Supporting information for

Visualizing biomaterial degradation by *Candida albicans* using embedded luminescent molecules to report on substrate digestion and cellular uptake of hydrolysate

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Materials characterization

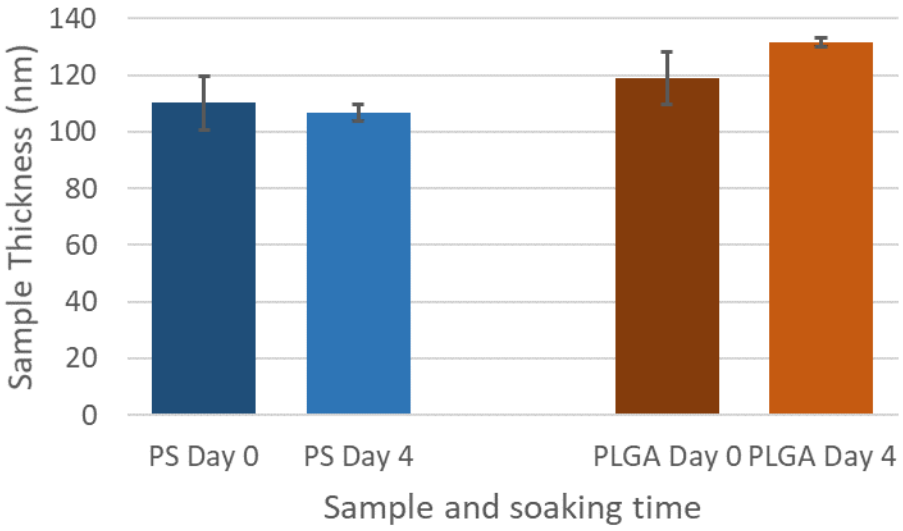
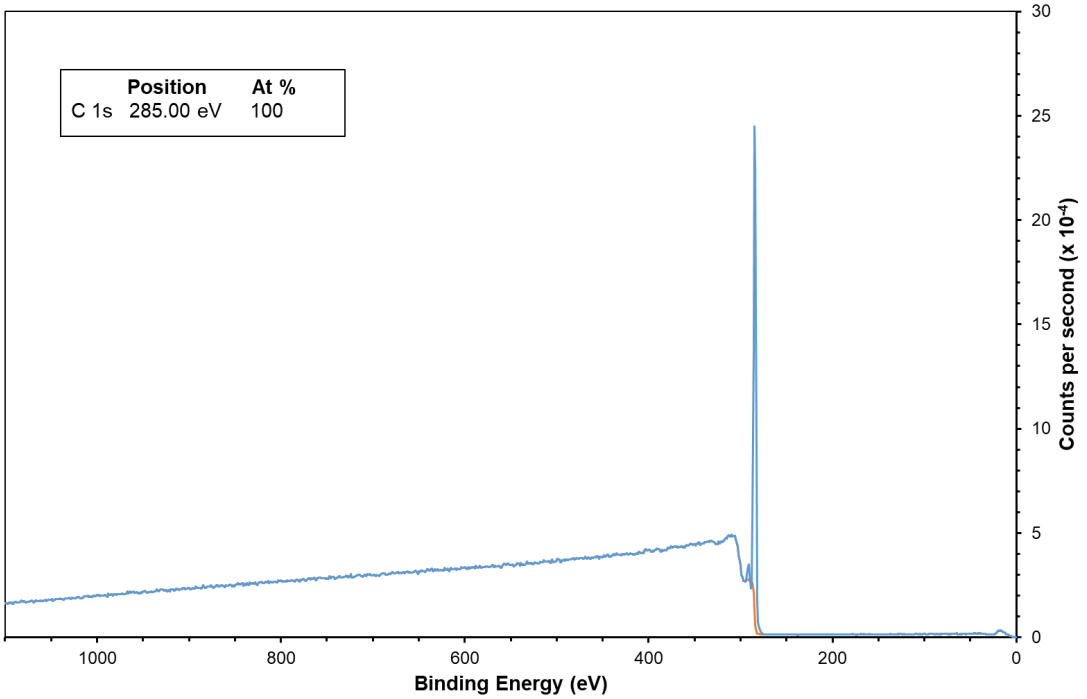


