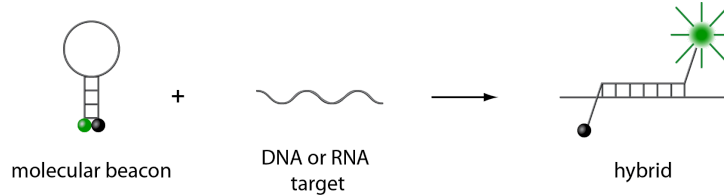


Introduction on Molecular Beacons

Molecular beacons are single-stranded oligonucleotide hybridization probes that form a stem-and-loop structure. The loop contains a probe sequence that is complementary to a target sequence, and the stem is formed by the annealing of complementary arm sequences that are located on either side of the probe sequence. A fluorophore is covalently linked to the end of one arm and a quencher is covalently linked to the end of the other arm. Molecular beacons do not fluoresce when they are free in solution. However, when they hybridize to a nucleic acid strand containing a target sequence they undergo a conformational change that enables them to fluoresce brightly.



In the absence of targets, the probe is dark, because the stem places the fluorophore so close to the nonfluorescent quencher that they transiently share electrons, eliminating the ability of the fluorophore to fluoresce. When the probe encounters a target molecule, it forms a probe-target hybrid that is longer and more stable than the stem hybrid. The rigidity and length of the probe-target hybrid precludes the simultaneous existence of the stem hybrid. Consequently, the molecular beacon undergoes a spontaneous conformational reorganization that forces the stem hybrid to dissociate and the fluorophore and the quencher to move away from each other, restoring fluorescence.

[click here](#) to read more on molecular beacons

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www www.molecular-beacons.org

Recent Publications from our group

Ma MT, Jiang Q, Chen CH, Badeti S, Wang X, Zeng C, Evans D, Bodnar B, Marras SAE, Tyagi S, Bharaj P, Yehia G, Romanienko P, Hu W, Liu SL, Shi L, and Liu D (2024) **S309-CAR-NK cells bind the Omicron variants in vitro and reduce SARS-CoV-2 viral loads in humanized ACE2-NSG mice.** Journal of Virology: e0003824. PMID: 38767356: [PubMed Link](#)

Banada PP, Green R, Streck D, Kurathi R, Reiss R, Banik S, Montalvan I, Jones R, Marras SAE, Chakravorty S, and Alland D (2023) **An expanded RT-PCR melting temperature coding assay to rapidly identify all known SARS-CoV-2 variants and sub-variants of concern.** Scientific Reports 13. 21927. PMID: 38081834: [PubMed Link](#)

Ebrahim L, Xu C, Wang A, Hernandez C, Siclari N, Rajah D, Walter L, Marras SAE, Tyagi S, Fine DH, Daep CA, and Chang TL (2023) **Oral Epithelial cells expressing low or undetectable levels of human angiotensin-converting enzyme 2 are susceptible to SARS-CoV-2 virus infection in vitro.** Pathogens 12. PMID: 37375533: [PubMed Link](#)