EMBO – Endocytosis in Health and disease - BASCHIERI

Poland, 10-15 September 2017

Endocytosis is one of the main functions of eukaryotic cells. By looking at the evolution of the endocytic machinery we can notice that endocytosis appeared together with the first eukaryotic cells and it can be hypothesized that all endomembranes originate from endocytic events. Margaret Robinson retraced the origin of the adaptor complexes AP1 and AP2 and, noticing that those complexes were related to COPI coats, decided to look for other coating complexes sharing the same structure but not necessarily the same sequence. With this approach it was possible to uncover the new adaptor complex AP5, whose role in the cells is still not completely understood. Looking for other types of cages, the Brodsky lab identified the new CHC22 gene that encodes for a protein capable of doing vesicles coats. Surprisingly, CHC22 coats are found mostly at the ERGIC and they are necessary for the trafficking of GLUT4 transporters. Therefore, CHC22 is a master regulator of glucose uptake [1].

Endocytosis is fundamental to control nutrient uptake of the cells. This means that endocytosis can tune the energy status of the cells and this links endocytosis to autophagy via the mTORC1 complex. The Zoncu lab showed that mTORC1 activation in response to nutrient deprivation can occur via two distinct mechanisms: direct recruitment of mTORC1 to the lysosomes or recruitment of the small GTPases RAGs on the lysososmes that will subsequently recruit mTORC1. Robbie Loewith showed that in yeast glucose deprivation is sufficient to induce inactivation of mTORC1. The inactive protein will self-assembly in a tubular structure (resolved by cryo EM) that will keep it inactive.

Nutrients uptake is critical also in cancer cells. Dafna Bar-Sagi showed how hyperactive Ras can drive absorbtion of albumin (that will be used as glutamine source) via increased micropinocytosis, and at the same time control plasma membrane cholesterol levels.

Endocytosis plays a pivotal role also in cancer progression. In fact cells control signaling of RTKs by selectively internalizing the active receptors and either degrading or recycling them. One of the best known examples is EGFR, a tumor driver for several cancers. Currently antibody based therapies are very effective in treating several cancers. However, relapses are often observed that are due to adaptations in the endocytic machinery that switches from degradation of the receptor to its recycling back to the plasma membrane. The Yarden lab showed that triple antibodies therapies drastically reduce the risk of acquiring resistance towards the treatment (therefore reducing relapses). Finally, Mahel Zeghouf from the Cherfils lab described a new inhibitor of the small GTPases Arf that acts with a novel mechanism, different from the current GEFs inhibitors and similar to GDIs. This inhibitor could be of importance in cancers where several Arfs are hyperactivated and contribute to increased endocytosis rates of nutrients.

Endosomes have long been object of attention with regards to signaling. Johanna Ivaska showed that not only RTKs can signal from endosomes, but also integrins can. This provides the cell with a “buffer” survival signal that is able to delay anoikis and that could thus be of relevance for cancer cells.

In a mass spectrometry screening on endosomal proteins, the Zerial lab identified plenty of proteins coming from other organelles (mitochondria, ER, etc.) and it is now clear that endosomes can establish contact sites with those organelles. Gia Voeltz identified the ER resident protein TMC1 as a critical factor to induce fission of ER-associated late endosomes and the physiological relevance of this observation is still object of study. Rab24, localized on endosomes and at the ER, is involved in mitochondria tubulation and in mitophagy and its depletion reduces the symptoms of fatty liver disease.

Ivan Dikic presented a new post-translational modification consisting in serine ubiquitination. This PTM drives selective autophagy of ER associated endosomes.

By controlling the positioning of endosomes, endocytosis controls cell fate. Gonzales-Gaitan from the University of Geneva showed that a specific MT motor protein named Klp98a, together with Notch and SARA, controls the segregation of endosomes during Drosophila development.
Clathrin mediated endocytosis (CME) of Notch can pull the transmembrane receptor, thus providing the force necessary for its activation. Therefore endocytosis can control Notch signaling and Langridge et al. show that this happens in vivo in Drosophila.
Pathogens often hijack endocytosis to enter the cell. This is the case of Salmonella typhimurium that induces micropinocytosis to be internalized in special vacuoles (Salmonella-Containing Vacuoles – SCV) that Stévenin et al. are studying in order to identify new targets for therapies.
Leishmania instead upregulates the transcription of Rab5a and blocks maturation of Cathepsin D. All together this will result in increased entrance and reduced lysosomal degradation of the pathogen (Rastogi et al.).

An old question in the field of Clathrin Mediated Endocytosis (CME) is whether clathrin coated pits (CCPs) form from flat lattices of clathrin that progressively invaginate (constant area model) or if they form as curved structures from the beginning (constant curvature model). Using CLEM (correlative light and electron microscopy) and theoretical models, the Boulant lab tackled this question and saw that clathrin coats are flat at the beginning and progressively invaginate when a critical quantity of clathrin is recruited to the plasma membrane [2].
The group of Jennifer Gallup showed how membrane curvature is important to recruit actin at the sites of CCPs nucleation. Progressive invagination of the plasma membrane will lead to the recruitment of specific proteins such as SNX9 and this will in turn drive local changes in the lipids composition of the plasma membrane. The response of actin to plasma membrane curvature will be amplified.
Immediately after scission from the plasma membrane, Clathrin Coated Vesicles are positive for Rab35 and Rab35 recruits OCRL there. OCRL is a lipid phosphatase that will drive the PI4,5P2 to PTdins conversion. The activity of Rab35 needs to be finely regulated and this is accomplished by recruitment of Rab GAPS at the plasma membrane and then by recruiting GEFs on the CCV. The lipid changes imposed by OCRL will be fundamental for cargo trafficking. Mutations of OCRL are associated with the Lowe syndrome. Arnaud Echard showed that in the absence of a functional OCRL it is possible to reduce the symptoms of the Lowe syndrome by using chemicals that artificially convert PI4,5P2 to PTdins.