Figure S1. Thickness by spectroscopic ellipsometry of PS and PLGA coatings containing Ir-based dye measured after prepared and four days' soaking in PBS. (n = 3, with error bars representing the standard deviation).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20
15
10
5
0
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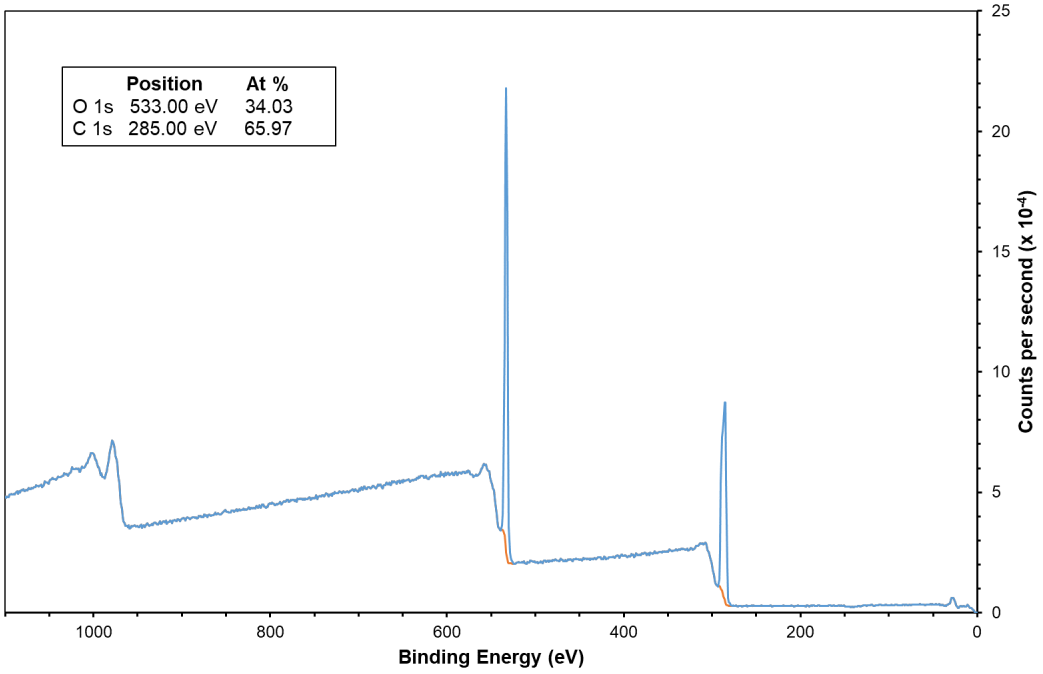
800
600
400
200
0
Binding Energy (eV)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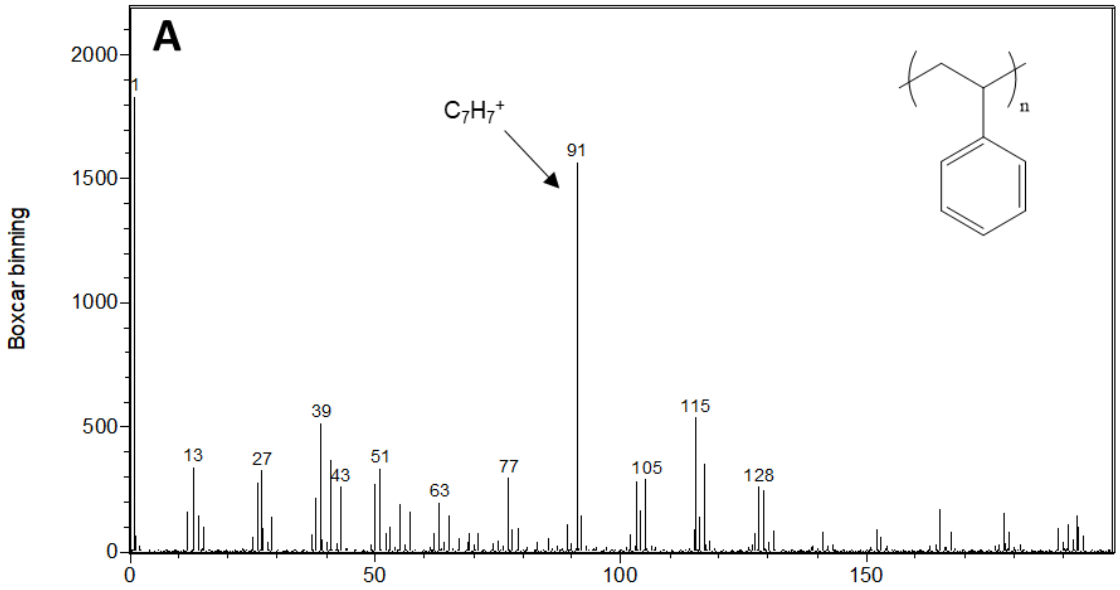
Binding Energy (eV)

