



**EUROPEAN FEDERATION OF  
BIOTECHNOLOGY**  
*Section of Environmental Biotechnology*

**General Assembly**

**ICEEM07, Wien, Sept 20, 2013**

**Fabio Fava, Spyros Agathos, Valter Tandoi  
Philippe Corvini (acting Chair)**



# THE EFB ENVIRONMENTAL BIOTECHNOLOGY SECTION

## Webpage:

[www.efb-central.org/index.php/Main/section\\_on\\_environmental\\_biotechnology](http://www.efb-central.org/index.php/Main/section_on_environmental_biotechnology)

**Current subscribers: ~3300 but Active members: ~800 from 30 Countries**

## Mission:

- To develop the science and engineering aspects of modern environmental biotechnology;
- To identify the most prominent European R&D priorities and stakeholder needs in the area of sustainable bioremediation of contaminated sites and wastewaters, biowaste biorefining, water purification, CO<sub>2</sub> fixation, etc.;
- To promote such R&D and innovation priorities and needs towards European Commission, OECD, European Technology Platforms and other European Agencies dealing with environmental protection and restoration;
- To promote international conferences on Environmental Biotechnology in Europe (and partner Countries) avoiding fragmentation and duplication ;
- To promote Environmental Biotechnology in the national science policies of European Countries.

## Governance:

Prof. Dr. Fabio Fava (Chairman), School of Engineering, University of Bologna, Bologna, I  
Prof. Dr. Philippe Corvini (Acting Chairman), Univ.Applied Sciences NS MuttENZ, Switzerland  
Prof. Dr. Spyros Agathos (Vice Chairman), University of Louvain, Louvain-la-Neuve, B  
Dr. Valter Tandoi (Secretariat) CNR, Water Research Institute, Monterotondo, Rome, I



## CURRENT SECTION EXPERTS GROUP (A)

Name	Affiliation	Country
Mauro Majone Alessandro Sidoli	University of Rome, Rome Italian Biotech Industry Ass, Milan	Italy
Ludo Diels Willy Verstraete	VITO, Mol Ghent University, Ghent	Belgium
Nicolas Kalogerakis Daniel Mamais	Technical University of Crete National Technical University of Athens	Greece
Philippe Corvini Hans Peter Kohler	Univ. Applied Sciences NS MuttENZ EAWAG, Dübendorf	Switzerland
Steven A. Banwart	University of Sheffield, Sheffield	United Kingdom
Piet Lens	UNESCO-IHE, Delft	The Netherlands
Victor de Lorenzo	CSIC, Madrid	Spain
Katarina Demnerova Vladimir Brenner	University of Prague, Prague AECOM, Prague	Czech Republic
Venko Beschkov	Bulgarian Academy of Sciences, Sofia	Bulgaria
Katarina Dercova	Slovak University of Technology, Bratislava	Slovak Republic
Merja Itavaara	VTT	Finland



## CURRENT SECTION EXPERTS GROUP (B)

Name	Affiliation	Country
Katalin Belafi-Bako Gabor Rakhely	University of Pannonia, Veszprem University of Szeged, Szeged	Hungary
Maria Reis Bruno Sommer Ferreira	University Nova de Lisboa, Lisboa Portuguese Ass. Biotech Industries, Lisboa	Portugal
Andreas Loibner	BOKU, Wien	Austria
Korneliusz Miksch Jan W Dobrowolski	The Silesian University of Technology, Gliwice AGH University of Science & Technology Krakow	Ponland
Maria Gavrilesu Michaela D. Stanescu	Gheorghe Asachi Technical University of Iasi, Iasi Aurel Vlaicu University, Arad	Romania
Thomas Schafer Jens Aamand	Novozymes, Bagsvaerd GEUS, Copenhagen K	Denmark
Rainer Meckenstock Manfred Kircher	Universität Tübingen, Tübingen CLIB2021, Düsseldorf	Germany
Sara Sjoling Lilia Maria Ahrné	Sodertorn University, Stockholm SIK-Gothenburg	Sweden
George O'Malley	BioRefinery Ireland, Newport	Ireland
Eric Trably	INRA –Narbonne	France



