

CURRICULUM VITAE

Alessandra Maria Bossi

Dipartimento di Biotecnologie, Università degli Studi di Verona
Strada Le Grazie 15, 37134 Verona
email: alessandramaria.bossi@univr.it

Education

1993: Degree in Biological Sciences/Biochemistry (5 years) from the State University of Milano, Italy. Thesis: "FT-IR and circular dichroism study on conformational changes of insulin." Prof. P. Tortora.

2002: Ph.D. in Polymer Chemistry, Cranfield University (UK). Thesis: "New materials for separation and sensing." Prof. A.P.F. Turner, Prof. S.A. Piletsky.

Appointed academic positions

Assistant Professor in Biochemistry (BIO/10), University of Verona (Italy) 2000-2014

Associate Professor in Analytical Chemistry (CHIM/01), University of Verona (Italy) from 2014 ongoing.

Invited visiting positions

- Marie Curie Fellow Cranfield University, UK 2006-2007.
- Visiting Professor for research and tuition, appointed out of selection and invitation, Université de Technologie de Compiègne (France) 2011, 5 months.
- Visiting Professor for monothematic lectures (6 hours) on the topic: nanomaterials for nanomedicine, Université de Technologie de Compiègne (France) 2017 and 2018.

Funded research projects and management experience

From 2000 AM Bossi has been awarded of grants for research projects on the basis of competitive selection, both at the national and international levels, as Principal investigator (PI), project leader, project partner. Among the financing bodies: National Research Council CNR 2000, Ministry of Education and Research PRIN 2001; PRIN 2003; Ministry of Foreign Affairs 2008, British Council 2008, European Union (EU) 7FP, Horizon 2020.

AM Bossi has received funding by private bodies for applied research and technology transfer activities, (e.g. gruppo Grandi Pastai Italiani 2006-2007; Infigo Diagnostics, Netanya, Israel). Finally AM Bossi has been funded by EU for high education activities of young scientists.

Within the host Dept. AM Bossi has been PI in charge of several one-year- grants for post doc (Assegni di Ricerca, AdR) granted on the basis of an intra-departmental competitive ranking based on the individual scientific performance (n. papers + n. projects over a time span of 3 years) in the following years: 2006, 2009, 2012, 2015, 2017.

Recently Funded Projects:

- Fondazione Cariverona, Verona Nanomedicine Initiative 2011-2014. 36 months, Participant. Title: "Nanotechnologies in the development of innovative protocols for the diagnosis of cardiovascular risk".
- European Union, FP7/2007-2013/ Marie Curie Intra-European Fellowship 2012-2014. Scientific Coordinator (PI) of the Marie Curie Fellow, Title: "Peptide Imprinted Polymers"; 24 months; REA grant agreement n° [327165].
- Ministero dell'Istruzione, dell'Università e della Ricerca Scientifica. FIRB 2013, 48 months. Participant. Title: "Abuse of Smart Drugs: impacts on society, healthcare, law; damages in young athletes: epidemiology; pathology, biochemistry and toxicology."

- European Union, H2020-MSCA-IF-2016. Marie Skłodowska Curie Actions 2017-2019. Scientific Coordinator (PI) of the Marie Curie Fellow, Title: "Gluten Epitope Molecularly imprinted polymer Sensor." 24 months; REA grant agreement n° [752438].

Technology transfer activity, patents:

1. US Patent 5,939,523 (August 17, 1999) Bossi, A.M., P.G. Righetti, E. Riva, L.F. Zerilli. "Purification of dalbaheptide antibiotics by isoelectric focusing." dal 17-08-1999 a oggi.
2. US Patent App. 10/520,656. (July, 11, 2003); Inventori: Alessandra Bossi, Anthony Francis, Olena Imiriyna, Sergey Piletsky. "Method of producing a microfluidic device." dal 11-07-2003 a oggi.
3. US Patent 7,682,836, 2010 Inventori: Piletsky, S.A., Piletska, O.V., Karim, K., Turner, A.P.F. and Bossi A "Selective Binding Materials" dal 23-03-2010 a oggi.

