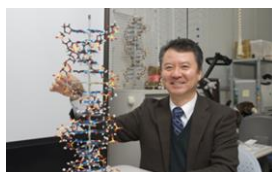


CBC SEMINAR ANNOUNCEMENT



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Genetic alphabet expansion technology and its diagnostic and therapeutic applications

Genetic alphabet expansion technology by introducing artificial extra bases or base pairs into DNA has rapidly been advanced. Current DNA-based technologies and nucleic acid functionalities are restricted by only four limited types of nucleotide components composed of four letters, A, G, C, and T, as nucleobases with similar chemical and physical properties. Thus, expanding the genetic alphabet could confer novel functionalities or technologies to DNA.

We have succeeded in developing the genetic alphabet expansion using new types of bases, called Ds and Px. The Ds and Px bases selectively pair each other and are highly hydrophobic. The Ds–Px pair functions as a third base pair with high efficiency and selectivity in DNA replication, along with the natural A–T and G–C pairs. DNA fragments containing the Ds–Px pair were amplified $\sim 10^{28}$ -fold by 100 cycles of PCR (10-cycle PCR and dilution process was repeated 10 times), and more than 97% of the unnatural base pairs survived in the amplified DNA.

Using this genetic alphabet expansion system, we developed the generation method of high-affinity Ds-containing DNA aptamers that specifically bind to target proteins or cells. We found that only two or three Ds bases in the aptamers greatly affected the tight binding to target proteins. We are now applying this aptamer technology to developing diagnostic and therapeutic agents as an alternative to antibody technology.

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| Date: | 7th March 2017 (Tuesday) |
| Time: | 11:00am – 12:30pm |
| Venue: | SPMS Research & Graduate Studies Office Conference Room |
| Host: | Asst Professor Shao Fangwei |