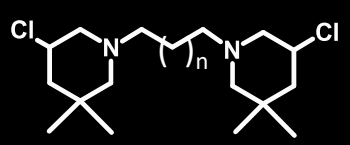
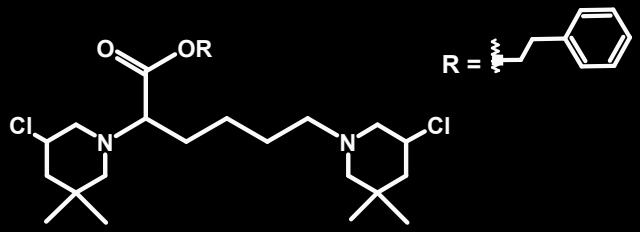
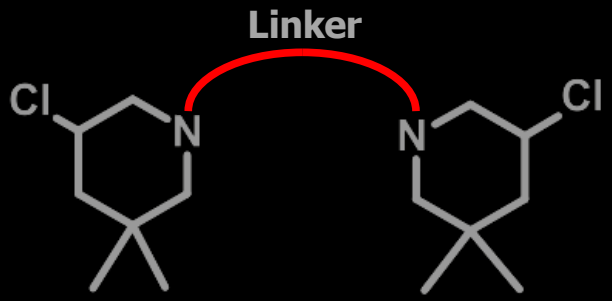
Nucleic acids cross-linkers

- Psoralens
- Bis-(1,2-dicarbonyls)
- Platinated complexes
- Bis-(2-chloroethyl)amines
- Others



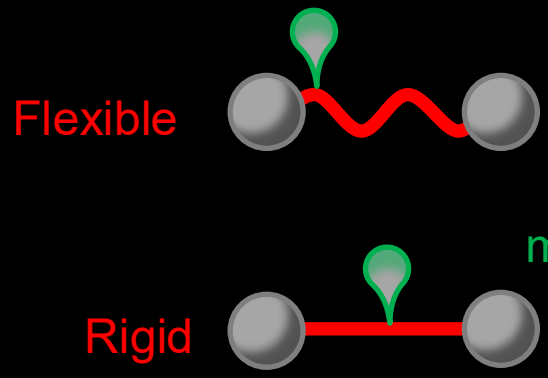


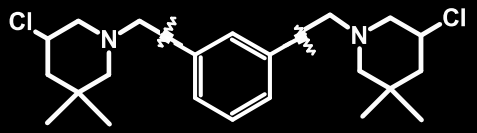
M. Scalabrin et al. Methods (2018) doi:0.1016/j.ymeth.2018.05.001
Yu *et al. PNAS 105* (2008) 12248
Q. Zhang et al. JASMS 17 (2006) 1570–1581



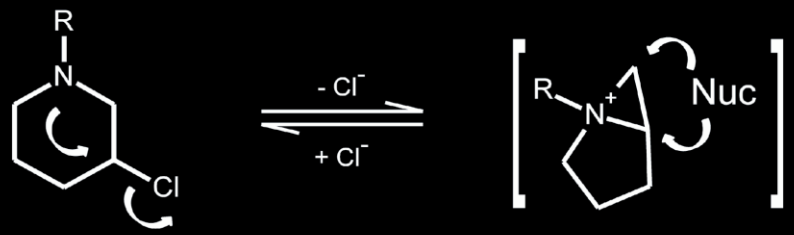
Bis-3-chloropiperidines (BICePs)

I. Zuravka et al. *ChemMedChem 9* (2014) 2178 – 2185
I. Zuravka et al. *Bioorg. Med. Chem.* 23 (2015) 1241–1250
I. Zuravka et al. *Bioorg. Med. Chem. Lett.* 25 (2015) 4606–4609