Recent advances in the field of fluorescence microscopy made it possible to study endocytosis in the context of a full organism, thereby overcoming the limitations imposed by in vitro systems. Tom Kirchhausen showed the potential of the Lattice Light Sheet Microscopy, system that his lab could use to observe clathrin coated structures in a Zebrafish embryo for very long time with virually no photodamage. In order to visualize processes in a full organism, Michiyuki Matsuda developed ERK FRET sensors that are able to report ERK activity in a living organism.

ESCRT proteins are gaining importance in the field. They can drive inside out or outside in deformation of membranes and therefore they are implicated in all the steps of trafficking, endocytosis and exocytosis. Adam Frost studies the specificity of each ESCRT for the outside-in or inside-out curvature. By live high-speed AFM the Roux lab described the mechanism used by ESCRTIII to impose membrane deformation: the complex forms spirals on membranes that provide stress energy which will then be released by buckling the central part of the spiral.

Caveolae are another type of endocytic structures. Interestingly, caveolae are mechanoresponsive structures and they provide the cells a way to resist to shearing stress. Robert Parton made an overview on caveolae explaining how mutations of the two major components of this structure, Cavin and Caveolin,

are associated with muscular diseases. In addition he showed the diversity of caveolae within different organisms: yeast don't have any caveolae, oysters have 24 whereas mammals have only 4, and in zebrafish caveolae do not flatten in response to shearing stress. Finally, the protein Cavin3 was found to interact with BRCA and it is strongly downregulated in the majority of breast cancer. Recent findings show that caveolae could also flatten in response to other kinds of stresses, such as UV exposure or ROS production by any mean.

1. Vassilopoulos, S.; Esk, C.; Hoshino, S.; Funke, B. H.; Chen, C.-Y.; Plocik, A. M.; Wright, W. E.; Kucherlapati, R.; Brodsky, F. M., A Role for the CHC22 Clathrin Heavy-Chain Isoform in Human Glucose Metabolism. *Science* **2009,** *324* (5931), 1192-1196.
2. Bucher, D.; Frey, F.; Sochacki, K. A.; Kummer, S.; Bergeest, J.-P.; Godinez, W. J.; Kraeusslich, H.-G.; Rohr, K.; Taraska, J. W.; Schwarz, U. S.; Boulant, S., Flat-to-curved transition during clathrin-mediated endocytosis correlates with a change in clathrin-adaptor ratio and is regulated by membrane tension. *bioRxiv* **2017**.

Chers/Chères membres du bureau de la SBCF,

Je rédige cette lettre suite à ma participation en 2017 au congrès joint de la Société Américaine de Biologie Cellulaire (ASCB) et de l'Organisation européenne de biologie moléculaire (EMBO) à Philadelphie. En effet, j'ai eu l'honneur de recevoir une bourse de voyage de la SBCF sans laquelle cette participation n'aurait été possible.

J'ai ainsi pu participer à cet important congrès international et y défendre mes résultats de thèse par la présentation d'un poster. Ces sessions ont été très formatrices pour moi d'un point de vue développement personnel (Communication, questions fréquentes…), et scientifique. Notamment, lors de ces échanges, j'ai eu la chance de rencontrer le Pr. L.Wiesman, directrice d'un laboratoire de recherche dans le Michigan, et spécialiste reconnue dans mon domaine d'étude. Le Pr. Wiesman a montré un grand intérêt pour nos travaux et cet échange a été très enrichissant pour moi et profitable au projet. Suite à cette discussion, nous envisageons de développer une collaboration scientifique autour de mon projet de recherche.

De plus, des sessions de type orientation et stratégie de carrière étaient organisées lors de ce congrès. J'ai ainsi pu confirmer mon désir de poursuivre ma thèse par un post doctorat académique à l'étranger.

Je tenais donc particulièrement à remercier le comité scientifique de la SBCF pour m'avoir accordé cette bourse de voyage qui m'a permis d'assister à ce congrès international de renom, ainsi que mon laboratoire pour son soutien dans la préparation de ce congrès.

Je vous prie d'agréer, chers/chères membres du bureau de la SBCF, l'expression de mon profond respect.

Mathieu CINATO.

Inserm/Université Paul Sabatier UMR 1048 – I2MC

1 avenue Jean Poulhès BP 84225
31432 Toulouse Cedex 4 - France
Tél. +33(0)5 31 22 41 17
Mathieu.cinato@inserm.fr
www.i2mc.inserm.fr

EMBO EMBL Symposium Microtubules
Heidelberg, May 27th – 30th

Thanks to the travel grant I received from the SBCF, I could take part in the EMBO EMBL Symposium Microtubules which took place at Heidelberg from May 27th to 30th. This meeting gathers world-renowned researchers in Microtubules field every two years.

It was a great opportunity for me to be part of this congress. Indeed, the passion of presenters and the quality of works which were presented really impressed me. Among all the scientists' presentations, two of them were particularly remarkable: Anthony Hyman and Linda Wordeman's presentations. In both cases, the way they presented it, the experiments they did, and their results were incredible. Since the topic sessions proposed well covered the broad theme of microtubules, I learnt a lot about properties of this cytoskeletal component in various models. I discovered experiments and analysis tools that I have never heard about and that I can easily apply to my own project.