## CURRENT SECTION EXPERTS GROUP (C)

Name	Affiliation	Country
Vladimir Popov	Russian Academy of Sciences, Moscow	Russia
Fazilet Vardar Sukan	Ege University, Izmir	Turkey
Vladimir Elisashvili	Durmishidze Institute of Biochemistry and Biotechnology, Tbilisi	Georgia
Hector Poggi-Varaldo	CINVESTAV-IPN, Mexico	Mexico
Jose Osvaldo Beserra Carioca	Federal University of Ceará - UFC	Brazil
Hanan Malkawi	Yarmouk University	Jordan
Yasser R Abdel-Fattah	Mubarak City for Scientific Research and Technology Applications	Egypt
Ameur Cherif	Univesity of Tunis	Tunisia
Pedro J. Alvarez	Rice University, Houston, TX	USA



## CURRENT SECTION EXPERTS GROUP (D)

Name	Affiliation	Country
Eugenia Olguin	President of International Society of Environmental Biotechnology (ISEB)	
Jose Duarte/Maurizio Petruccioli	President of International Association Mediterranean Agroindustrial Waste (IAMAW)	
Hisao Ohtake	President of Environmental Biotechnology section of the Asian Federation of Biotechnology (AFOB)	
Eliora Ron	General Secretary of EAM & Chair of BAM section of IUMS	
Roberto De Philippis	President of the International Society for Applied Phycology	
Teresa Lettieri	European Commission, DG Joint Research Centre, Ispra, Italy	
Laura Giuliano	Mediterranean Science Commission (CIESM)	
Joanna Dupont	EUROPABIO & ETP-SUSCHEM	
James Philp	OECD, Paris	OBSERVER

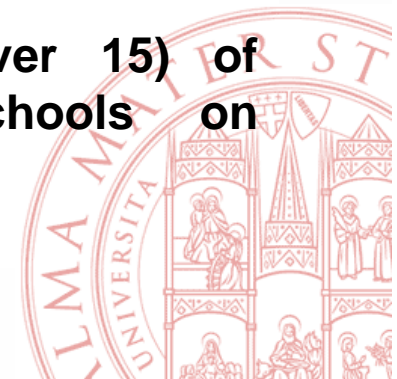


# Results achieved so far



## OBJECTIVES ACHIEVED

- **Identified the major emerging European R&D priorities and stakeholder needs in the areas** of i) water resources preservation, treatment and purification, ii) organic waste treatment and biorefining, iii) sustainable bioremediation of contaminated sites and wastewater, iv) CO<sub>2</sub> and other greenhouse gases fixation and atmospheric reduction, and v) emerging pollutants, etc., **to foster sustainable approaches and strategies to environmental impacting activities and to protect and restore ecosystems;**
- **Prepared 7 position papers on the identified priorities to promote them towards the major European and National Institutions and Associations supporting research and running policy in the environmental biotech areas;**
- **Collected information on previous and major ongoing national EU R&D projects** in the main areas of environmental biotechnology. The list is available on the section website;
- **Organization (1), co-organization (2) and promotion (over 15) of international conferences, workshop and summer schools on Environmental Biotechnology** in EU and partner Countries





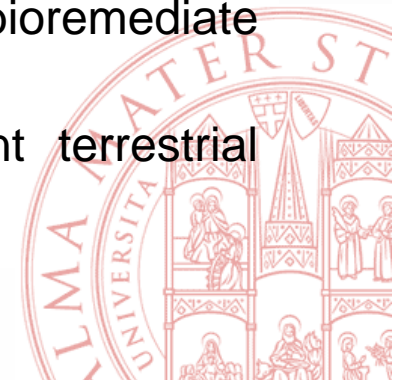
## R&D PRIORITIES AND NEEDS IDENTIFIED (A)

