Chemical biology of G-quadruplexes based on telomestatin analogs

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G-Quadruplexes (G4s) are complex nucleic acid structures that can form in guanine-rich regions of DNA and RNA, and play important roles in DNA transcription, replication, and cellular senescence. To study the functions of G4s, researchers have developed G4 ligands in past two decades, with telomestatin being one of the most potent natural products discovered in 2001 (Figure 1).[1] We have synthesized telomestatin analogs of 6OTD due to the limited availability and reactive functional groups of telomestatin.[2]

In this paper, the author presents a post-target-binding visualization strategy for G4s in cells using an azide-labeled 6OTD analog named 6OTD-Az. To identify the cellular target of 6OTD-Az, click chemistry between 6OTD-Az and a cell-permeable dye CO-1[3] that contains a strained alkyne moiety and a BODIPY fluorophore was employed. The post-binding visualization strategy revealed that 6OTD colocalized with RNA G4 in living cells, providing insights into the cellular localization and potential roles of G4s in cellular processes. This strategy can be used to further understand the functions of G4s and their interactions with other molecules in cells.[4]

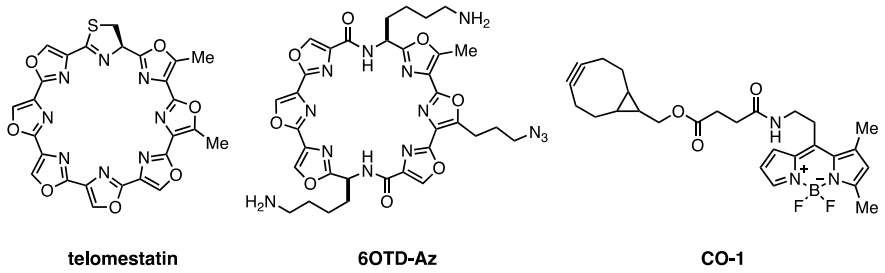

Figure 1 Structures of telomestatin, 6OTD-Az, and CO-1.

References
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