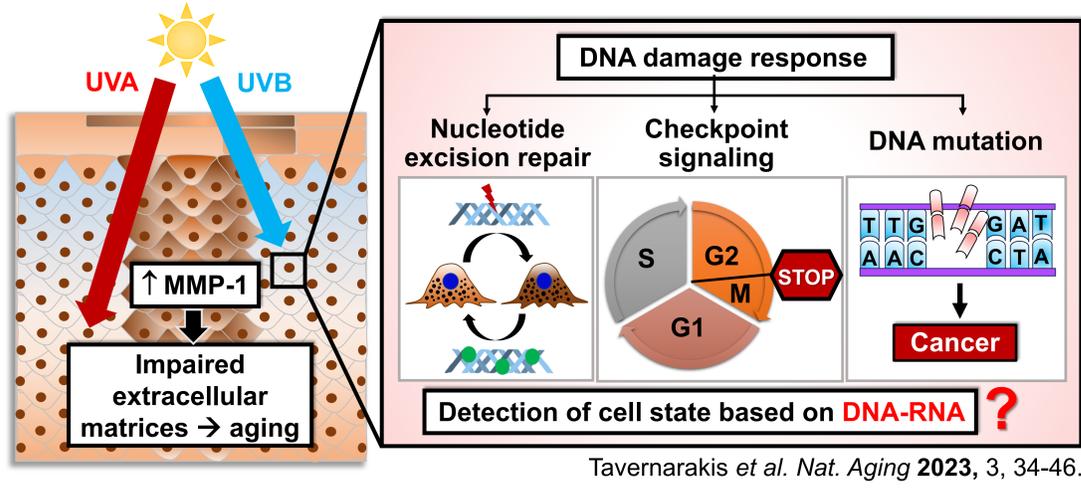


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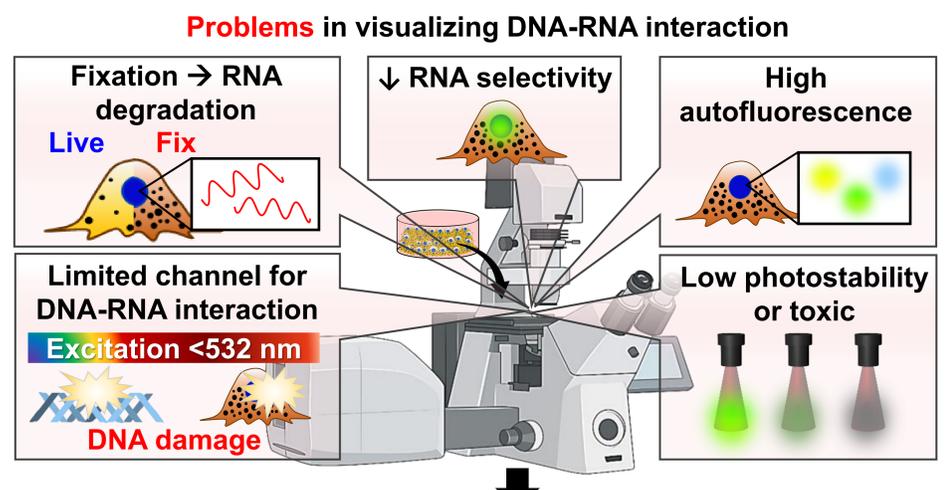
E-mail: SUTRISNO.Linawati@nims.go.jp