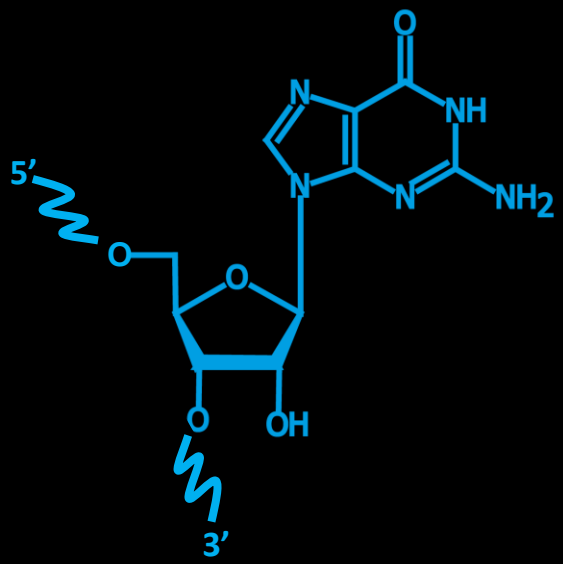




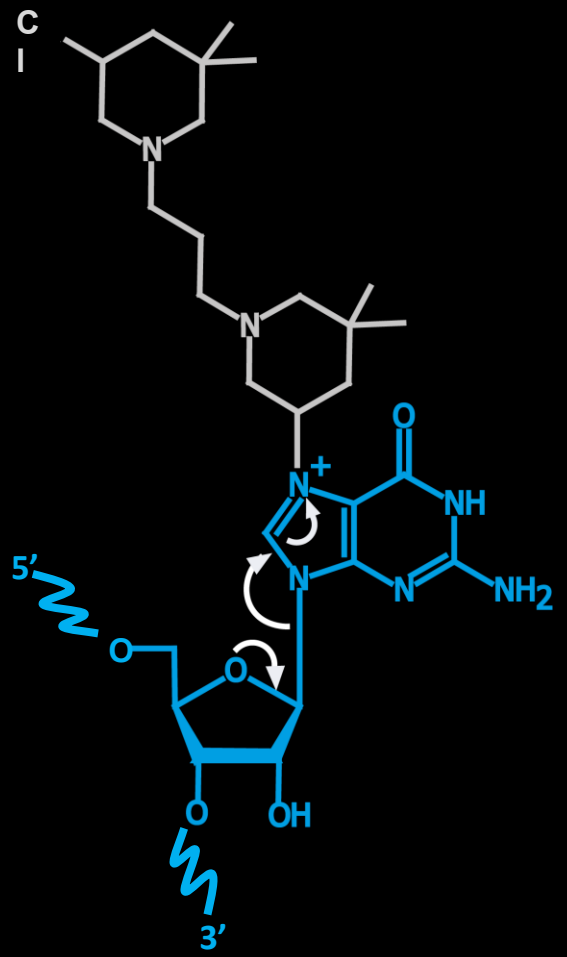
Nucleic acids alkylation



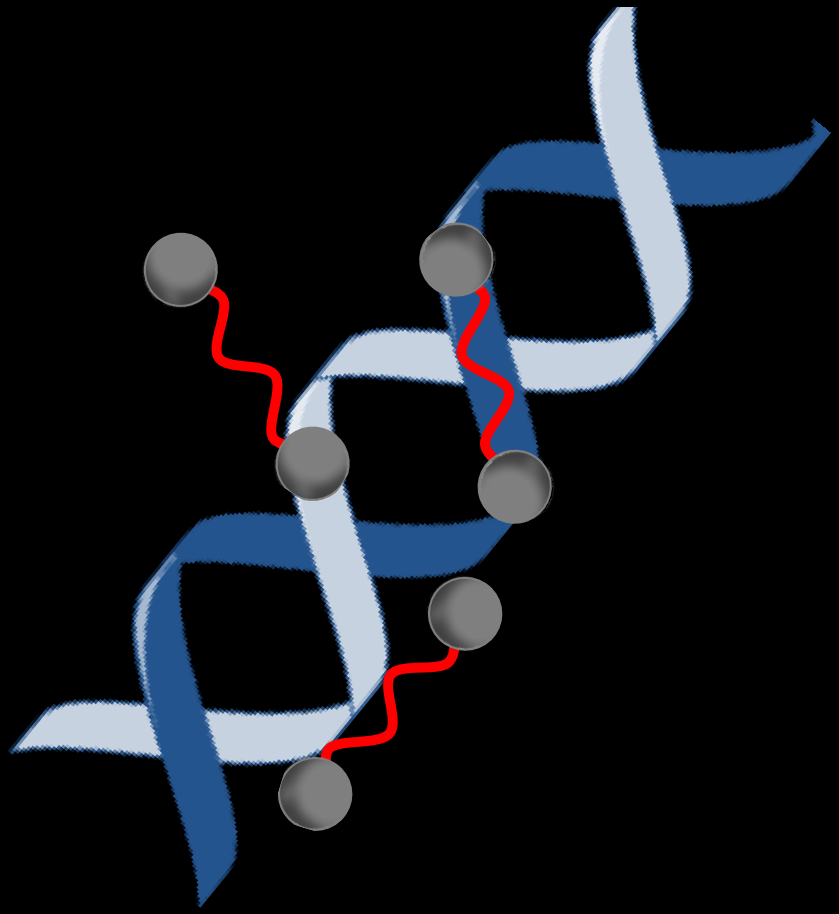
A. Sosic et al. *ChemMedChem* 12 (2017) 1471-1479



BICePs



Adducts produced by bifunctional cross-linkers



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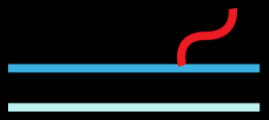
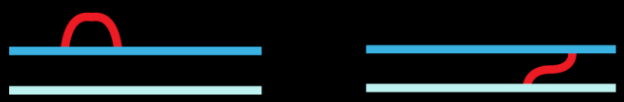


