EPICONCEPT NEWSLETTER

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Epigenetics and Periconception Environment

Participating countries: AT, BE, BG, CH, CZ DE, DK, EE, ES, FI, FR, DE, GR, HR, HU, IE, IL, IT, LT, MK, NL, NO, PT, SE, SK, SI, SL, TR, UK

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In this Issue:

Message from the Editor

Welcome to the first edition of Epiconcept's newsletter

This newsletter will provide you with updates from our STSMs we have funded, update you with news from our meetings and also inform you about up and coming events and meetings which you could participate in.

For those of you who were members of COST-GEMINI you have known me for a while now and it is with regret that I am writing to inform you all that I will no longer be the administrator to this action from June 2013. The reason for this is that I am making a big move down under to Australia!

I wish you all well.

Best wishes
Sara Gottliebsen
Epiconcept Administrator

A message from the Chairman

Dear Epiconcept members

Our Epiconcept Action started last October and it is time now to look back upon the first months of our action. We have already achieved a lot, with the invaluable help of the Executive committee, and of course Sara Gottliebsen and Laszlo Tecsi: A first meeting in April 2013, the "conception" (what's in a word) of our website EPICONCEPT : http://cost-epiconcept.eu/ , several STSMs and now this first newsletter. A workshop in Barcelona is in preparation for 14-15 October 2013, as well as a Research Front for Reproduction Fertility and Development focused on Epigenetics and Periconception environment. We are quite busy!

The first annual meeting was held in Antalya-Turkey and was a great success, attracting more than 130 attendants; many of those were young researchers. Mehmet and his crew selected a beautiful location and organized a smooth meeting! Thank you again!

What did we learn? In the first workshop it was explained how difficult it is to retrieve biological relevant data from genome wide analysis by Eric Bongcam. In fact a complete COST action has been dedicated to this topic. We also learnt more about imprinting and different model species as explained by Colum Wash and Mario Fraga. One of the speakers from Canada, Claude Robert, could not make it due to a Lufthansa strike but he managed to produce a webinar, which is now available both on Youtube and on our website. He is presenting the EmbryoGENE project, and both a transcriptomic platform and a DNA methylation platform are available, please check out the following links on YouTube.
www.youtube.com/watch?v=ble2V8d5WdQ&feature=youtu.be and
www.youtube.com/watch?v=MVMQAMiihpw&feature=youtu.be

In the second workshop data on epigenetic effects in different mouse models were presented, both during gametogenesis, fertilization, embryo development and postnatal development, lectures of Gavin Kelsey, Melissa Mann, Alfonso Gutierrez Adan and Nathalie Beaujean. Next a selection of young researchers presented their data and we discussed their findings afterwards.

The next morning we first listened to Sasa Jenko, a European officer from the European commission. She explained to us how EU research directorates are working and how we can lobby for our research interest in EU. Then the third workshop started, presenting different model species such as fish (F. Pifferer), mice (Tom Fleming), Poultry (Anne Collin) and even yeast (Liior David)! Over lunch we became very interactive in the session dealing with Science Scientists and the Public: Frank Burnet, the man with the red shoes, was able to show us how we can explain what we do to a lay audience. Interesting and entertaining!

I can only say for myself that I truly enjoyed this first meeting, and I know Alireza did too! Not only did we meet old friends from GEMINI again, we also got to know many new people. I hope this COST Action may become a very successful means of networking, connecting and collaborating with people that we otherwise would never have met. Plans for the 2014 meeting are in preparation, Sofia Engrola will host us in the Algarve, Portugal.

For those of you who could not make it to Turkey, I hope to meet you there next year.

Best wishes

Ann and Alireza

Spring 2013

1st Annual Meeting – Organisers Report

The concept of “sun, sand and sea” for the venue of the meeting triggered me to propose the invitation to Antalya for the first annual meeting of Epiconcept and during the kick-off meeting in Brussels, Management Committee members accepted the proposal probably with a doubt that whether it would be a good idea to have the first meeting organized by someone new within the group. Feeling this and also knowing the huge amount of efforts and time required to prepare the meeting, I had to start with a selection of venue and local organizers committee.