Editorial activity:

Guest Editor of the Special Issue "Novel Approaches of Nanoparticles in Biosensing"-Sensors (ISSN1424-8220, IF 2.033) <http://www.mdpi.com/journal/sensors>.

Member of the Editorial Board of Sensors Section Board for 'Biosensors' from 2018 (ISSN 1424-8220, <http://www.mdpi.com/journal/sensors/>, impact factor 2.677, Biosensors section).

Reviewers Activity :

- Reviewer for international scientific journals with peer review (e.g. ACS Nano; ACS Applied Material and Interfaces; Analytical Chemistry; Analytical and Bioanalytical Chemistry; Nanoscale; Nature Protocols; Sensors; Talanta).
- Reviewer of projects for the following scientific foundations: Israel Science Foundation (ISF) (Israele); Deutsche Forschungsgemeinschaft (DFG) (Germania); ERA-Chemistry consortium (Germania); Chemical Royal Society (UK); National Science Center (Polonia).

Doctoral School Boards:

Member of the Doctoral School Board in Molecular Industrial and Environmental Biotechnology Università di Verona from 01-01-2002 to 31-12-2012;

Member of the Doctoral School Board in Nanoscience and Avanced Technologies Università di Verona from 01-01-2013 ongoing.

Invited opponent member for the dissertation of the following doctoral theses:

1. Dottorato in Scienza ed Alta Tecnologia, XXV CICLO, Scienze Biochimiche, Dipartimento di Chimica, Università di Torino, 11-3-2013.
2. Linneus University, Kalmar, Sweden. Title of the thesis: QCM-based sensing using biological and biomimetic interfaces. Candidate: Elmund Louise. 31-10-2014.
3. Universite de Technologie de Compiegne, France. Candidate: Mrs. DAOUD ATTIEH Mira. Title of the thesis: Enzymatically initiated synthesis of biomimetic receptors based on molecularly imprinted polymers by free radical polymerization. 1-04-2016.
4. Universite de Technologie de Compiegne, France. Candidate: Jingjing XU. Title of the thesis: Solid phase synthesis of molecularly imprinted polymer nanoparticles for protein recognition. 21-4-2017.
5. Oslo University, School of Pharmacy, Norway. Candidate: Mrs. Cecilia Rossetti: Title of the thesis: Molecularly Imprinted Polymers as new tool in proteomics: the case study pf SCLC diagnosis. 19-12-2017.
6. Linneus University, Kalmar, Sweden. Candidate: Ndizeye Natacha. Title of the thesis: New strategies for preparing polymers with hierarchical architectures. 5-10-2018.

Lecturer activity at University of Verona

-2001/2002 to 2004/2005: Enzymology, 60 hours, SSD BIO/10, LM, Biotecnologie Agroindustriali -da --
 2003/2004 to 2005/2006: Applied Biochemistry, SSD BIO/10, L, Biotecnologie Agroindustriali
 -2005/2006: Enzymology, 4 CFU, SSD BIO/10, LM, Biotecnologie Molecolari ed Industriali

- 2005/2006: Proteomics, 5 CFU, SSD BIO/10, LM, Biotecnologie Molecolari ed Industriali
- 2007/2008: Enzymology, 4 CFU, SSD BIO/10, LM, Biotecnologie Agro-Alimentari
- A.A. 2009/2010: Applied Biochemistry, 4CFU, SSD BIO/10, L, Biotecnologie
- A.A. 2011/2012 to 2014/15: Protein engineering, SSD BIO/10, 6CFU, LM, Biotecnologie Agroindustriali
- 2014/2015- ongoing: Omics Sciences, Proteomics (4CFU), SSD CHIM/01, LM7, Biotecnologie Agroalimentari
- 2015/2016- ongoing: Functional Proteomics (6CFU), SSD CHIM/01, LM9, Molecular and medical biotechnology, Tuition in english
- 2015/2016- ongoing: Research Inspired Laboratory (2CFU), SSD BIO/10, LM9, Molecular and medical biotechnology, Tuition in english

Istitutional roles

2014-2018 member of the Departmental Commission FUR;
 From 2016 member of the AQ team (assessment of the quality) for the Master course in Molecular and medical biotechnology (LM9).