Figure S2. XPS Survey spectra for PS (Top) and PLGA (bottom) coatings on silicon wafers. These coatings contained the ReZolve-ER fluorescent probes.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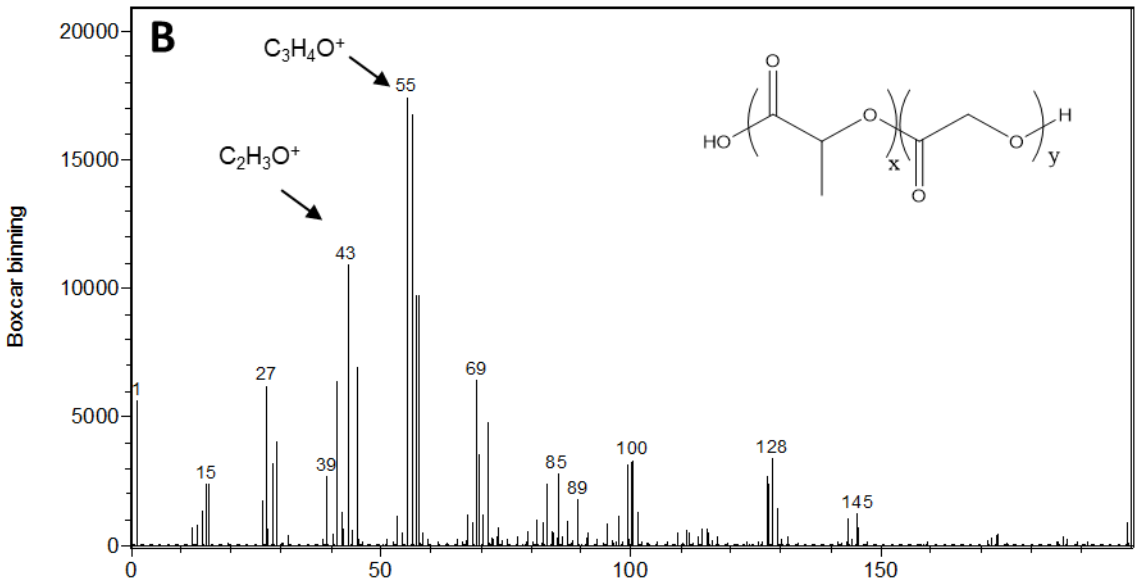
n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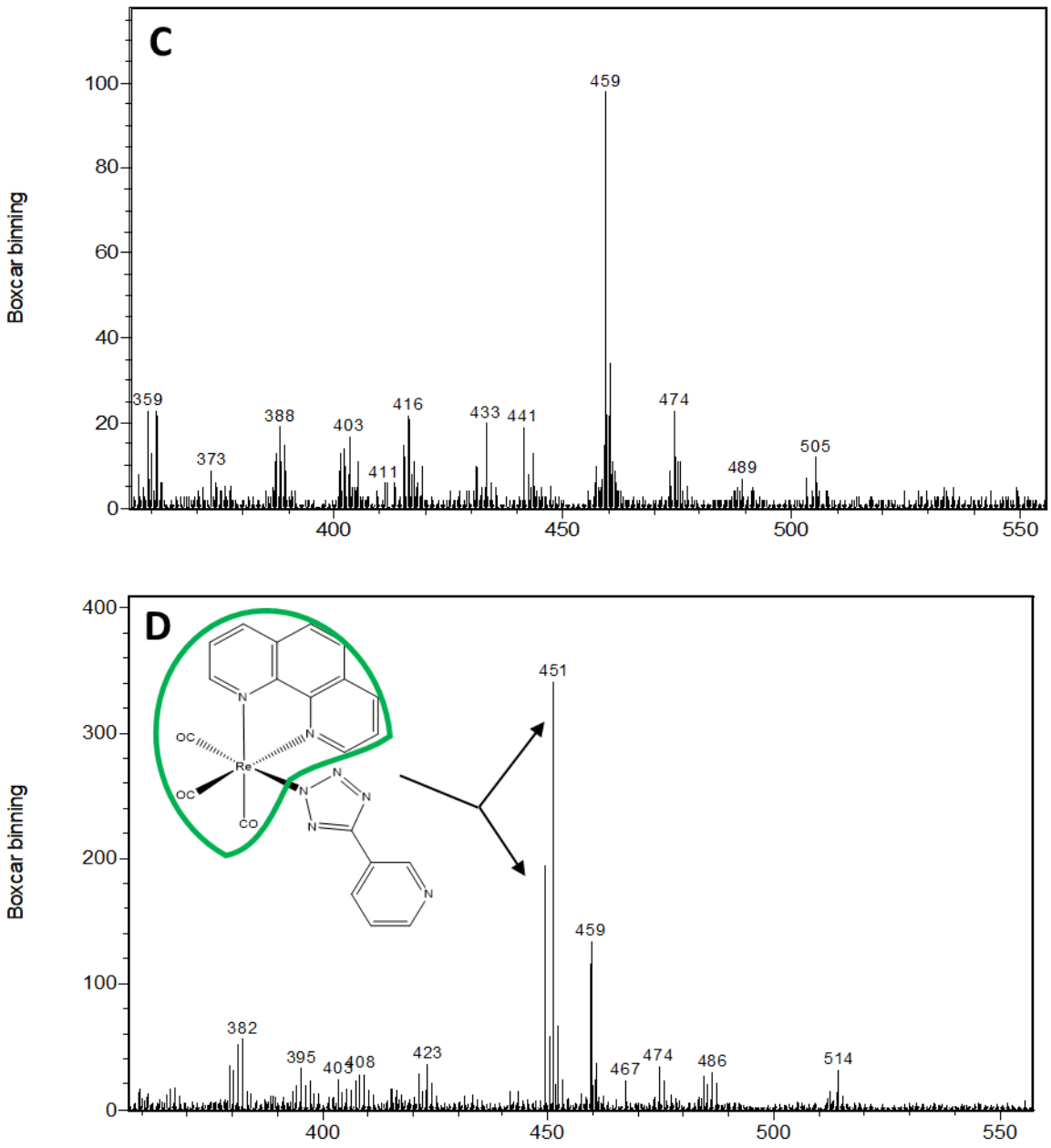