Moreover, I was lucky to have the possibility to present my work as a poster and exchange with great researchers about it. None of the people I met were working on skeletal muscle fibers, that's why I was pleasantly surprised by the number of people who came to see my poster and interact with me. This was a unique opportunity for me to get so many good pieces of advice at such an auspicious time like a second year of PhD. Indeed, positive and negative criticisms showed me new issues concerning my project but they also brought me ideas of new experiments to do to validate the system I am working on. I also took benefit from poster sessions to meet other poster presenters and to discuss about their work. Due to the large number of posters, the session of 2 hours long was not enough to see all the posters I wanted. But I was still able to see many of them and as presenters were really affordable, I could have scientific discussions. Additionally, these poster sessions were profitable as potential collaborations were established.

In addition to the scientific feedbacks on my work, I had the opportunity to talk with other participants and learn from them about their own experiences in foreign laboratories. Indeed, I had preconceived ideas about research in other continents which turned out to be false. Moreover, the congress schedule offered us the possibility to be part of a round table concerning researches in emerging regions and countries. During this time, Christian Gonzalez Billaut from Chile, Krishanu Ray from India, Guangshuo Ou from China, Maria Kavallaris from Australia and Patricia Garcez from Brazil explained us how research works in their country and their own lab. In addition to the benefits of a scientific and professional experience in a foreign lab, they also outlined the difficulties that foreigners could encounter (like the language for example). It was an enriching discussion which allowed me to obtain real answers about what could be life both personally and professionally in such countries. They also mentioned various difficulty levels to get a position in all those 5 countries for outsiders. Finally, this session allows me to have an overall view of research and possibilities that could be mine abroad. This was for me an excellent and timely topic to talk about in order to make plans for the future.

For all these reasons, I would like to extend the warmest thanks to the SBCF who gave me the opportunity to enjoy this EMBO EMBL Symposium Microtubules in Heidelberg.

22nd International Congress of the World Muscle Society
Attendance report

Thanks to the grant I received from the French Society for Cell Biology, I had the chance to be part of the 22nd International Congress of the World Muscle Society which took place in Saint-Malo, Brittany, France, from Tuesday 3rd to Saturday 7th October 2017.
This international congress, organized for the first time in France, gathered more than 550 participants. One of the characteristics of the WMS meetings is that the list of attendees includes all the kinds of scientists working in the field of Myology: PhD students, post-docs, young researchers, principal investigators, but also clinicians and industrials. And given the reputation of the WMS, its annual congress appeal the most recognised specialists from all around the world.

Overview of the congress

The first evening of the congress was dedicated to the Opening Ceremony which consisted in a lecture by Xavier Bailly (head of Mont Saint-Michel Abbey and Carrouges Castle for the Centre des monuments nationaux) on the history of Mont Saint-Michel, followed by the Welcome reception.
The scientific program itself started on Wednesday 4th October morning. The four full days of the congress were well balanced between invited lectures, selected short talks, poster sessions and industry symposia.
The three sessions of invited lectures by nine specialists in the field dealt with thematics as diverse as *Excitation-contraction coupling: basic aspects and related disorders*, *Extra-muscular manifestations in neuromuscular diseases*, *Advances in the treatment of neuromuscular diseases*. These sessions highlighted another main characteristic of the WMS meetings which is to organize programs that put together fundamental research, clinical applications and derived treatments, for them to be as intricate as possible.
The five sessions of a total of thirty-seven selected short talks and “Late breaking” talks allowed the audience to get insight into recent -mainly unpublished- results and latest advances in excitation-contraction coupling, muscle homeostasis, genes and diseases, therapies and pathways, muscle function and imaging, therapy and prevention.
The 499 (!) posters were divided into four sessions of 1.5h, each divided into eight parallel sessions. The poster sessions were probably the most frustrating part of the meeting since it was impossible to see all the potentially interesting posters and discuss with their presenter. But the smart distribution of the posters into 32 sub-sessions allowed the attendees to pre-select easily the posters which interested them the most in order to make the most benefit from poster sessions.
Finally, three industry symposia were organized. I attended only the two first symposia: the symposium 1 sponsored by Avexis on Spinal Muscular Atrophy and the symposium 2 sponsored by Santhera Pharmaceuticals on Duchene Muscular Dystrophy. Indeed I did not belong to the targeted audience since these symposia were clearly dedicated to clinicians.

Personal benefit from the attendance at the 22nd congress of the WMS

On a more personal point of view, my presence to the 22nd International Congress of the World Muscle Society had three major impacts.

