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2024- Present	Professor, Okayama University
2014-2024	Associate Prof., Kyushu University
2007-2013	Assistant Prof., Kyushu University
2006-2007	Postdoctoral Researcher, Stanford University, USA
2006 PhD	Kyushu University, JAPAN
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Research Interests:

Nucleic Acid Chemistry, Organic Chemistry, Chemical Biology, Nucleic Acid Therapeutics

Selected Publications:

1. Notomi R., Sasaki S. and **Taniguchi Y.***, Novel strategy for activating gene expression through triplex DNA formation targeting epigenetically suppressed genes, ***RSC Chem. Biol.***, **2024**, 9 (5) 884-890.

2. Tomimatsu K., Fujii T., Bise R., **Taniguchi Y.**, Ochiai H., Ohishi H., Ando K., Minami R., Tanaka K., Tachibana T., Mori S., Harada A., Maehara K., Nagasaki M., Uchida S., Kimura H., Narita M. and Ohkawa Y., Precise immunofluorescence canceling for highly multiplexed imaging to capture specific cell states, ***Nature Commun***, **2024**, 8;15(1): 3657.

3. Wang L., Notomi R., Sasaki S. and **Taniguchi Y.***, Inhibition of transcription and antiproliferative effects in a cancer cell line using antigene oligonucleotides containing artificial nucleoside analogues, ***RSC. Med. Chem.,*** **2023**, 14 (8), 1482-1491.

4. Notomi R., Sasaki S. and **Taniguchi Y.***, Recognition of 5-Methyl-CG and CG Base Pairs in Duplex DNA with High Stability using Antiparallel-type Triplex-forming Oligonucleotides with 2-Guanidinoethyl-2'-deoxy-nebularine, ***Nucleic Acids Res.***, **2022**, 50 (21) 12071-12081.

5. Miyahara R. and **Taniguchi Y.***, Selective Unnatural Base Pairing and Recognition of 2-Hydroxy-2'-deoxyadenosine in DNA by Pseudo-dC Derivatives, ***J. Am. Chem. Soc.,*** **2022**, 144 (35) 16150-16156.

Development of Pseudo-C to form Base Pairs with 2-OH-A in Oligonucleotide

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Abstract

2-Hydroxy-adenosine (2-OH-A) is one of the most common oxidative damage bases, also known as iso-guanosine (iso-G) due to its structural properties. This nucleic acid can form base pairs with the guanine base (G) as well, thus inducing transversion mutations during the replication step. Moreover, this structure has also been observed in RNA. Base pairing between 2-OH-A and G is due to the pairing of purine rings, which requires the development of new nucleic acid derivatives with a pyrimidine skeleton to form base pairs without significantly changing the structure of the double-stranded DNA or RNA. Iso-cytidine (iso-C) has been developed so far but has not been developed for further applications due to its chemical stability.

I therefore focused on the pseudo-cytosine (ψ-C) skeleton to design and synthesis an artificial nucleic acid (Figure 1, right). The artificial nucleic acid was incorporated into DNA and double-stranded DNA formation was evaluated by melting temperature measurement, and it was found that selective and stable base pairing was formed (Miyahara R. and Taniguchi Y., *J. Am. Chem. Soc.*, 2022, 144, 16150.). The artificial nucleic acid was also incorporated into RNA and evaluated for double-stranded RNA formation by melting temperature measurement, and it was found that selective and stable base pairing could be formed in the same way (*paper preparation*).