Affiliation to Scientific Societies

- In 2016 elected member of the Scientific Board of the international Molecular Imprinting Society.
- From 2013 member of the Società Chimica Italiana (SCI).

National Scientific Habilitation

National scientific habilitation (ASN 2016) for the position of Full Professor in Analytical chemistry, SSD CHIM/01, granted the 12-4-2017.

Description of the scientific activity

AM Bossi's research activities are in the field of analytical chemistry, where she has been active in pursuing method developments for protein and peptide targeted separation and quali-quantifications. In particular, AM Bossi conceives, designs and synthesizes bio-mimetic polymeric materials (acrylamides, methacrylates, acrylates, thiophenes, anilines), prepared by the strategy of molecular imprinting of polymers, with the aim of producing robust and stable synthetic receptors, outperforming their natural counterparts. Her most original contribution to the research area has been to propose strategies for the successful imprinting of proteins and peptides.

In terms of materials, AM Bossi has expertise in polymer design (syntheses at micro- and nano-metric scale), in the control over the polymer growth by photoactivated and iniferter-driven polymerization techniques, in the addition/inclusion of functional properties to the polymeric materials, such as responsiveness, intelligent properties, catalysis, molecular recognition, refolding.

She has been studying the biophysical and structural properties of the polymers, such as the fractal distribution of polymeric chains, growth of nanovoids, core-shell materials. AM Bossi studies the application of the aforementioned materials as recognition elements in sensors (electrochemical, optical), as well as the use of these materials as molecular baits for proteomics and for selective enrichment of target analytes in mass spectrometry (MALDI MS and LC MS-MS).

Oral and invited communications to conferences

Oral presentations to conferences:

- 1) The second world conference on "Synthetic Receptors" Salzburg (Austria), 7-9 September 2005. "Reconfigurable supports for selective adsorption and separation of biomolecules." A.M. Bossi, M. Varejka, S. Piletsky
- 2) 5th International Workshop on Molecularly Imprinted Polymers "MIP2008", Kobe (Japan), September 7-11, 2008. "Fabrication of polymer arrays for sensor technology." A.M. Bossi, I. Sanchez, O. Henry, S. Piletsky
- 3) 7th International Workshop on Molecularly Imprinted Polymers "MIP2012", Paris (France), August 27-30, 2012. "Rational selection of peptide epitope templates for protein imprinting." A.M. Bossi, R. Levi
- 4) International Biolron Society 2013 Meeting, London (England), April 14-18, 2013. "SPR biosensors and "natural hepcidin receptor" immobilization for hepcidin-25 determination in serum." AM Bossi, F. Lonardoni, I. Chianella, A. Castagna, M. Bovi, O. Olivieri, D. Girelli

