German Stem Cell Network (GSCN)
c/o Max Delbrück Center (MDC)
Robert-Rössle-Str. 10
13125 Berlin

From:
Dr. Dirk Löffler
ETH Zürich, D-BSSE
Mattenstrasse 26
CH-4058 Basel
Switzerland

Basel, 11.09.2018

Dirk Löffler – ISEH 2018 personal experience report for GSCN

The annual International Society for Experimental Hematology (ISEH) meets once per year. This year´s meeting was held in Los Angeles, USA at the Meyer and Renee Luskin Conference Center at the campus of the University of California (UCLA) and organized among others by the now former ISEH president Hanna Mikkola.
With just over 600 participants this year, the meeting created an informal atmosphere where international phD students and postDocs from all over the world were able to get to know each other while also having abundant opportunities to approach established leaders of the hematologic stem cell field. Nancy A. Speck, received this year´s Donald Metcalf award for her contributions to this field for her work on how hematopoietic cells form in the major arteries of the mouse embryo.
Among many others, central topics of this year´s conference were the identity of the hematopoietic stem cell (HSC) niche, the role of metabolism in regulating and maintaining HSCs and novel purification strategies to enrich human umbilical cord blood derived HSCs.
Dominique Bonnet from the Francis CRICK institute in the United Kingdom showed that human umbilical cord blood derived HSC purities of about 30% can be accomplished when EPCR is used as an additional marker to CD34, CD90 and CD49f. This finding is exciting since previous purification strategies yieled only up to 10% HSC purities making single cell functional studies extremly challenging and expensive. Using this novel approach these studies should now become feasible and will most likely enable further insights into human hematopoiesis.
Larry Luchsinger from the Hans-Willem Snoek Lab demonstrated a previous unappreciated role of calcium signaling and its role in self-renewal. Although some uncertainties remain, the bone marrow seems to be a calcium sink and low levels of calcium are crucial to maintain hematopoietic stem cells in vivo as well as in vitro.
Work from the Schroeder lab presented by Konstantinos Kokkaliaris demonstrated using a recently published 3-dimensional full bone multiplexed immunostaining technique that HSCs do not localize preferently to any of the currently used niche markers for sinusoids, endotheal etc. Although it cannot be excluded that novel niche markers may reveal specific microenvironments in the future, this research suggests that HSCs are located in random places in the bone marrow. In other words the entire bone marrow could be the niche for HSCs. This work finally resolves the controversies that accumulated over the last decades where different labs proposed different bone marrow cell populations as HSC niches. However, it remains to be seen whether future studies will after all be able to identify specific cell populations using novel markers.

I was also presenting my work as a poster and a short talk titled “Hematopoietic stem cells use asymmetric cell division to control metabolic activation and differentiation“ at this year’s meeting. The interest in my research was high and many people came to see my poster, attended my talk and engaged in discussions during the social event. It was encouraging to see that people agreed with my rational and line of argumentation stating that asymmetric cell division of HSCs had so far not been demonstrated. In my work I demonstrate for the first time directly that the asymmetric inheritance of factors during mitosis of highly purified mouse HSCs can predict future daughter cell activation and differentiation. This finding directly links a mitotic event to future daughter cells fates and therefore demonstrates that HSC use asymmetric cell division as a mechanism to control future daughter cell fates.

This year multiple opportunities were provided by the organizers to network in sessions like the “New Investigators Meet the Expert Mixer”, the Social Event or more informal dinners at the pool party at the W hotel close to the Luskin center. During these events I was able to catch up with former collaborators while also getting to know phD students and postDocs conducting exciting research across the globe. These network events also gave me the opportunity to talk to established PI to identify future job opportunies for junior group leader positions I am currently looking for.
I am looking already forward to next year´s ISEH and recommend this meeting to young phD and postDocs excited about hematopoietic stem cell research.

Dirk Löffler