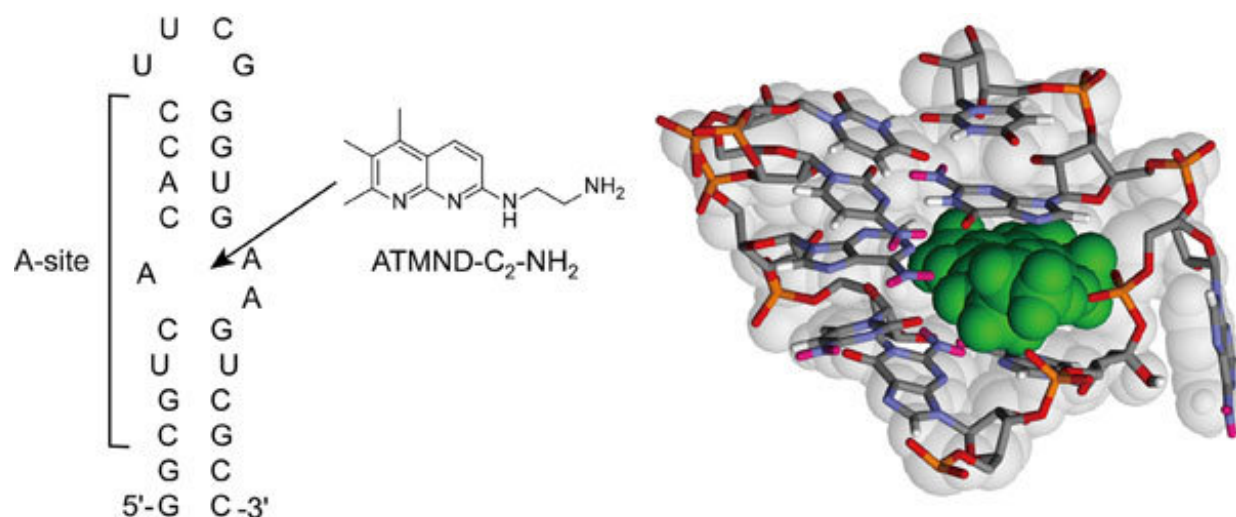


The tightest non-aminoglycoside ligand for the bacterial ribosomal RNA A-site

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Chemical structure of ATMND-C₂-NH₂ and sequence of the bacterial (*Escherichia coli*) A-site-containing RNA model used in this study. It also shows the possible structure of the complex between ATMND-C₂-NH₂ (green color) and internal loop of A-site. Credit: Seiichi Nishizawa

A research group at Tohoku University has made a significant discovery with positive implications for the development of bacteria-fighting drugs. The aminoacyl-tRNA site (A-site) of the 16S RNA decoding region in the bacterial ribosome looks promising for a new era of antibiotic drug development.

Traditional aminoglycoside [antibiotics](#) are problematic given their high toxicity and the potential for [resistance development](#). The research at Tohoku University focused on bacterial A-site binding small ligands whose structures are distinct from the aminoglycoside family, which offer potential for the development of novel drugs that treat bacterial infections with a reduction in the problems associated with traditional antibiotics.

The research group led by Dr. Seiichi Nishizawa and Dr. Yusuke Sato (Department of Chemistry, Graduate School of Science) has reported a novel small [ligand](#), ATMND-C₂-NH₂ that has the tightest binding affinity for the bacterial A-site among the non-aminoglycoside ligands.

ATMND-C₂-NH₂ shows a significant fluorescent quenching response upon selective binding to the internal loop of the bacterial (*Escherichia coli*) A-site-containing model RNA.

ATMND-C₂-NH₂ has also proven useful as an indicator for assessing ligand/A-site interactions.

The results obtained by the research group offer a rational basis for the generation of novel A-site binding ligands with a view toward novel antibiotics with less toxicity and minimum resistance development.

More information: Yusuke Sato et al. Fluorescent Trimethylated Naphthyridine Derivative with an Aminoalkyl Side Chain as the Tightest Non-aminoglycoside Ligand for the Bacterial A-site RNA, *Chemistry - A European Journal* (2018). [DOI: 10.1002/chem.201802320](https://doi.org/10.1002/chem.201802320)

Provided by Tohoku University

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