

## Curriculum vitae Andrea Splendiani

Andrea Splendiani



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18<sup>th</sup> August, 1973

Nationality: Italian

### Brief description

I am a computer scientist with interests in Semantic Web, Open Data, Ontologies, Taxonomies, Bioinformatics and Systems Biology. As a researcher, I have been focusing on the interface between knowledge representation, user interaction and analytics, mostly in a biomedical domain.

I have experience in information modeling, development of standards, software engineering and design, project management and general management, as well as european and international research.

### Current Position

**Senior Bioinformatics Scientist - Data Integration** at Rothamsted Research (BBSRC), Harpenden, UK

### Education

- 2006** **PhD in computer science** at University of Milano-Bicocca (Milano, Italy)
- 2002** **“Laurea” degree (Ms) in Information Technology** at **Politecnico di Milano** (Milano Italy)
- 1993** **“Maturità scientifica”** degree at Liceo scientifico Temistocle Calzecchi Onesti (Fermo, Italy)

### Professional history

- 2003-2010** Participation in Leaf Bioscience s.r.l. as **founder, CEO** and **PI** in the dc-thera Network of Excellence.
- 2007-2008** **Postdoc** on the european project bootstrap ([www.bootstrap.org](http://www.bootstrap.org)), located at the **Medical Informatics** Department of the University of Rennes 1 (now INSERM U936), FR
- 2005-2006** Stagiaire Scientifique in the **Systems Biology Unit** of **Institut Pasteur**, Paris, FR
- 2002-2005** **Research assistant** at university of Milano Bicocca, **Biotechnology and Bioscience dept.** and at **Genopolis** Consortium, Milano, IT
- 2001-2002** Consultant at Biopolo srl, Milano, IT.

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## Awards, Professional associations, languages, references

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### Main Awards and Grants

- 2005-2010** DC-Thera Network of Excellence grant for Integration for the development of a knowledge management systems and integration of data analysis open source resources, (awarded to Leaf Bioscience, about 320k€ in 5 years)
- 2005** ESF “Integrated Approaches to Functional Genomics” Exchange Fellowship (“network based analysis of gene expression data”)
- 2004** Participation at the project Digital Gate to California after the selection of “Leaf Bioscience” as “innovative company”. (met investors, legals and companies in the IT and bioinformatic sector in Silicon Valley).
- 2003** Awarded a financing from “Province of Milan” for new enterprise proposals (“startup, nuove imprese al via 2002” about 30k€ )
- 2002-2005** Fellowship at the university of Milano Bicocca for the development of an integrated functional genomics platform

### Professional associations

Invited expert, HCLS Interest group, W3C consortium (2009-)  
Member of the “**order of engineers**” (chartered engineer) of **Milan, civil, information, industrial** sectors (no. **A24699**, admission test completed in 2002)  
Senior member of the Italian Bioinformatics Society (2004-)  
Member of the International Society for Computational Biology (2001-)

### Languages

Italian (mother tongue)  
English (fluent)  
French (conversational)

### Hobbies

Burning Man, Traveling, Music, Photo, Motorcycling

### References

(e-mails are available upon request)

Prof. Paola Ricciardi-Castagnoli, Singapore Immunology Network (SIgN), Singapore (Employer, PhD co-advisor)  
Prof. Giancarlo Mauri, Computer Science Dept., univ. of Milano Bicocca, Italy (PhD advisor)  
Prof. Duccio Cavalieri, Pharmacology Dept., University of Florence, Italy (Pathway analysis advisor)  
Prof. Carlo Ghezzi, Computer Engineering Dept., Politecnico di Milano, Italy (MS Thesis advisor)  
Prof. Gary Bader, University of Toronto (Collaboration on BioPAX)  
Benno Schwikowski, Unité de Biologie Systémique, Institut Pasteur (PhD co-advisor)  
Alan Ruttenberg, Science Commons, Boston (Collaboration on BioPAX)