Monofunctional adducts

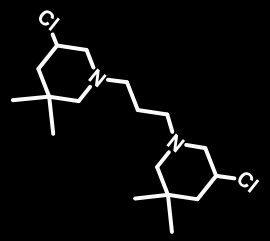
Type 1 Type 2



Bifunctional adducts

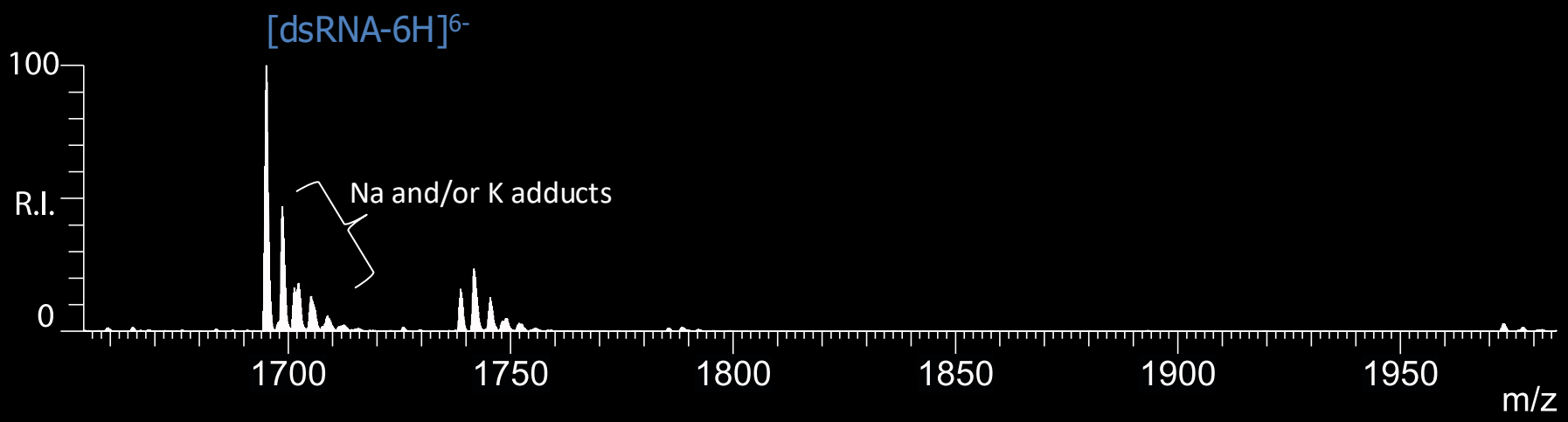
A. Sosic et al. *ChemMedChem* 12 (2017) 1471-1479

