

“Training and research  
in *Listeria*  
*monocytogenes*  
adaptation through  
proteomic and  
transcriptome deep  
sequencing analysis”

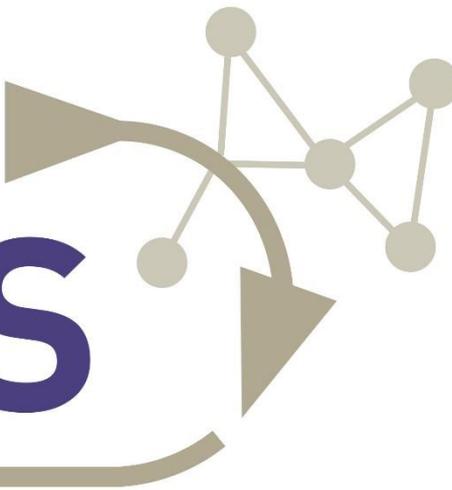
**Newsletter n°2**

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# LIST MAPS



## Editorial

Time flies when you are having fun! It has been already one year since ESRs started their work in the network. Our annual meeting held near Paris was the keynote of a busy year and the opportunity to come back to the achievements of this period. Training is on good tracks. Indeed all ESRs attended complementary courses relevant to their needs as identified in their Personal Career Development Plan. All ESRs also attended two network-wide training events, the Summer School on transcriptomics and the related workshop on statistics.

Research-wise, individual projects are well on track at this stage and it was nice to see the dedication and energy that all ESRs put in their work. All the tools are now implemented in order to make the most of the data which is being produced within List\_MAPS. The international conference ISOPOL was another highlight where members of List\_MAPS gathered, met other international experts and presented the latest developments in the field of the biology of *Listeria monocytogenes*.

At the beginning of the second year, an exciting programme is ahead of us. The second summer school will focus on the latest technologies of Proteomics. A workshop will address how regulatory models can assist the design of research hypothesis and in turn how experimentation can refine models. These network-wide training events will provide ESRs with the skills and knowhow necessary to maximise the output of large datasets. Indeed, production of transcriptomic and proteomic data is on the agenda. During this second period of List\_MAPS, ESRs will engage in secondments to perform specific experiments.

Early July, the network will attend the FEMS congress in Valencia. It will be the opportunity to present List\_MAPS's research advances to the international scientific community.

Tuning into entrepreneurship is on the training side. Production of online resources on this topic is now completed. This online course will give ESR theoretical background and interactive hands-on experience in turning research results into business opportunities.

At the time I am writing this editorial, the end of the year is around the corner. 2017 will see List\_MAPS cruising full speed and I would like to take this opportunity to wish you all the best for the coming year.

Dr Pascal Piveteau,  
Coordinator



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## OVERVIEW OF THE 1<sup>st</sup> year

At the end of the first year of lab work, all protocols required to fulfil our research objectives have been optimized. These include RNA extraction, qPCR assays and conditions of MALDI imaging mass spectrometry. Bioinformatics tools dedicated to *Listeria monocytogenes* have been developed to analyse RNA-Seq data and investigate regulatory circuitry. Moreover, a collection of deletion mutants have been constructed to be tested under the various environmental conditions investigated within List\_MAPS.

Investigation of the fate of *Listeria monocytogenes* in specific habitats gave new insights on its ecology. Indeed, a series of experiments in soil microcosms was set up to refine our understanding on the link between the diversity of the microbiota and the fate of *Listeria monocytogenes*. The purpose was to assess the consequences of habitat perturbations on survival and persistence of the pathogen. The fate of *Listeria monocytogenes* depended on the conditions tested but under specific perturbation regimen, *Listeria monocytogenes* persisted throughout the experiment while it could no longer be detected in the controls. This suggests that in case of perturbation of the habitat, the risk of its invasion by *Listeria monocytogenes* could rise. Diversity analysis of the soils' microbiota is on the way.