## Academic activities

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### Teaching and Tutoring

- 2010** “Use of semantic web resources for computational biology and bioinformatics”  
8h tutorial at the European Conference on Computational Biology (ECCB). (September 2010) (Ghent)
- 2009** “Introduction on Semantic Web based biomedical applications development”  
3 days course at the Italian oncological research network. (March 2010)
- 2008** "Semantic Web Applicatons and Tools"  
4h tutorial at the Bioinformatics Italian Society (March 2009)
- 2002-2005** **Tutorials** on microarray databases at the University of Milano-Bicocca, Biotechnology and Bioscience dept. (Master in bioinformatics).  
Tutorials at EMBO courses on functional genomics. “**Microarray databases**” (2003), “**Network based functional annotation**” (2005)
- 2002-2005** **Thesis supervisor** for undergraduate students at the **Computer Science Dept.** University of Milano-Bicocca (2003-2004).

### Conference organization and chairing

SWAT4LS (Semantic Web Applications and Tools for Life Sciences) [www.swat4ls.org](http://www.swat4ls.org) Edinburgh (2008), Amsterdam (2009), Berlin (2010), London (2011)

Nettab (Collaborative Bioinformatics Research and Development) [www.nettab.org/2009/](http://www.nettab.org/2009/)

I-ATLAS (International Workshop on Gene signalling Pathway Analysis and Representation) [www.i-atlas.org](http://www.i-atlas.org)

### Scientific reviewer

Briefings in Bioinformatics, Bioinformatics, BMC Bioinformatics, PLOS ONE, MIE (Medical Informatics Europe), Nettab (Network Tools and Standards for Biology), SWAT4LS (Semantic Web Applications and Tools for Life Sciences), ICMLA (International Conference on Machine Learning and Applications), VPH-related grants.

## Professional history (detail)

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### 2009-

**Senior Bioinformatics Scientist** at Rothamsted Research (BBSRC), Harpenden, UK

Working on Semantic Web based **data integration** in the life sciences domain. Main responsibilities include the **semantic analysis** of the Ondex (data integration software) data model, the **design** of the **information model** for the PHI-base host-pathogen interaction database, and the design of **visualization** systems for Semantic Web knowledge bases.

External collaborations include the development of **analytical tools** for RDF knowledge bases (biomedical and UK gov) in collaboration with Wyne state university, the coordination of the Semantic Web working group within the BioPAX consortium and the organization of the SWAT4LS international workshop (Semantic Web Application and Tools for Life Sciences).

### 2003-2010

Participation in Leaf Bioscience s.r.l. as founder, CEO and PI in the dc-thera Network of Excellence.

Leaf Bioscience has been a small company founded to provide open source based solutions for bioinformatics. It developed web solutions for non-profit entities (the Italian biotechnology directory) and semantic-web based knowledge-management systems for scientific research ([www.dc-thera.org](http://www.dc-thera.org)). At its peak, it reached a turnover of approximately 100k€ and employed five collaborators scattered across Europe.

### 2007-2008

**Postdoc** on the european project bootstrep ([www.bootstrep.org](http://www.bootstrep.org)), located at the **Medical Informatics** Department of the University of Rennes 1 (now INSERM U936), FR

Design and development of a software infrastructure for ontology and taxonomy management and enrichment, with the goal of improving text mining in biomedical literature.

### 2005-2006

Stagiaire Scientifique in the **Systems Biology Unit** of **Institut Pasteur**, Paris, FR

Supervisor: Benno Schwikowski.

Working on the integration of rules-based inference system, microarray data analysis and ontologies for biological pathways qualitative analysis and visualization. Prototyping of interactive systems based on Cytoscape, Jena, BioPAX.

### 2002-2005

**Research assistant** at university of Milano Bicocca, **Biotechnology and Bioscience dept.** and at **Genopolis** Consortium, Milano, IT

Supervisor: Paola Ricciardi-Castagnoli

Planning, development and maintenance of an internal microarray database/LIMS for dendritic cells transcriptome profiling, that included MAGE support and intuitive context based analysis/browsing interfaces.

