L and Roda A. "MassUntangler: A novel alignment tool for label-free liquid chromatography-mass spectrometry proteomic data". *J Chromatogr A* 2011. Dec 9;1218(49):8859-68. doi: 10.1016/j.chroma.2011.06.062. Epub 2011 Jun 22. PMID: 21783198  
IF 3.98 Q1
- 11. Sala M, Braida D, Lentini D, Busnelli M, Bulgheroni E, Capurro V, Finardi A, Donzelli A, Pattini L, Rubino T, Parolaro D, Nishimori K, Parenti M and Chini B. "Pharmacologic rescue of impaired cognitive flexibility, social deficits, increased aggression, and seizure susceptibility in oxytocin receptor null mice: a neurobehavioral model of autism". *Biol Psychiatry* 2011. May 1;69(9):875-82. doi: 10.1016/j.biopsych.2010.12.022. Epub 2011 Feb 21. PMID: 21306704  
IF 11.41Q1
- Mazzara S, Cerutti S, Iannaccone S, Conti A, Olivieri S, Alessio M and Pattini L. "Application of Multivariate Data Analysis for the Classification of Two Dimensional Gel Images in Neuroproteomics". *J Proteomics Bioinform* 2011  
Indexed in Scopus
- 12. Cappadona S, Nanni P, Benevento M, Levander F, Versura P, Roda A, Cerutti S, and Pattini L. "Improved Label-Free LC-MS Analysis by Wavelet-Based Noise Rejection". *Journal of Biomedicine and Biotechnology – Special Issue on Proteomics* 2010. 2010:131505. doi: 10.1155/2010/131505. Epub 2010 Jan 28. PMID: 20150965  
IF 3.17 Q2

- Cagliani R, Fumagalli M, Pozzoli U, Riva S, Cereda M, Comi GP, Pattini L, Bresolin N, Sironi M. "A complex selection signature at the human AVPR1B gene". *BMC Evol Biol* 2009. Jun 1;9:123. doi: 10.1186/1471-2148-9-123. PMID: 19486526  
IF 3.22 Q2
- Nanni L, Mazzara S, Pattini L, Lumini A "Protein classification combining surface analysis and primary structure". *Protein Eng Des Sel* 2009. Apr;22(4):267-72. doi: 10.1093/protein/gzn084. Epub 2009 Feb 1. PMID: 19188137  
IF 2.04 Q3
- 13. Manfredi I, Zani AD, Rampoldi L, Pegorini S, Bernascone I, Moretti M, Gotti C, Croci L, Consalez GG, Ferini-Strambi L, Sala M, Pattini L, Casari G. "Expression of mutant beta2 nicotinic receptors during development is crucial for epileptogenesis". *Hum Mol Genet* 2009. Mar 15;18(6):1075-88. doi: 10.1093/hmg/ddp004. Epub 2009 Jan 18. PMID: 19153075  
IF 5.34 Q1
- 14. Cappadona S, Levander F, Jansson, M, James P, Cerutti S, Pattini L "A Wavelet-Based Method for Noise Characterisation and Rejection in High-Performance Liquid Chromatography Coupled to Mass Spectrometry". *Anal Chem* 2008. Jul 1;80(13):4960-8. doi: 10.1021/ac800166w. Epub 2008 May 30. PMID: 18510348  
IF 6.32 Q1
- Corti V, Sanchez-Ruiz Y, Piccoli G, Bergamaschi A, Cannistraci CV, Pattini L, Cerutti S, Bachi A, Alessio M, Malgaroli A."Protein fingerprints of cultured CA3-CA1 hippocampal neurons: comparative analysis of the distribution of synaptosomal and cytosolic proteins". *BMC Neurosci*. 2008. Apr 10;9:36. doi: 10.1186/1471-2202-9-36. PMID: 18402664  
IF 2.31 Q3
- 15. Pattini L, Mazzara S, Conti A, Iannaccone S, Cerutti S, Alessio M. "An Integrated Strategy in Two-Dimensional Electrophoresis Analysis Able to Identify Discriminants Between Different Clinical Conditions". *Exp Biol Med* 2008. Apr;233(4):483-91. doi: 10.3181/0707-RM-187. PMID: 18367638  
IF 2.68 Q2
- L.T.Mainardi, L.Pattini, S. Cerutti, "Application of the Ramanujan Fourier transform for the analysis of secondary structure content in amino acid sequences". *Methods of Information in Medicine* 2007 . 46(2):126-9. PMID: 17347741  
IF 1.77 Q3
- M. Severgnini, L. Pattini, C. Consolandi, E. Rizzi, C. Battaglia, G. De Bellis, S. Cerutti, "Application of the Taguchi method to the analysis of depositino step in microarray production". *IEEE Trans on NanoBioscience* 200  
IF 2.77 Q2



- L. Pattini, I, Merelli, S. Cerutti, L. Milanese, "Representation and Modelling of Protein Surface Determinants". *IEEE Trans on NanoBioscience* 2005. Dec;4(4):301-5. PMID: 16433296  
IF 2.77 Q2
- Pattini L., Cerutti S., "Hydrophobicity analysis of protein primary structures to identify helical regions". *Methods of Information in Medicine* 2004. 43(1):102-5. PMID: 15026848  
IF 1.77 Q3
- Pattini L., Cerutti S., "The role of 3'UTRs in the mechanisms for segregating mitochondrial proteins". *IEEE Trans on NanoBioscience* 2003. IEEE Trans Nanobioscience. 2003 Dec;2(4):233-8. PMID: 15376913  
IF 2.77 Q2
- Mainardi LT, Kupila J, Nieminen K, Korhonen I, Bianchi AM, Pattini L, Takala J, Karhu J, Cerutti S. "Single sweep analysis of event related auditory potentials for the monitoring of sedation in cardiac surgery patients". *Comput Methods Programs Biomed* 2000. Nov;63(3):219-27. PMID: 11064145  
F 2.50 Q2

#### Contributions to books

- Pattini L, Cerutti S, "Biomolecular sequence analysis", in S. Cerutti, C. Marchesi, *Advanced Methods of Biomedical Signal Processing*. IEEE Press - Wiley (2011), pp. 489-506.
- Pattini L, Cerutti S, "Analisi di sequenze", in R. Bellazzi, S. Cavalcanti, G. Toffolo, C. Cobelli, *Genomica e Proteomica*. PATRON editore Gruppo Nazionale di Bioingegneria (2007), pp. 97-115.
- Merelli I., Pattini L., Cerutti S., Milanese L., "Amino acids surface patterns in protein domain functionality analysis", in *Bioinformatics of Genome Regulation and Structure II*, Springer Science+Business Media, Inc. 2006, pp. 225-233.
- Pattini L, Cerutti S, "Analisi di sequenze di biomolecole", in S. Cerutti, C. Marchesi, *Metodi avanzati di elaborazione di segnali biomedici*. PATRON editore Gruppo Nazionale di Bioingegneria (2004), pp. 431-447.

#### Patents

- Cappadona S. Pattini L., Cerutti S. Levander F. James P., "Metodo e sistema per rilevare picchi peptidici in segnali HPLC-MS", MI2007A001107 (National patent), 2007.
- Cappadona S. Pattini L., Cerutti S. Levander F. James P., "Methods and system for detecting peptide peaks in HPLC-MS signals", PCT/IT2008/000360 (international extension), 2008.