

9th Spring Seminar of the Center for Applied Biotechnology and Molecular Medicine (CABMM)



The 9th annual CABMM Spring Seminar was held on May 23rd, 2019, at the University of Zurich. Almost 80 participants registered for the event. The program included two sessions: the first with presentations of CABMM members involved in spine research, followed by the second, which focused on bioprinting and its potential in 3Rs and regenerative medicine. The participation to the event was recognized as continuing education for animal experimentation by the Veterinary Office of the Canton of Zurich and VSKT (E-TV).

On behalf of the steering committee, Prof. Dr. Janine Reichenbach opened the meeting, and thanked Dr. Silke Kalchfner-Mark and Marina Klawitter for their work in organizing the event. Dr. Silke Kalchfner-Mark then introduced the speakers and moderated the meeting.

The first presentation by Prof. Dr. med. Oliver Hausmann from the Hirslanden Klinik St. Anna in Lucerne focused on bench to bedside research in spine surgery, highlighting innovations in spine surgery and how the future requires a more biological approach. He discussed inflammaging, the link between inflammation and degenerative disc disease and the involvement of *Propionibacterium acnes* infection. Then, the presentation by Stefan Dudli, PhD, from the USZ showcased modic changes (MCs) in low back pain and how endplate damage allows for enhanced fluid flow and enhanced disc – bone marrow cross-talk. He highlighted that bone marrow mesenchymal stromal cells may be mediators of MCs and that extracellular matrix damage-associated molecular patterns or DAMPs may account for their origin. The 3rd presentation by Dr. med. Christoph E. Albers from the University Hospital Bern focused on augmenting spinal fusion by inhibition of BMP2 antagonists. In his talk, he presented L51P, a synthetic engineered BMP2 variant, which reverses the inhibitory effect of Noggin on BMPs. He also demonstrated that delivering a combination of BMP2 and L51P into a bone defect showed the best results in bone consolidation and enhanced the effect of BMP2. The session was followed by a coffee break at the entrance of the lecture hall, providing an opportunity for scientific exchange and networking.

The second session had two presentations focusing on bioprinting and its potential for regenerative medicine applications and in reducing, refining and replacing animal experiments. Markus Rimann, PhD, from the ZHAW Wädenswil, gave an introductory talk about bioprinting, showcasing the technology's capabilities in producing 3D organotypic constructs (muscle, skin, kidney), bio-inks as well as various methods including laser induced forward transfer, inkjet printing and robotic dispensing to print ECM and cells, photo- patterning, scaffold-free microtissue method and the droplet-based method. He highlighted how printing precision and reliability of structure formation is still the biggest challenge, especially when cells are involved. The presentation by Philipp Fisch, MSc, from the ETH Zurich, showcased how bioprinting may be used to regenerate cartilage tissue, particularly osteochondral grafts and auricular cartilage grafts. He highlighted the potential of a hyaluronan-based ink, hyaluronan transglutaminase, which relies on factor XIII-mediated crosslinking and allows for controllable gelation kinetics.

In her closing remarks, Dr. Silke Kalchfner-Mark highlighted how the sessions demonstrated the translational character of the CABMM, from the basic science side to the clinical side. The following Apéro provided further opportunities for scientific exchange.



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Oliver Hausmann



Stefan Dudli



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Christoph Albers



Markus Rimann



Philipp Fisch