### 2001-2002

Consultant at Biopolo srl, Milano, IT.

IT support, Unix systems administration and microarray data analysis (Affymetrix service provider)

## Professional Skills

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### Knowledge-engineering and information design

Semantic Web technologies (RDF, OWL, SPARQL), Linked-Data, Ontologies. Relational Model-SQL, Object Oriented modeling/UML.

### Software development

Experience of almost 25 years in programming and in many languages and technologies.

Main programming languages used in the last year: C, Java, php, Python.

Software engineering (UML/Xp basics, svn, eclipse), Language and compiler design.

### IT Infrastructures

Unix systems, compiler design, software engineering, web stack, relational engines, triple-stores

### Bioinformatics

Basics of microarray data analysis, bioinformatic IT systems (pipelines, microarray databases), pathway databases, representation and exchange languages (MAGE, BioPAX), Ontologies (OWL), RDF, Semantic Web. Some specific software internals (Cytoscape). Ontology design.

### Scientific

Basic knowledge of molecular and cell biology. Some notions of immunology. Basics of dynamic modeling/systems theory, control systems, electronics and robotics.

### Business

Experience as a CEO of a small srl (ltd) (negotiations, management of a group of 2-3 people, accounting, FP6 EU projects bidding and reporting).

## Projects/Software (detail)

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- 2008- The DC-Thera Directory.** Knowledge management system for immunology. <http://dc-research.eu>  
Web based system implemented mainly in php/symphony, featuring RDF export (SPARQL/RDF/RDFa) and integration of several ontologies and text mining functions.  
Roles: design and supervision (2-4 people team)
- 2007- Beat:** Framework for ontology alignment and enrichment designed for the bio-domain.  
Implemented in Java (Jena libraries), incorporating a few text processing functionalities (normalization, string matching, terminology alignment)  
Roles: design and development (sole project + collaborators)
- 2005- RDFScape: Cytoscape plugin for the integration of ontologies and data analysis** (Java based, Jena+Swing, primarily targeted at BioPAX and microarray data) <http://www.bioinformatics.org/rdfscape/>  
Roles: design and development (1-2 people team)
- Collaboration with the **BioPAX** working group (editor and workgroup leader)  
Roles: Coordination of the workgroup activities (about 10pp). Engagement with the community, requirement analysis (>50 core people).
- 2002- [www.biodirectory.it](http://www.biodirectory.it)** Italian biotechnology web directory (java,php,mysql)  
**2010** Roles: design and development (4 people team)
- 2005 Cytoscape BioPAX importer plugin** (Protégé OWL-api based) currently available at [www.geocities.com/sergentpenguin](http://www.geocities.com/sergentpenguin)  
Roles: design and development (sole project)
- 2001- GenopolisDB gene expression database** (php, java) (project, development and maintenance)  
**2005** <http://www.bioinformatics.org/genopolisdb/> . Integration with ArrayExpress through an automated MAGE-ML based pipeline.  
Roles: design and development (3-4 people team)
- 2000 Smart3web:** Robotic arm simulator over the Internet (VRML, Java, Matlab), SimpleSemCC: Hierarchy of compilers and abstract virtual machine for SimpleSem (Java, JavaCC), Pretty Pascal: (Code formatter/analyzer based on context grammars)

## Education (detail)

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### Degrees

- 2006** **PhD in computer science** at University of Milano-Bicocca (Milano, Italy)  
Thesis: **Integration of ontologies and high-throughput data in bioinformatics**  
Supervisor: Prof. Giancarlo Mauri
- 2002** **“Laurea” degree (Ms) in Information Technology** at **Politecnico di Milano** (Milano Italy),  
Marks 96/100.  
Research thesis: **GCDB: An information system for the study of gene expression**  
Supervisor: Prof. Carlo Ghezzi
- 1993** **“Maturità scientifica”** degree at Liceo scientifico Temistocle Calzecchi Onesti (Fermo, Italy)  
Marks: 60/60 with special honors