Typical outcome of probing reactions

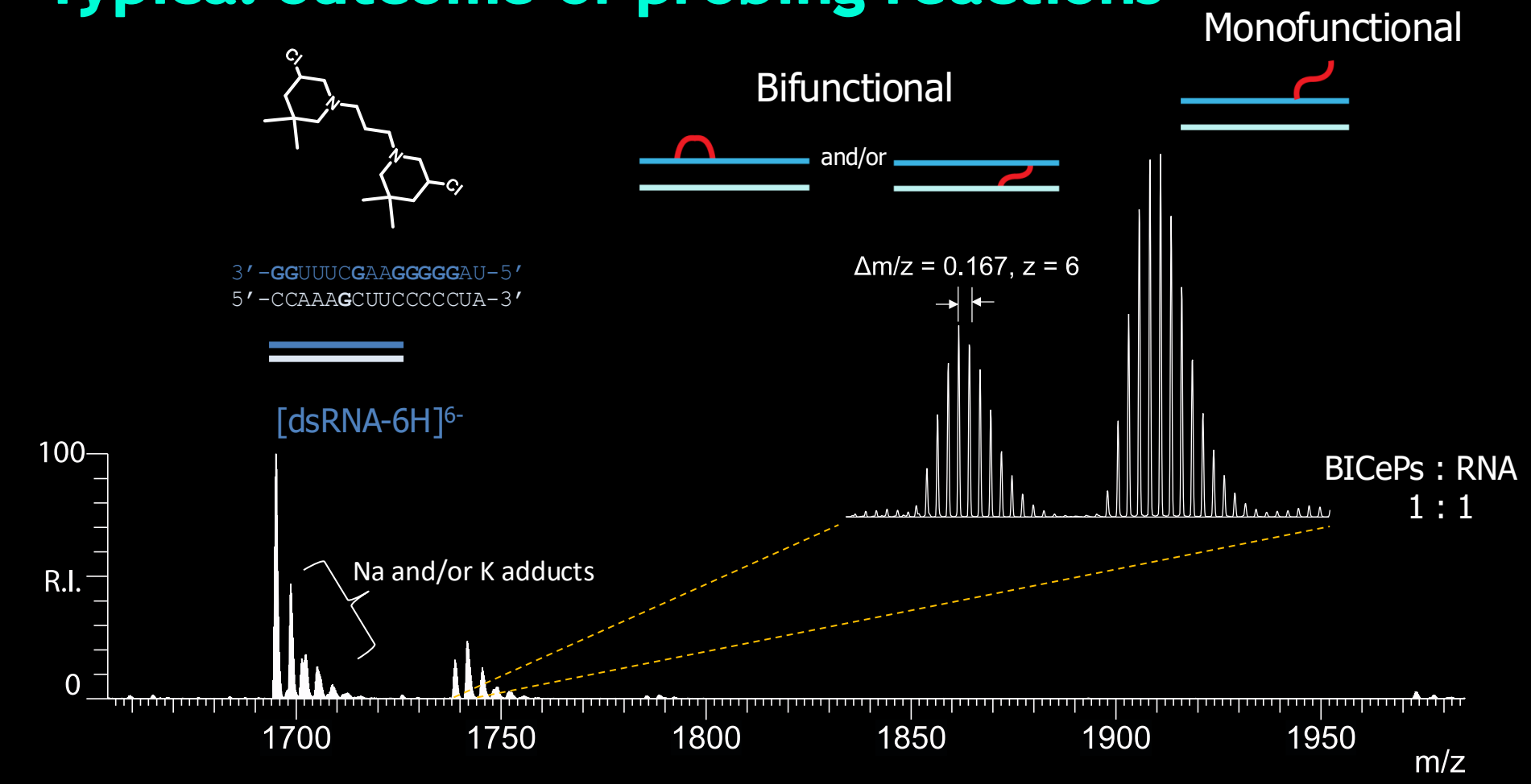


3′-GGUUUCGAAGGGGGAU-5′
5′-CCAAAGCUUCCCCCUA-3′

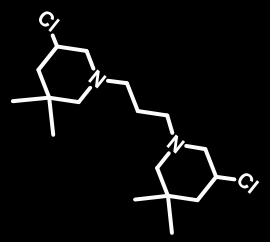




Typical outcome of probing reactions

