Title:	Multi-stimuli programmable FRET† based RGB absorbing antennae towards ratiometric temperature, pH and multiple metal ion sensing
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Abstract:	A red-green-blue (RGB) multichromophoric antenna 1 consisting of energy donors naphthalimides and perylenediimides and a central aza-BODIPY energy acceptor along with two subchromophoric red-blue (RB 6) and green-blue (GB 12) antennae was designed that showed efficient cascade Förster resonance energy transfer (FRET). RGB antenna 1 showed pronounced temperature-dependent emission behaviour where emission intensities in green and red channels could be tuned in opposite directions by temperature giving rise to unique ratiometric sensing with a temperature sensitivity of 0.4% °C. RGB antenna 1 showed reversible absorption modulation selectively in the blue region (RGB ↔ RG) upon acid/base addition giving rise to pH sensing behaviour. Furthermore, RGB antenna 1 was utilized to selectively sense metal ions such as Co2+ and Fe3+ through a FRET turn-off mechanism induced by a redox process at the aza-BODIPY site that resulted in the selective spectral modulation of the red band (i.e., RGB → GB). Model antenna RB 6 showed white light emission with chromaticity coordinates (0.32, 0.33) on acid addition. Antennae 1, 6 and 12 also exhibited solution state electrochromic switching characterized by distinct colour changes upon changing the potential. Finally, antennae 1, 6 and 12 served as reversible fluorescent inks in PMMA/antenna blends whereby the emission colours could be switched or tuned using different stimuli such as acid vapour, temperature and metal ions.
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