First, I had the chance to attend talks and poster presentations that were directly linked with my research field. Indeed, as a post-doc in the laboratory of Dr Vincent Gache, I am studying the molecular mechanisms involved in the correct positioning of nuclei in muscle fibers. I am thus particularly interested in muscle pathologies that are characterized by a mispositioning of myonuclei such as the centronuclear myopathies (CNM). In this regard, the 22nd International Congress of the World Muscle Society was really informative to me since three talks were directly linked with CNM. In the *New genes and diseases* session, Dr Jocelyn Laporte (IGBMC, Illkirch, France) described the characterization, in a cohort of 11 patients, of a novel class of congenital myopathy whose clinical picture includes perinatal hypotonia, severe axial and generalized weakness. Histology analysis revealed sarcoplasmic reticulum dilatation, internal nuclei and some myofibrillar disorganization. This new congenital myopathy is due to mutations in *CACNA1S* (Cav1.1), the gene encoding the pore-forming subunit of the voltage-gated L-type Ca2+ channel (DHPR) that is located on the T-tubule and that is one of the two key players of excitation-contraction coupling in skeletal muscle. This study confirms the link between excitation-contraction coupling disturbance and CNM, since mutation in the gene encoding RyR1 have also been shown to trigger CNM and triads alterations is recognized as an ultrastructural characteristic of CNM. Two other selected talks by Dr Julie Dumonceaux (UCL, London, UK) and Elinam Gayi (University of Geneva, Geneva, Switzerland) dealt with treatments of X-linked CNM which are the CNM due to mutations in myotubularin. Dr Dumonceaux showed that the myostatin pathway is down-regulated in the *Mtm1* KO mouse model, and that it is reactivated following AAV-mediated *Mtm1* gene therapy. Interestingly, whereas anti-myostatin approaches were ineffective in the mutated mouse, the restoration of *Mtm1* expression is associated with successful anti-myostatin treatments. E. Gayi demonstrated the efficiency of a tamoxifen treatment on the same mouse model. At the clinical level, tamoxifen increases lifespan and leg muscle force. At the histological level, tamoxifen decreases the number of abnormally located nuclei, and partially rescues the morphology of triads consistent with an improved excitation-contraction coupling. Interestingly, this is associated with a decreased expression of *Bin1* and *Dnm2* in mutated mice. Besides these talks, one of the 32 parallel poster sessions was also specifically dedicated to Centronuclear Myopathies (Poster 247 to 264). This session was well balanced between clinical and fundamental research. Four posters reported the identification of new CNM-causing mutations, four others corresponded to clinical studies on large cohorts of patients allowing a better clinical characterization of CNM. Finally, four posters described the identification of new phenotypic features in some specific CNM patients. On the fundamental research side, three posters were dedicated to the comprehension of the disease mechanisms. Notably, one poster reported the first high throughput transcriptomic analysis to characterize, at the transcriptional level, affected XLMTM dogs as well as XLMTM dogs treated by gene therapy. Eventually, three posters described studies to treat CNM animal models either by expressing related gene (*Mtmr2*) or through antisense strategy decreasing the *Dnm2* overexpression in *Mtm1* knock out mice. Overall, thanks to talks and posters the 22nd congress of the WMS allowed me to be aware of the latest advances concerning centronuclear myopathies.

Moreover, the 22nd International Congress of the World Muscle Society gave me the opportunity to strengthen the collaborations that our team has already established with the two main French groups working on centronuclear myopathy. Thus, I met Dr Jocelyn Laporte who initiated a whole exome sequencing project on CNM patients with a particular focus on MTM1 and BIN1, and Dr

Marc Bitoun who is interested in DNM2-related CNM. We had the possibility to exchange on our latest results and discuss the future directions of our common projects. I also took advantage of this congress to discover more precisely the work of foreign muscle laboratories, to meet renowned scientists and discuss with young researchers from labs located in Europe and in the US in view of my future post-doc.

Finally, the abstract I submitted to the 22nd International Congress of the World Muscle Society has been selected for an oral presentation (NI.O.23) in the final day first plenary session entitled *New insights into muscle function, imaging, therapy and prevention*. Thus, I had the chance to present my work *Sh3kbp1 involvement during skeletal muscle fibers formation: a new candidate for centronuclear myopathies* to the whole muscle community present at the congress. This led to interesting discussions and unexpected inputs from other scientists during the following coffee breaks and lunch time. And finally, my oral presentation has been awarded one of the Elsevier main prizes for the six best posters and oral presentations by young researchers. This award in such a big muscle meeting constitutes a real encouragement as well as a recognition of the quality of our project.

For all these reasons, I sincerely thank the French Society for Cell Biology for the grant I obtained to be part of this 22nd International Congress of the World Muscle Society.

Compte rendu
19èmes Journées de Biologie des Tissus Minéralisés
Pauline MARIE

Les 19èmes Journées Françaises de Biologie des Tissus Minéralisés se sont déroulées du 18 au 20 mai 2017 à Lyon. Ce congrès a rassemblé une centaine de participants venus d'horizons différents, qu'ils soient chercheurs, médecins ou cliniciens, réunis par leur thème de recherche, les tissus minéralisés (en particulier l'os sans oublier les dents, la coquille d'œuf ou les coraux). Essentiellement francophone, il s'est ouvert à l'international par la présence de différents orateurs invités venus de Belgique, du Royaume-Uni et d'Allemagne. Quatre conférences d'experts reconnus et une vingtaine de présentations orales en majorité assurées par des doctorants et post-doctorants se sont succédées sur trois demi-journées entrecoupées de sessions consacrées à la quarantaine de présentations affichées. Une dernière demi-journée était consacrée à des conférences de spécialistes en commun avec la Société Française de Rhumatologie.