Conditions relevant to the food-processing environment were implemented. A variety of carbon and energy sources were selected as abiotic factors. The available carbon and energy source affects planktonic growth, biofilm formation and production of EPS. Comparative analysis of the performance of 20 genome-sequenced *L. monocytogenes* isolates from different origins revealed diversity in these effects. The ability of a collection of food isolates to form biofilms was assessed with the Biofilm Ring Test device and with the crystal violet method. Phenotypic diversity was observed in the ability to form biofilms and cold stress conditions (4°C) resulted in strong biofilm formation. Subproteome extraction of planktonic and sessile *Listeria monocytogenes* grown at mid-log and stationary phase at 10°C, 25°C and 37°C are currently performed before their next analysis and comparison by a shotgun proteomics approach. The conditions of MALDI imaging mass spectrometry have been optimized on *L. monocytogenes* biofilms and applied for the investigation of the response to dehydration stresses. The lethal effect of two visible light intensities (25 mW/cm<sup>2</sup> and 35 mW/cm<sup>2</sup> 470 nm light) was tested. Cells grown to the stationary phase were more resistant compared to exponential phase. Inactivation of  $\sigma^B$  resulted in increased sensitivity to visible light compared to the wild-type at stationary phase. Neither  $\Delta sigB$  mutant nor parental strain were completely inhibited after exposure to visible light for up to 8 h. An adaptive response to visible light may exist as it does for other stresses. More testing is required to confirm this hypothesis.

Foods contain different constituents that may impact upon the ability of *Listeria monocytogenes* to survive in the gut. We are examining different food components that may influence how *Listeria monocytogenes* responds to stress in the gut in order to build a picture of how foods may affect the stress response of the bacterium prior to and during infection.



### **Presentation of the company**

GenXPro is specialized in Next-Generation-Sequencing (NGS) based analysis and bioinformatics. Founded in 2005, we have developed a broad spectrum of techniques and methods based on NGS and provide a full service, including bioinformatics statistical analyses and presentation of the data. Our service portfolio also includes metagenomics and metatranscriptomics. In 2008 we have invented the "TrueQuant" method, which is based on barcoding each DNA-molecule prior to PCR amplification. As each barcode-template combination is statistically unique, PCR-duplicates can be identified and eliminated from the dataset to prevent PCR-bias. Our customers are from all fields of life sciences but mainly from agro- and medical institutions and companies worldwide. Recently, we are concentrating our efforts to offer services for precision medicine in cancer treatment. This year we have launched a transcriptome sequencing kit based on our TrueQuant method for high resolution gene expression analysis and low-bias data called "MACE" (Massive Analysis of cDNA Ends).

### **Why the company participates to List\_MAPS?**

The better understanding *Listeria* is pivotal to prevent fatal food contaminations. We were interested in participating in this European project, because we wanted to learn more about the highly interesting food-safety field and to provide new technological approaches based on NGS. Besides listeria-specific insights, we are also hoping to increase our knowledge in metatranscriptomics. We aim to develop technical tools such as test-kits and bioinformatics solutions based on the insights we get from the project.

**Dr Björn Rotter, Head of functional genomics <sup>1</sup>**

**Website:** <http://genxpro.net/>

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<sup>1</sup> See the page of the company and the presentation of Björn Rotter on the website of List\_MAPS: <http://blog.u-bourgogne.fr/list-maps/consortium/beneficiaries/genxpro/>

## ISOPOL

Organized by the Institut Pasteur from **14 to 17 June 2016**, ISOPOL XIX was the first international event that List\_MAPS' ESRs attended. They met scientists from all over the world to exchange and update on topics of *Listeria monocytogenes*.

Three supervisors of List\_MAPS were speakers (Birgitte Kallipolitis, Conor O'Byrne and Pascal Piveteau) and two ESRs presented a poster (Amber, Natalia).

You can read the [special issue](#) we made after the event, which includes photos, testimonies of ESRs and summaries of the supervisors' presentations.



Group photo of ISOPOL participants, Institut Pasteur

## SUMMER SCHOOL



From left to right: Marianne H.Larsen (UCPH); Pascal Piveteau (UB); Angela Ortiz Camargo (ESR1); Ignasi Ferrer Lluís (ESR10); Amber Dorey (ESR4); Natalia Crespo Tapia (ESR6); Catarina Marinho (ESR8); Patrícia Dos Santos (ESR7); Tiago Santos (ESR5); Vanessa Las Heras (ESR2); Björn Rotter (GenXPro); Ibrahim Sultan (ESR9); Bohyung Lee (ESR11); Miguel Villoria Recio (ESR3); Klaus Hoffmeier (GenXPro)

The 1st Summer school of List\_MAPS was organized in Frankfurt by GenXPro from the **4<sup>th</sup> to the 6<sup>th</sup> of July 2016**. During 3 days, the ESRs attended presentations and workshops about the Next Generation Sequencing platforms, transcriptomes, QPCR data analyses, eucaryotes and procaryotes transcriptomics.

