Supporting Information for

A reversible fluorescent probe for monitoring Ag(I) ions

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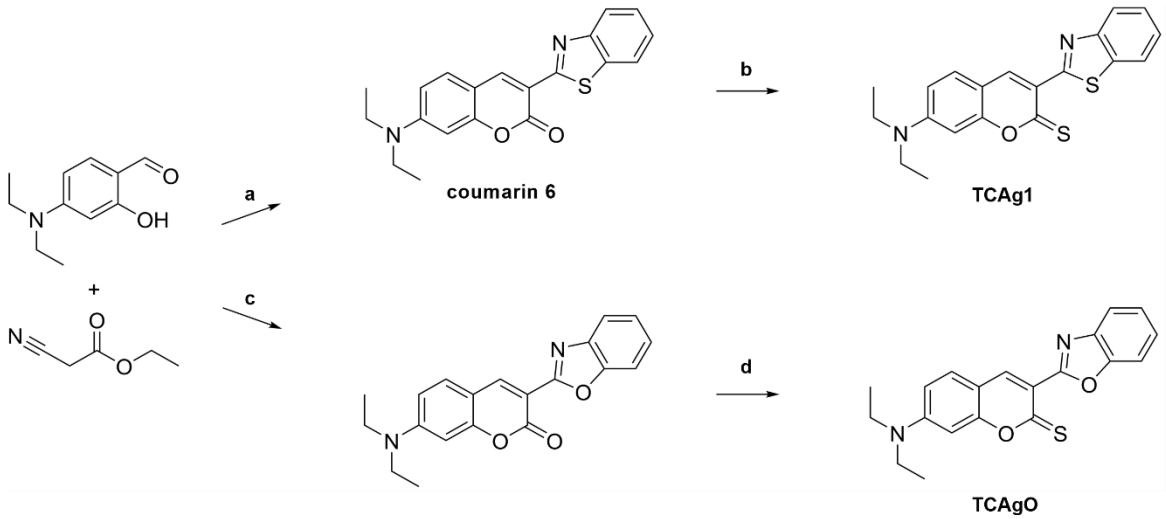
Supplementary figures



Scheme S1. Synthesis of 3-(benzo[d]thiazol-2-yl)-7-(diethylamino)-2*H*-chromene-2-thione (**TCAg1**) and 3-(2-benzoxazolyl)-7-(diethylamino)-2*H*-1-benzopyran-2-one (**TCAgO**). Reagents and conditions: a) 2-aminobenzenethiol, piperazine, ethanol, reflux, 16 h, 71%, b) Lawesson's reagent, toluene, reflux, 18 h, N_2, 60%; c) 2-aminophenol, benzoic acid, ethanol, reflux, 24 h, 72%; d) Lawesson's reagent, toluene, reflux, 3 d, N_2, 73%.

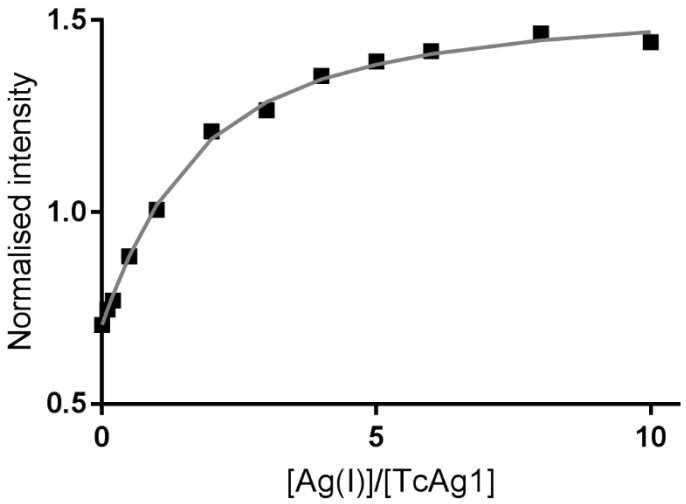


Figure S1. Titration of **TcAg1** (10 µM) with increasing concentrations of Ag(I) (1:1 THF/H_2O, λ_{ex} = 530 nm) enables calculation of a binding affinity of 9.1 ×10^4 M. Grey curve indicates fit, black squares are collected data.