1. Innovative approaches and tools for the biomonitoring, evaluation of the ecological and health risks, and bioremediation of emerging pollutants (pharmaceuticals, endocrine disruptors, hormones, viruses, toxins, etc) in soils, sediments, groundwater, air, industrial and urban wastewaters, aquaculture effluents, and freshwater and marine ecosystems;
2. Improvement/Intensification of existing sustainable remediation techniques for contaminated sites (mainly *in situ* technologies, i.e., monitored/enhanced natural attenuation, etc) also with the view of the reuse of cleaned soil for agricultural and other purposes;
3. Bioremediation/purification of agro-industrial and urban effluents and wastewaters via integrated/intensified, sanitary-safe approaches (i.e., anaerobic/aerobic microbial treatment; nano/photo/chemical and biological treatment), phyto and algal remediation (with exploitation of produced biomass), enzyme-based treatment, bioelectrochemical treatment, etc, and via recovery of nutrients (and their exploitation) and reuse of cleaned water (also in agriculture).



## R&D PRIORITIES AND NEEDS IDENTIFIED (B)

4. Environmental impacts and fate of biopolymers, nanomaterials and novel materials, e.g. OLED, OPV, etc. as well as those resulting from biorefineries, in terrestrial, freshwater and marine environments;
5. Multipurpose biorefineries for the conversion of surplus, byproducts, waste, effluents of the food processing and agro-industry into biobased chemicals, materials and energy;
6. Microbial fixation of CO<sub>2</sub> and GHGs in soils (to combat climate changes and soil losses/desertification), in sea and in biogeochemical processes (i.e., with algae, etc.) for fighting climatic change;
7. Exploitation of microorganisms from non conventional environments like desert, deep seas, contaminated sediments
8. Activity mining in environmental metagenomes and development of biological materials and catalysts with NTN (new-to-nature) properties engineered through Synthetic Biology;
9. Exploitation of biogeochemical cycles with the view to accumulate useful minerals in the environment, stabilize toxic heavy metals and bioremediate mining sites and explorations;
10. Modeling the impact of new and old pollutants on important terrestrial ecosystems (sea, lakes, soils) and also climatic change impacts.

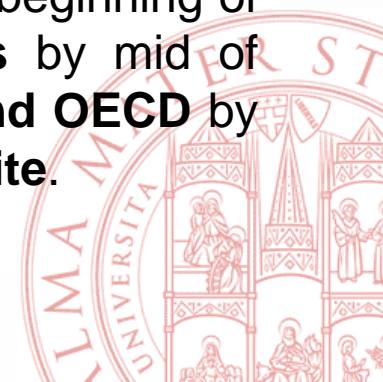


## POSITION PAPERS PREPARED (A)

**4 position papers were prepared** by January 2012:

- 1) Biowaste Biorefinery in Europe: Opportunities and R&D Needs, by Fava et al
- 2) In situ Groundwater and Sediment Bioremediation: Barriers and Perspectives by Majone et al
- 3) R&D Needs in the Field of Biomonitoring, Evaluation of the Ecological Risks, and Bioremediation of Emerging Chemical and Biological Micropollutants in Soils, Sediments, Groundwater, Industrial and Municipal Wastewaters, Aquaculture Effluents, and Freshwater and Marine Ecosystems by Gavrilesu et al.
- 4) R&D Priorities in the Field of Sustainable Remediation and Purification of Agro-Industrial and Civil/Urban Effluents and Wastewaters, by Miksch et al.

They were **approved by the whole Experts Group members** at the beginning of February 2012 **and then submitted to all section members** by mid of February 2012 and then to **the EU Commission (DG KBBE), and OECD** by mid of March 2012. They were **also posted at the section website.**



## **POSITION PAPERS PREPARED (B)**

The same 4 papers have been upgraded to Ms to be submitted to *New Biotechnology* together; other 3 additional novel position papers on other identified topics were prepared for *New Biotechnology*. All 7 Ms were submitted together to the Journal at the end of April 2013.

