ABA/ASB biophysics and medicine session 2018

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Split over two days on the third and fifth of December in 2018, we held two sessions focusing on Biophysics and Medicine at the joint Asian Biophysics Association/Australian Society for Biophysics meeting. This session was jointly chaired by myself, Dr. Matt Baker, (UNSW), and Prof. Jamie Vandenberg (Victor Chang Institute), with a specific focus on research in biophysics that intersected with disease, infection, treatment, or translation to patient therapy, akin to some of the chairs' work in this area previously (Lau et al. 2018; Nichols et al. 2019). We had two local invited speakers, Dr. Rob Salomon (Garvan) and Prof. Ewa Goldys (UNSW), and two invited international speakers: Prof. Zhihong Zhang (HUST, China) and Prof. Fan Bai (Peking University, China). Dr. Rob Salomon from the Garvan-Weizmann Centre for Cellular Genomics in Sydney opened the first session as an invited speaker to talk about his recent work combining flow cytometry with whole transcriptome sequencing to build profiling tools for breast cancer (Salomon et al. 2019). This was followed by invited speaker Prof. Ewa Goldys who showcased her work on biophotonics and nanoscale probes to add molecular functionality to fluorescent nanoparticles to build a suite of sensors (Ma et al. 2019). Our first international guest, Prof. Kenshiro Manuyama from Nagaoka University (Japan) then spoke on his work using human-induced pluripotent stem cells (hiPSCs) to study cellular migration during human gastrulation (Yamamoto et al. 2018).

After a short coffee break, we welcomed another five speakers! Prof. Hye Ran Koh from Chung-Ang University (Korea) spoke about RNA interference and the use of single-

molecule fluorescence via FISH to quantify RNAi efficiencies (Koh et al. 2018). This was followed by Dr. Lining Arnold Ju from the Charles Perkins Centre at Sydney University talking about force sensing via integrin activation in diabetes detected via a biomembrane force probe (Chen et al. 2019). Outside of this session, Dr. Ju should also be commended for playing a big role at the meeting liaising between Chinese delegates and Australian delegates. Next in this session we welcomed Prof. Satoru Kidoaki from the National Institute of Health Sciences (Japan) to talk about mesenchymal stem cells (MSCs). Prof. Kidoaki spoke about “frustrated differentiation,” where nomadic movement of MSCs maintained an undifferentiated state, and their experiments using microelastically patterned gels to observe this (Ebata et al. 2018). Following this, we returned to nanophotonics, with our invited speaker Prof. Zhihong Zhang bringing her perspective on in vivo immuno-optical imaging from Huazhong University of Science and Technology (China). Prof. Zhang shared her recent work to develop a fluorescent antigen model based on tetrameric far-red fluorescent protein. This was combined with in vivo photoacoustic imaging and fluorescence imaging to reveal strategic arrangement of KCs in the liver (Yu et al. 2019). Finally, as the last talk of the day on Monday, we heard from the local speaker Ashley Rozario from Monash, who spoke, with fantastic images, about their work using super-resolution microscopy to investigate DNA damage (Rawlinson et al. 2018).

Two days later, we had hoped to start the session with invited speaker Prof. Fan Bai (Peking University, China), to discuss his latest work on the ATP dependence of protein aggregation for the regulation of bacterial dormancy, and the implications for bacterial persistence (Pu et al. 2019). Unfortunately, Prof. Bai was unable to attend at short notice, so Dr. Annete Dowd (UTS), originally scheduled to jointly chair this session, valiantly stepped up at short notice to deliver a talk on applications of spectroscopy to biological imaging (Colusso et al. 2017). We then welcomed Dr. Gangadhara Gangadhara, who had flown further than any other speaker, all the way from Sweden but as a member of

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the Indian Biophysical Society had been keen to attend this Asian Societies Meeting. Dr. Gangadhara spoke of his work at Astra Zeneca in Sweden, showcasing some of the equipment and pipelines for characterization of PI3K inhibitors (Gangadhara et al. 2019). Dr. Gangadhara has subsequently decided to relocate to Australia, so anyone looking to utilize his pharma-industry expertise should look him up! The second last talk of the session was from Yun Zhu from the Institute of Biophysics at the Chinese Academy of Sciences (China) who presented an onslaught of structural data surrounding their new HIV-1 fusion inhibitors (Zhu et al. 2016). Lastly, we closed the session with Derrick Lau, from UNSW Sydney, talking also about HIV, and his PhD work in single-molecule fluorescence work to characterize capsid formation (Márquez et al. 2018).

Overall, it was a diverse and exciting lineup with speakers from across Australia and the region, showing the strength of applied biophysics across Asia—especially at the interface with medicine.

Compliance with ethical standards

Conflict of interest Matthew A. B. Baker declares that he has no conflict of interest.

Ethical approval This article does not contain any studies with human participants or animals performed by the author.

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