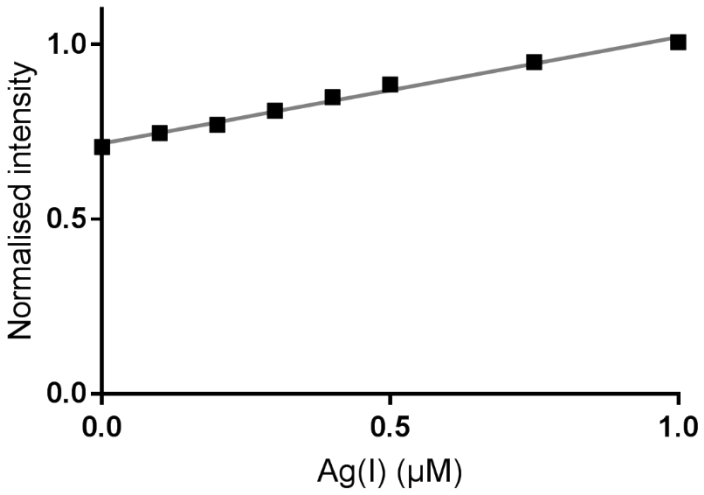


Figure S2. Titration of **TcAg1** (10 μM) with small concentrations of Ag(I) (1:1 THF/H2O, λ_{ex} = 530 nm) enables calculation of a limit of detection of 0.13 μM. Grey curve indicates regression line, black squares are collected data. Limit of detection (LOD) was calculated to be 0.13 μM from the equation LOD = $3s_{y/x} \div b$, where $s_{y/x}$ = the error on the slope (0.0127), and b is the slope of the regression line (0.305).

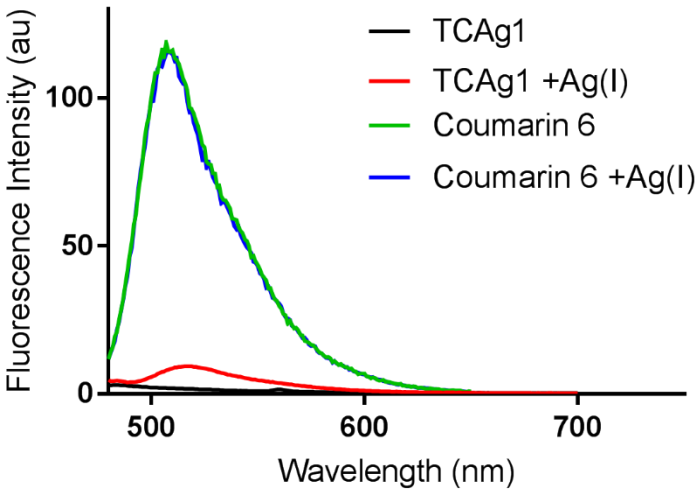


Figure S3. Fluorescence emission spectra of **TCAg1** and coumarin 6 in 1:1 THF/H_2O, λ_{ex} = 470 nm. 10 µM **TCAg1** (black); 10 µM **TCAg1** with 10 eq. Ag(I) (red); 1 µM coumarin 6 (green); 1 µM coumarin 6 with 10 eq. Ag(I) (blue).