**The additional 3 Manuscripts are:**

- 5) Microbial Fixation of CO<sub>2</sub> in Water Bodies and in Soils to Combat Climate Change, Soil Loss and Desertification, by De Philippis et al.
- 6) Biotechnologies for Critical Raw Material Recovery from Primary and Secondary Sources: R&D Priorities and Future Perspectives, by Lenz et al
- 7) The Role of Environmental Biotechnology in Exploring, Exploiting, Monitoring and Preserving the Marine Environment, by Kalogerakis et al

**All 7 papers along with an Editorial prepared by Kircher are now under revision in *New Biotechnology*; they will constitute a special segment on the EFB Environmental Biotechnology section in the *New Biotechnology* issue planned for the end of 2013.**

**This issue will be then submitted to the EC DG Research and Innovation (KBBE, Environment, etc), OECD, PPP Spire, ETP Water, KIC Raw Materials, etc**



## EVENTS ORGANIZED/PROMOTED BY THE SECTION (A)

The following 2011 events have been supported/promoted:

- 1) The section actively participated in the *5th European Bioremediation Conference*, Chania, Greece, July 4-7, 2011 (F. Fava co-chaired the conference, which hosted the 1<sup>st</sup> section Experts meeting).
- 2) *11th Conference on Bacterial Genetics and Ecology BAGECO*, Corfu, Greece, May 29-June 2, 2011
- 3) *Conference on Environmental (Bio)Technologies*, Gdansk, Poland, September 5-8, 2011
- 4) *4th International Conference on Biotechniques for Air Pollution*, La Coruña, Spain, October 12-14, 2011
- 5) Workshops on bioremediation of contaminated sites and biowaste biorefinery at *Ecomondo 2011*, Rimini, Italy, 9-12, Nov 2011

The following 2012 events have been supported/promoted:

- 1) **The section was the main convenor of the Conference *Environmental Microbiology and Biotechnology in the frame of the Knowledge-Based Bio & Green Economy (EMB2012)***. Bologna Italy, April 10-12, 2012. It was organized with FEMS and co-promoted by ISEB, the Environmental Biotech section of the Asian Federation of Biotechnology (AFOB), IAMAW, ETP SusChem, EuropaBio, OECD



## **EVENTS ORGANIZED/PROMOTED BY THE SECTION (B)**

**The following 2012 events have been supported/promoted (continued)**

**2)** Innovation of sustainable production 2012 i-SUP2012, Bruges, Belgium, 6-9 May, 2012, <http://www.i-sup2012.org/>

**3)** 1st International Symposium Mediterranean Agro-industrial Wastes and Effluents. Santarem, Portugal, 5-8 June, 2012. <http://www.iamawaste.org>

**4)** 5th International Symposium on Biosorption and Bioremediation. Prague, Czech Republic, June, 25-28, 2012 . <http://biobio.vscht.cz>

**5)** Sustainable Development and Eco-Innovation. In relation to the United Nations Earth Summit Focus on Green Economy. 6-8th September 2012 Krakow, Poland.

**6)** 15th European Congress on Biotechnology. Istanbul, Sept. 23-26, 2012 <http://www.ecb15.org/>

**7)** 15th International Biotechnology Symposium (IBS) and Exhibition, “Innovative Biotechnology for a Green World and beyond”. September 16 to 21, 2012 in Daegu, Korea. <http://www.ecb15.org/>

**8)** Workshops on bioremediation of contaminated sites and biowaste biorefinery in the frame of Ecomondo 2012, Rimini, Italy, 9-12 Nov 2012

**9)** The EC-US Workshop "Microbial Community Dynamics: Cooperation and Competition" , November 5-7, 2012 in Saint Louis, Missouri (USA), organized by the Working Group on Environmental Biotechnology of the EC-US Task Force

**10)** The EU BIODESERT final conference on “Microbial resource management for agriculture in arid lands”, December, 16-18, 2012, Tunis ([www.biodesert.unimi.it](http://www.biodesert.unimi.it)).



