Lab on a Chip

EDITORIAL

View Article Online
View Journal | View Issue

Introduction: themed issue dedicated to Professor Kahp-Yang Suh

Cite this: *Lab Chip*, 2014, **14**, 2143

Pilnam Kim,[a] Noo Li Jeon[b] and Ali Khademhosseini[cdefg]

DOI: 10.1039/c4lc90048k

www.rsc.org/loc

Kahp-Yang Suh was an extraordinarily insightful and productive scientist in the field of nanotechnology, materials science and bio-inspired systems. He published over 200 journal articles over his short academic life. We were all shocked by his untimely passing and in this issue we celebrate his contribution to microfluidics research. His research interests at Seoul National University focused on multi-scale manufacturing and integration for BioMEMS/NEMS. Kahp-Yang's scientific activity also included biomimetic sensors and devices such as gecko adhesives made of polymeric nanohairs.[1–5] His research in organ-on-a-chip and micro/nano textured substrates for tissue engineering were also highly innovative.[6–28] It was also Kahp-Yang who brought Korean science to the attention of Harp Minhas, the editor of *Lab on a Chip*, and inspired significant collaboration between the *Lab on a Chip* journal and the Korean microfluidics community.

This issue includes 7 scientific papers concerning various areas of lab-on-a-chip, written by friends and colleagues of Kahp-Yang, and includes contributions on a range of topics related to Kahp-Yang's work. A number of papers in this issue discuss the interaction of microfluidic systems with biomaterials to create highly structured 3D culture microenvironments. For example, Lee and colleagues discuss the use of microfluidic systems for fabricating fibers for cell culture applications (DOI: 10.1039/c3lc51414e). Park's group discusses the use of microfabricated hydrogels for islet encapsulation and the effects of hydrogel geometry on their proper function (DOI: 10.1039/c3lc51421h). In addition, Khademhosseini and colleagues demonstrate the use of microfluidic bioprinting systems in generating 3D hydrogel microchannels for vascularized tissue engineering (DOI: 10.1039/c4lc00030g). Finally, Moraes and colleagues discuss the use of 3D micropatterning techniques to manipulate cell shape and behavior (DOI: 10.1039/c4lc00122b).

Another area that has made major progress recently is the use of microsystems for cellular analysis. In this issue, Levenberg and colleagues discuss the use of microfluidic systems for single cell analysis (DOI: 10.1039/c4lc00013g). Sitti and colleagues discuss the use of magnetic robots for the trapping and transport of microorganisms (DOI: 10.1039/c4lc00004h). In addition, Neužil and colleagues discuss the miniaturization of lab-on-a-chip systems to generate handheld and portable analytical systems (DOI: 10.1039/c4lc00310a).

These papers provide a small sample of research in areas that were influenced by Dr Suh. These papers demonstrate the directions in which lab-on-a-chip and intelligent manufacturing of biomaterials could contribute to the development of the next generation of healthcare systems.

As a tribute to Kahp-Yang, this issue has been put together by guest editors Professors Ali Khademhosseini (Harvard-MIT), Pilnam Kim (KAIST), and Noo Li Jeon (Seoul National University). The guest editors would also like to acknowledge the editorial staff of *Lab on a Chip*, in particular Harp Minhas, for their advice, dedication and handling of this issue.

[a] *Department of Bio and Brain Engineering, KAIST, Daejeon 305-701, Republic of Korea*
[b] *School of Mechanical and Aerospace Engineering, Seoul National University, Seoul 151-744, Republic of Korea*
[c] *Biomaterials Innovation Research Center, Division of Biomedical Engineering, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston 02139, MA, USA*
[d] *Harvard-Massachusetts Institute of Technology Division of Health Sciences and Technology, Massachusetts Institute of Technology, Cambridge 02139, MA, USA*
[e] *Wyss Institute for Biologically Inspired Engineering, Harvard University, Boston 02115, MA, USA*
[f] *Department of Maxillofacial Biomedical Engineering and Institute of Oral Biology, School of Dentistry, Kyung Hee University, Seoul 130-701, Republic of Korea*
[g] *Department of Physics, King Abdulaziz University, Jeddah 21569, Saudi Arabia*

References

1 W. G. Bae, D. Kim and K. Y. Suh, *Nanoscale*, 2013, **5**, 11876–11884.
2 H. E. Jeong, J. K. Lee, H. N. Kim, S. H. Moon and K. Y. Suh, *Proc. Natl. Acad. Sci. U. S. A.*, 2009, **106**, 5639–5644.
3 H. E. Jeong and K. Y. Suh, *Nano Today*, 2009, **4**, 335–346.