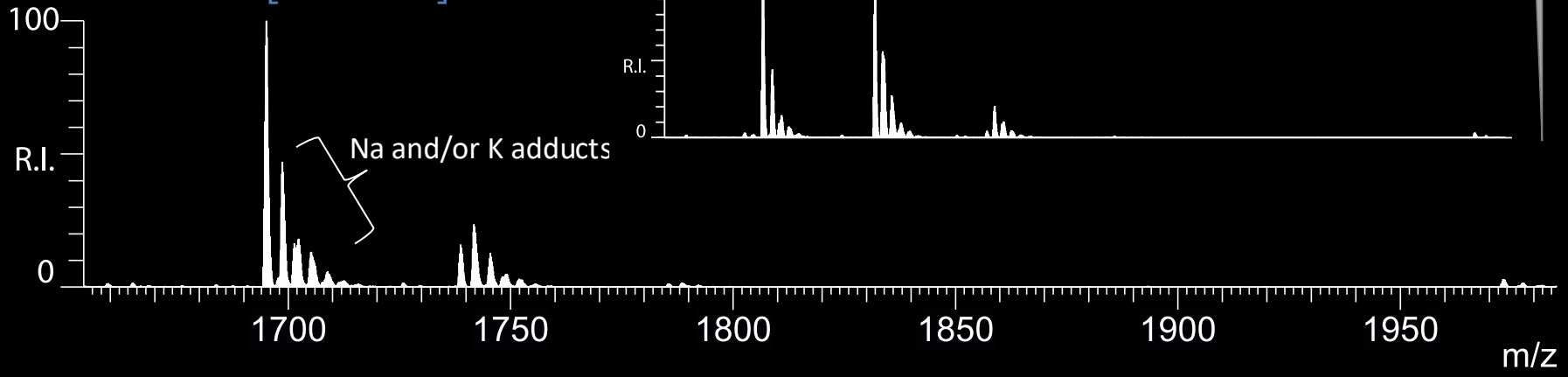


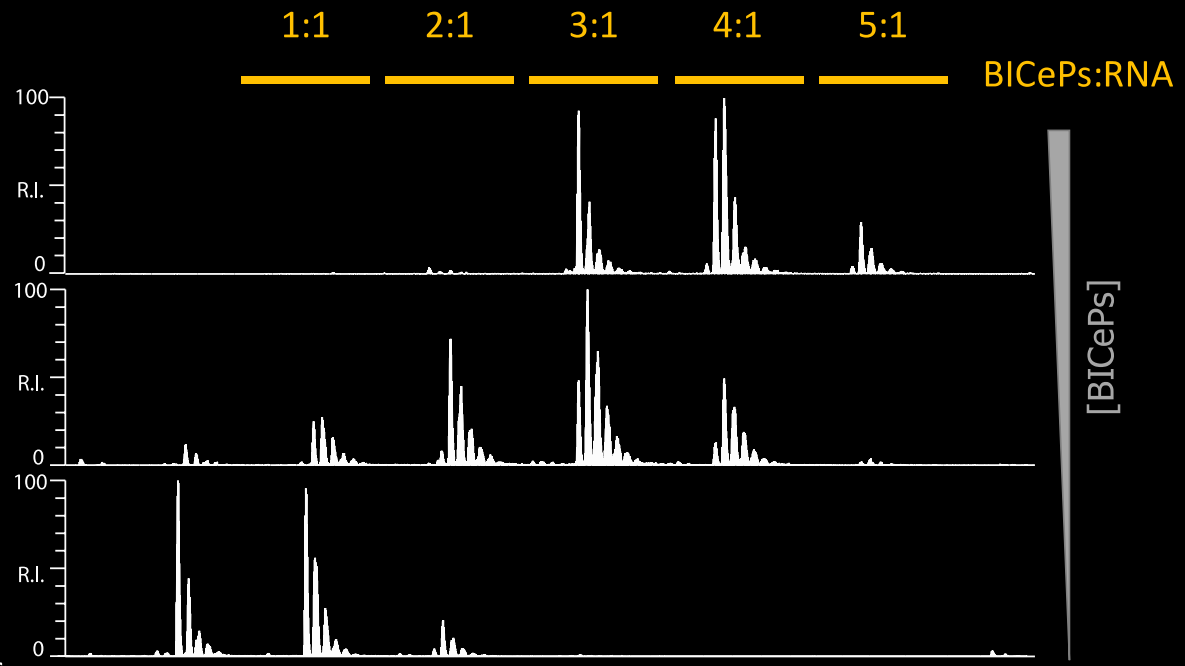
Typical outcome of probing reactions



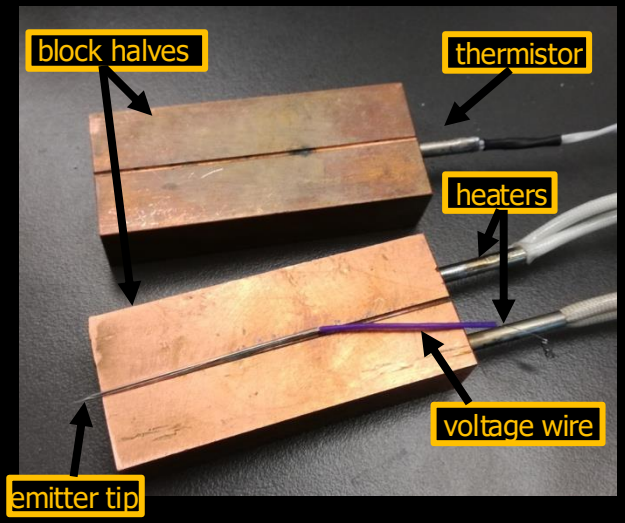
3′-GGUUUCGAAGGGGGAU-5′
5′-CCAAAGCUUCCCCCUA-3′

