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Automatic Actin Filament Quantification and Cell Shape Modeling of Osteoblasts on Charged Ti Surfaces

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Supplementary Material

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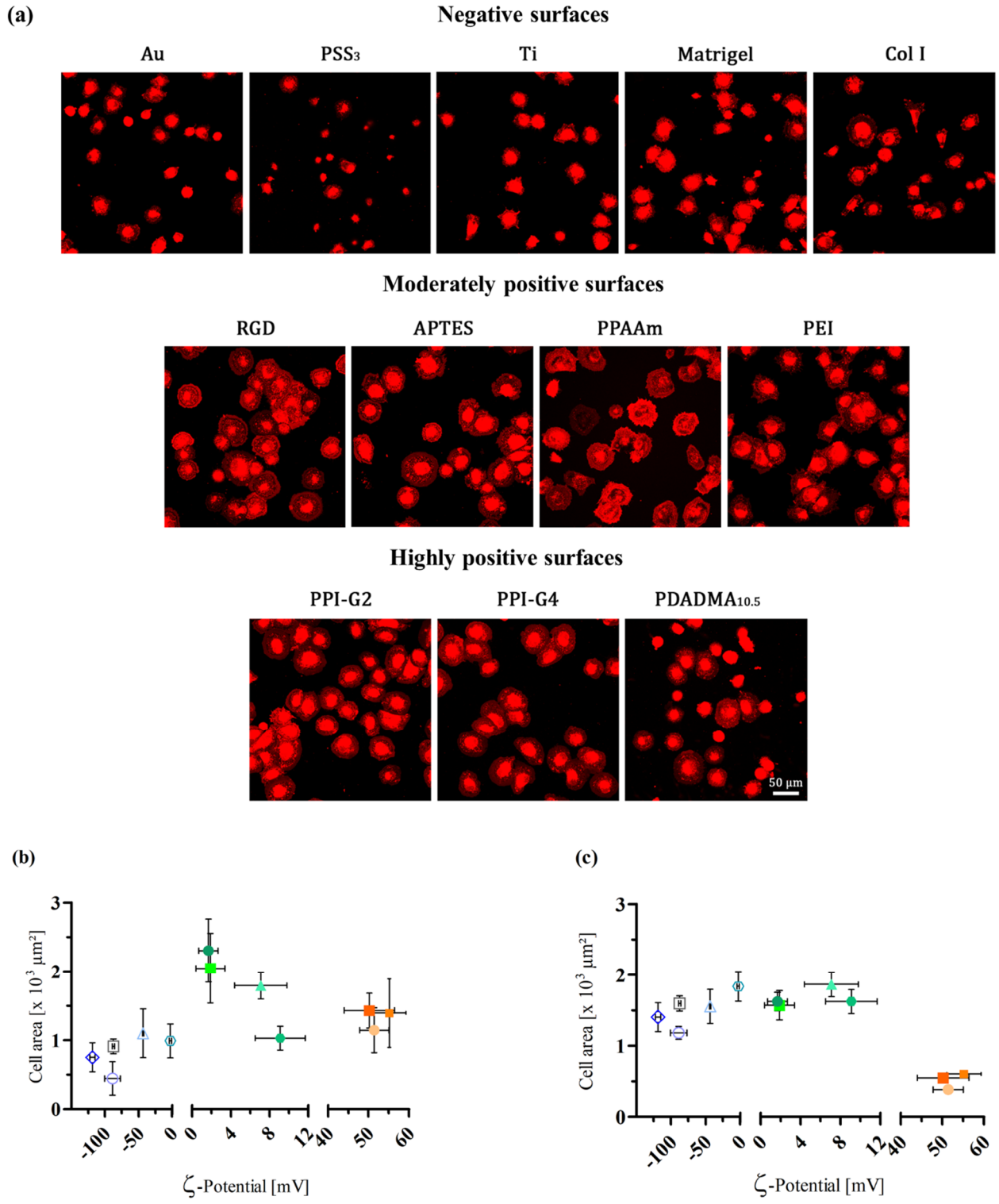

Figure S1. Spreading course of MG-63s on modified Ti surfaces dependent on the ζ-potential. (**a**) Microscopic images of PKH26 stained cells after 1 h on negative, moderately, and highly positive surfaces. (**b**) Cell area after 1 h and (**c**) after 24 h on charged surfaces. Note that cells on highly positive surfaces exhibit impaired cell spreading. For information on the conducted PKH26 membrane staining, see Gruening et al. 2020 [2], and for surface preparation and characteristics, see Gruening et al. 2020 [1]. Plot: cell areas in mean ± SD; surfaces from negative to positive ζ-potential: Au (gold), PSS (polystyrene sulfonate), Ti (titanium), Matrigel, Col I (collagen type I), RGD (arginine–glycine–aspartate sequence), APTES (3-aminopropyltriethoxysilane), PPAAm (plasma polymerized allylamine), PEI (polyethylenimine), PPI-G4 (polypropylenimine dendrimer generation 4), PDADMA (polydiallyldimethylammonium chloride), and PPI-G2 (polypropylenimine dendrimer generation 2).

Table S1. Cell spreading data of 1 and 24 h dependent on the ζ-potential. Shown are ζ-potential values in means ± SD from Gruening et al. [1], cell area values in mean ± SD and circularity in medians with 25th and 75th quartiles in gray. Statistics: Kruskal–Wallis + Dunn's, $p < 0.05$, * significance to Ti and # significance to PPAAm; $n = 3$ independent experiments.

	Surface	Au	PSS_3	Ti	Matrigel	Col I	RGD	APTES	PPAAm	PEI	PPI-G4	$PDADMA_{10.3}$	PPI-G2
	ζ-Potential [1]	−118.7 ± 4	−88.8 ± 12	−87.5 ± 2	−43.3 ± 1	−2.8 ± 1	1.7 ± 1	1.9 ± 1	7.1 ± 3	9.1 ± 3	50.2 ± 6	51.4 ± 4	55.2 ± 4
1 h	**Cell area**	749 # ± 212	443 #* ± 241	910 # ± 104 [2]	1099 # ± 354	990 # ± 246	2044 #* ± 507	2301#* ± 458	1792 * ± 195 [2]	1028 # ± 172	1428 * ± 253	1144 # ± 325 [2]	1392 #* ± 498
	Circularity	0.68 # *0.61* *0.75*	0.73 #* *0.67* *0.78*	0.69 # *0.6* *0.74*	0.68 # *0.63* *0.73*	0.59 * *0.51* *0.67*	0.71 #* *0.66* *0.77*	0.66 # *0.57* *0.73*	0.61 * *0.51* *0.69*	0.68 # *0.62* *0.73*	0.75 #* *0.68* *0.79*	0.72 #* *0.65* *0.76*	0.78 #* 0.73 0.81
24 h	**Cell area** [1]	1402 ± 202	1181 # ± 90	1595 ± 108	1553 ± 241	1836 ± 210	1568 ± 207	1623 ± 131	1865 ± 175	1621 ± 169	547 #* ± 45	383 #* ± 42	601 #* ± 40
	Circularity	0.42 *0.34* *0.61*	0.50 *0.36* *0.57*	0.36 *0.28* *0.45*	0.50 *0.38* *0.65*	0.37 *0.26* *0.50*	0.46 *0.40* *0.64*	0.45 *0.36* *0.66*	0.44 *0.37* *0.54*	0.38 *0.32* *0.49*	0.74 #* *0.67* *0.77*	0.77 #* *0.74* *0.81*	0.73#* 0.69 0.77

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