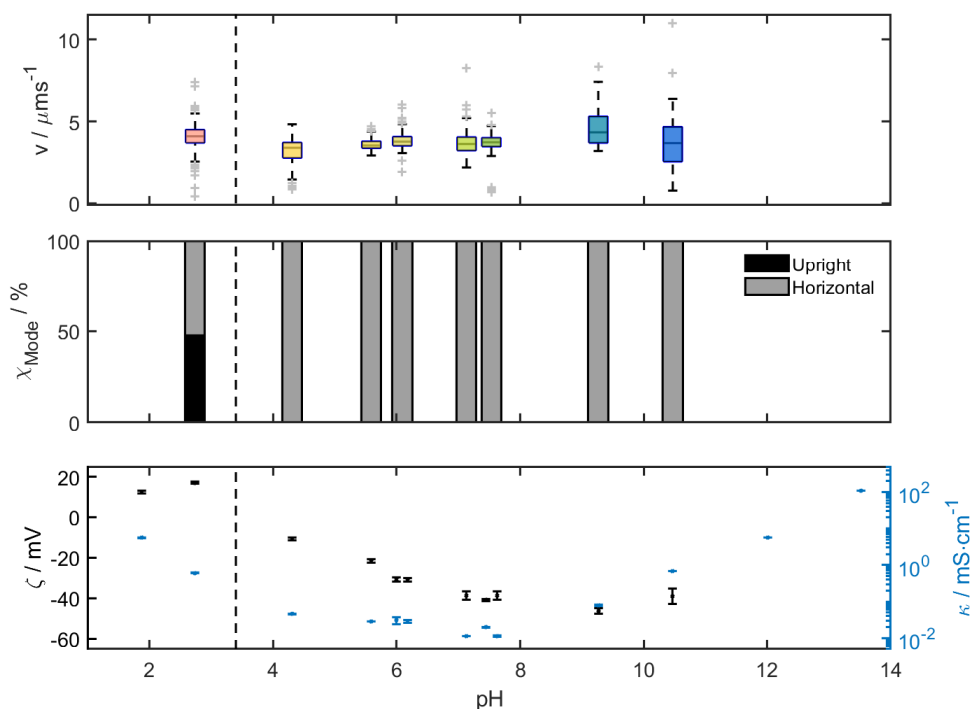


# Supplementary Materials: Progress Report on pH-Influenced Photocatalysis for Active Motion

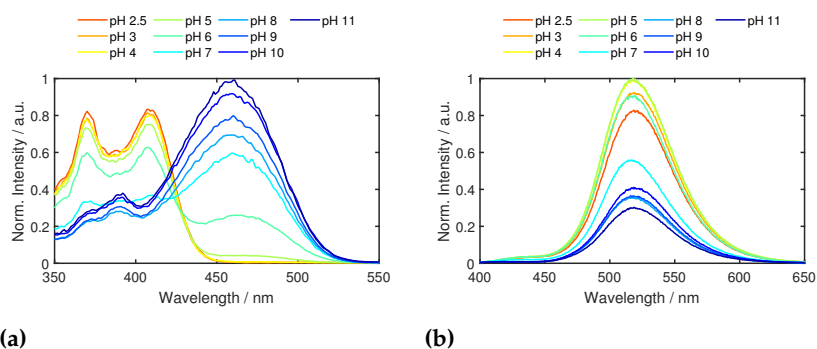
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## 1. Motion modes of spheroidal swimmers



**Figure S1.** Motion characteristics of spheroidally-shaped swimmers at different pH values. First graph shows box plots for mean speed distributions (colors correspond to universal pH indicator color index, grey crosses represent outliers), second plot illustrates ratio between upright and horizontal motion at corresponding pH and third plot shows zeta potential of particles and conductivity of the solution. Dashed line marks the  $\text{pH}_{\text{PZC}} = 3.4$

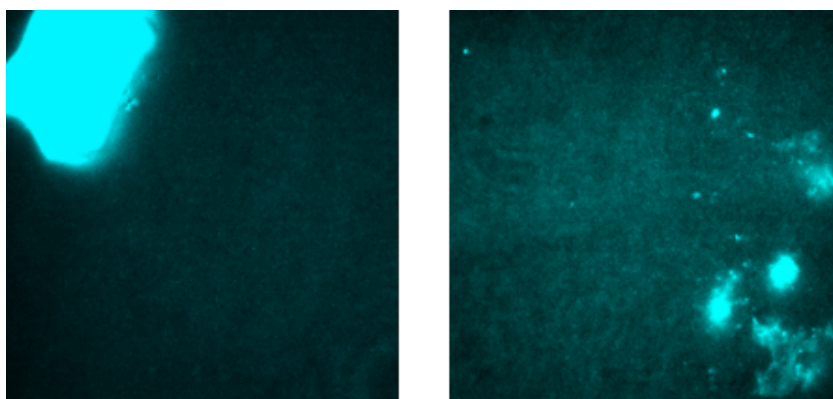
## 2. Fluorescence spectroscopy of free HPDASCl-APTES



**Figure S2.** (a) Excitation and (b) emission spectra of HPDASCl-APTES. For excitation spectra, emission wavelength was set to 560 nm. For emission spectra, samples were excited at a wavelength of 365 nm.

**Table S1:** Excitation and emission maxima of HPDASCl-APTES immobilized on SiO<sub>2</sub> mi-croparticles ( $d = 463 \pm 29$  nm) in this work and for Clasen *et al.*[1]

	This work	Clasen <i>et al.</i> [1]
$\lambda_{max,exc}$	ROH : 406 nm	ROH : 414 nm
	RO <sup>-</sup> : 454 nm	RO <sup>-</sup> : 497 nm
$\lambda_{max,emm}$	ROH : -	ROH : 453 nm
	RO <sup>-</sup> : 512 nm	RO <sup>-</sup> : 530 nm



**Figure S3.** Fluorescence microscopy images of substrates functionalized with HPDASCl with a concentration of  $1.41 \cdot 10^{-4} \text{ mmol} \cdot \text{L}^{-1}$ . Samples were excited with a 488 nm laser and imaged with 588 nm cutoff filter. Note: emission is also detected when exciting with a 405 nm laser, indicating ESPT behavior. However, as the intensities were lower, we chose to use 488 to optimally visualize the spatial distribution of the functionalization.

1. Clasen, A.C. Immobilisierbare Pyrenderivate zur Anwendung als pH-Sonde. PhD thesis, Saarland University, 2019.