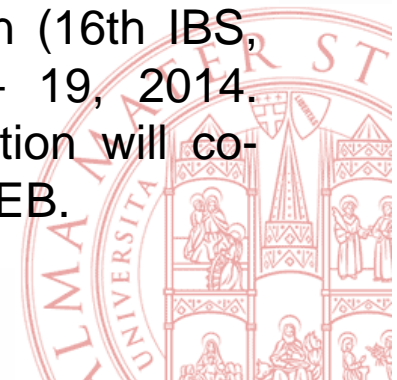
## EVENTS ORGANIZED/PROMOTED BY THE SECTION (C)

**The following 2013 Events have been sponsored and promoted:**

- 1) 7th International Conference on Environmental Engineering and Management – Integration Challenges for Sustainability (ICEEM 07), 18-21 September 2013, Vienna, Austria ([www.iceem.eu](http://www.iceem.eu))
- 2) the European Symposium of Biopolymers- ESBP2013, Lisbon, Portugal 7-9 October, 2013 (<http://www.esbp2013.org/>).
- 3) Workshops on bioremediation of contaminated sites and biowaste biorefinery in the frame of Ecomondo 2013, Rimini, Italy, Nov 2013 (<http://en.ecomondo.com/>).

**The following 2014 Events are under promotion:**

- 1) "The Microbial Resource Management for polluted marine environments and bioremediation", MedRem-2014, Hammamet, Tunisia, 16-18 January 2014
- 2) 16th European Congress on Biotechnology (the EFB conference) Edinburgh, 13-16 July 2014; The section will co-coordinate one of the sessions
- 3) The 16th International Biotechnology Symposium and Exhibition (16th IBS, IBS2014), Fortaleza, Ceara, Northeast Brazil, September 14 – 19, 2014. (Organized by our ExGroup colleague Osvaldo Carioca. The section will co-coordinate the environmental biotechnology session together with ISEB.



## OTHER EVENTS ORGANIZED/PROMOTED BY THE SECTION

**The section also promoted the following Summer Schools:**

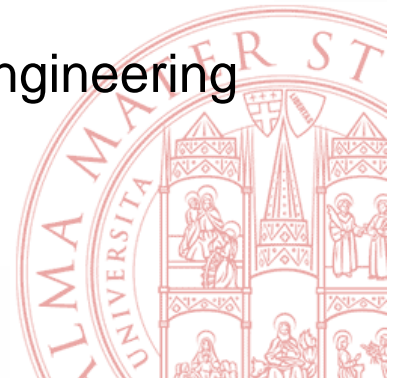
- 1) Contaminated soils: from characterization to remediation - Summer School within the Erasmus Mundus Joint Doctorate ETECOS3. University Paris-Est (Paris, France) 18-22 June 2012
- 2) Bioenergy from wastewater and solid wastes - Summer School within the IRSES project BLOWET University South Florida (Tampa, USA) 16-20 July 2012
- 3) Reuse of nutrients in agricultural systems - Summer School within the Erasmus Mundus Master Class IMETE University Ghent (Ghent, Belgium) 17-21 September 2012
- 4) Biofilms for Technology - Summer School in regular MSc Program UNESCO-IHE (NL) , 24-28 September 2012





## SUMMARY RESULTS ACHIEVED

- ❑ Identification of the most prominent European R&D priorities and stakeholder needs in the area of sustainable bioremediation of contaminated sites and wastewaters, biowaste biorefining, water purification, CO<sub>2</sub> fixation, etc.;
- ❑ Promotion of such R&D and innovation priorities towards European Commission, OECD, European Technology Platforms and other European Agencies in the sector;
- ❑ Involvement of the section in the major international events on environmental biotechnology, by contributing to a preliminary reduction of fragmentation and duplication of initiatives, and to an intensification of cooperation with ISEB, FEMS, Asian Federation of Biotechnology, OECD, etc
- ❑ Contribution to the development of the science and engineering aspects of modern environmental biotechnology;



# Future activities



## **POSSIBLE ACTIVITIES**

**To continue identifying and promoting RTD needs and opportunities** in the Environmental Biotechnology in Europe and member states (position papers on the highlighted ones);

