



Complex formation of an RNA aptamer with a part of HIV-1 Tat through induction of base triples in living human cells proved by in-cell NMR

Omar Eladl^{1,2,3,†}, Yudai Yamaoki^{1,2,4,†}, Keiko Kondo^{1,4,5}, Takashi Nagata^{1,2,4} and Masato Katahira^{1,2,4,5,*}

- ¹ Structural Energy Bioscience Research Section, Institute of Advanced Energy, Kyoto University, Kyoto 611-0011, Japan; omar.eladl.47r@st.kyoto-u.ac.jp (O.E.); yamaoki.yudai.7n@kyoto-u.ac.jp (Y.Y.); kondo.keiko.3u@kyoto-u.ac.jp (K.K.); nagata.takashi.6w@kyoto-u.ac.jp (T.N.)
- ² Graduate School of Energy Science, Kyoto University, Kyoto 606-8501, Japan
- ³ Faculty of Pharmacy, Zagazig University, Zagazig 44519, Egypt
- ⁴ Integrated Research Center for Carbon Negative Science, Institute of Advanced Energy, Kyoto University, Uji 611-0011, Japan
- ⁵ Biomass Product Tree Industry-Academia Collaborative Research Laboratory, Kyoto University, Kyoto 611-0011, Japan
- * Correspondence: katahira.masato.6u@kyoto-u.ac.jp
- † These authors contributed equally to this work.

Supporting information

Figure S1. *In vitro* ¹H NMR spectra of TA (150 μM) at different molar ratios of [TA]:[Arginine] in transport buffer (TB) at 10°C. Imino proton region is shown.

Figure S2. *In vitro* ¹H NMR spectra of TA (150 μM) at different molar ratios of [TA]:[Argininamide] in transport buffer (TB) at 10°C. Imino proton region is shown.

Figure S3. *In vitro* ¹H NMR spectra of TA (150 μM) at different molar ratios of [TA]:[RG peptide] in magnesium ion-excluded TB at 10°C. Imino proton region is shown.

Figure S4. UV-melting curves for the TA-RG peptide complex. The melting curve for the TA-RG peptide complex in TB (orange) and magnesium ion-excluded TB (black).

Figure S5. Intracellular distribution of FAM-labeled TA and TAMRA-labeled RG peptide. Confocal fluorescence microscopy images of HeLa cells treated by electroporation with the complex of FAM-labeled TA and TAMRA-labeled RG peptide. The cell nuclei were stained with Hoechst 33342. Fluorescence images for FAM-labeled TA (a), TAMRA-labeled RG peptide (b), and Hoechst 33342 (c). Bar = 30 μm.