Aussi, je tiens à remercier la SBCF de m'avoir accordé une bourse pour participer à ces 19èmes Journées.
En premier lieu, assister à ce congrès a été pour moi l'occasion de découvrir, de me familiariser avec le modèle os et d'acquérir de nouvelles connaissances sur ce tissu particulier qui représente la structure de notre corps. Différentes présentations même éloignées de mon sujet de post-doctorat ont retenu mon attention.
Lors de ces journées, ma présentation orale intitulée « Identification de nouvelles protéines impliquées dans la résorption osseuse » rapportait les premiers résultats issus de mon post-doctorat après seulement 8 mois de recherche. Elle m'a permis d'estimer comment mes travaux étaient perçus par la communauté scientifique et a été le point de départ de plusieurs discussions passionnantes autour de l'étude que je mène. Ces retours positifs m'encouragent à poursuivre mes recherches dans la direction envisagée qui apparait adaptée pour l'identification de nouvelles protéines intervenant dans la résorption osseuse.
Etre membre du jury post-doc a représenté une nouvelle expérience enrichissante. Nous étions chargés de juger les présentations tant orales et affichées des doctorants et ainsi attribuer deux bourses de la SFBTM (une pour une présentation orale, une pour une présentation affichée) à deux étudiants.

Participer aux 19èmes Journées de Biologie des Tissus Minéralisés m'a donné l'opportunité de présenter mes travaux et d'échanger autour de la thématique de l'os. Ainsi, je recommande à tous les doctorants et jeunes chercheurs intéressés par les tissus minéralisés d'assister à ce congrès passionnant et convivial.

Paris, le 18 décembre 2018

Lisa Martino
20 rue george sand
91260 Juvisy sur orge
Tel : 07 78 78 25 79
Email : lisa.martino.lm@gmail.com

Institut Jacques Monod
Laboratoire Cycle cellulaire et Développement
Responsable d'équipe : Lionel Pintard

Compte-rendu du congrès ASCB-EMBO

Grâce à la bourse de voyage de la SBCF, j'ai eu l'opportunité d'assister au congrès international de l'ASCB-EMBO du 2 au 6 décembre 2017, à Philadelphie (U.S.).
Ce congrès a eu lieu au meilleur moment pour ma carrière professionnelle car mon travail de thèse venait d'être publié (Martino *et al*. Developmental Cell, 2017), mon manuscrit de thèse était finalisé et je me préparais à soutenir. J'étais donc à une étape finale de ma thèse, suffisamment mature pour parler de mon projet avec assurance. Lors de ce congrès, j'ai eu la chance de pouvoir présenter mes résultats à l'oral lors d'un microsymposium, et de répondre aux questions de l'audience. De plus, j'ai eu l'occasion de discuter avec des chercheurs reconnus dans mon domaine, de partager des informations intéressantes et même de rencontrer pour la première fois un de nos compétiteurs.
Je suis donc rentrée au laboratoire avec de nouvelles connaissances, de nouvelles idées, et une plus grande confiance en moi, ce qui m'a sûrement permis d'aborder plus sereinement ma soutenance de thèse et toutes les présentations par la suite.

Je vous remercie de nouveau pour l'attribution de cette bourse de voyage.
Bien cordialement,

Lisa MARTINO

Anne NEHLIG
anne.nehlig@gustaveroussy.fr

Compte-rendu du congrès ASCB-EMBO 2017, Pennsylvania Convention Center, Philadelphie, USA, 2 au 6 Décembre 2017

Le congrès de l'ASCB-EMBO 2017 a réuni plus de 6000 participants et 250 exposants. Le Convention Center était très grand et tout était très bien organisé et indiqué pour rejoindre les différentes salles de conférence. Les organisateurs étaient aux petits soins en cas de problème.

Ce congrès m'a permis de profiter d'un large choix de thématiques tant pour les conférences que pour les posters, de tables rondes et de conférences sur « Career Enhancement », et de stands de commerciaux présentant les dernières technologies. Les orateurs et les présentations étaient de grande qualité.

Le premier jour, le samedi 2 Décembre, j'ai assisté aux subgroup E « Microtubule Motors: Emergent Phenomena and News Paradigms » puis au subgroup M « Bottom-Up Cell Biology ».
L'Opening Night Reception qui suivait l'Opening Session du Keynote Speaker Fred Kavli le soir-même m'a permis de rencontrer de nouvelles personnes autour d'un buffet.

Le dimanche 3 Décembre, je présentais mon poster dans la session « Spindle Assembly », ce qui m'a permis de discuter de mon projet avec une dizaine de personnes et de trouver des scientifiques avec qui rester en contact et partager des outils qui me seront utiles pour finaliser mon projet de thèse. Les sessions posters des journées du dimanche au mardi m'ont permis de retrouver ces personnes devant leurs posters et d'en découvrir beaucoup d'autres sur ma thématique de travail.

Puis tout au long de ce congrès, j'ai sélectionné des conférences autour de la thématique des microtubules et de la division cellulaire, telles que:

<u>Microsymposia:</u>
-Cytoskeletal Molecular Dynamics
-Cell Death, Cell Volume and Cytokinesis
-Cellular Regulation of the Cytoskeleton
-Spindle Architecture, SAC and Meiosis
-Chromosome Structure, Centromeres and Kinetochores

<u>Minisymposia:</u>
-Regulation of Cell Size, Mitosis and Meiosis
-Ensuring Fidelity of Chromosome Segregation
-Mechanics of Cell Division and Cytokinesis
-The Life of a Microtubule: Birth, Dynamics and Function

<u>Symposia:</u>
-Quality Control : Orchestration of mitosis by Anaphase-Promoting Complex, a fascinating molecular machine

En conclusion, le congrès de l'ASCB-EMBO 2017 fut mon premier grand congrès international et une grande opportunité pour moi de présenter et de valoriser mes résultats de thèse et d'enrichir mes connaissances. J'ai également pu rencontrer de nouvelles personnes du monde entier, expertes dans mon domaine de travail, et de trouver d'éventuelles collaborations. Et ces rencontres m'ont permis d'avoir un retour sur mes travaux et d'avoir plusieurs très bons conseils.