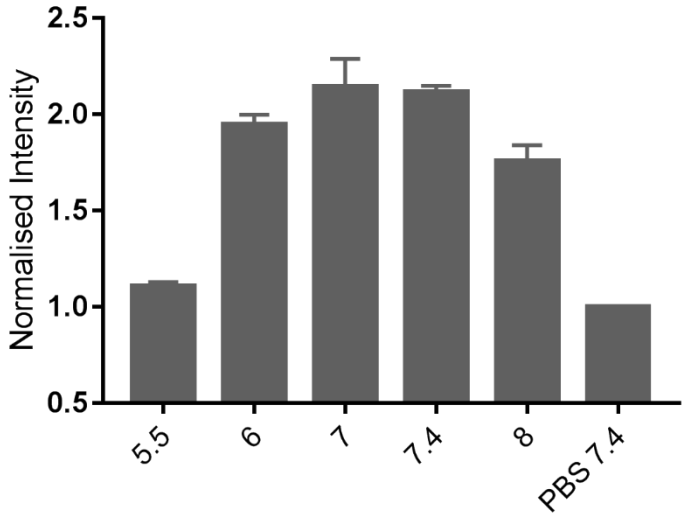


Figure S4. pH screen of **TCAg1** (10 µM probe, 100 µM Ag(I), 1:1 THF:buffer; pH 5.5 and 6 in 20 mM MES buffer; pH 7, 7.4 and 8 in 20 mM HEPES buffer). λ_{ex} = 530 nm, λ_{em} = 565 nm. Error bars represent standard deviation (*n* = 3).

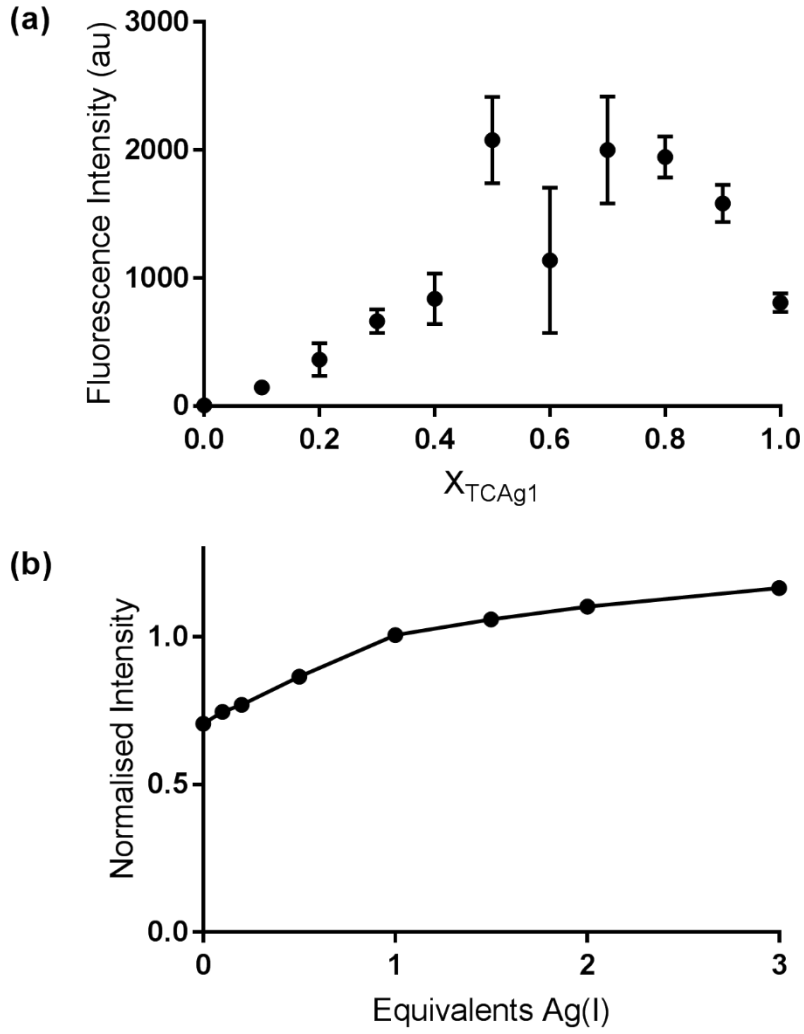


Figure S5. (a) Job's plot of **TCAg1** with added Ag(I) ($X_{\mathbf{TCAg1}}$ = mole fraction of probe). Error bars represent standard deviation (n = 3). (b) Normalised intensity of **TcAg1** with increasing concentrations of Ag(I) (10 µM probe, 1:1 THF/H_2O, λ_{ex} = 530 nm, λ_{em} = 565 nm).