With the meeting experience in the region in Antalya and considering the quality and price it was not difficult to decide the venue of the meeting but it took a couple of weeks to search and find the most appropriate place. We thought that the venue and area in all aspects should meet the requirements not only for the “sun, sand and sea” but also the food, history and natural beauty. The participants had the opportunity to attend the meeting, to use the beach, to taste unlimited food and drinks, to visit some of the historical places and a water fall. All participants appreciated the location, the organization and the tasty meals! It was an excellent opportunity for some of the participants to practice their “belly dancing” performances in the last evening of the meeting. From the feedback I understand that participants also enjoyed the social program which included a variety of local folk dances and Sufi dervish’s performance. We noticed that participants were always together outside of the sessions although there were other attractions within the hotel and also lots of people around. I believe that this was important for “getting to know each other” to become “Epiconcept family” and exchange of ideas, results and experiences.

We managed to have some local support towards organizing the meeting in addition to a grant from COST. This support and also registration fees were very helpful in organizing the activities related to the meeting. Finally we even managed to assign some money for local grants for poster presenters not covered by COST grants.
There were a total of 100 presentations in the meeting, 23 oral and 77 poster presentations. It was very unfortunate that one of the invited speakers from Canada was not able join us due to an airline strike. The rest of the speakers and all presenters were present and contributed to the scientific sessions of the meeting. There was a total of 127 participants, including accompanying people, from 23 European and 3 non-European countries present in the meeting. It was very clear that most of the participants were young scientists.

I hope that all participants left with good memories and enjoyed the time they spent in Antalya.

Best wishes

Mehmet Kuran

The following are reports from delegates who attended COST-Epiconcept's First Annual Meeting held in Antalya, Turkey.

Report by: Agnieszka Waclawik, Poland

The First General Meeting of EPICONCEPT was held in Antalya in the Turkish Riviera, which is the most stunning part of Turkey's Mediterranean coast. We had a very intensive scientific and social programme. During the first Epiconcept Conference I learned why studies on epigenetics are so important. We had lectures and discussions on which epigenomic tools can be used to visualize epigenetic changes, especially in the periconception environment. We could learn from many different model species. Last but not least, we learned how to communicate results of our studies to the lay public and to the media. This session was very lively and interactive. During the poster sessions we also had fruitful discussions. After the scientific programme we had the gala dinner with typical Turkish food, Turkish dancers and belly dancers. It all made a huge impression on us.

The last day was the excursion. We admired the beauty of Turkish landscapes, city side, Roman time monuments such as amphitheatre, ruins of temples, and the Perge ancient city. We also relaxed during the trip by a boat and visited the Manavgatt waterfall. We enjoyed the Turkish hospitality, great food and sun! We would like to thank the organizing committee for their effort in the success of this Conference.

Report by: Eline Wydooghe and Bart Leemans

While writing our abstracts we were already dreaming about the Turkish sun, sea and sand. Only a few weeks later, we could finally take the plane in a cold and rainy Belgium towards the sun. At the airport in Antalya, we could already feel the Turkish hospitality: the Epiconcept assistants took care of us and a small bus drove us directly to the hotel. Once in the hotel we discovered an enormous buffet to fill our empty stomachs and to prepare us for the welcome drink. There we could start to make our first contacts and we put up our posters for the poster session.

The first day of lectures we was about epigenetics in the traditional models. We've really enjoyed the talk of Melissa Mann, who learned us a lot of genomic imprinting in mouse embryos. After that the day went very quickly with a lot of interesting oral presentations, short communications and also the poster session. While enjoying a coffee, we could discuss our results with other scientists, which is a great opportunity for young researchers. While the guys were enjoying football in the evening (Bayern Munchen – Barcelona: 4-0 !), the girls found that the water of the sea was not that warm yet. Later in the evening, we discovered other talents in our lab group in the karaoke organized by the hotel. From now on, when we'll hear "Dancing queen" on the radio, we will always remember our stay in Turkey. After this performance, we visited the disco of the hotel, but we will not further comment on this ☺+

The second day was a day of new experiences: there were talks about drosophila, birds, zebra fish, rabbits, … We were introduced to a whole new area of science, which is one of the nice things about the COST-meetings. Furthermore, prof. Burnet, a very special and enthusiastic man came and learned us some tips