**To continue organizing and promoting international conferences on Env. Biotechnology** in EU and partner Countries, in close cooperation with other EFB sections, ISEB, FEMS, AFOB, OECD, etc **promoting reduction of fragmentation and duplication;**

**Try to involve Experts Group members and the section members as whole in a COST or H2020 CA/SA actions** to get economical support for continuing EFB networking and promoting activities in the field of environmental biotechnology (please note that our section is not a legal entity and that EFB, a legal entity, decided to do not participate in EU projects);

**Try to involve Experts Group members in a H2020 application for a joint PhD programme,** to start mobilizing young students in the frame of the section members and promoting activities in the field of environmental biotechnology;

**Engage companies in the sector**



# Other Actions



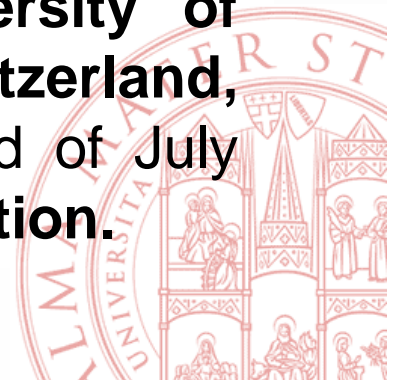
# AN OPPORTUNE ACTION

## To elect a new section chair...

It is normally an opportunity to change a chair after 3 years mandate....

..especially in this case where the current chair cannot longer continue covering the position for several new commitments and a very capable and motivated colleague of the Experts Group provides his availability to cover such a position.

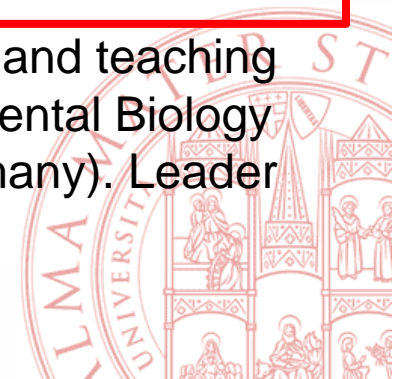
I asked to all section subscribers and experts group members to express their interest in covering the chair position at the end of June but **only Prof. Dr. Philippe Corvini (University of Applied Sciences and Arts Northwestern Switzerland, Switzerland) submitted his candidature** by the end of July 2013. **Thus, he is the only candidate for such a position.**



# Curriculum Vitae of Philippe Francois-Xavier Corvini

## *Professional career*

- ❖ **Since 09-2012: Adjunct Professor at Yancheng Institut of Environmental Technology and Engineering**
- ❖ **Since 09-2012: Lecturer qualification (habilitation) at the University of Basel**
- ❖ **Since 03-2011: Co-founder and co-owner of INOFEA GmbH**
- ❖ **Since 09-2010 Adjunct Professor at Nanjing University. School of the Environment, State Key Laboratory of Pollution Control and Resource Reuse (China)**
- ❖ **Since May 2007: Professor of Environmental Biotechnology and Head of the Institute for Ecopreneurship. School of Life Sciences, University of Applied Sciences Northwestern Switzerland (FHNW, Muttenz)**
- ❖ **Since 05 2007: Adjunct lecturer (Privatdozent) at the RWTH Aachen University (Germany)**
- ❖ **Sept 2003-Apr 2007: Scientific assistant (Postdoc) for research and teaching at the Institute of Environmental Research – Chair for Environmental Biology and Chemodynamics, RWTH Aachen University, Aachen, Germany). Leader of the group: Environmental Microbiology and Technology.**