### Other courses attended

- 2011** **Web publishing of Scientific Data and Services** (Fredericton, Canada, May 19-20)
- 2006** DASI '06: Bertinoro PhD **school on Data and Service Integration** (Bertinoro, Italy, October 10-15)
- 2004** 3rd VIPS Advanced School on **Computer Vision, Pattern Recognition and Image Processing**  
(Introduction to Bayesian Inference and Statistical Learning) Verona, Italy, November 15-19
- First International School on **Biology, Computation and Information**  
(Mathematical modeling tools for systems biology) Dobbiaco (BZ), Italy, September 19-25
- 1st International School on **Advanced BioMedicine and Bioinformatics** Lipari Island, May 29 - June 5

## Publications and communications

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### Journal Papers

**Andrea Splendiani**, Albert Burger, Adrian Paschke, Paolo Romano, M Scott Marshall

*Biomedical semantics in the Semantic Web*

Journal of Biomedical Semantics 2011, 2(Suppl 1):S1

Cavaliere D, Rivero D, Beltrame L, Buschow SI, Calura E, Rizzetto L, Gessani S, Gauzzi MC, Reith W, Baur A, Bonaiuti R, Brandizi M, De Filippo C, D'Oro U, Draghici S, Dunand-Sauthier I, Gatti E, Granucci F, Gündel M, Kramer M, Kuka M, Lanyi A, Melief CJ, van Montfoort N, Ostuni R, Pierre P, Popovici R, Rajnavolgyi E, Schierer S, Schuler G, Soumelis V, **Splendiani A** et al.

*DC-ATLAS, a Systems Biology Resource to Dissect Receptor Signal Transduction in Dendritic Cells.*

Immunome Research 2010, 6:10 (19 November 2010)

Demir E, Cary MP, Paley S, Fukuda K, Lemer C, Vastrik I, Wu G, D'Eustachio P, Schaefer C, Luciano J, Schacherer F, Martinez-Flores I, Hu Z, Jimenez-Jacinto V, Joshi-Tope G, Kandasamy K, Lopez-Fuentes AC, Mi H, Pichler E, Rodchenkov I, **Splendiani A** et al.

*The BioPAX community standard for pathway data sharing*

Nat Biotechnol. 2010 Sep;28(9):935-42

Albert Burger, Paolo Romano, Adrian Paschke, **Andrea Splendiani**

*Semantic Web Application and Tools for Life Sciences, 2008 – Introduction*

BMC Bioinformatics 2009, 10 (S10), S1

E. Beisswanger, V. Lee, Kim JJ, Rebholz-Schumann D, **A. Splendiani**, O. Dameron, Schulz S, U Hahn.

*The Gene Regulation Ontology (GRO): Design Principles and Use Cases.*

Stud Health Technol Inform. 2008;136:9-14

### **Splendiani A**

*RDFScape: Semantic Web meets Systems Biology (selected In IMIA Yearbook of Medical Informatics)*

BMC Bioinformatics 2008 Apr 25, 9 (S4):S6

**Splendiani A**, Brandizi B, Even G, Beretta O, Pavelka N, Pelizzola M, Foti M, Mauri G, Ricciardi-Castagnoli P.

*The Genopolis Microarray Database*

BMC Bioinformatics 2007 Mar 8, 8(Suppl 1):S22

Pavelka N, Pelizzola M, Vizzardelli C, Capozzoli M, **Splendiani A**, Granucci F, Ricciardi-Castagnoli P.

*A power law global error model for the identification of differentially expressed genes in microarray data.*

BMC Bioinformatics. 2004 Dec 17;5(1):203.