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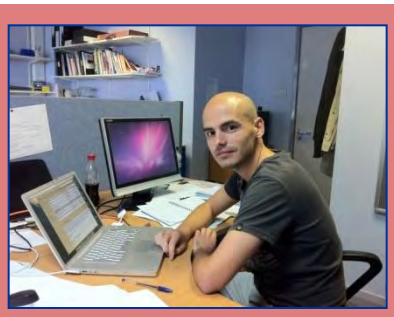
Trans COST-AllBio meeting, 2012



From 29-30 November 2012, I was invited as a delegate of the COST action EPICONCEPT to the Trans-COST meeting that took place in Amsterdam. This meeting was organized by the AllBio consortium, a Coordination action funded under FP7 that coordinates the efforts for the generalization and the broadening of the applicability of the many human-centric bioinformatics facilities to other areas of the life sciences. The central aim of the AllBio consortium is to transfer the knowledge of existing bioinformatics tools and web services among the various life sciences areas and to identify still unsolved bioinformatics challenges. For this reason, this meeting gathered around 20 researchers from different COST actions and European initiatives. Immediately, it was clear that this meeting gathered both biologists and bioinformatics. Therefore, this was a great opportunity to discuss about the different needs and problems that biologists meet when working with the vast amount of data that high throughput technologies can produce, and how the bioinformatics can help to solve those problems.

The first day of the meeting started with an introduction from Erik Bongcam-Rudloff about the AllBio action. Then, all the participants gave a 10 minutes presentation regarding the different COST actions and consortiums we were representing. There were a great variety of topics but all this different actions had something in common, the interest in Systems Biology and high throughput technologies to develop projects that ranged from the 1000Genomes, the generation of the rabbit genome or the development of a virtual liver among many others.
After the presentations there was time for discussions, which were centered in how we can improve the collaboration between biologists and bioinformatics and what is needed in order the biologist can use the different bioinformatic tools that already exist. One of the first things that came up was that there is a need to improve in education and training from the early stages of the research career, PhD courses, and even during the University degree. Also, we realized that there are already several courses and training schools taking place but there is very few knowledge of them and need to be better advertised.

As one of the main reasons of the meeting was to get to know each other and establish a network between different groups that may be interested in bioinformatics and next generation sequencing technologies, we agreed to form a mail list and a Google group with the information of all the participants, including profile and area of expertise.
The second day of the meeting consisted on a workshop where we formed three working groups to discuss about possible common efforts and plans in different areas of interest. The areas of interest were, 1) Training; 2) Platform building; and 3) Standardisation.

I was involved in the discussion of the training needs, especially for biologists. We talked about the need of developing bioinformatics training in high schools (happening in Switzerland and Holland) and promote the Universities, especially biology degrees to include some bioinformatics during the degree. We also discussed about the need to train the trainers, including post-docs and lecturer and senior lecturers and how to get accreditation for that.
The Platform building working groups focused in the discussion of several issues, including: the developing of new bioinformatic tools, summarizing the tools already existing, validation of these tools, strengthen the community and convince people to join. They concluded that a way to do this is first to do a pilot project test case and lobby preparing a white paper. In this regard, the AllBio action is already summarizing the existing bioinformatic tools. Finally the working group in charge of the Standardisation highlighted the importance to generate standards for the different Omics technologies and the Metadata produced.

In summary, this was a very interesting meeting that gave the opportunity to establish a connection with different groups that may share an interest with EPICONCEPT. Although the main topic of conversations was not epigenetics, this meeting allowed an interaction between life sciences researchers and bioinformatics. This interaction could be of great importance when designing and analysing experiments that involve high throughput technologies. Moreover, this meeting could be used to promote the EPICONCEPT COST action since the generation of a mail list and Google group can be used to coordinate training schools, and promote short-term scientific missions between actions.

Report by Ignacio Caballero, University of Sheffield, UK

The Joint Workshop on Relationship between genome and epigenome held at the European Commission SDR1 conference room, in Brussells, 14th and 15th of February 2013

In this workshop the leaders of the COST were met with the policy makers of FP7 and one of the main aims of this workshop was to build new scientific communities with the focus on the new generation of young scientists.