Beyond the scientific training, this 1st Summer School was the opportunity for the ESRs to learn how a company works. Two visits in the premises of GenXPro and Thermo Fisher Scientific was organized, where the ESRs met people from different sectors of the company (human resources, law, sales).



Monday 4<sup>th</sup>: presentation by Björn on NGS platforms



Tuesday 5<sup>th</sup>: day in Thermo Fisher Scientific



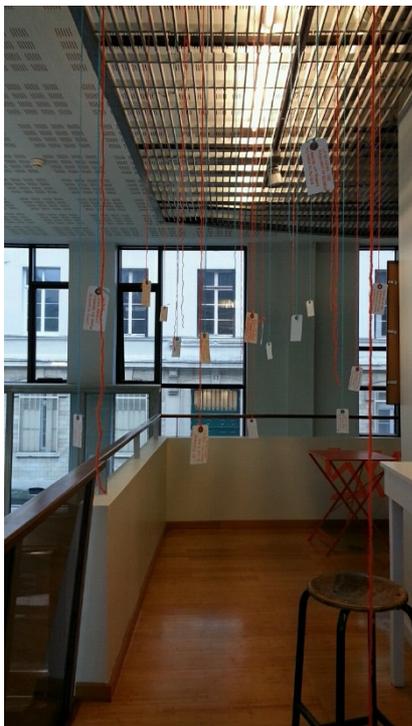
Since 2005 the European Researchers' Nights have been organized every September. These Nights are dedicated to popular science by meeting researchers in an interactive way. This year, the European Researchers' Night took place on Friday 30 September in over 250 cities. In France, the event is coordinated by the University of Burgundy and Franche-Comté and 5 ESRs participated to this edition, in Dijon and in Paris. <http://nuitdeschercheurs-france.eu/>

### Dijon

From 6:00 pm to 11:00 pm, the Night was organized in three different buildings of the campus where people met researchers through experiments, presentations, games, speed-searching, etc. Cédric Villani, a French mathematician who won the medal Fields in 2010 was the sponsor of the event and gave a conference to close the Night.

### Paris

In Paris, the Night took place at the "Espace des Sciences Pierre-Gilles de Gennes" with a concert, a tree of ideas, a revisited speed-searching with pictures and others workshops to understand and discover the relation between researchers and ideas.



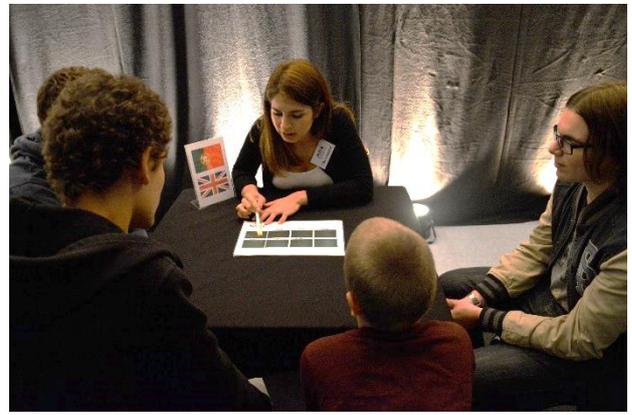
Night in Paris, Tree of ideas



Night in Dijon, Speed-searching, Chloé Andriot©



Speed-searching of Angela (ESR1)



Speed-searching of Catarina (ESR8)

**What did you do for this 2016 edition of the Researchers Night? After one year working in your project, was it easier for you to explain your work?**

**Angela:** For the researchers night 2016, I did what they call: speed searching, where people come in groups to hear us explaining our work. For this kind of activities we cannot use any technical/complex language due to the fact that people who come to listen to us, are people that range from small kids to elderly people and who most of them have no scientific knowledge. If want to make ourselves understandable, we have to explain in simple words the overall of our projects and the importance of our research, however we cannot go into depth trying to explain our experiments or our results. I believe that after one year, we understand more the essence of our research which makes it somehow easier to describe, but the idea with this activities is to briefly explain in 8 minutes what we do and why we do it so we cannot say more than the general overall of our work.

**Catarina:** In the 2016 edition of the Researchers' Night, I collaborated on the speed searching activity, which consists in explaining my research topic to the common public, using understandable terms, within 8 minutes, 9 times. Since it was held in Dijon, I had the extra dare of speaking in French! It was challenging to put on understandable non-scientific terms my studies, although, the previous outreach activity in the high school Charles de Gaulle assisted me to prepare a speech to explain my project and understand what people consider more interesting about it.