# Curriculum Vitae of Philippe Francois-Xavier Corvini

## *Professional career (con't)*

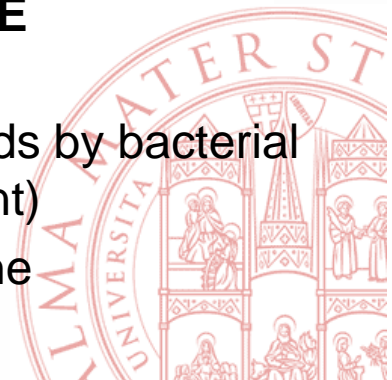
- ❖ May 2003-Aug 2003: Postdoc at the Unit of Bioengineering of the Catholic University of Louvain (UCL) in Louvain la Neuve (Belgium).
- ❖ May 2001-Apr 2003: Postdoc at the Institute of Environmental Engineering (ISA, RWTH Aachen University, Aachen). Coordination of the research works of 10 PhD students on the elimination of endocrine disrupters from wastewater (Graduate College AGEESA, German Research Foundation, DFG). Research activity : Nonylphenol microbial degradation by *Sphingomonas* TTNP3.
- ❖ Nov 2000-Feb 2001: Research Engineer. Laboratory of the Bioprocesses in Food Industry (LABIAL), at the Elite High School Ecole Nationale Supérieure d'Agronomie et des Industries Alimentaires (ENSAIA) of the Institut National Polytechnique de Lorraine (INPL); Nancy (France).
- ❖ Feb 2000-Apr 2000: Teaching (in parallel to PhD) at the Institut Universitaire de Technologie (IUT A) – Université des Sciences et des Technologies de Lille (France); Fermentation processes for technicians in food industry and biology.
- ❖ Oct 1997-Sept 2000: PhD as employee of the French Ministry of Education Research and Technologies.



# Curriculum Vitae of Philippe Francois-Xavier Corvini

## *Selection of significant grants (above 50000 €) in the last 5 years*

- ❖ 2013 SNSF degradation of sulphonamides (Main applicant)
- ❖ **2012 FP7 KBBE Kill Spill (co coordinator)**
- ❖ **2012 FP7 KBBE Bioclean (FHNW main applicant)**
- ❖ **2012 FP7 KBBE Water4Crops (FHNW main applicant)**
- ❖ **2012: EU FP7 Eurostar Envirus (co applicant)**
- ❖ **2012: EU FP7 Eranet Innovera Istopp (FHNW main applicant)**
- ❖ 2012: Sequential treatment of lignins by advanced chemical oxidation processes and nanobiocatalysis for the production of industrially relevant oligomers and monolignols, SNSF NRP66 (Main applicant)
- ❖ **2011: FP7 EU ICT Sunflower (Partner)**
- ❖ 2011: The fate of <sup>14</sup>C-radiolabelled diclofenac and its main human metabolite 4'-hydroxydiclofenac in membrane bioreactor treatment of wastewater, SNSF (Co-applicant)
- ❖ **2010: Scientific coordinator and partner of the FP7 EU KBBE MINOTAURUS on bioremediation (15 participants 3 Mio €)**
- ❖ 2010: Oxidative stress during degradation of phenolic compounds by bacterial ipso-hydroxylases — a challenge for the cell SNSF (Co-applicant)
- ❖ 2009: Understanding biomineralization and its implications for the environmental chemistry of selenium, SNSF (Main Applicant)<sup>24</sup>





# Curriculum Vitae of Philippe Francois-Xavier Corvini

## ***Others :***

- ❖ Co-author of more than 70 peer-reviewed publications
- ❖ Acting Chair of the Section Environmental Biotechnology of the European Federation of Biotechnology (EFB) and Swiss representative of the EFB
- ❖ Member of the Advisory Board of the Swiss Federal Office of the Environment
- ❖ Co-leader of the platform Biorefinery of the CTI research consortium Sustainable Engineering
- ❖ Ad hoc Expert for EU research directorate KBBE
- ❖ PhD committee (Belgium, Canada, Sweden, China, Italy, Spain, Germany) and Evaluator of research projects for various national and international institutions (Italy, Belgium, Sweden, Czech Republic, ESF)
- ❖ Editorial advisory board Open Biotechnology and Scientific advisory board of Environmental Engineering and Management Journal and Reviewer for more than 20 peer-reviewed journals
- ❖ Member of COST actions on xenobiotics and antibiotics in the environment and of FP7 NanoImpactNet

