# Exploring the Binding of natural Molybdenum Cofactor Derivatives to the *moaA* Riboswitch

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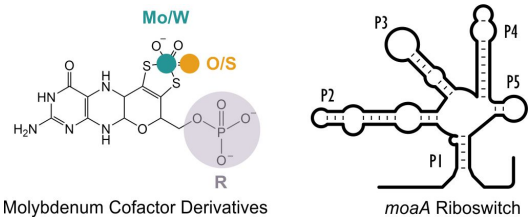
Riboswitches are mRNA sequences in the 5'-untranslated region that change their structure upon binding of a specific metabolite, thereby regulating the expression of downstream genes. The *moaA* riboswitch has been predicted to respond to the molybdenum cofactor (Moco)[1]. The instability and high oxygen sensitivity of Moco prevented to unambiguously demonstrate this interaction to this date. By footprinting experiments under anaerobic conditions, we however showed that the Moco-derivative released from Xanthine Oxidase (S-Moco) induces a structural change of the *moaA* riboswitch.

Riboswitch classes recognize small modifications of the metabolite triggering them, using different recognition mechanisms involving aromatic moieties or charged functional groups. We know that the pterin moiety alone is not enough to be recognized by the *moaA* riboswitch [2]. We therefore want to test, which naturally ocuring Moco derivatives are recognized by this hardly investigated riboswitch. We are especially interested in the specificity with respect to the phosphate group as well as the identity of the metal centre.
While in-line probing is the state of the art to investigate a structural change of RNA in an isolated system, its long incubation time is hindersome when working with oxygen sensitive and unstable Moco derivatives. We are therefore working on establishing alternative methods to test for binding and structural change.




Molybdenum Cofactor Derivatives *moaA* Riboswitch

## Acknowledgements

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[1] Elizabeth E. Regulski, Ryan H. Moy, Zasha Weinberg, Jeffrey E. Barrick, Zizhen Yao, Walter L. Ruzzo, Ronald R. Breaker, *Mol Microbiol.,* **2008,** 68(4), 918-32.
[2] Fabio Amadei, Maria Reichenbach, Sofia Gallo, Roland K. O. Sigel, *J Inorg Biochem*., **2023,** 242, 112153.