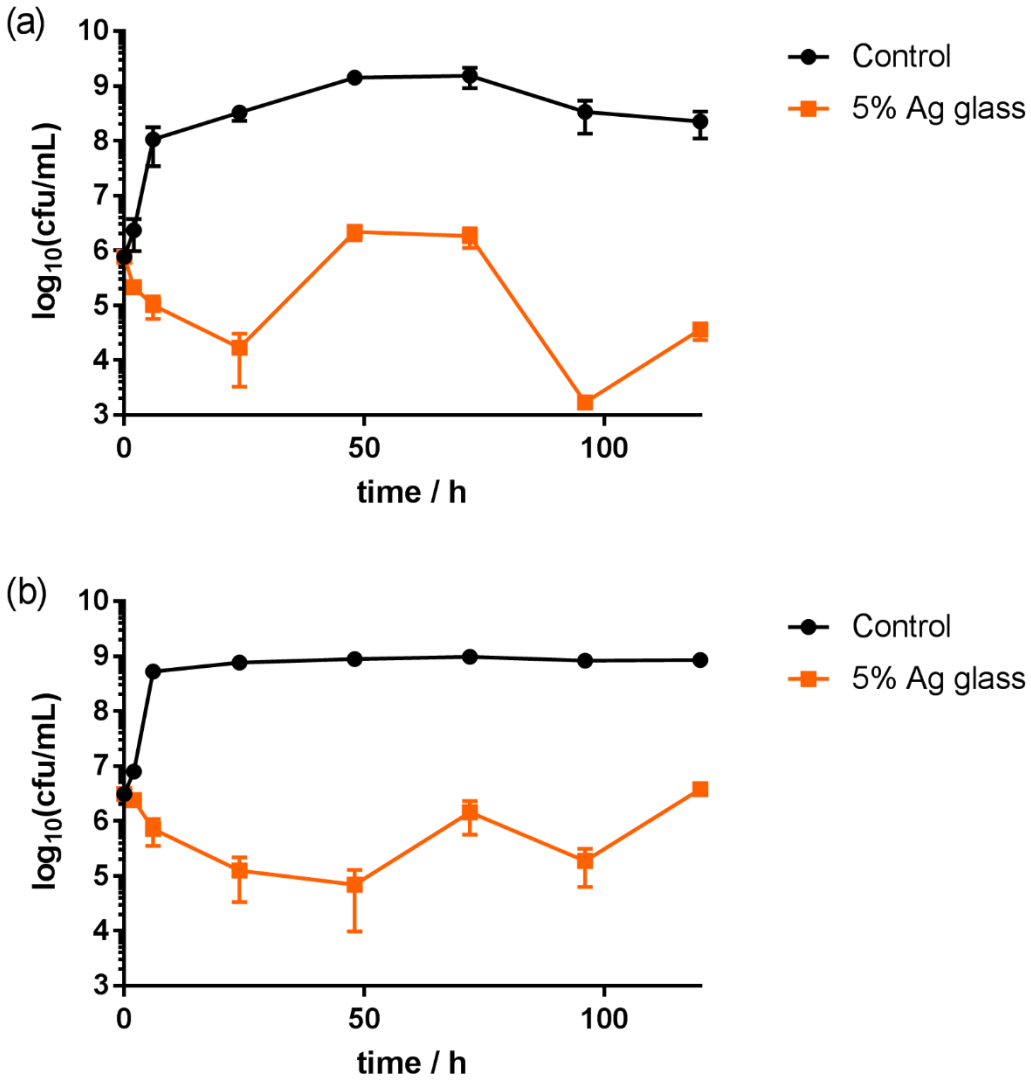


Figure S6. Effect of silver glass on planktonic bacterial growth of (a) *S. aureus* and (b) *E. coli*.