**Tiago:** The 2016 edition of the Researchers Night was my second outreach experience. The first was one year ago, in the beginning of the project, and I had the chance to experience speed searching and explain, with simple words, what I intended to study during my PhD. On this year's researchers night I didn't do speed searching, instead I was interviewed by the Radio Dijon Campus. The interview was also very challenging, first because I am not proficient in French and second because I had to try to explain my PhD work and goals with simple words to a vast audience. Nevertheless it was a rewarding experience.



Radio interview of Tiago (ESR5)



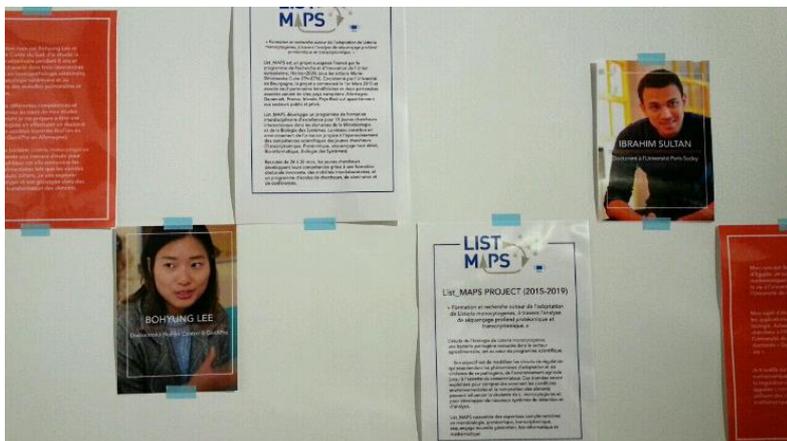
“Qui-est-ce?” Bohyung (ESR11)



“Qui-est-ce?” Ibrahim (ESR9)

**Bohyung:** I have participated in ‘Qui est-ce?’ in other word, speed searching. It was designed to make the visitors guess what kind of research we are engaged in by asking several questions. The visitors could get ideas from various cards with images related to studying science. Most of them could easily guess that I am in the field of biology, then with the card of ‘animaux vivant (live animals)’, I told them my study is with much smaller scale of creatures alive. In the end, most visitors could guess that it is about microorganisms. It was much more fun and interesting for both parts than just explaining what my study is about from the beginning. And once again, it was nice to know that people are interested in research and science. And yes, it was much easier to explain my work to people compared to last year.

**Ibrahim:** I participated in the Researchers Night event which took place at "Espace des sciences Pierre-Gilles de Gennes" in Paris, the event was well organized and had many activities with different types of contents. For me, I participated in an activity called speed searching, where you meet many visitors individually and for an average period of seven minutes for each visitor, the participant will ask you many yes or no questions and by the end of the seven minutes s/he guesses what is your area of research and then you briefly explain your project. It was a unique experience where I met many people from different backgrounds and from different ages and where I had to present my research project in a simple form based on the participant sequences of questions. That was my second time to participate in an outreach activity after my participation in a similar event at the beginning of my PhD project where the audiences were all from the same age. I felt an advancement in my way to simplify my work that is due to the experience gained from the first event additionally to a better understanding of my research area after one year of the project.



The theme of this edition was "the idea". What this word invokes to you in your work?



"The idea" is the result of thinking and thinking is something that a researcher is doing on a daily basis. A researcher is always searching for innovative solutions and suggestions or is trying to analyze the facts and the events around him, so he thinks and comes up with an idea then tests it to see whether it is true or wrong, in both cases the results will be useful since science is based on experiments of the ideas. **Ibrahim (ESR9)**

In my opinion, the idea is the main foundation of research. Brilliant ideas usually are born into some previous findings that somehow lead to a thesis, hypothesizing their purpose, for instance. Unfortunately, or not, not all ideas lead to success, but indeed that is what science is all about, a cycle of hypothesizing, testing and validation or failing ideas, that somehow are rethought and put into perspective again. My project consists on the idea that the AgrA and the  $\sigma B$  regulons somehow overlap on *Listeria monocytogenes*; this thesis was hypothesized based on previous experiments that highlighted this possibility; therefore, I'm studying how this interconnection might occur, in which conditions and its consequences. I truly believe that this was an excellent idea, so I'm putting all my efforts to validate my thesis. **Catarina (ESR8)**