Figure S3. ToF-SIMS positive ion spectra of the low molecular mass region for PS (A) and PLGA (B) showing characteristic mass fragments and polymer chemical formulas (inset). Positive ion spectra of high-mass regions from PLGA coatings where the probe

was absent (C) or present (D) with characteristic fragment containing isotopic Re and ligands producing two peaks at m/z = 449 and 451 amu.

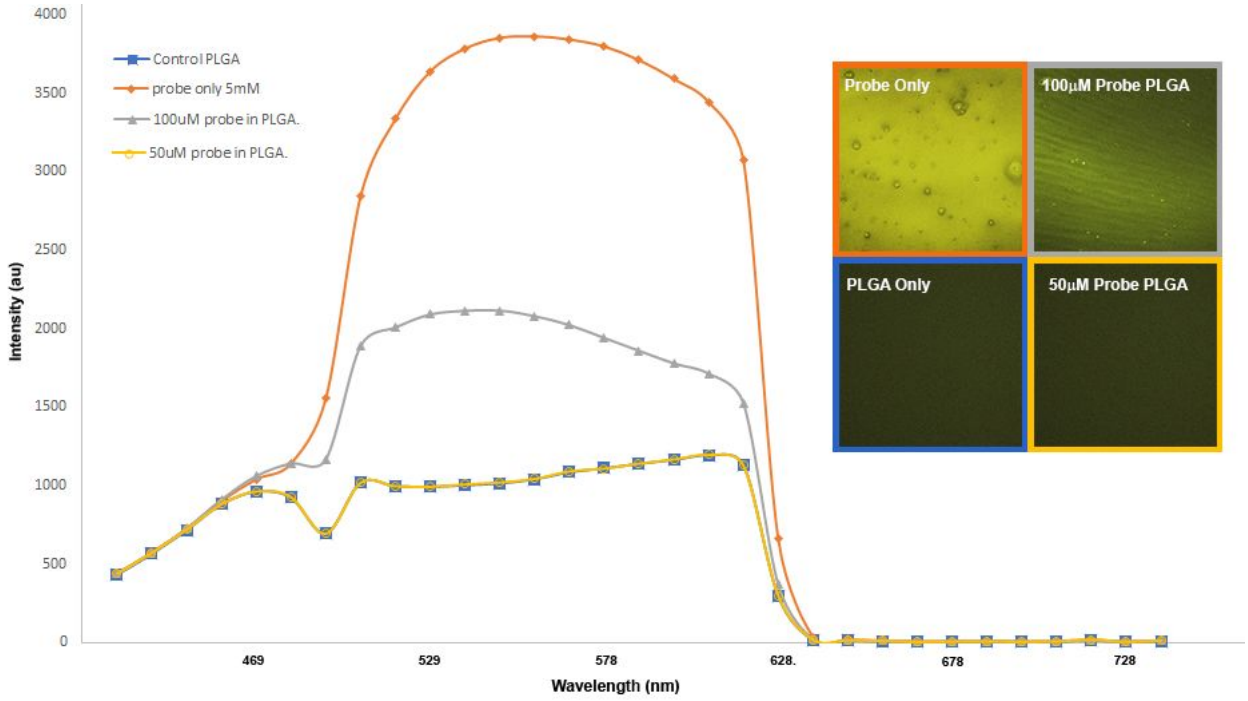

Figure S4. Emission signal intensity of the control PLGA substrate (blue squares), the ReZolve-ER probe in solution (probe only, orange), and embedded in PLGA materials (from 100 µM solution, grey; from 50 µM solution, yellow). A concentration of 100 µM of probe used in the spin-casting solution produced a signal that could be identified within the polymer matrix and showed up on micrographs (inset).