Research background



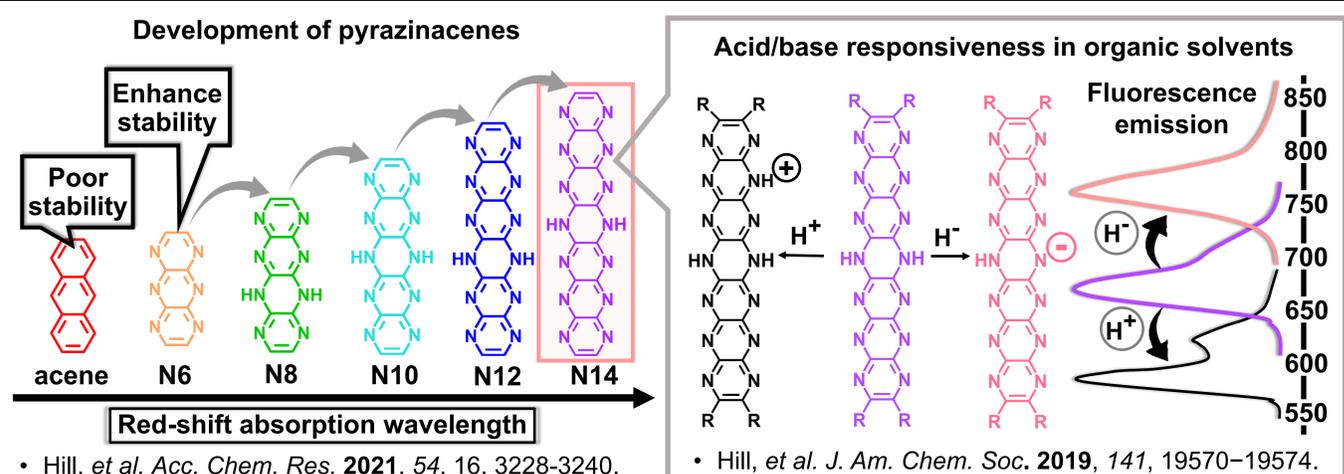
Tavernarakis et al. *Nat. Aging* 2023, 3, 34-46.

Key questions about DNA and RNA in aging cells are still **underexplored** → long-term imaging is crucial for spatiotemporal mapping of cell fate transitions



Inaccurate results → has been **ignored over decades**

Previous work on the development of pyrazinacene as a chromophore

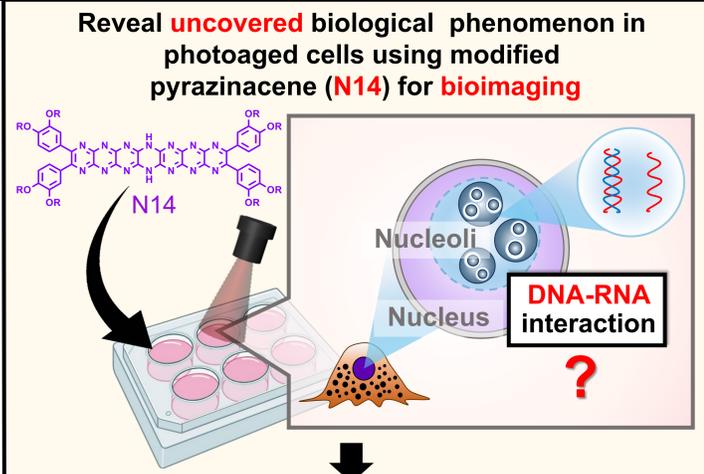


Hill, et al. *Acc. Chem. Res.* 2021, 54, 16, 3228-3240.

Hill, et al. *J. Am. Chem. Soc.* 2019, 141, 19570-19574.

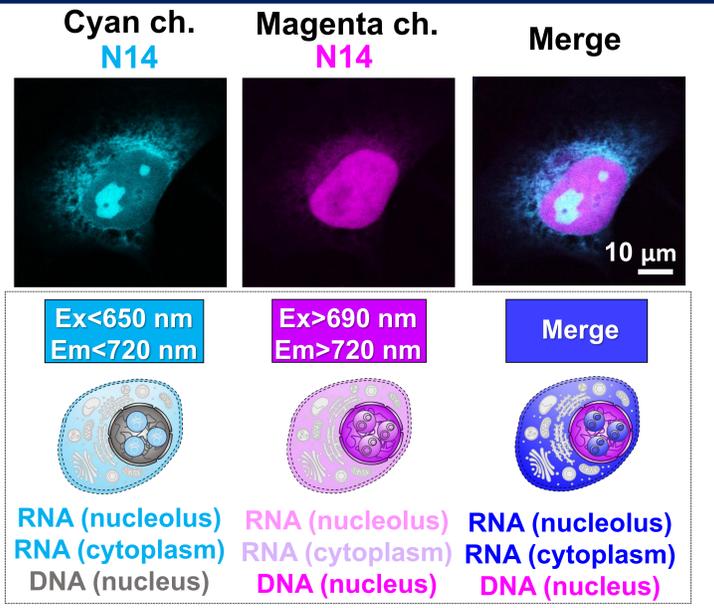
The **longest** known pyrazinacene (N14)'s protonation influences its **near-infrared (NIR) fluorescence**, offering potential for **long-term** imaging