The workshop was very interesting and also quite intense, and included experts in a diverse spectrum of disciplines related to genetics and epigenetics. Over the two days of the workshop we heard many excellent speakers covering many areas of genome and epigenome, with lectures included topics such as: networking and research in genome and epigenome worldwide, challenges in data analysis, link between genome and epigenome, the role of genetic and epigenetic factors from periconception to ageing, and the role of genome and epigenome in susceptibility to disease and disease progression focusing on cancer, allergy and inflammation. In addition, young scientists had the opportunity to present their work, ideas and major funding concerns in a panel discussion regarding building future carriers of emerging group leaders. Several PhD students had also the opportunity to give a talk about their work.

The overall quality of the presentations and the presented posters was very good and several presentations gave rise to stimulating discussions.

Attending the workshop was an excellent opportunity to discuss my ideas and meet some of the most influential and respected scientists in the field of epigenome. As the meeting was relative small, by invitation only, and the fact that I am a newcomer to the field of epigenetics, the workshop was extremely useful for me in giving a very interesting overview of the current state of the field, and there were many new insights to my work gained from the talks and posters presented. I was very much valued the opportunity to share my work by presenting a poster, and received valuable feedback, encouraging me to advance my work in a very positive direction and collaborations to initiate with scientists related to the field of epigenetics.

I also particularly enjoyed the workshop dinner were we had the chance to meet the Head of Unit of the Regional Dimension of Innovation of the European Commission and discuss about future research funding opportunities under the Horizon 2020 framework programme.

I would like to thank all the organizers for staging this so interesting and well co-ordinated workshop and I would like especially to thank Ann and Alireza for inviting me and funding my attendance to this stimulating meeting.

Report by Georgios Michailidis

A priceless COST workshop

From 14-15 February 2013, the European Commission and COST organized a joint workshop on the relationship between the genome and the epigenome. This workshop took place at the headquarters of the European Commission in Brussels, Belgium. Participants from Framework programmes and from various COST actions related to (epi)genomic research were invited to participate in this workshop. As a result, a delegation from the COST EpiConcept action was also present. The goals of the workshop were to discuss the link between the genome and the epigenome, to define the key challenges in these areas of research and to think about exploration of new technologies. Finally and not unimportantly the workshop was bringing together scientists with shared interests. Synergism between COST actions and Framework Programme projects was stimulated while simultaneously trying to avoid too much overlap between projects. From the start it was made clear that this workshop would work both ways: for scientists to understand how the programmes from the European Commission work and for the European Commission to get information from the scientists what they consider to be important.

The workshop consisted of sessions with key speakers followed by panel discussions. On day 1 we could enjoy the following topics: Session 1: Networking and research in genome and epigenome worldwide; Session 2: Key challenges in data analysis; Session 3: Link between genome and epigenome; and Session 4: From periconception to ageing – What is the role of genetic and epigenetic factors? On the second day, session 1 was about: The role of genome and epigenome in susceptibility to disease and disease progression: Cancer. The Session 2 was entitled: The role of genome and epigenome in susceptibility to disease and disease progression: Allergy and Inflammation.

Picture by Chris Irons

From the presentations and the panel discussions two points became obvious. The first is how little we know of the epigenome, and with that that there is also still a lot unknown about the genome. It was rather heavily debated on how to proceed in this respect: should we put our money on high throughput analyses so that whole genome and epigenome information becomes available, or is it wiser to spend our energy on more detailed studies of specific parts of the (epi)genome? The advantages of high throughput approaches are clear: a plethora of data, but as a disadvantage most of these data tend to be superficial. In addition if the data become available for the scientific community it is important that the data are stored well so that they can still be reached after years. Also, the quality of the data may vary and statistical tools are needed. Excellent systems biology becomes required when handling large data sets and it seems obvious that for future research systems biology becomes more and more important.
The advantages of detailed analysis of small parts of the (epi)genome are equally clear: one can get a good understanding of what is really taking place in the cell on a biochemical level. On the other hand it is difficult to decide what/where to analyze. As a conclusion a combination of both types of analyses may give the best answers.