- 5) 11th International Conference on Nanosciences & Nanotechnologies (NN14), Thessaloniki (Greece), July 8-11 2014. "Molecularly imprinted nanoparticles for point-of-care analysis in Nanomedicine." A.M. Bossi., D. Girelli D., O. Olivieri
- 6) European Iron Club 2014; Verona (Italy), September 11-14 2014. "Hepcidin-25 assays and sensors based on molecularly imprinted nanoparticles. " Bossi A.M., Andreetto E., Cenci L., Castagna A., Girelli D., Olivieri O.
- 7) European Iron Club 2016; Innsbruck (Austria), April 7-10, 2016. "Molecularly imprinted nanoparticles targeted at the recognition of hepcidin-25: new opportunities in the hepcidin determination panorama." A.M. Bossi, L. Cenci, D. Girelli.
- 8) The 9th International Congress on Molecular Imprinting-MIP2016; Lund (Sweden), June 23-27, 2016. "Molecularly imprinted nanoparticles in MALDI-TOF mass spectrometry." A.M. Bossi, L. Cenci, G. Guella.
- 9) Analytical Proteomics - V-ICAP 2017 conference. Caparica (Portugal), July, 1 – 6, 2017. Title: Molecularly imprinted micro- and nano-materials for direct protein MALDI-TOF MS analysis. A.M. Bossi, L. Cenci, A. Anesi, G. Guella.
- 10) XXVI Congresso Nazionale della Società Chimica Italiana, 11-14 Settembre 2017, Paestum. Title: Molecularly Imprinted Materials Coupled to MALDI-TOF Mass Spectrometry for the Targeted Analysis of Peptides and Proteins. L. Cenci, G. Guella, A.M. Bossi.
- 11) 28th Anniversary World Congress on Biosensors, 12-15 June 2018, Miami (Florida, US). Title: Plasmonic platform in plastic optical fibers combined with molecularly imprinted nanogels to sense ultralow protein concentrations. N. Cennamo, M. Pesavento, L. Zeni, A.M. Bossi.
- 12) XXVII Congress of the Analytical Chemistry Division, Analitica 2018, 16-20 September 2018, Bologna. Keynote lecture. Title: Molecularly imprinted nanogel particles: tailor-made protein and peptide receptors for sensing and assays. A.M. Bossi.

Invited lectures to conferences:

- 1) 1st Summer School on "Imprinted Polymers at the nano- and microscale", Ile d'Oleron (France) May 16-20, 2011. Invited Lecture on ligand binding affinity, A.M. Bossi
- 2) II International Congress of the Chinese Advanced Material Society, Zhenjiang (China), May 16-19, 2013. "On the rational selection of peptide epitope templates for protein imprinting." A.M- Bossi http://www.thecams.org/en_index.php
- 3) Scuola Internazionale:Marie Curie ITN CHEBANA; Summer School Biarritz, France, September 1-7, 2013, Title: Epitope imprinting. On the rational selection of peptide epitopes. Author: A. Bossi
- 4) The 8th International Congress on Molecular Imprinting-MIP2014, Jiangsu University, Zhenjiang (P. R. China), 18-21 September 2014. "Molecularly Imprinted Polymers Matrixes for MALDI-MS." Bossi A.M., Cenci L.
- 5) 22nd Meeting of the International Society for Molecular Recognition, Affinity 2017, Paris (France), Pierre and Marie Curie Campus, June 25th-29th, 2017. Title: Molecularly Imprinted Nanoparticles Targeted at Structured Peptides: an Assistance to Folding? Bossi A.M. <http://www.affinity2017.net>
- 6) The 8th International Workshop on Surface Modification for Chemical and Biochemical Sensing, SMCBS'2017. Palace Hotel in Zelechow (Poland), November 3-7, 2017. Title: Molecularly imprinted nanomaterials targeting linear and structured peptides. Bossi A.M. <http://www.smCBS2017.pl>
- 7) The 10th International Congress on Molecular Imprinting-MIP2018; Jerusalem (Israel), June 24-28, 2018. "Imprinting Structured Peptides: a Step Toward Folding Assistance?" A.M. Bossi <http://www.ortra.com/events/mip2018/Program/InvitedLecturers.aspx>

Chairperson:

- 1) 22nd Meeting of the International Society for Molecular Recognition, Affinity 2017, Paris (France), Pierre and Marie Curie Campus, June 25th-29th, 2017.
- 2) The 8th International Workshop on Surface Modification for Chemical and Biochemical Sensing, SMCBS'2017. Palace Hotel in Zelechow (Poland), November 3-7, 2017.

