

Determining the Stereochemistry and Conformation of Natural Products and Synthetic Chiral Molecules by Vibrational Circular Dichroism Spectroscopy

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The configuration and conformation of a molecule affect its bioactivity, reactivity, physical properties, etc. However, the analysis of such three-dimensional structures is often time-consuming and difficult. VCD (vibrational circular dichroism) spectroscopy is capable of elucidating molecular three-dimensional structures that are difficult to analyze by other methods such as NMR. This lecture discusses our VCD applications to various organic molecules such as natural products [1] and synthetic molecules [2]. Our recent studies of VCD spectroscopy in the 1900-2400 cm^{-1} region with the use of spectrally isolated chromophores such as azide, deuterium, nitrile, etc. will also be briefly discussed [3].

[1] (a) Taniguchi, T. et al. *J. Am. Chem. Soc.* **2015**, *137*, 12191. (b) Taniguchi, T. et al. *Chem. Commun.* **2022**, *24*, 7455. [2] Taniguchi, T. et al. *Org. Lett.* **2017**, *19*, 404. Taniguchi, T. et al. *J. Am. Chem. Soc.* **2018**, *140*, 15577. [3] (a) Taniguchi, T. et al. *Phys. Chem. Chem. Phys.* **2021**, *23*, 27525. (b) Zubir, M. Z. M. et al. *Org. Biomol. Chem.* **2022**, *20*, 1067.

Brief CV



Education and Working Experience

- Senior Lecturer at Faculty of Advanced Life Science, Hokkaido University: May, 2019 – present.
- Assistant Professor at Faculty of Advanced Life Science, Hokkaido University: May, 2010 – Apr, 2019.
- Postdoctoral Fellow at Department of Chemistry and Chemical Biology, Harvard University: Aug, 2008 – Apr, 2010. (Prof. Daniel Kahne)
- Postdoctoral Fellow at Department of Chemistry, Columbia University: May, 2007 - Jul, 2008. (Prof. Koji Nakanishi)
- PhD. Science, Graduate School of Science, Hokkaido University: Mar, 2007.
- Visiting Scholar at Department of Chemistry, Columbia University: Aug, 2005 - Jul, 2006. (Adviser: Prof. Koji Nakanishi)
- MS. Science, Graduate School of Science, Hokkaido University: Mar, 2004.
- BS. Science, Faculty of Science, Hokkaido University: Mar, 2002.

Honors and Awards (selected)

- Thieme Chemistry Journals Award (2020)
- Banyu Chemist Award (BCA) (2019)
- Award for Encouragement of Research in Polymer Science; The Society of Polymer Science, Japan (2015)
- The Chemical Society of Japan Award for Young Chemists (2015)
- NOASTEC (Northern Advancement Center for Science & Technology) Presidential Prize (2012)
- Incentive Award at 54th Symposium on the Chemistry of Natural Products (2012)
- Young Scientist's Research Award in Natural Product Chemistry at the 47th Natural Product Chemistry Meeting (2012)
- Participant of the 59th Meeting of Nobel Prize Winners in Chemistry at Lindau (2009)
- Travel Award by the Stereochemical Society of Greater New York for the poster presentation at 19th International Symposium on Chirality (2007)