Research purpose

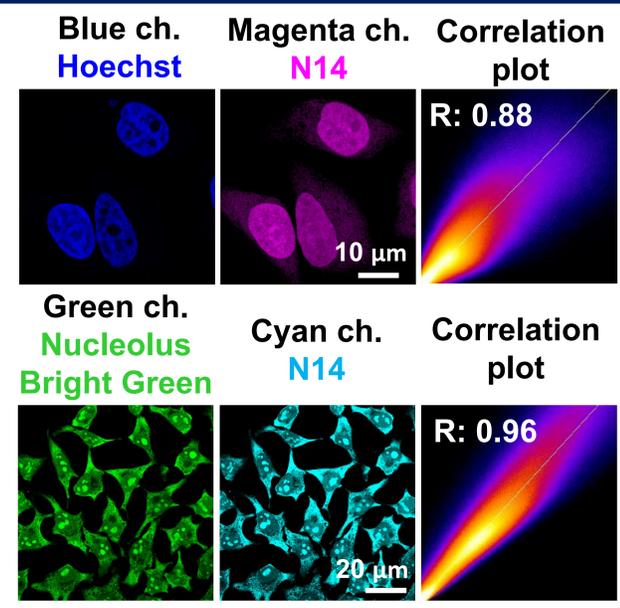


Provide crucial **biological insights**, as well as new **drug development**

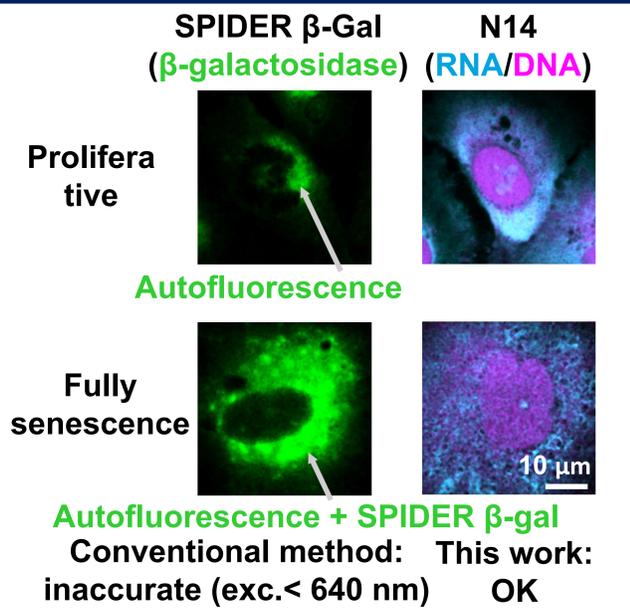
Unique: dual labeling of RNA and DNA



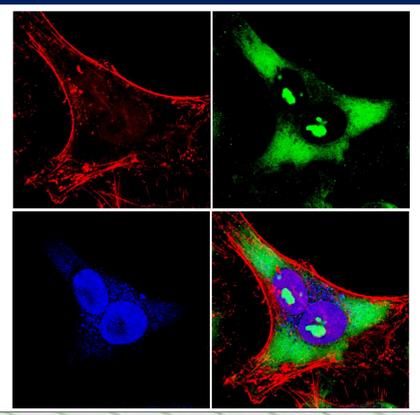
High RNA-DNA specificity



Senescence (aging) detection



Multicolor imaging



Summary

Conventional approach to stain RNA/DNA		
Acridine Orange (AO)	PC5	trans-1-Halo
<ul style="list-style-type: none"> × UV-Vis sensitive cells × Cannot distinguish states or long-term imaging 	<ul style="list-style-type: none"> × Single organelle stain × Cannot detect multiple cell states 	

This work: **First exploration of N14 for bioimaging**

- ✓ Quantify multiple cell stage
- ✓ UV-Vis sensitive cells
- ✓ Multiplex and long-term imaging