Société de Biologie Cellulaire de France

Compte Rendu pour une bourse de voyage

Bordeaux, 19 Mai 2017

Le congrès biannuel de Biologie Cellulaire des Kinetoplastides, organisé par l'Université de Chicago à Woods Hole (USA) rassemble la communauté internationalle qui travaille sur trois Maladies Tropicales Négligées: La maladie du sommeil (*Trypanosoma brucei ssp*), la maladie de Chagas (*Trypanosoma cruzi*) et la Leishmaniose (*Leishmania sp*). Les travaux les plus récents et innovants sont présentés lors de ce meeting en trois sessions : Biologie Cellulaire du vecteur, Expression génétique, Développement de médicaments, Biologie moléculaire-RNA, Biologie Cellulaire du pathogène et Biologie moléculaire de la différentiation du pathogène. Le programme est planifié sur 5 jours, permettant un environnent ouvert à la discussion et le partage des idées scientifiques.

Ma participation, en forme de poster dans la session de Biologie Cellulaire du pathogène, m'a permis de présenter mes résultats en biochimie et biologie cellulaire au sujet d'une kinésine (non étudiée jusqu'à présent) spécifique aux kinétoplastidés et essentielle à la survie de *T. brucei*. Nos résultats démontrent pour la première fois un lien direct entre une structure du cytosquelette du parasite et le système endomembranaire. J'ai pu discuter avec différents experts sur le sujet, et avoir un retour sur les possibles voies à explorer, un échange très apprécié.

Je souhaite remercier la SBCF qui par son soutien financier, m'a permis de participer à ce congrès unique dans le domaine de recherche en parasitologie. Cette expérience fut très enrichissante en tant que jeune chercheuse, sur le plan de la qualité scientifique des travaux présentés et pour l'opportunité de développer des collaborations dans le futur.

Doranda Perdomo, Ph.D

Laboratoire de Microbiologie Fondamentale et Pathogénicité UMR-CNRS 5234

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CENTRE DE RECHERCHE UGA - INSERM U 1209 - CNRS UMR 5309

Society of Biology of the Cell - France
16 boulevard St Germain, 75005 Paris
www.sbcf.fr

Anca Radu Iordache
Institute for Advanced Biosciences – Grenoble
Allée des Alpes, 38706
✉ : anca.radu@univ-grenoble-alpes.fr
☎ : +33 638 714 198

Dear committee of the SBCF,

I would like to express my appreciation for the opportunity to attend EMBO/ASCB meeting. It was a great experience to participate to an international conference at a large scale.

During this meeting I have given a Microsymposium talk regarding my PhD subject: The tumor suppressor Lkb1 controls cell fate through pyruvate-alanine transamination, in the session, ***Microsymp 14: Cell Metabolism*** scheduled, Tuesday, December 5th at 11:00am. Just after this session, at noon, I also presented a poster on the same subject during Cell Fate Determination session. Both presentations represented a great experience because I exchanged knowledge with a lot of researchers from all over the world. After the microsymposium presentation I received several interesting questions regarding the metabolic pathways that I presented and the role of Lkb1 in tumors of the peripheral nervous system. During the poster session, many researchers who have also assisted to my oral presentation were present. I had an interesting discussion with Stephane Corbel from Genomics Institute of the Novartis Research Foundation, San Diego, United States, who proposed me a possible post-doctoral position. I spooked also with Bryan Lo from Molecular Oncology Diagnostics Laboratory, Ottawa, Canada who works on pancreatic cancer and who has also a secondary project on Lkb1 role during embryogenesis and we exchanged our email addresses for possible collaborations. I also discussed with Alexander Muir from Koch Institute for Integrative Cancer Research and Department of Biology, Massachusetts Institute of Technology, Cambridge, United States who has given also an oral presentation during the same ***Microsymp 14: Cell Metabolism*** session and pointed out that the amino acid composition of the cell medium is very important for cell metabolism and proliferation. He showed that lung cancer cell line cultured in adult bovine serum, which better reflects nutrients available to cells in vivo, exhibit decreased glutamine catabolism and reduced reliance on glutamine anaplerosis compared to cells cultured in fetal bovine serum. He specified that the high extracellular cysteine levels found in the fetal bovine serum force cells to use glutamine metabolism. I also appreciated Jennifer Lippincott Schwartz's speech about technics that allow us to analyze the 3D organelle shape (FIB-SEM), organelle dynamics (TIRF-SIM) and to analyze the behavior of single molecules (proteins) in high resolution (Lattice Light Sheet Microscopy). All these technics are proposed by Advanced Imaging Center (AIC) at Janelia Research Campus and are available to the scientific community.

Globally I mostly assisted to the sessions regarding the structure of the cell, metabolism, stem cells and autophagy. During these sessions there were many talks which impressed me such Gia Voltez (Structure of the cell), Michael N Hall (Metabolism) , Rose Willett and Shawn Ferguson (Organelles in metabolism and stress responses), Lukas Kapitein and Kang Shen (Cell Biology of neurons), Valentina Greco (Cell interaction), Meng-meng Fu, Alex Weiner and Marina Vidaki (Subcellular organization of neural cells), Alexendre Muir (cell Metabolism), Li Yu, Keigo Morita, Sandra Maday and Barbara Celona (Autophagy), Dhanendra Tomar (Cellular Metabolism). During

these presentations there were several scientists who announced that they were recruiting postdoctoral researchers.

