Travel Grant GSCN
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Report of the ISSCR Annual Meeting 2017 (Boston, USA) by Nina Cabezas Wallscheid

This year, the ISSCR Annual Meeting was of particular interest for my research interests since numerous key scientists of the hematopoietic stem cell (HSC) field presented their work.

For example, Connie Eaves talked about the latest research performed in her laboratory on characterization of human HSCs at the single-cell level. Eaves group used Cytoff as tool to address at the single-cell level which proteins are expressed in human long-term HSCs. They found that proteins such as CD33 and CD202b can now be used as novel human HSC markers. Impressively, they combined not only Cytoff but also single-cell RNA-seq and single-cell bisulfite methylome analysis to further define the human HSC compartment. Next, Iman Fares (Guy Sauvageau's group) showed that EPCR, which is a well-known mouse long-term self-renewal HSC marker (see Wilson et al., *Cell Stem Cell* 2015) can now also be used as a novel marker for isolating human long-term HSCs. An additional single-cell talk was given by Ido Amit. Ido showed his latest study published by *Cell* which include a comprehensive single-cell RNA-seq analysis of Alzheimer diseased patients. Remarkably, Ido has established a system in which he has reduced the cost of single-cell RNA-seq to only 0.5-1$ per single-cell. John Dick talked about his latest research on the clonal evolution of Acute Myeloid Leukemia (AML). Cris lo Celso shed light on her newest results on AML niche using the latest technology in imaging study which has been recently published in *Nature*. Very fascinating, Sean J. Morrison presented his latest work on metabolic cues that regulates the murine hematopoietic system. His research focused on how vitamin C (ascorbate) regulates HSC self-renewal. His group showed that supplementation of vitamin C in Tet2-mutated leukemic mouse models is sufficient to restore Tet2 activity and consequently increase survival. These findings are very exciting as we have recently found that vitamin A is critical for the maintenance of HSCs (Cabezas-Wallscheid et al., *Cell* 2017). Remarkably, during the plenary session I presented my work after Morrison's talk as one-minute poster teaser presentation. Numerous scientists approached my poster intrigued by these two new findings: mainly two vitamins (vitamin A and vitamin C) play an important role in HSC maintenance. Indeed, very recently we have been asked to write a Preview on the role of vitamin C in HSCs and leukemia (*Vitamin C: C-ing a New Way to Fight Leukemia* by Schönberger and Cabezas-Wallscheid *Cell Stem Cell* 2017; online soon).

I had very stimulating discussions during the poster session which was extremely well-visited. This avid discussion was stimulated in part by the poster teaser presentation during the plenary session and due to the recent acceptance of our study (our study was published in May and the ISSCR Annual Meeting took place in June). Further, since I very recently became an independent group leader (Max Planck Institute of Immunobiology and Epigenetics in Freiburg) I had a unique chance to network and discuss potential future collaborations with other scientists from the field.

During the conference, I also attended the event organized by the GSCN. During this event I had the opportunity to interact with other German scientists working with other types of stem cells. Also very stimulating was to met several Germany-based stem cell scientists that I already met during pass Annual GSCN meetings.

Overall, to attend this year's ISSCR Annual Meeting it was a very stimulating and productive experience.

Report for the GSCN – ISSCR 2017

The annual meeting of the International Society for Stem Cell Research (ISSCR) represents a unique opportunity for almost 4000 international scientists to meet and discuss on most recent findings of stem cell biology embedded in an inspiring frame of oral and poster presentations. In 2017, the conference was located in the vibrant atmosphere of innovative research in Boston, USA. Having recently finished my PhD, I was looking very much forward to this opportunity to present my data on a poster. My attendance was supported by a travel grant of the German Stem Cell Network (GSCN). Therefore, I would like to summarize here my personal experience.

The scientific program was kicked off by focus sessions representing a great add-on to this year's program emphasizing selected topics of translational research and cutting-edge technologies. Among those, iPSCs-based models and applications, product manufacturing and opportunities as well as ethical considerations of the organoid technology were elaborated and discussed. During the inspiring plenary lectures, pioneers of the field highlighted important aspects of stem cell biology. Exemplarily, Magdalena Zernicka-Goetz presented her findings on the crosstalk between embryonic and extra-embryonic stem cells during mammalian *in vivo* and *in vitro* early embryogenesis. Shinya Yamanaka recapitulated the recent progress on clinical-grade iPSC clones and the establishment of a cell bank from homologous HLA haplotypes in Japan. Hans Clevers presented captivating visual illustrations of "mini-guts" and further 3D-culture systems of Lgr5-positive stem cells of various human organs which can be subsequently genetically modified. Whereas Jürgen Knoblich focused on iPSC-derived cerebral organoids to model human brain development and help to uncover underlying mechanisms of neurodevelopmental diseases. The current state of clinical application of stem cells and progenies in Parkinson's Disease and stroke was addressed by Ole Lindvall. Thus demonstrating the importance of neuronal replacement facilitated by the use of stem cells. The first successful clinical application of iPSC-derived retinal pigment epithelium cells in age-related macular degeneration was led by Masayo Takahashi. Therefore, her report on the encountered challenges, improved transplantation protocols and future plans was highly exciting and valuable.