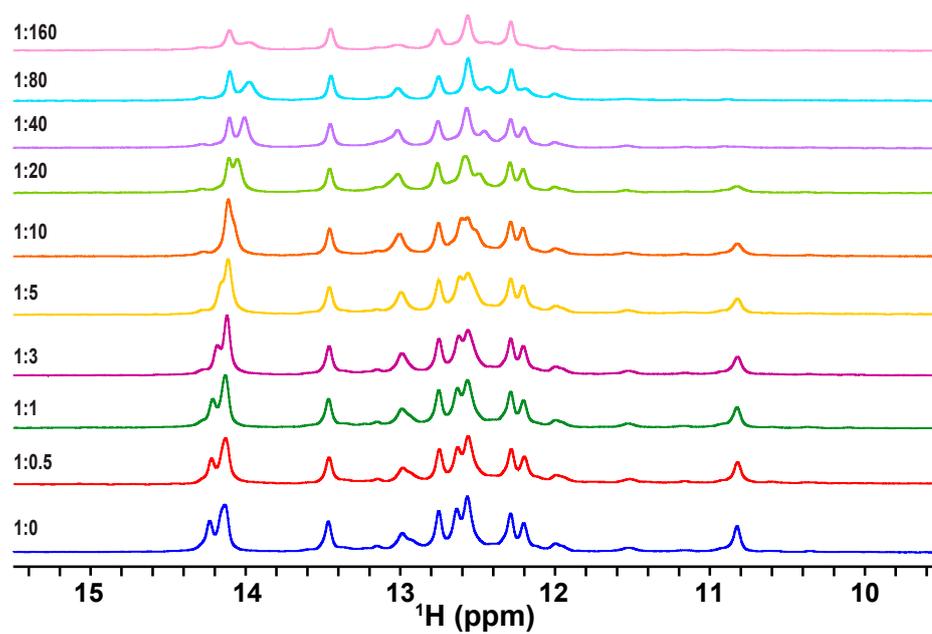


Figure S1. *In vitro* ^1H NMR spectra of TA (150 μM) at different molar ratios of [TA]:[Arginine] in transport buffer (TB) at 10°C. Imino proton region is shown.

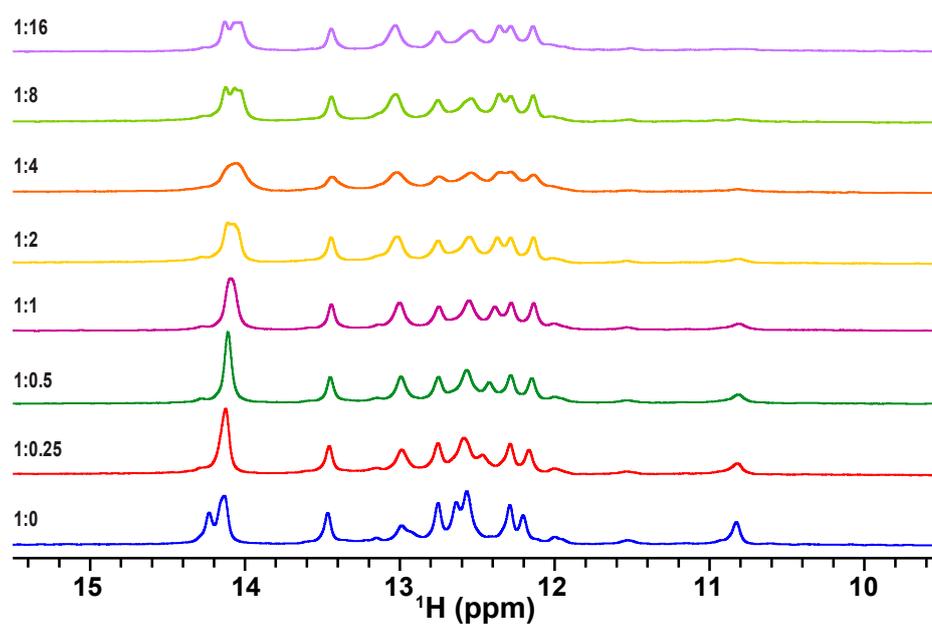


Figure S2. *In vitro* ^1H NMR spectra of TA (150 μM) at different molar ratios of [TA]:[Argininamide] in transport buffer (TB) at 10°C. Imino proton region is shown.

