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Fluorescence self-quenching assay for the detection of target collagen sequences using a short probe peptide

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ABSTRACT:

The development of novel assays to detect collagen fragments is of utmost importance for diagnostic, prognostic and therapeutic decisions in various collagen-related diseases, and one essential question is to discover probe peptides that can specifically recognize target collagen sequences. Herein we have developed the fluorescence self-quenching assay as a convenient tool to screen the capability of a series of fluorescent probe peptides of variable lengths to bind with target collagen peptides. We have revealed that the targeting ability of probe peptides is length-dependent, and have discovered a relatively short probe peptide FAM-G(POG)₈ capable to identify the target peptide. We have further demonstrated that fluorescence self-quenching assay together with this short probe peptide can be applied to specifically detect the desired collagen fragment in complex biological media. Fluorescence self-quenching assay provides a powerful new tool to discover effective peptides for the recognition of collagen biomarkers, and it may have great potential to identify probe peptides for various protein biomarkers involved in pathological conditions.

¹ Equal contribution.

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