Ideas can grow bigger through discussion. I try to talk to people and most of the times, I get help for my next step in research. For me, ideas don't just pop up like a magic. My best solution to have good ideas in research is to talk to people in terms of brain storming. **Bohyung (ESR11)**

Idea is the main concept throughout a PhD work or a scientific career. Ideas lead to the questions that we want to answer. They are also related with all major breakthroughs in science, because sometimes an idea outside the box leads to a big discovery. During this first year of PhD, I have already experienced what is to work around an idea and occasionally, during lab work, ideas come up and you try new approaches. Together with some luck to the mixture you get your data and answers that contribute to the advances in Science. **Tiago (ESR5)**

Our work as scientist has to be constantly full of ideas. For instance sometimes we have to work based on trials and error because the methods in our research are either new for us or for everyone and we have to come up with ideas to make things work. Based on this, sometimes our ideas are wrong and other times our ideas are right, and when they do is a relieving for us because it show us green light to continue with the next step on our experiments. Furthermore, we must always create new ideas that contribute to the creation and development of our projects, such as new experiments or innovative methods for the research in our topic. **Angela (ESR1)**

## WORKSHOP on statistics...



INRA Jouy-en-Josas

To end their first year of research and training programme, the ESRs attended a workshop “Introduction to statistical analysis of expression data with R” in the INRA unit MalAGE in Jouy-en-Josas (France). During three days, from 10-12 October 2016, they learnt how to use R language with differential gene expression analysis of RNA-Seq data and graphical representation of expression data. It was quite an intensive workshop, especially for those who weren’t familiar with programming languages, but they all saw how useful it was for their project!



Monday 10<sup>th</sup>, Introduction to R language by Sophie Schbath



Wednesday 12<sup>th</sup>, Graphical representation of expression data by Pierre Nicolas and Cyprien Guérin

## ... AND ANNUAL MEETING



From left to right: Laurent Gal, Dominique Garmyn, Alain Rico, Boyhung Lee, Patrícia Dos Santos, Birgitte Kallipolitis, Hanne Ingmer, Sophie Schbath, Tiago Santos, Catarina Marinho, Ignasi Ferrer Lluís, Amber Dorey, Angela Ortiz Camargo, Tjakko Abee, Björn Rotter, Conor O’Byrne, Christian Provot, Miguel Villoria Recio, Natalia Crespo Tapia, Vanessa Las Heras

Presentation of Amber (ESR4)

After the workshop, the ESRs joined the rest of the List\_MAPS members at the CNRS center in Ivry-sur-Seine for the annual meeting. Thursday 13<sup>th</sup> of October was dedicated to research and each ESR presented the progress of his/her project. The day ended with a general discussion and we all went to enjoy a dinner in the restaurant “La Maison Courtine” in Paris. The next day, the communication and management parts of List\_MAPS were presented with the preparation of the mid-term report.

After one year working, this meeting was the time to see the progress of the project and be ready for the second year.



From left to right : Patrícia Dos Santos, Tiago Santos, Catarina Marinho, Björn Rotter, Conor O’Byrne, Pascal Piveteau, Tjakko Abee, Angela Ortiz Camargo, Bohyung Lee, Alain Rico



From left to right : Pierre Nicolas, Laurent Gal, Birgitte Kallipolitis, Michel Hébraud, Ibrahim Sultan, Miguel Villoria Recio, Ignasi Ferrer Lluís, Dominique Garmyn, Cécile Bernard, Natalia Crespo Tapia

## SECONDMENT ESR2 VANESSA LAS HERAS<sup>2</sup>



Frankfurter Innovationszentrum Biotechnologie (FIZ), Frankfurt

A secondment is a period spent by an ESR at the premises of a partner other than the one which has appointed the ESR under the project. They are an opportunity to benefit from specific training facilities and give them the opportunity to experience the working environment in other laboratories.