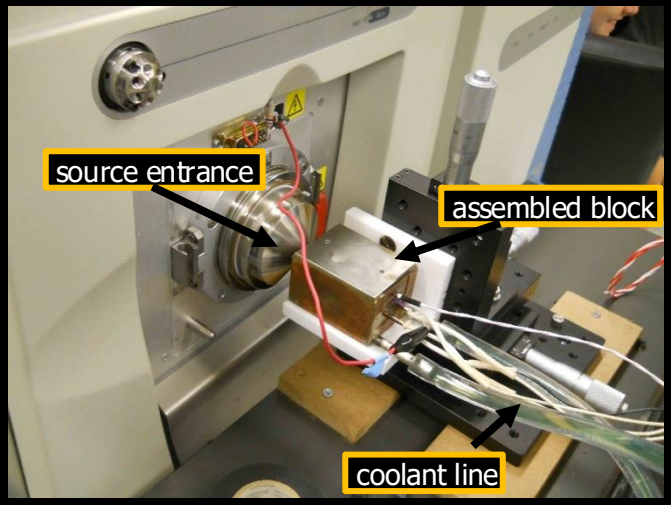
[dsRNA-6H]$^{6-}$





Alternative approach: thermal melting



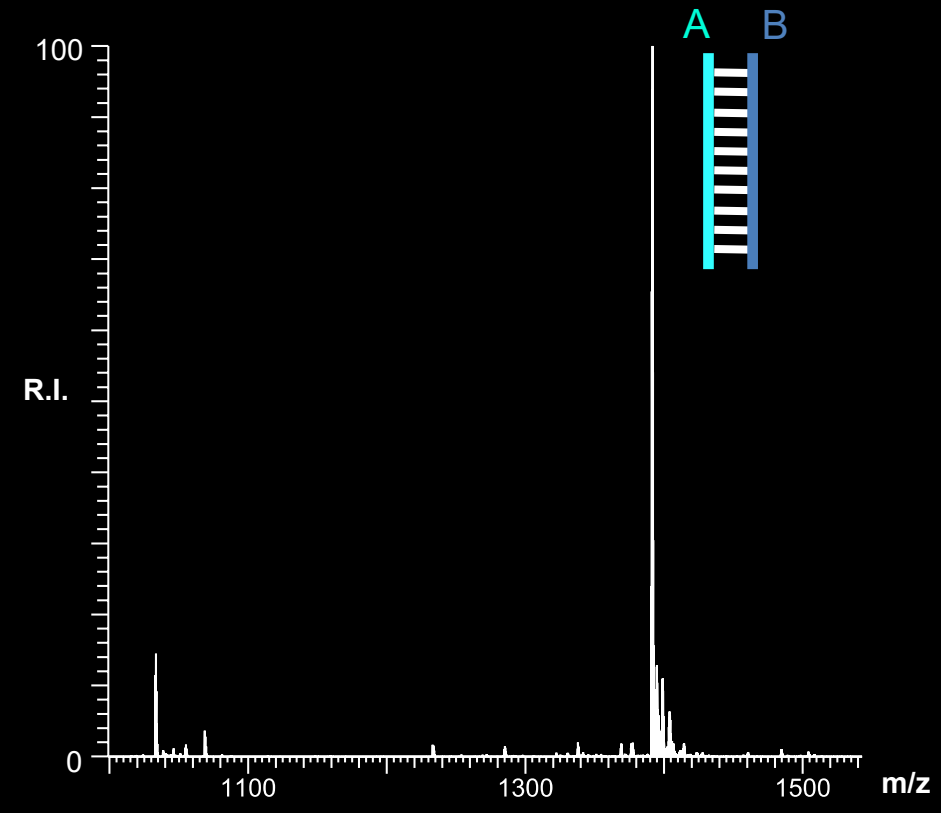


- Analysis from -20 to 100°C
- Minimal fluctuations (<0.2°C at 60Hz)
- Automated data acquisition

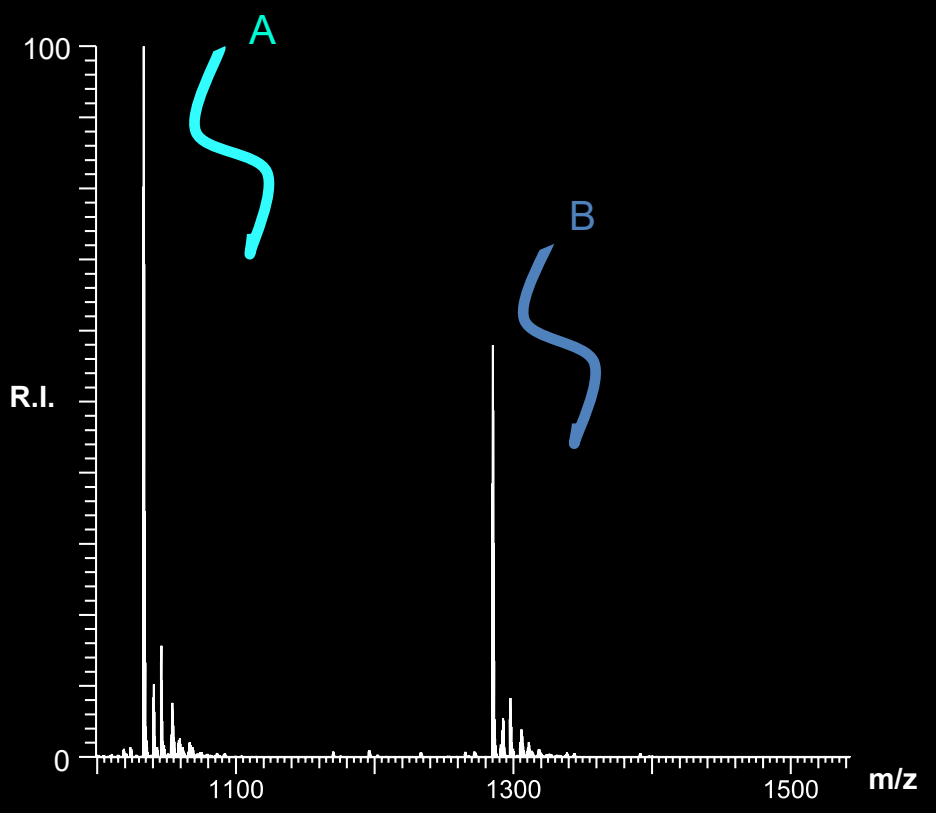
Wang, Guanbo et al. *Anal. Chem.* 83.8 (2011): 2870-2876
Cong, Xiao, et al. *JACS* 138.13 (2016): 4346-4349