4 T. I. Kim, H. E. Jeong, K. Y. Suh and H. H. Lee, *Adv. Mater.*, 2009, **21**, 2276–2281.
5 C. Pang, G. Y. Lee, T. I. Kim, S. M. Kim, H. N. Kim, S. H. Ahn and K. Y. Suh, *Nat. Mater.*, 2012, **11**, 795–801.
6 K. Y. Suh, M. C. Park and P. Kim, *Adv. Funct. Mater.*, 2009, **19**, 2699–2712.
7 K. Y. Suh and H. H. Lee, *Adv. Funct. Mater.*, 2002, **12**, 405–413.
8 K. Y. Suh, Y. S. Kim and H. H. Lee, *Adv. Mater.*, 2001, **13**, 1386–1389.
9 M. C. Park, J. Y. Hur, H. S. Cho, S. H. Park and K. Y. Suh, *Lab Chip*, 2011, **11**, 79–86.
10 K. Gupta, D. H. Kim, D. Ellison, C. Smith, A. Kundu, J. Tuan, K. Y. Suh and A. Levchenko, *Lab Chip*, 2010, **10**, 2019–2031.
11 K. J. Jang and K. Y. Suh, *Lab Chip*, 2010, **10**, 36–42.
12 B. K. Lee, H. Y. Lee, P. Kim, K. Y. Suh and T. Kawai, *Lab Chip*, 2009, **9**, 132–139.
13 S. H. Lee, D. H. Kang, H. N. Kim and K. Y. Suh, *Lab Chip*, 2010, **10**, 3300–3306.
14 J. K. Park and K. Y. Suh, *Lab Chip*, 2011, **11**, 23–24.
15 J. M. Karp, J. Yeh, G. Eng, J. Fukuda, J. Blumling, K. Y. Suh, J. Cheng, A. Mahdavi, J. Borenstein, R. Langer and A. Khademhosseini, *Lab Chip*, 2007, **7**, 786–794.
16 A. Khademhosseini, J. Yeh, S. Jon, G. Eng, K. Y. Suh, J. A. Burdick and R. Langer, *Lab Chip*, 2004, **4**, 425–430.
17 P. Kim, S. E. Lee, H. S. Jung, H. Y. Lee, T. Kawai and K. Y. Suh, *Lab Chip*, 2006, **6**, 54–59.
18 S. M. Kim, S. H. Lee and K. Y. Suh, *Lab Chip*, 2008, **8**, 1015–1023.
19 K. W. Kwon, S. S. Choi, S. H. Lee, B. Kim, S. N. Lee, M. C. Park, P. Kim, S. Y. Hwang and K. Y. Suh, *Lab Chip*, 2007, **7**, 1461–1468.
20 M. C. Park, J. Y. Hur, K. W. Kwon, S. H. Park and K. Y. Suh, *Lab Chip*, 2006, **6**, 988–994.
21 P. Kim, K. W. Kwon, M. C. Park, S. H. Lee, S. M. Kim and K. Y. Suh, *BioChip J.*, 2008, **2**, 1–11.
22 M. S. Kim, A. Y. Kim, K. J. Jang, J. H. Kim, J. B. Kim and K. Y. Suh, *Nanotechnology*, 2011, **22**, 494017.
23 P. Kim, D. H. Kim, B. Kim, S. K. Choi, S. H. Lee, A. Khademhosseini, R. Langer and K. Y. Suh, *Nanotechnology*, 2005, **16**, 2420–2426.
24 D. H. Kim, E. A. Lipke, P. Kim, R. Cheong, S. Thompson, M. Delannoy, K. Y. Suh, L. Tung and A. Levchenko, *Proc. Natl. Acad. Sci. U. S. A.*, 2010, **107**, 565–570.
25 D. H. Kim, Kshitiz, R. R. Smith, P. Kim, E. H. Ahn, H. N. Kim, E. Marban, K. Y. Suh and A. Levchenko, *Integr. Biol.*, 2012, **4**, 1019–1033.
26 K. J. Jang, H. S. Cho, D. H. Kang, W. G. Bae, T. H. Kwon and K. Y. Suh, *Integr. Biol.*, 2011, **3**, 134–141.
27 K. J. Jang, A. P. Mehr, G. A. Hamilton, L. A. McPartlin, S. Y. Chung, K. Y. Suh and D. E. Ingber, *Integr. Biol.*, 2013, **5**, 1119–1129.
28 K. H. Song, K. W. Kwon, J. C. Choi, J. Jung, Y. Park, K. Y. Suh and J. Doh, *Integr. Biol.*, 2014, **6**, 450–459.

