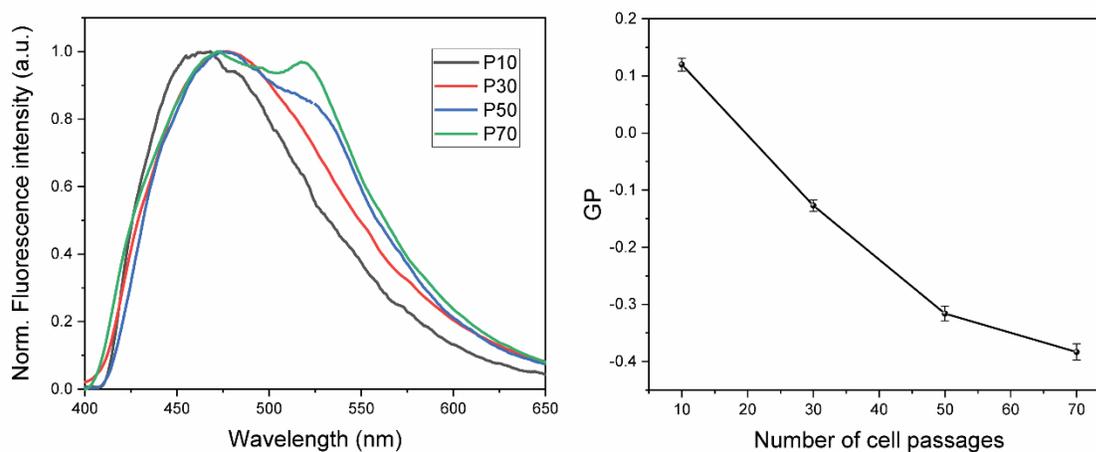


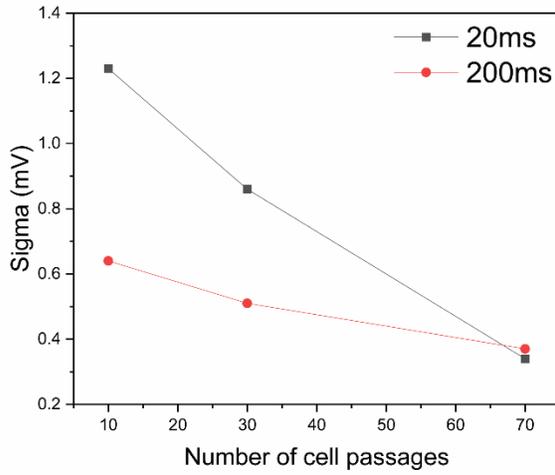
# SUPPORTING INFORMATION

## Membrane Order Effect onto the Photoresponse of Organic Transducer

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**Figure S1.** Laurdan Spectra evolution as a function of cell passage number. a) Laurdan emission spectra acquired in HEK-293T cells at a different passage number. b) Evolution of the extracted GP value as a function of cell passage number. Data are represented as mean  $\pm$  SD.



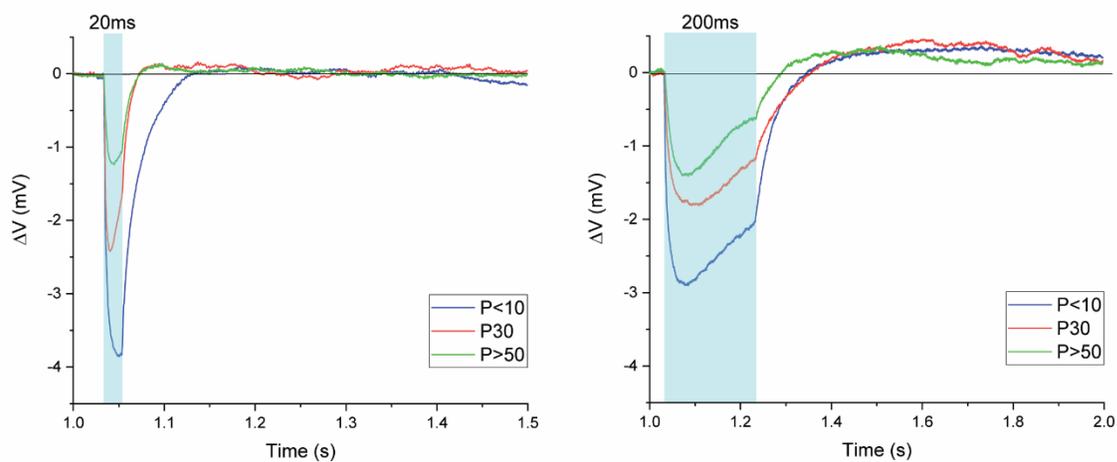
**Figure S2.** Standard deviation value of the cell membrane potential modulation as a function of the cell passage number. These values are reported as a results of 20ms (black line) and 200ms (red line) light pulses duration.

**Table S1.** Resulting values of the deconvolution process for 460nm component ( $I_B$ ) and its standard deviation ( $\sigma_B$ ) and for 510nm component ( $I_G$ ) and its standard deviation ( $\sigma_G$ ). GP and  $\sigma_{GP}$  value obtained by the previous parameters. All the values are extracted or calculated at different cell passage number.

	$I_B$	$\sigma_B$	$I_G$	$\sigma_G$	GP	$\sigma_{GP}$
P10	0,707	0,007	0,555	0,006	0,120	0,011
P30	0,538	0,006	0,695	0,005	-0,127	0,010
P50	0,443	0,008	0,853	0,005	-0,316	0,013
P70	0,391	0,008	0,876	0,006	-0,383	0,015

**Table S2.** Resulting values of the deconvolution process for 460nm component ( $I_B$ ) and its and for 510nm component ( $I_G$ ) obtained at 40°C.  $GP_{40^\circ}$  value was calculated by the previous parameters while  $GP_{20^\circ}$  was taken by Supporting Table 1.  $\Delta GP$  and  $\sigma_{\Delta GP}$  was calculate as difference between GP calculated at 40°C and 22°C. All the values are extracted or calculated at different cell passage number.

	$I_B$	$I_G$	$GP_{40^\circ}$	$GP_{22^\circ}$	$\Delta GP$	$\sigma_{\Delta GP}$
P10	0,465	0,538	-0,073	0,120	-0,193	0,021
P30	0,229	0,673	-0,492	-0,127	0,365	0,025
P70	0,066	0,774	-0,843	-0,383	0,460	0,072



**Figure S3.** Representative traces of membrane potential hyperpolarization of Ziapin2-treated HEK-293T cells at increasing cell passages. Light stimulation (power density: 53mW/mm<sup>2</sup>) persists for both 20ms (left) and 200ms (right).