Thermal melting of RNA duplex

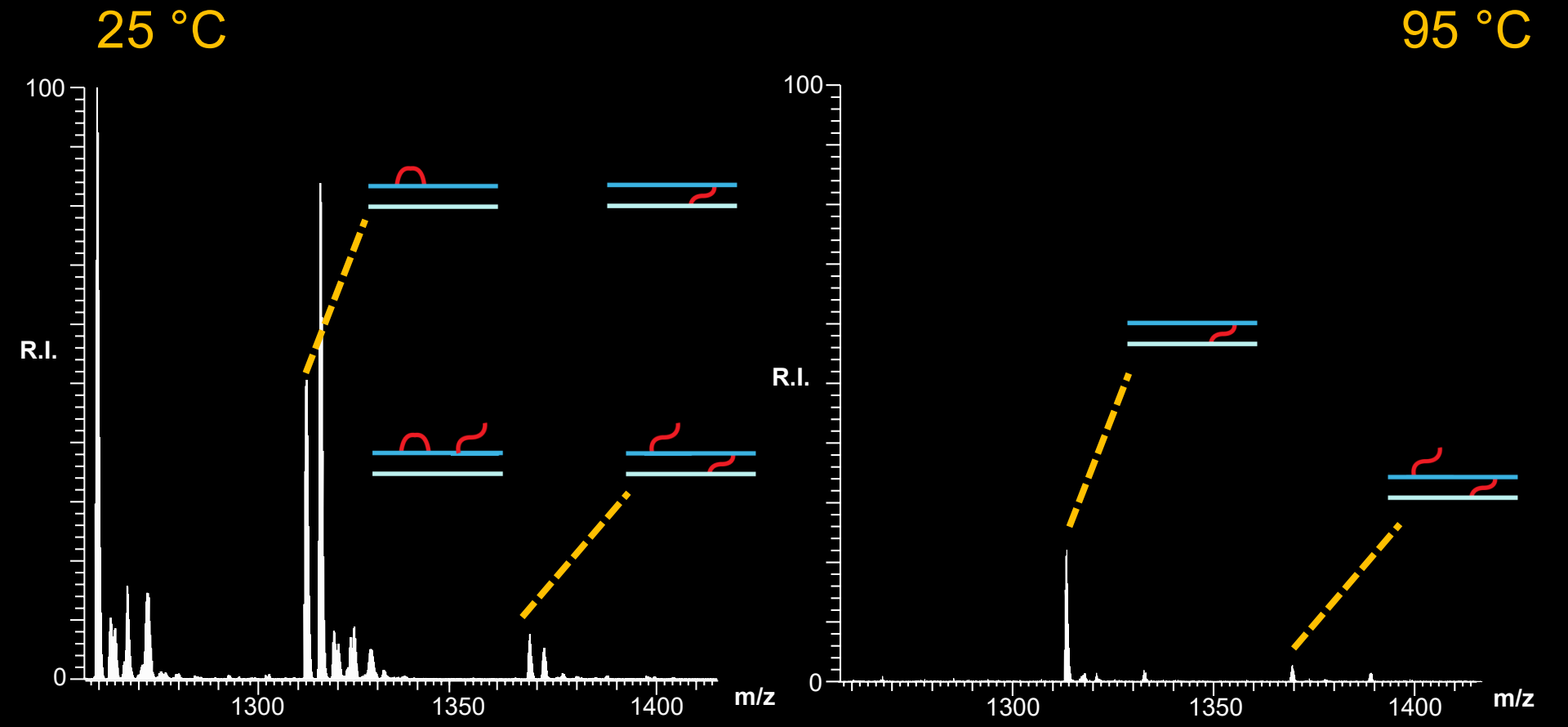
25 °C



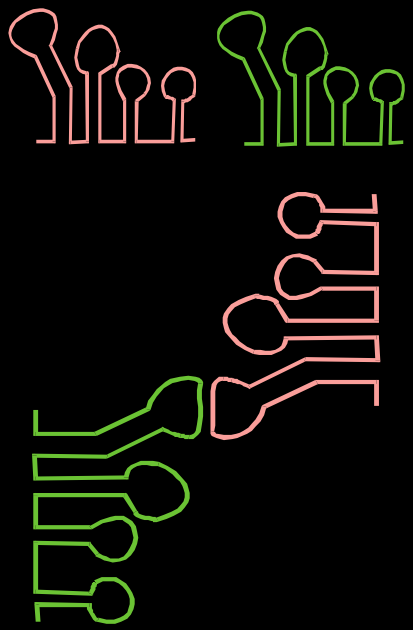
95 °C

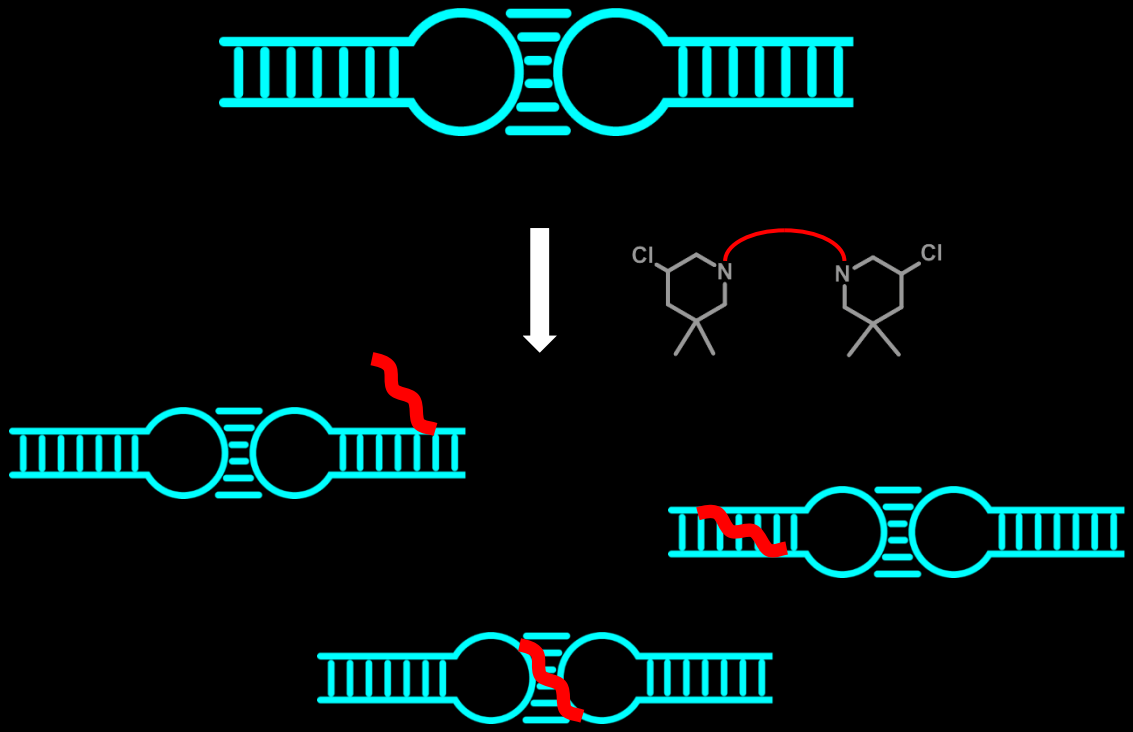