Overall, my attendance to this conference was very useful, mainly because I was given the opportunity to present my PhD work and secondly because I was able to enlarged my professional network and helped me identifying possible post-doctoral projects.

I am really grateful for the provided travel award which supported my attendance at this international meeting.

Best regards,

Anca Radu

Paris, le 7 Décembre 2017

Compte-rendu du congrès de l'ASCB

Doctorante en 4ème année à l'Institut Curie dans l'équipe de Danijela Vignjevic, j'ai reçu une bourse de voyage de la SBCF pour me rendre au congrès de l'ASCB à Philadelphie du 1er au 6 décembre 2017. Dans le cade de ce congrès, j'ai été sélectionnée par l'ASCB pour présenter mes travaux dans le Minisymposium 16 : Mechanical coupling from nucleus to extracellular matrix. J'ai présenté mon travail de thèse, qui vise à comprendre la migration des cellules tumorales dans le carcinome intestinal chez la souris. J'ai également eu l'occasion de présenter mes travaux par un poster.

Les divers talks de l'ASCB couvrent un large éventail de la biologie cellulaire à l'échelle mondiale. C'est le premier congrès de cette ampleur auquel j'assiste, et ça a été pour moi l'occasion de découvrir des approches complètement nouvelles de la biologie cellulaire. Etant dans ma dernière année de thèse, je recherche actuellement des thématiques et des laboratoires pour mon post-doc et l'ASCB m'a fait prendre conscience quel type d'approches je voudrais développer dans ma carrière par la suite.

Outre les talks auquels j'ai assisté, j'ai réellement apprécié de rencontrer des jeunes chercheurs qui présentaient leurs posters. Cela a été l'occasion d'interagir de façon moins formelle que pendant les symposiums. Pendant les séances posters, j'ai également rencontré un collaborateur potentiel qui fait de la modélisation mathématique des interactions cellule-cellule. Cette approche sera bienvenue pour décrire dans des termes physiques le comportement dynamique de mes cellules cancéreuses.

Pour conclure, l'ASCB m'a permis de m'ouvrir d'avantage à la science au niveau international, de présenter mes travaux et de créer de nouvelles collaborations, et je remercie la SBCF d'avoir rendu cela possible.

Cordialement,

Ralitza Staneva

Bourse de voyage – Société Française de Biologie Cellulaire

Rapport de la conférence EMBO
« Endocytic trafficking and signaling in health and disease »

(1) Organisation globale de la conférence

La conférence EMBO « *Endocytic trafficking and signaling in health and disease* », organisée par Marta Miaczynska et Aurélien Roux, s'est tenue du 10 au 15 septembre 2017 à Serock (Pologne). Un total de 178 participants a pu présenter leurs travaux de recherche au cours des différentes présentations orales et sessions de posters.

Les présentations orales ont été découpées en 7 sessions, listées ci-dessous, comportant chacune des présentations d'orateurs invités et d'orateurs sélectionnés.

Session 1 : *Endocytic protein assemblies.*
Session 2 : *Endosomal trafficking.*
Session 3 : *Crosstalk between endosome traffic and other cell processes.*
Session 4 : *Intracellular signalint and traffic.*
Session 5 : *Endocytosis and disease.*
Session 6 : *Physical principles applied to endocytosis.*
Session 7 : *Endocytic processes in development and cell organization.*

Les présentations d'ouverture et de fermetures d'une durée d'une heure chacune ont été données par Margaret Robinson et Rob Parton, respectivement.

3 sessions posters ont eu lieu, d'une durée de deux heures chacune, à la suite des sessions orales 2, 4 et 5.

(2) Synthèse des faits scientifiques discutés lors des présentations

Au cours de cette conférence, de nombreux scientifiques internationaux sont venus présenter leurs travaux les plus récents, et encore non publiés, sur les processus d'endocytose, le transport et les interactions entre compartiments endocytaires.

De nombreuses présentations ont traité des processus d'endocytoses, en particulier clathrin-dépendante, ainsi que du recrutement de machinerie type ESCRT. La plupart des présentations démontraient l'importance de l'utilisation de techniques de microscopie de pointe pour étudier les processus endocytaires.

3 présentations, dont la mienne, étaient centrées sur le processus de macropinocytose, qui est actuellement en pleine émergence.

La plupart des approches se concentraient sur la compréhension des processus endocytaires à l'échelle moléculaire.

(3) Participation personnelle à la conférence

J'ai eu l'occasion de présenter mes travaux à deux reprises.

Tout d'abord lors d'une présentation orale d'une durée de 15 minutes suivie de 5 minutes de questions qui a eu lieu au cours de la session orale n°3 (« *Crosstalk between endosome traffic and other cell processes* »).

Puis plus tard dans la même journée j'ai pu présenter mes travaux sous forme de poster, ce qui m'a permis d'obtenir différents retours sur mes résultats de thèse, d'entamer des discussions scientifiques approfondies et d'élargir mon réseau professionnel.

(4) Résumé des rencontres et échanges scientifiques

Parmi les partenaires scientifiques rencontrés à cette conférence, plusieurs ont proposé d'établir des collaborations.

Ivan Dikic, de la Goethe University de Francfort, travail sur l'ubiquitination induite par des bactéries intracellulaires dans leur cellule hôte. Il a démontré l'interaction entre *Legionella* et la protéine du réticulum endoplasmique RTN4. De récent résultat obtenus dans notre laboratoire tendent à montrer que *Salmonella* est aussi capable d'interagir avec le réticulum endoplasmique lors de sa vie intracellulaire. Nous sommes actuellement en discussion avec Ivan Dikic pour établir une collaboration sur ce projet.

