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Photodynamic diagnosis (PDD) of bladder tumour tissue significantly improves endoscopic diagnosis and treatment of bladder cancer in rigid cystoscopes in the operating theatre and thus reduces tumour recurrence. PDD comprises the use of blue light, which unfortunately excites green fluorescence from urine. As this green fluorescence confounds the desired red fluorescence of the PDD, methods for avoiding this situation particularly in cystoscopy using flexible cystoscopes are desirable. In this paper we demonstrate how a tailor made high power LED light source at 525 nm can be used for fluorescence assisted tumour detection using both a flexible and rigid cystoscope used in the outpatient department (OPD) and operating room (OR) respectively. It is demonstrated both in vitro and in vivo how this light source can significantly reduce the green fluorescence problem with urine. At the same time this light source also is useful for exciting autofluorescence in healthy bladder mucosa. This autofluorescence then provides a contrast to the sensitized fluorescence (PDD) of tumours in the bladder.

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