Vanessa (ESR2) was the 1<sup>st</sup> ESR to do a secondment. She left Cork in Ireland to Frankfurt in Germany, from 7th to 27th of July 2016. This is how she experienced this opportunity:

*“ My secondment challenged me not only with a new country but also with a new working environment. These changes were very stimulating and invited me to make the most out of my secondment. Not only I was able to learn a group of techniques not available in my host institution, but I also encountered a completely different work flow that gave me an excellent overview of how work in a company can be. This experience was therefore a very enriching opportunity in the way that it gave me a broader view of alternative careers to academia.*

*Integration was the easiest part of my secondment and I enjoyed every single moment with my new colleagues. I found an extremely multicultural dynamic team that gave me the opportunity of trying all the techniques by myself and was available to troubleshoot all the time, giving me the experience of a lifetime. During these troubleshooting moments I found myself not only discussing the protocols I was performing but also my project and what I can do to optimize the data I generate, which in the near future will be very beneficial for my work.*

*At a personal level, I left GenXPro not only a better researcher but also a better person. ”*

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<sup>2</sup> See the dedicated page of Vanessa in the website : [http://blog.u-bourgogne.fr/list-maps/early-stage-researchers/vanessa-las-heras/?noredirect=en\\_US](http://blog.u-bourgogne.fr/list-maps/early-stage-researchers/vanessa-las-heras/?noredirect=en_US)



## ESR1 Angela Rocio ORTIZ CAMARGO

### **It has been one year now that you are in Dijon in France, is the life very different from your country and your last place of living?**

Yes it is completely different. I am from Colombia and before coming here I had been living in the Netherlands for three years. In Colombia I lived in the capital Bogota, which is a very large city. Bogota is a place where I had plenty of different things to do and places to go, although you have to be mentally ready to have a lot of patience because it can be quite chaotic.

In the Netherlands I lived in the small and beautiful village of Wageningen a place full of people from around the world that come to study there in the University, but before all, is a place where people are friendly and kind. Dijon is a great city, but it is difficult to blend in if you cannot speak the French fluently. On the positive side the food is very delicious and the wines are great.

### **Your work in the laboratory takes a lot of your time, what do you do to change your mind and relax?**

Well whenever work allowed me, I go back to Netherlands. My boyfriend and some of my friends are there, so it is nice to go and visit them maybe have dinner and catch up on each other's life. If I stay in Dijon and I have some time off on the weekends, I can take a walk in the city center, a place full of beautiful architecture and nice shops. At home I like to relax watching a movie, cooking which is something I really enjoy or maybe call my family. I brought my bicycle from the Netherlands so whenever I can; I ride it around the city enjoying some sightseeing.

### **Your project is to understand the adaptation and survival of *Listeria monocytogenes* in soil, what will be your main objectives for your second year of research?**

Well during my first year, I was able to work mainly on perturbation experiments which study the effect of temperature and different populations of microorganisms in the establishment and survival of *L. monocytogenes* in soil. Some results are pending but the results that we have so far are very interesting and show how biotic and abiotic factors can influence *Listeria* survival in soil. Additionally, I was able to work on the relationship of *Listeria* with plants' rhizosphere for testing of transcriptomics results, which were very interesting to me since I had to work with plants in *in vitro* conditions. But the second year is just starting and for this, much more results are expected. First I will finish the perturbation experiments, to have light on the biodiversity of the microbial populations of the soils we work with. Then I will start working on my transcriptomic experiments of *Listeria* in soil. Additionally, I will have my first secondment at INRA Clermont-Ferrand France, where I will be able to learn different techniques for proteomics analysis. Lastly, after analysis of transcriptomics and proteomics results, I aim to select important targets for construction of mutants, followed by the analysis of their physiology in soil, plants and *In vivo* conditions which will be the topic of my second secondment. So, it will be a lot of work but also and hopefully a lot of very interesting results to come.

### **In the next year, you will participate to one of the major international event in microbiology, FEMS Congress, in addition to the network activities, how do you perceive these events for your personal and professional life?**

To start with, I must say that participating in the FEMS congress will be a very exiting experience for me. Not only to listen and learn what other microbiologists in Europe are working with but also to blend in with them and be able to share experiences. In the past I had participated in Latin-American congresses of microbiology but this is the first time I will attend a congress of such a magnitude here in Europe. Moreover, I am hoping to put some of my work in display by then because I am sure it will be a terrific experience. I believe that these activities such as FEMS Congress, the summer School 2, and the workshops are made to enrich my knowledge and improve my skills as a scientist, because not all that you learn is inside the lab. As scientists, we have to be in constant training to keep ourselves updated with the latest technologies in the study of microorganisms but also in tools that we can use for the analysis of our results.