The second point that was made very clear is that epigenetics plays a role and is considered to be important in many different scientific fields; from embryonic development to human organ function, organismal function, plants, ageing and disease etc. At the same time there are many epigenetic processes of which our knowledge is still at a rather premature stage, like nuclear reprogramming, gene and transposon silencing or heritability of epigenetic modifications.

In between the scientific presentations there was a demonstration from Paul Liam Harisson from the University of Dundee. Harisson is an artist that seeks the interface between science and arts and he showed breath-taking and eye-opening movies of his interpretation of dynamic epigenetic landscapes.

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and tricks about how to communicate our results to the public. With an interactive session during the afternoon, he brought us into an unknown field. After a fruitful second poster session, there was the MC meeting, so we had some time to enjoy the sun and one of the many swimming pools of the hotel. With our nicest dress/suits, we could enjoy the gala dinner with a typical Turkish meal, which we will remember as sweet but very nice. During the dinner we could also enjoy typical Turkish dancers and a belly dancer, and afterwards it was our turn to put on our dancing shoes.

On Friday we could discover the beauty of Antalya. A very enthusiastic guide showed us Side, a very important port city in ancient time. Afterwards, we've visited a very impressive amphitheater, which made us feel like gladiators in an arena. In the afternoon we made a relaxing boot trip on the … river under a hot Turkish sun. We could appreciate a picturesque view with pirate boats, cows, orange and pomegranate trees and mountains with snow in the background. After that we've visited an enormous waterfall, the Manavgatt waterfall. To end this nice excursion we could sniff the atmosphere in Perge ancient city.

Next morning very early we had to leave this warm and beautiful country, back to reality. Nevertheless, we came back with a nice experience and a backpack full of scientific ideas and energy to continue our work in the lab. We would like to thank the organizing committee and we are looking forward to the second Epiconcept meeting.

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In addition to the panel discussion that followed specific sessions there were two independent panel discussions that were dedicated to the questions a) how talented researchers can establish themselves to become independent group-leaders, and b) what is needed to push the scientific boundaries of genetics and epigenetics forward.
It was generally acknowledged that there are established funding possibilities for PhD students and young post-doctoral researchers, but few opportunities for talented young researchers who want to start their own groups. A general 'complaint' is that most of the research money is granted to large consortia of already established researchers. Few countries have national funding, for example directly from academic institutions, to help emerging group leaders. One of the suggestions made was to provide grants for 1 or 2 years that would allow young scientists to pursue 'crazy ideas' that may be risky but may open new avenues of research and that would help to distinguish themselves.

As for the discussion of high throughput analysis or detailed studies it was clear that different groups were actively lobbying for either of these approaches, this with the Horizon 2020 programme in the background. Indeed 'selling' your research to the European commission is important and the European Commission in fact is very happy to hear what we as scientist consider to be important for their policy making.

Between the sessions there was enough time for socializing and networking. Particularly since scientists from different COST actions were brought together it was a good place to meet people from other disciplines but with surprisingly similar questions and problems. It was an excellent opportunity to learn about the strategies of the European Commission for money distribution. Indeed it became quite clear that this was the place and time to 'make your mark' for the policy makers and lobby for the importance of your research. Equally important however was that this workshop was valuable for extending one's network. This would help to create the core consortia that are much liked by European Commission.

Article by Bernard Roelen, Netherlands

STSM REPORTS

The following are reports from members who have been awarded a short term scientific mission grant:

Daniela Bebbere, PhD

Sassari, Italy – Freising, Germany

07th -28th April 2013

STSM "Global and local DNA methylation analysis using pyrosequencing"

I am a junior researcher in the Department of Veterinary Medicine of the University of Sassari, Italy. In April 2013, I received an STSM grant from the Epiconcept COST Action to join the laboratory of Dr Susanne Ulbrich in the Physiology Department of Weihenstephan Technische Universitaet in Freising, Germany.

The short mission was focused on acquiring competence on two different approaches for the analysis of methylation: a combination of methylation-sensitive high resolution Melt (MS-HRM) and pyrosequencing for local, highly specific analysis, and a luminometric methylation assay (LUMA) for the evaluation of global methylation.

