

“Our study on this programmable, near-infrared probe creates opportunities to use these molecules in biological and medical applications,” says iCeMS bioengineer Ganesh Pandian Namasivayam.

The team used their probe to observe telomere dynamics during different phases of cell division and to gauge telomere length by measuring the fluorescence intensity. Being able to visualize telomere length was both surprising and exciting, says Namasivayam, as it can be developed to create an efficient and robust approach for detecting severe telomere shortening in diseases, such as age-related retinal degeneration, with low energy light.

Since PIPs can be designed to target any DNA sequence in the genome by changing their arrangement, the scientists anticipate the approach can be adapted to make near-infrared fluorescent probes for visualizing other important DNA sequences related to disease.

Image Caption: *A fluorescent compound was attached to the PIP that targets the DNA repeating sequence found in telomeres. This probe, called SiR-TTet59B, enables observation of telomeres in action.*