Since I am especially interested in neural stem cells, regenerative biology and disease modeling I focused my attention on related talks during concurrent sessions and would like to mention some personal highlights. Among the most prominent topics, the organoid technique was applied in several studies, such as the generation of region-specific cerebral organoids recapitulating the physiological brain architecture and disease pathologies in patient-specific samples. The vast potential of 3D-culture systems, was demonstrated for example by Julia Ladewig applying a forebrain organoid-based system to identify pathological changes associated with the Miller-Dieker-Syndrome. Moreover, the importance of single cell analyses was shown by several researchers. Ernest Areas, for instance, implicated this strategy to decode the dopaminergic niche identifying three different types of distinct radial glia in the developing mouse brain. Additionally, Barbara Treutlein investigated cerebral organoids and directly converted neuronal cells using single-cell RNA-seq to identify cell compositions of organoids and lineage relationships of different cell types. I was highly intrigued by the talks of Lorenz Studer presenting novel protocols and key factors to rapidly and efficiently differentiate Schwann cells and astrocytes from iPSCs. Significant achievements in the understanding and modeling of diseases using the CRISPR/Cas technology were presented in many sessions.

Furthermore, the three poster sessions offered a great platform to directly discuss data with the authors and were ideal to pave the way for potential collaborative projects. During my poster presentation I had the opportunity to show my data to peers and experts of the field in a pleasant atmosphere. As a result, I faced positive feedback and valuable critical suggestions that could contribute to further progress of my project. In addition, several ideas for potential collaborations were examined.

Last but not least, I would like to point out the numerous networking opportunities such as the young investigator social night, Meet-up Hubs and coffee breaks. During the meeting of the GSCN members at the Meetup-Hub and at the Wunderbar-event in a close-by restaurant I met all stage researchers an of the German stem cell community. It was great to exchange personal experience and the progress of ongoing projects.

Taken together, I enjoyed an exciting and fruitful meeting and would like to cordially thank the GSCN for supporting my participation.

Sincerely,
Katharina Günther

ISSCR 2017 Annual Meeting; Boston, 14-17 June

Deniz Kanber, Universitätsklinikum Essen, Institut für Humangenetik, Essen

First, I would like to thank the GSCN for this travel award. From the start, just by looking at the list of the invited speakers I was really impressed by this meeting. Moreover, given that there were so many sessions on organoids and organogenesis I knew that it would be very important to take part as I am working on the establishment of a human cell based *in vitro* model for retinoblastoma.

For me it was the first time attending a ISSCR annual meeting and so I participated the “first-attendee orientation” which was kind of fun and the first opportunity to get in contact with other scientists from all around the world.

The highlights of the meeting for me were the sessions on organoids and the opportunity to listen to Shinya Yamanaka. His talk about the iPSC-based Stock Project for allogeneic transplants that can be used for about 80% of the Japanese population was fascinating. I also enjoyed the talks on imprinting and epigenetics from Alexander Meissner, Rudolf Jaenisch and Edith Heard. These talks were very intriguing and educational to me.

Beside the interesting talks there were a huge number of very interesting posters about organoids and the CRISPR/Cas9 system. The poster sessions were very informative and a very good opportunity for discussions with other scientist. I got an idea about the research topics of other groups and could also get a valuable input and new ideas for improving my own project.

I also took part in the Meet the Expert Luncheon where I had chosen Constance Cepko’s table. She is an expert for retina development in mice and we all had a good exchange about scientific knowledge and career planning. Although I must say that I liked the Meet the Expert Luncheon at the GSCN meeting in Hannover better last year.

Again, I am very grateful for the GSCN for giving me the opportunity to attend this meeting. From the meeting, I gained new impulses for my project concerning modifications in the differentiation protocol and the CRISPR/Cas9 system and I am very motivated to test these now that I am back.