Organization of conferences

- The 10th International Congress on Molecular Imprinting-MIP2018; Jerusalem (Israel), June 24-28, 2018. Member of the Scientific Committee. <http://www.ortra.com/events/mip2018/Committees.aspx>
- The 7th International Symposium on Sensor Science 2019; Napoli (Italy), May 9-11 2019, Member of the Scientific Committee. <https://i3s2019napoli.sciforum.net>

Invited lectures and seminars:

- 1) Linneus University, Kalmar, Sweden. Title of the seminar: Molecularly imprinted nanogels: tailor-made protein and peptide receptors for sensing and assays. 4-10-18.

Bibliometric indexes

AM Bossi is coauthor of 80 papers on scientific international journals with peer review process and of 8 books chapters. Scopus database on the 14-2-2018: products n. 85, H-Index = 28, 2820 citations.

<http://orcid.org/0000-0002-2542-8412>

Selected papers:

1. Asnaghi, D., Giglio, M., Bossi, A. and Righetti, P.G.: Spinodal decomposition driven microsegregation in polyacrylamide gels. *J. Molec. Struct.* 383 (1996) 37-42
2. Bossi A., Piletsky, S.A., Piletska, E.V., Righetti, P.G., Turner, A.P.F.: Surface grafted molecularly-imprinted polymers for protein recognition. *Anal. Chem.* 73 (2001) 5281-5286
3. Bossi A., Bonini F., Turner A.P.F., Piletsky S.: Molecularly Imprinted Polymers for the Recognition of Proteins: the State of the Art. *Biosensors & Bioelectronics* 22 (2007) 1131-7
4. Bonini F., Piletsky S., Turner A.P.F., Speghini A., Bossi A. Surface imprinted beads for the recognition of human serum albumin. *Biosensors & Bioelectronics* 22 (2007) 2322-2328
5. Lakshmi D., Bossi A., Whitcombe M.J., Chianella I., Fowler S.A., Subrahmanyam S., Piletska E.V. and Piletsky S.A. An Electrochemical Sensor for Catechol and Catecholamines Based on a Catalytic Molecularly Imprinted Polymer-Conducting Polymer Hybrid Recognition Element. *Anal Chem* 81 (2009) 3576–3584.
6. Bossi A.M., Sharma P.S., Montana L., Zoccatelli G., Laub O., Levi R. Fingerprint imprinted polymer (FIP). Rational selection of peptide epitope templates for the determination of proteins by molecularly imprinted polymers. *Anal Chem.* 84 (2012) 4036-41.
7. Cenci, L., Andreetto, E., Vestri, A., Bovi, M., Barozzi, M., Iacob, E., Busato, M., Castagna, A., Girelli, D., Bossi, A.M. Surface plasmon resonance based on molecularly imprinted nanoparticles for the picomolar detection of the iron regulating hormone Heparin-25. *J Nanobiotechnol*, 13 (2015), art. no. 51
8. Cenci, L., Guella, G., Andreetto, E., Ambrosi, E., Anesi, A., Bossi A.M. Guided Folding Takes a Start from the Molecular Imprinting of Structured Epitopes. *Nanoscale* (2016) 8 (34), pp. 15665-15670
9. Bertolla, M., Cenci, L., Anesi, A., Ambrosi, E., Tagliaro, F., Vanzetti, L., Guella, G., Bossi, A.M. Solvent-Responsive Molecularly Imprinted Nanogels for Targeted Protein Analysis in MALDI-TOF Mass Spectrometry (2017) *ACS Applied Materials and Interfaces*, 9 (8), pp. 6908-6915.
10. Cenci, L., Tatti, R., Tognato, R., Ambrosi, E., Piotto, C., Bossi, A.M. Synthesis and characterization of peptide-imprinted nanogels of controllable size and affinity (2018) *European Polymer Journal*, 109, pp. 453-459