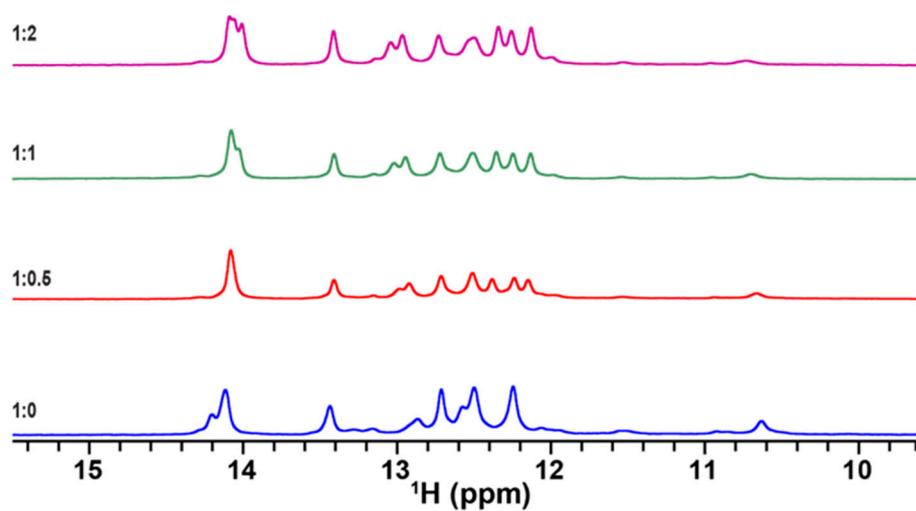


Figure S3. *In vitro* ^1H NMR spectra of TA (150 μM) at different molar ratios of [TA]:[RG peptide] in magnesium ion-excluded TB at 10°C. Imino proton region is shown.

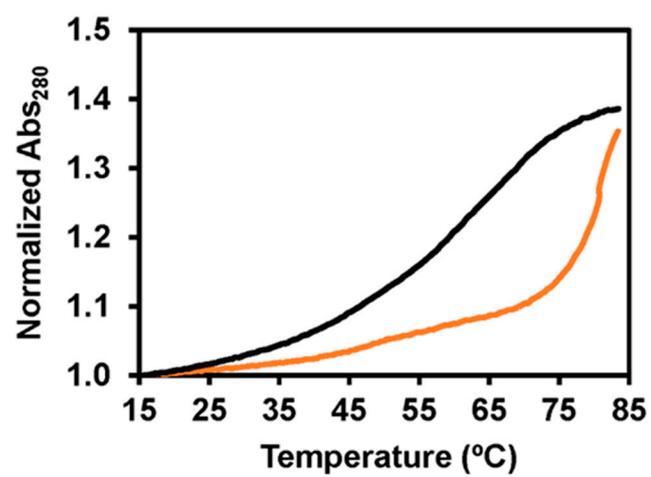


Figure S4. UV-melting curves for the TA-RG peptide complex. The melting curve for the TA-RG peptide complex in TB (orange) and magnesium ion-excluded TB (black).

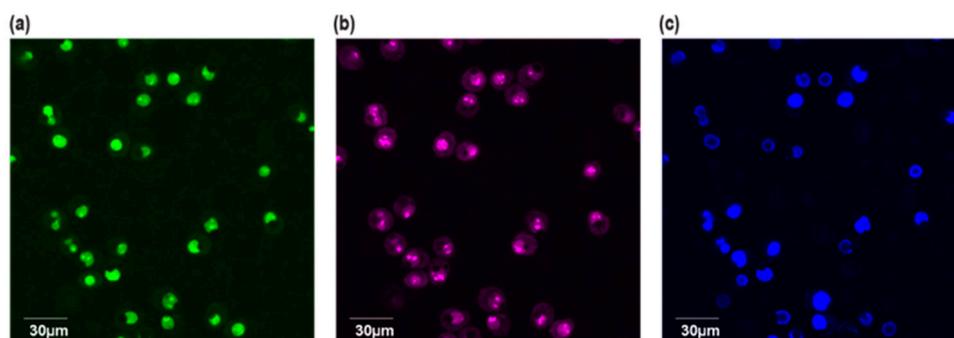


Figure S5. Intracellular distribution of FAM-labeled TA and TAMRA-labeled RG peptide. Confocal fluorescence microscopy images of HeLa cells treated by electroporation with the complex of FAM-labeled TA and TAMRA-labeled RG peptide. The cell nuclei were stained with Hoechst 33342. Fluorescence images for FAM-labeled TA (a), TAMRA-labeled RG peptide (b), and Hoechst 33342 (c). Bar = 30 μm .