*In revision:* **Splendiani A**, Michaela G, Austin J, Cavaliere D, Scognamiglio C, Brandizi M

*Knowledge sharing and collaboration in translational research and the DC-THERA Directory*

*Submitted:* Vladimir Mironov, Nirmala Seethappan, Ward Blondé, Erick Antezana, **Andrea Splendiani** and Martin Kuiper

*The NTNU SPARQL benchmarking: gauging triple stores with actual biological data*

## Publications and communications

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### Book chapters and other publications

Paolo Romano and **Andrea Splendiani**

*Applications of Semantic Web Methodologies and Techniques to Biology and Bioinformatics*  
(Reasoning Web 08 , Springer LNCS 5224, 2008,VII)

### Selected papers in conference and workshop proceedings

**Andrea Splendiani**, Chris J Rawlings, Shao Chih Kuo, Robert Stevens, Phillip Lord

*Lost in translation: data integration consumers meet the Semantic Web*  
(experiences from the Ondex project)

to appear in IEEE proceedings of Deit: Data Engineering Internet Technology 2011

Marco Brandizi, Michaela Guendel, Ciro Scognamiglio and **Andrea Splendiani**

*DC-THERA Directory, a Knowledge Management System for the support of the European Dendritic Cell Immunology Community (demo paper)*

In proceedings of the SWAT4LS workshop, Amsterdam, 2009. CEUR-WS Vol 559

**Andrea Splendiani**, Martin Kuiper, Chris J Rawlings

*Toward a New Paradigm for User Interaction on the Semantic Web to Support Life Sciences Investigation*  
(position paper)

In proceedings of the 6<sup>th</sup> International Workshop on Semantic Web User Interaction (SWUI 2009), CEUR-WS Vol. 544

M. Guendel, C. Scognamiglio, M. Brandizi, **A. Splendiani**

*The DC-THERA Directory, a Knowledge Management System to support collaboration on Dendritic Cell and Immunology research.*

In proceedings of Nettab 2009: Ninth Annual Workshop Network Tools and Applications in Biology, ISBN 978-88-7388-242-8

**Andrea Splendiani**

*Ontology based data analysis.*

Dagstuhl proceedings, 2006. <http://drops.dagstuhl.de/opus/volltexte/2006/474/>

**Andrea Splendiani**

*Ontology based analysis of experimental data (position paper).*

Uncertainty Reasoning for the Semantic Web Workshop, International Semantic Web Conference, Galway 2005. ISWC-URSW 2005, p102-103

## Publications and communications

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### Editorial activity

**Andrea Splendiani**, Albert Burger, Adrian Paschke, Paolo Romano, M Scott Marshall  
*Semantic Web Applications and Tools for Life Sciences*, 2009  
Journal of Biomedical Semantics 2011, 2(Suppl 1)

Albert Burger, Paolo Romano, Adrian Pashcke and **Andrea Splendiani**  
*Semantic Web Applications and Tools for Life Sciences*, 2008  
BMC Bioinformatics 10 (Suppl. 10), 2009

Paolo Romano, Rosalba Giugno, Alfredo Pulvirenti, **Andrea Splendiani**, Alfredo Ferro  
*Nettab 2009. Ninth Annual Workshop Network Tools and Applications in Biology (Technologies, Tools and Applications for Collaborative and Social Bioinformatics Research and Development)*  
ed. liberodiscivere, Genova, IT ISBN 978-88-7388-242-8, 2009

### Recent Invited Seminars and Talks

BioHackathon Symposium, Tokyo 2010: Visualization and Analysis of Biological Networks on the Semantic Web  
Combined CellML SBGN SBO BioPAX MIASE Workshop, Auckland, 2009: BioPAX for Semantic Web based Data Integration

Seminar in Trondheim NTNU, 2009: Semantic Web Knowledge bases and network-based visualization  
BioPAX f2f meeting, NYC, 2009: BioPAX is from Venus, the Semantic Web is from Mars.