Kay Oliver Schink et Harald Stenmark, de l'Hopital Universitaire d'Oslo, ont fait de récentes découvertes sur l'identité vésiculaire des macropinosomes dans un contexte physiologique. Nous souhaiterions inviter Kay Oliver Schink à présenter ces données à l'Institut Pasteur et établir une collaboration entre nos laboratoires afin de partager les outils moléculaires associés à la reconnaissance des macropinosomes.

Par ailleurs, Gia Voeltz, de l'Université du Colorado a révélé de nouvelles protéines impliquées dans la fission endosomale réticulum-dépendante. Il serait intéressant de tester l'implication de ces protéines dans un contexte pathologique, en particulier lors du processus de rupture de la vacuole bactérienne.

Enfin Dafina Bar-Sagi, du NYU Langone Medical Center, a présenté une voie de signalisation permettant la formation de macropinosomes particulièrement présents dans les cellules tumorales. Ceci pourrait constituer une piste intéressante pour mieux comprendre la formation des macropinosomes associés à l'infection de *Salmonella*.

(5) Conclusion et remerciements

En conclusion, ma participation à cette conférence a été extrêmement prolifique en matière d'interactions scientifiques et mon projet en bénéficiera grandement.

Je remercie la Société Française de Biologie Cellulaire de m'avoir octroyé ce soutien financier.

Je reste à votre disposition pour tout renseignement complémentaire, et vous prie d'accepter, Madame, Monsieur, mes chaleureux remerciements pour votre aide dans ce projet.

Virginie Stévenin

09/01/2018

Diana Vargas-Hurtado
PhD student
Institute Curie (Basto Lab)

SUBJECT: attendance report 2017 ASCB annual meeting

The American Society of Cell Biology (ASCB) annual meeting is one of the biggest conferences in the field of Cell Biology. Each year it gathers scientists from all around the world to share their work and exchange knowledge on techniques and up-to-date scientific research. This year's meeting took place in Philadelphia, USA from December 2nd till December 6th.

Thanks to the sponsorship from SBCF, I had the opportunity to attend this year's meeting. For me ASCB 2017 was a great experience in many ways:
It provided me the opportunity to attend many interesting talks, where I could learn about new discoveries on the filed and I was able to discuss and exchange ideas about my own project. I personally benefited and learnt where the field stands specially in the areas of cytoskeleton dynamics, and cell division. There were several symposia, occurring every day, that covered both subjects.

For example, on the first day there was a whole session dedicated to the newest advances on the field of microtubule cytoskeleton dynamics and mechanics. From this session, two talks from William Hancock and Thomas Surrey were very informative for me as they shared their up-to-date research and techniques used to study kinesins, these microtubule motor-proteins that have key roles in the transport of proteins cargo and in the organization of the microtubule cytoskeleton during interphase and mitosis.
Another very attractive talk in my opinion was the one given by Christopher Walsh, who in his keynote, talked about the genomic diversity that the mammalian has and accumulates throughout adulthood. He also stated that this genomic diversity might account for the diverse phenotypes and varieties of certain brain congenital and acquired diseases.

At 2017 ASCB conference I was also granted with the great opportunity to present my research in the mini-symposium "Mechanics of cell division and cytokinesis" and also in a poster session. I presented my project with the title: "Spindle morphology tailoring through time: Interplay between spindle architecture and morphogenesis in the mammalian brain". I can gladly say that presenting my work in both sessions was a wonderful opportunity to me. Indeed, in both occasions, I had very good and constructive feedback. I could also discuss with some stablish scientists as well as several students and postdoc who assisted to the talk or came to the poster.

In summary, the 2017 ASCB meeting was an enriching experience for me that not only allowed me to expand and update my knowledge on my field of interest but also motivated me to continue on my project and future career development.

Paris, 17 December 2018

Dear SBCF travel grant committee,

This year I received a travel grant from SBCF to attend the yearly meeting of the International Society for Extracellular Vesicles (ISEV), the largest meeting in the field, attended by well over a 1000 scientists from all continents. The ISEV 2018 meeting took this year place in the Palau de Congressos in Barcelona (Spain) from 2-6 May. I had the privilege to present my work during a plenary session of highlighted abstracts, ensuring a broad exposure towards the attendees. I got useful feedback from the audience during the question time, and also during networking events later, including feedback from well-established researchers in the field (a.o. Hector Peinado CNIO, Madrid). All these various interactions, long or short, enabled me to improve the project. We were also able to establish new collaborations based on our zebrafish model as well as meet existing collaborators (J. Goetz, Uni Strasbourg) to discuss progress and future strategy. Apart from the networking, I learned about new exciting techniques during the oral sessions, among others miRNA barcoding (Albert Lu, Pfeffer lab, Stanford) to do genome interrogation for molecular players in exosome biogenesis. In addition, I could attend multiple satellite sessions. One of these sessions was on in vivo imaging of EVs, which is highly relevant for my current work. Apart from these oral presentations, I had a lot of useful interactions at the poster sessions (I also chaired one of these sessions), for example on work on an in vivo assay in Drosophila by Leonie Witte from the lab of Julia Gross (University of Göttingen, Germany).
All in all I enjoyed this conference a lot, and I am very grateful to the SBCF for making this possible.

Yours sincerely,

Frederik Verweij