“FISH-STICs” offers an RNA-FISH probe synthesis approach that is low cost and easy accessible

Background

In vitro–transcribed in situ hybridization (ISH) probes have long been applied in histology, and whole-mount gene expression pattern analysis, but they have found little application in the single-molecule RNA detection desirable in studies of mRNA localization. For that purpose, multiply labeled fluorescent oligodeoxynucleotides (ODN) probes can image single mRNAs (RNA-fluorescence in situ hybridization, RNA-FISH), however, the synthesis of FISH currently requires in house DNA synthesis and post-synthesis dye coupling, an inefficient process that is difficult to control and therefore inaccessible to most laboratories. Thus, alternative methods of making FISH more accessible and sensitive are highly sought-after.

Technology

Dr. Kevin Czaplinski has developed a strategy that uses commercially synthesized oligonucleotides as RNA-FISH probes without further modification and show that such probes work well for detection of RNA in cultured cells. His approach - namely FISH with Sequential Tethered and Intertwined nucleic acid molecule Complexes (FISH-STICs) - can bind a high concentration of fluorescent ODN to a short stretch of an RNA using commercial DNA synthesis outlets available to any laboratory. The in situ hybridization probes FISH-STICs overcome the above noted limitations and permit rapid, simple, cost efficient and sensitive detection of multiple nucleic acids (and/or other nucleic acids) simultaneously.

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Advantages
• One FISH-STIC probe detects mRNA molecules in culture, probe detection can be improved by the addition of multiple probes that can be easily adapted for robust mRNA quantification
• Rapid, simple and cost-effective

Applications
• Research Tool
• Diagnostics

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