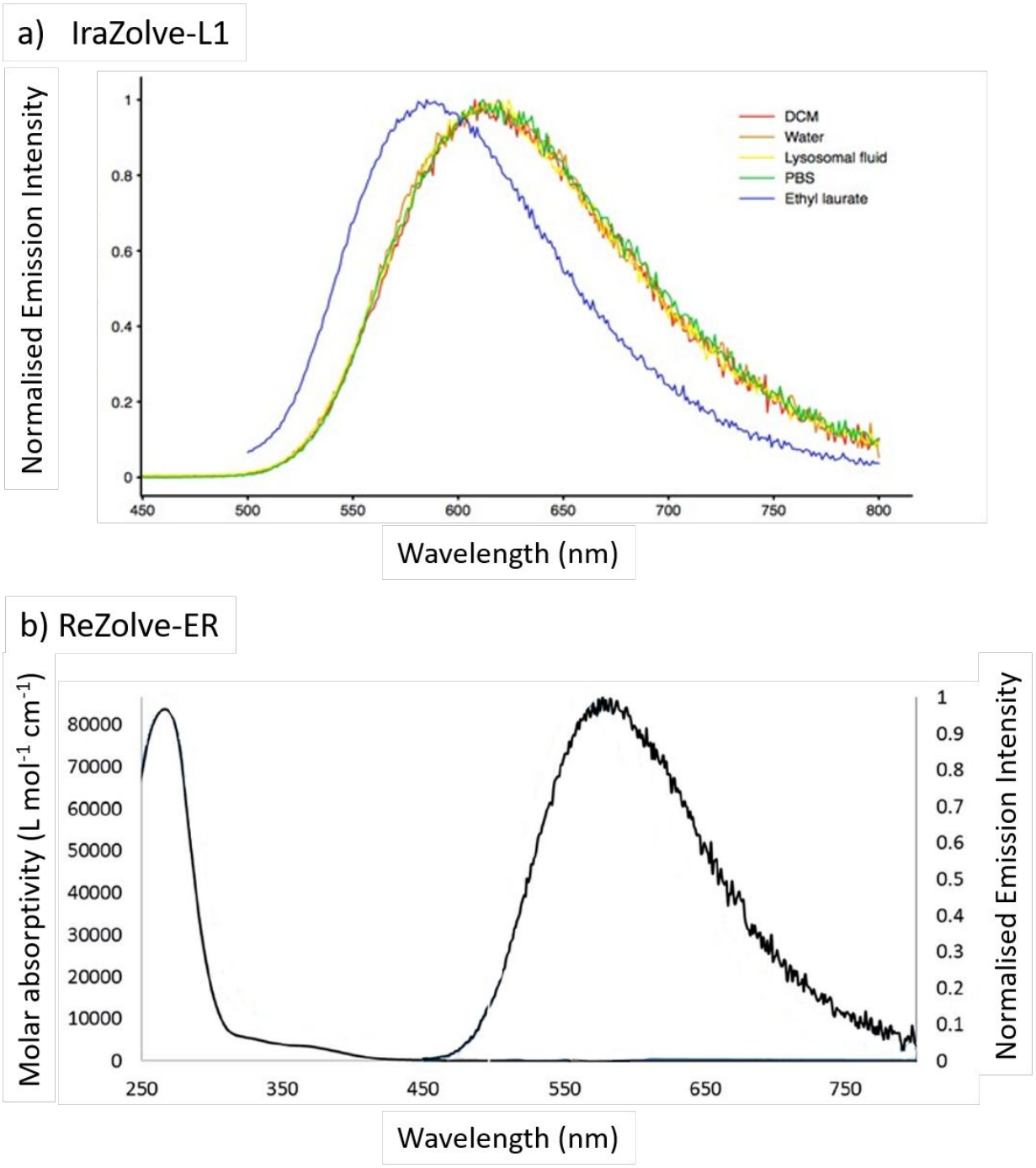

Figure S5. Emission intensity profiles for luminescent probes used in experiments. a) IraZolve-L1 probe in different solvents and b) molar absorptivity and emission intensity for ReZolve-ER.

Culturing *C. albicans*

In this study, it was important to prepare fungal cultures to ensure that the organism was metabolically active (i.e. in log phase growth) and capable of degrading materials substrates. We found that using previously frozen cultures that were cultured once overnight on Sabouraud agar (SAB) at 37°C were not metabolically active and grew very slowly on substrates. However, when subcultured and incubated again for an additional 24 hours, cultures were much more metabolically active and were suitable for surface experiments.

Also, it was found that choice of culture medium was important when studying the potential degradation of surface coatings. Initial surface experiments using *C. albicans* on surfaces used the defined RPMI (Roswell Park Memorial Institute) medium for culturing, however, the yeast took preferential advantage of the nutrients available in solution and failed to digest the polyester substrate to which it was adhered. However it was found that using a minimal medium NANG (no amino acids, no glucose), provided no externally

delivered benefit for the yeast and thus the adaptable yeast used the PLGA substrate a source of nutrition.