## ESR3 Miguel VILLORIA RECIO

### **How do you adapt to Copenhagen in Denmark? Do you think you would like to stay there after your Ph.D.?**

The first time I visited Copenhagen was on a warm sunny weekend in June 2015, right while I was wrapping up my MScRes thesis and applying for my current PhD position. I thought the vibrant, youth atmosphere, the flow of the bicycles and the fantastic organization of the city was something I was deeply intrigued to experience myself. Upon recruitment, I moved over these lands by the end of September 2015 and, in plain language, it was not easy at all! Housing market is very tight and I struggled a lot to find accommodation. This is the usual in a demanded, popular city like Copenhagen and it is not exclusive to the internationals; the situation also applies to the Danes. It took a while to formalise my working papers, besides being an EU citizen! Now, once everything done and you find yourself out of the “newcomer bureaucracy loop” ... it all runs as smooth as the bikes under the sun. Let me explain you; becoming part of the Danish society is not sooner said than done, but it brings so many benefits that it makes it all worth it. It is surprising how much help you can get if you form a family or study here. Another good point is that the vast majority of the population has an exquisite English command! Learning Danish is strongly recommended though. It would be rather difficult to tell whether I would like stay or not after my PhD, but if that was what I wanted, I think that the market possibilities are very big and this city could definitely cover one’s personal and professional goals!



### **Do you find some time to do your hobbies?**

Working as a PhD goes further beyond a full time job. I have not had much spare time to fulfill my personal hobbies to be honest. It depends on whether I am going through a busy busy period or not. I have had the chance to have some weekend getaways but I would like to get back to a good sport routine and more time to gather with friends for some drinks and catching up chatting. Copenhagen is fantastic when it comes to jogging, cycling or meeting friends in cozy, candle lighted places.

### **You start your second Ph.D. year, do you feel more confident in your work?**

Definitely! They say 1st PhD year is the easiest of all. I may be going against the tide. I now feel more confident of myself and know more about the way to follow, who to ask when in need, how things work and set enough in my project to have a good perspective of it all. Working in the IVS department in the UCPH has been a great pleasure for me. All my colleagues are very kind and friendly. The fact that everybody is very approachable and there is no hierarchy whatsoever makes the working environment very pleasant. The PhD community is pretty big and we prepare events every now and then to keep an active social life within the institute.

### **List\_MAPS is a collaborative project, did you start to work closely with some of the others ESRs and partners?**

Being part of a bigger project brings into play many opportunities never available unless collaborating with other labs abroad. List\_MAPS has been the biggest project I have ever taken part of. Mobility, science sharing and support are key to me. Besides the difficulties of being apart, all labs are very collaborative one another and we support and exchange ideas between us to improve the quality of our science and benefit from the project as a whole. I find it easier and easier every time we meet to communicate with the other partners and establish work relationships. It has been very constructive to me having the possibility to expand my network and, after my PhD 1st year review, I feel more confident about my research. Many partners supported our ideas and had inputs and suggestions to improve it. I think it is now, easier than ever, the time to collaborate among us all. The relationship with the rest of the ESRs is fantastic. We all form a fresh dynamic group full of interests and energy. I am sure that in the nearer future some of them will become well-established scientists. Therefore, not only it is important for us as -early stage researchers- to benefit from the most experienced researchers but also to make a good network among us students to work together in the future. Suiting my experiments, I am expecting to visit next year either my partners in Ireland or The Netherlands! We have already discussed these possibilities and as soon as I finish my current experiments, we will think about what to do exactly there. List\_MAPS mobility programme is been so far and in short truly amazing!



### **You did your studies in Spain and now you work in Frankfurt in Germany, how is it to move in a new country for two years?**

In my case I already had a previous experience living in Germany for 6 months, as I did a Bachelor exchange under the Erasmus project to Jena. Due to this experience I knew, more or less, what to expect from Germany, even though you always have surprises discovering the city and the region. Life in Frankfurt is slightly different from life in Jena and quite different from life Barcelona. Frankfurt is a relatively small city when compared with Barcelona, but it has a huge importance as it has many bank headquarters and a very important airport, which means that it is a very international city. Even though, I must say that I miss having the beach and the Pyrenees so close as I had them in Barcelona.

So far now it is 1 year already that I am living here, and I would really recommend anyone to live in Germany, as for my past and present experiences Germany is a nice Country. The only drawbacks I found when I moved in was all the bureaucracy needed to be done to be registered in Germany and the difficulty of finding housing in Frankfurt and the prices of it, but, once this is done, it is a really nice city to live in, even though it can be sightseen in 1 day.