This scientific visit was an excellent opportunity to learn new methodologies and exchange ideas, and will add significant value to the quality of my current and future research in Sassari. Dr. Ulbrich and her team were extraordinarily supportive and generously helped to make my stay productive.

The mission was also an opportunity to perform experiments within a on-going collaboration between the two laboratories. During the mission, we set up a pyrosequencing assay for the analysis of the *IGF2* methylation in the bovine, and performed the analysis in two different tissues of bovine fetuses at the 80th day of pregnancy. These data will contribute to a joint publication in the area of epigenetics in cattle.

I would like to truly thank Epiconcept for providing me with this valuable opportunity, and Dr. Susanne Ulbrich and her team for welcoming me in an exceptional way at both professional and personal level.

Veronica Maillo
Madrid, Spain – Dublin, Ireland
March – April 2013

I am a PhD student and this is my 3rd year working at the Department of Animal Reproduction, INIA, Madrid, Spain under the supervision of Dr. Dimitrios Rizos. The main focus of my research is related to better understanding infertility in dairy cattle. During the first years of my PhD, I have done several experiments; one of them involved the use of postpartum lactating and non-lactating dairy cows to study their metabolic profile after calving and to evaluate the capacity to support the development of early embryos at Day 60 or 90 postpartum. Another experiment investigated the effect of a single administration of hCG at 24, 48, 72 or 96 hours after ovulation in an attempt to stimulate the growth of the corpus luteum and in that way to increase the concentration of progesterone, stimulate uterine gene expression and improve early embryo development. These two studies were

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published in the *Journal of Dairy Science* and *Reproduction, Fertility and Development*, respectively.

With this STSM we planned together with Prof. Lonergan to do an experiment to study the interaction of the early embryo and the oviduct around the time of embryonic genome activation. There is strong evidence in the literature for an effect of the oviduct on the quality of the embryo; however, there is limited evidence of a reciprocal effect. Indeed, it is possible to produce embryos in vitro in the absence of contact with the maternal reproductive tract and to establish pregnancies after transfer on Day 7, long after the embryo would have left the oviduct. The oviduct transcriptome from pregnant and non pregnant animals will be analyzed by microarray. Furthermore, the oviductal flushing will be used for proteomic and metabolomic analysis. The advent of transcriptomic, proteomic and metabolomic technologies allows a holistic analysis of mechanisms involved in signaling between the embryo and its maternal environment before implantation. This is undoubtedly one of the most exciting processes in reproductive biology and has enormous practical implications. When the analysis of the data is finished the results will be published.

I would like to thank COST Epigenomics who awarded me a STSM grant supporting my stay at Lyons Research Farm (University College Dublin, Ireland) for the duration of the experiment, as part of my PhD. Moreover, it is always a good opportunity to work with Prof. Lonergan and his group, who I would like to thank for all the help supplied during the study, lead to an outstanding experience for me, scientifically and personally.

EPICONCEPT NEWS & INFORMATION

COST-EPICONCEPT Executive Committee

POST	NAME	COUNTRY
Chairman	Ann Van Soom	Belgium
Vice Chairman	Alireza Fazeli	UK
WG1 Lead	Trudee Fair	Ireland
WG1 Deputy	Alfonso Gutierrez-Adan	Spain
WG2 Lead	Kevin Sinclair	UK
WG2 Deputy	Anne Navarrete-Santos	Germany
WG3 Lead	Amos Tandler	Israel
WG3 Deputy	Pascale Chavatte-Palmer	France
WG4 Lead	Tiziana Brevini	Italy
WG4 Deputy	Anita Franczak	Poland
STSM	Christine Aurich	Poland
STSM	Eline Kjorsvik	Norway

Letters

As an Epiconcept member we would love to hear your news on say successful grant applications, or how much you enjoyed attending a meeting.

If you are looking to solve a problem and need a collaborator make a pitch for all to see and hopefully someone will come forward to help solve your research problem!!

If you would like to contribute to the next edition of the newsletter please email your article to secretary@cost-epiconcept.eu.

Information

Here at Epiconcept HQ we would like to keep an ongoing record of any publications that may have come about due to Epiconcept.

We would also like to keep a more specific record of any outcomes from attending an STSM.

Please keep me updated with such information by emailing, secretary@cost-epiconcept.eu.