Inter-strand cross-links detection



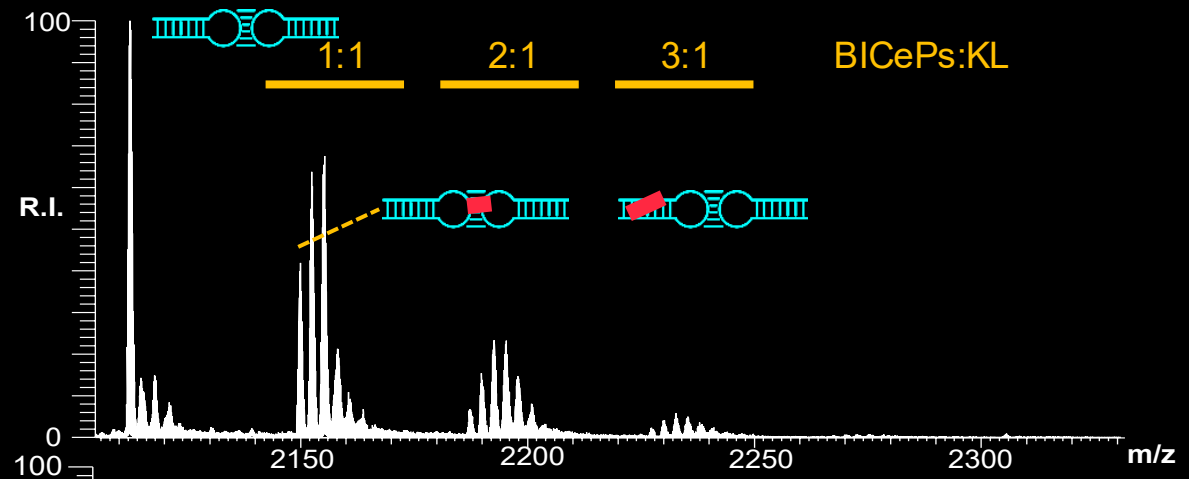
Probing DIS kissing complex





Thermal melting of DIS kissing complex

25 °C



95 °C