### **Do you find time to enjoy the city, travel in the country and do your hobbies?**

In my opinion, if you are interested in where you are living in, and you are an open-minded and outgoing person, you can always find a moment to discover the secrets of the city you are living in, and discover, as well, the traditions of the country. Germany is a country with a lot of history, and Frankfurt, particularly, also has many traditions. Since I am here I have had the opportunity to discover the local German gastronomy, including some specialties from Frankfurt, and, at the same time, hear pieces of history about the city and the country. As I said before, Frankfurt can be seen in one day, but it is a worth day. Besides this I have also traveled a little bit around Frankfurt, and I have visited towns like Heidelberg, Marburg, Würzburg and also cities like Munich. I have to say that all of them are worth visiting and very different from the towns and the style I am used in Catalonia. In reference to my hobbies I don't have really specific hobbies, as I like being with people doing different activities, and in Frankfurt I have had the opportunity to do so.

### **It has been one year now you started your research work, how do you feel about it?**

After one year I feel proud of what I have learned and what I have done in the company. As my research field is much linked to informatics I had to learn how things were being done in the company so I could adapt my skills to their needs and vice-versa, and, so far, the feeling I have is that we are going in the right direction. At the beginning we explored many approaches and finally we decided that the best solution would be me learning different programming languages to adapt myself to GenXPro's current implementation. This decision implied tough work at the beginning, as learning different programming languages at the same time is difficult, but easier solutions at the end. I am very proud, and happy, of my work at List\_Maps, which is providing tools so all the other researchers could understand the results they obtain from their samples. I am very excited to see what comes up from the results of all studies!

### **You are recruited by a company, GenXPro, does this experience help you to choose (or not) the private sector for your future career?**

When I finished my master studies I only had experience in the public sector, working in university research labs or in public hospitals. For me having the chance to work in a private company was a big opportunity I could not let it go. GenXPro offered me the chance to work in a good environment and the research the company does is innovative, which is always great as you never know which results you will obtain from it. I must say that the feeling I have working in the private sector is really close to the feeling I had when I was working in the public sector. So far, if in the future I have to choose between working in the public sector or in the private sector I do not know which way I will choose, and I guess that it will depend on the offer itself to decide where to go.

## JOINT SYLLABUS-ENTREPRENEURSHIP

The ESRs will follow an on-line joint syllabus in entrepreneurship to increase their employability. The platform is ready and all the resources have been selected (MOOCs, e-books, etc.) to help them to build a business model and business plan.

The training will start in January 2017 and each month, until June, they will discover a topic related to the business plan.

Helped with the private partners of List\_MAPS but also with external professionals, the ESRs will have all the keys to better understand how they can create a product or service from an idea.

## DISSEMINATION

- Posters [Angela](#) and [Catarina](#) (Journée des doctorants INRA)
- Posters Angela, Natalia and [Amber](#) (ISOPOL)

## COMMUNICATION

A French version of the website is available: <http://blog.u-bourgogne.fr/list-maps-fr/>

You can find on the website all the information, like the outreach presentations made by the ESRs for their project:

<a href="#">Angela</a>	<a href="#">Miguel</a>	<a href="#">Tiago</a>	<a href="#">Natalia</a>	<a href="#">Ibrahim</a>	<a href="#">Bohyung</a>
<a href="#">Vanessa</a>	<a href="#">Amber</a>	<a href="#">Patrícia</a>	<a href="#">Catarina</a>	<a href="#">Ignasi</a>	

If you want to read (again) the 1<sup>st</sup> newsletter and the one made for ISOPOL:

[1st newsletter](#) (October 2015-March 2016)

[Newsletter ISOPOL](#)

# WHAT'S NEXT ?

## EVENTS AND MEETINGS

**23 February 2017:** Mid-term review meeting

**9-13 July 2017:** FEMS Congress, Valencia, Spain

**Summer 2017:** Summer School 2, Saint-Genès-Champanelle, France

**Fall 2017:** Scientific workshop and annual meeting

## SECONDMENTS

**ESR9:** Ibrahim (INRA) to GenXPro

**ESR1:** Angela (UB) to INRA unit Microbiologie

**ESR3:** Miguel (UCPH) to UCC

**ESR10:** Ignasi (GXP) to INRA unit MalAGE

**ESR7:** Patrícia (SDU) to NUIG

**ESR8:** Catarina (UB) to SDU

**ESR4:** Amber (NUIG) to UB

**ESR6:** Natalia (WUR) to UCC

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List\_MAPS Consortium



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