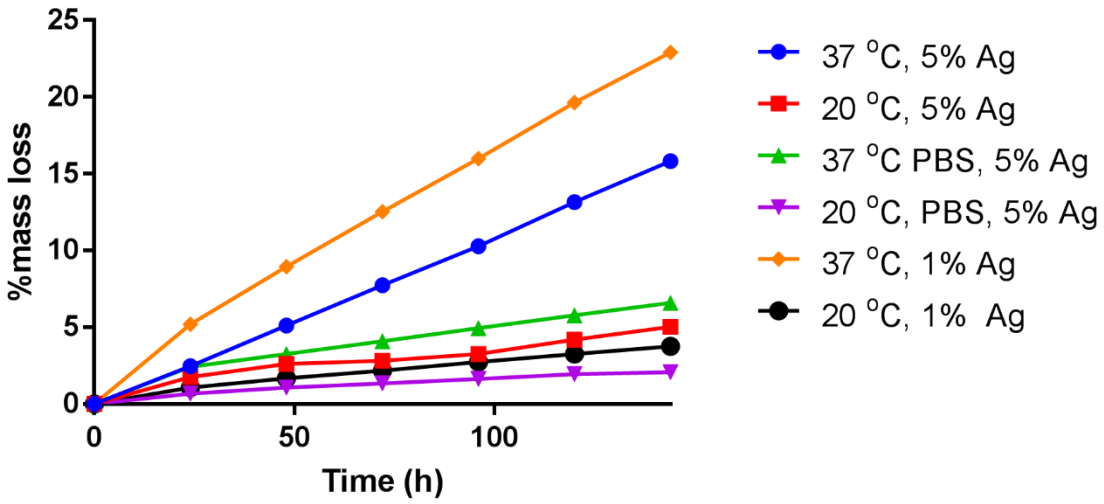


Figure S7. Percentage mass loss of silver-doped glasses incubated at the temperatures indicated in distilled water or phosphate-buffered saline (PBS, pH 7.4).

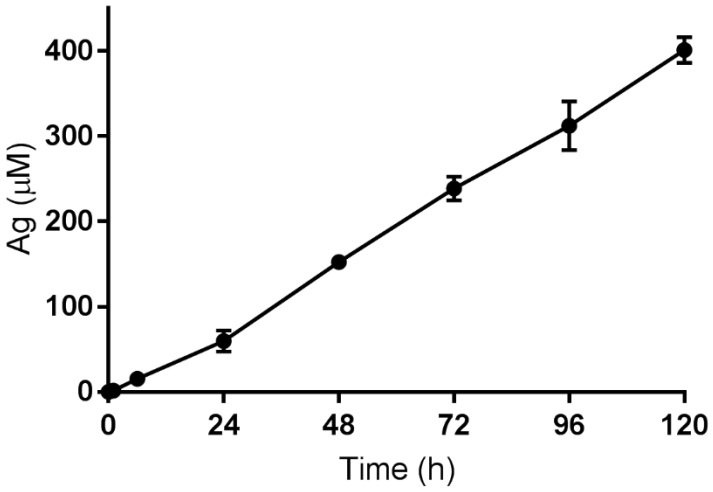


Figure S8. Silver concentrations of distilled water incubated with 5% Ag-doped phosphate glass for specified times (37 °C), as determined by ICP-MS. Error bars represent standard deviation (*n*=3).

References

(1) Choi, M. G.; Kim, Y. H.; Namgoong, J. E.; Chang, S.-K. *Chemical Communications* **2009**, 3560.

(2) Ye, F.-F.; Gao, J.-R.; Sheng, W.-J.; Jia, J.-H. *Dyes and Pigments* **2008**, *77*, 556.