**Wooli Bae, Ph.D.**

Department of Bioengineering

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**Research Aims**

Using nucleic acid nanotechnology to understand underlying principles of fundamental biological/biophysical process. Current research focuses on developing an RNA module to implement novel-decision making synthetic circuits in living cells.

**Education**

B.S, Physics, KAIST, Republic of Korea 03/2003 - 02/2007

Ph.D. (unified M.S & Ph.D. course), Physics, KAIST, Republic of Korea 02/2007 - 02/2014

Thesis: Self-Assembled Biomolecular Nanostructures with Single Molecule Techniques

- Single Molecule FRET for SNARE protein interaction and Magnetic Tweezers for DNA nanostructure folding

Advisor: Prof. Tae-Young Yoon

**Professional Experience**

Post doctorial Research Fellow, KAIST, Korea, Advisor: Prof. Tae-Young Yoon 02/2014 – 08/2014

Post doctorial Research Fellow, LMU, Germany, Advisor: Prof. Tim Liedl 10/2014 – 11/2017

Research Associate, Imperial College London, Advisor: Dr. Guy-Bart Stan and Dr. Thomas Ouldridge

 12/2017 - Present

**Background and Skills**

Membrane biophysics, Single molecule fluorescence, single molecule force spectroscopy, superresolution microscopy, DNA/RNA nanotechnology.

**Publications**

(1) Funck, T.; Liedl, T.; **Bae, W\***. *Applied Sciences* **2019**

(2) **Bae, W**.; Kocabey, S.; Liedl, T. *Nano Today* **2019**.

(3) Kempter, S.; Khmelinskaia, A.; Strauss, M. T.; Schwille, P.; Jungmann, R.; Liedl, T.; **Bae, W**\*. *ACS Nano* **2019**.

(4) Maier, A. M.; **Bae, W**.; Schiffels, D.; Emmerig, J. F.; Schiff, M.; Liedl, T. *ACS Nano* **2017**.

(5) Nicoli, F.; Barth, A.; **Bae, W**.; Neukirchinger, F.; Crevenna, A. H.; Lamb, D. C.; Liedl, T. *ACS Nano* **2017**.

(6) Nickels, P. C.; Wünsch, B.; Holzmeister, P.; **Bae, W**.; Kneer, L. M.; Grohmann, D.; Tinnefeld, P.; Liedl, T. *Science* **2016**.

(7) Kocabey, S.; Kempter, S.; List, J.; Xing, Y.; **Bae, W**.; Schiffels, D.; Shih, W. M.; Simmel, F. C.; Liedl, T. *ACS Nano* **2015**.

(8) **Bae, W**.; Kim, K.; Min, D.; Ryu, J. K.; Hyeon, C.; Yoon, T. Y. *Nat. Commun.* **2014**.

(9) **Bae, W**.; Choi, M. G.; Hyeon, C.; Shin, Y. K.; Yoon, T. Y. *J. Am. Chem. Soc.* **2013**.

(10) Diao, J.; Ishitsuka, Y.; **Bae, W**. *Biosci. Rep.* **2011**.

**PROCEEDINGS**

**Wooli Bae,** Thomas Ouldridge, Guy-bart Stan. Autonomous generation of multi-stranded RNA complexes for synthetic molecular circuits. DNA 24 2018, *Oral presentation*

**W. Bae**, K. Kim, C.B. Hyeon, D. Min, J. Ryu, T.Y. Yoon, Dynamic Folding Energy Landscape Modulation Drives the Rapid Assembly of DNA nanostructure. The Korean Physical Society fall meeting 2013, *Oral presentation*

**W. Bae**, M. G. Choi, Y. K. Shin, T. Y. Yoon (Presenter), Strong, positive cooperativity of SNARE for fusion pore opening studied at the single-molecule level. Biophysical Society 55th annual meeting. (2011), *Oral presentation*

**W. Bae**, T. Y. Yoon, Single-molecule study of the neuronal exocytosis mechanism. The Korean Physical Society 85th regular meeting (2009), *Oral presentation*

**HONORS & AWARDS**

Bronze prize, 8th Samsung Electronics Human Tech Research Prize. 2002.

Student presentation award, Korean Physical Society, 2013.

Young researcher award, Korean Society for structural biology, 2015.

Selected oral presentation from track C submission, DNA24, 2018.

**Teaching Experiences**

Supervising master thesis of Alicia Clement : Molecular toggle switch based on inhibitory RNA polymerase aptamers.

 Advisor :Dr. Guy-Bart Stan and Dr. Thomas E. Ouldridge 2019 - present

Supervising master thesis of Arthur Ermatov : RNA/DNA hybrid origami for efficient mRNA delivery

 Advisor : Prof. Tim Liedl 2017 - 2018

Teaching assistance for 2014 Winter/Spring semester Undergraduate Research Program, KAIST. Silver award. Advisor : Prof. Tae-Young Yoon 2013

Teaching assistance for advanced physics experiment class II, KAIST 2012