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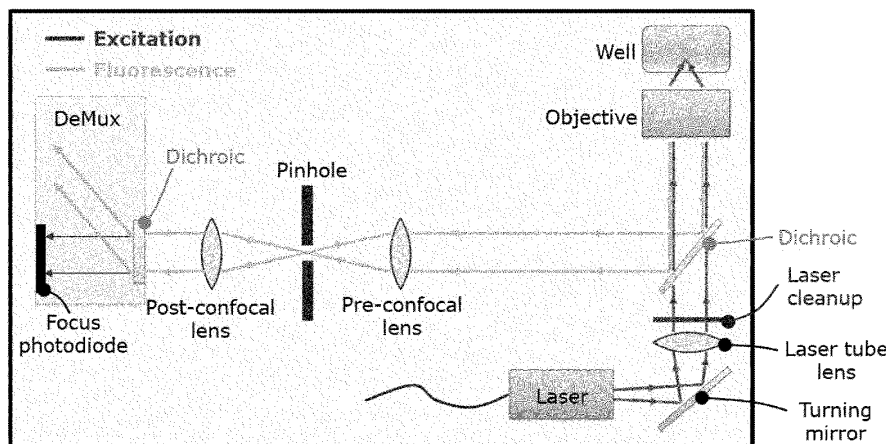
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(54) Title: OPTICAL DESIGN FOR A FIBER-COUPLED, SINGLE-MOLECULE DETECTION INSTRUMENT



(57) Abstract: A Method and a detection system for detecting protein concentrations in a prepared assay solution consisting of several components, arranged after each other, the components being a fiber coupled laser for emitting laser light, a laser tube lens to focus the laser light, a laser cleanup filter for blocking non-laser wavelengths, a first dichroic filter for passing the laser light and reflecting fluorescence light, an objective lens to focus the laser light to a small excitation volume, the objective also collecting fluorescence light emitted from a sample, a pre-confocal and a post-confocal lens with a pinhole positioned between them to focus and re-focus the fluorescent light, a second dichroic filter, a focus photodiode for auto-focusing on the sample, at least one bandpass filter for spectrum filtering of the fluorescent light, at least one fiber focus lense for coupling the fluorescent light to an optical fiber, at least one fiber patch cables to couple fluorescently focused light to at least one computer-based detector for signal detection, wherein the sample is

[Continued on next page]

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located after the objective lens, the second dichroic filter, the focus photodiode and the at least one bandpass filter are forming a De-Multiplexer for the incoming fluorescence light and the at least one bandpass filter, at least one fiber focus lense, at least one fiber patch cables and at least one computer-based detector always consist of same the number and one of each of them are located along a respective fluorescence light.