Electronic Supplementary Material (ESI) for Journal of Materials Chemistry B.

Supplementary Information

Table S1 Kinetic characteristics of the isolated recombinant enzymes. The following substrates were used: pNPGP for CelB-R_6, Glucose and ADP for GKin-R_6, and Glucose-6-phosphate and $NADP^+$ for G6PDH-R_6. The kinetic constants of the enzymes have been determined in solution (s) and immobilized on diatom silica (i).

	Yield (mg L^{-1})	**K_M** (mM)	**V_{max}** (µmol min^{-1} mg^{-1})	**k_{cat}** (min^{-1})	**k_{cat}/K_M** (mM^{-1} min^{-1})
CelB-R_6	76	1.24 ± 0.04 (s) 1.45 ± 0.08 (i)	119.8 ± 4.2 (s) 32.62 ± 0.4(i)	6718 ± 236 (s) 1812 ± 20 (i)	5654 ± 388 (s) 1209 ± 60 (i)
GKin-R_6	73	5.21 ± 0.2 (s) 5.23 ± 0.4(i)	8.16 ± 0.07 (s) 6.34 ± 0.3 (i)	424 ± 3 (s) 345 ± 15 (i)	80.5 ± 3 (s) 63.6 ± 2.5 (i)
G6PDH-R_6	46	1.76 ± 0.05 (s) 1.67 ± 0.1 (i)	2.57 ± 0.04 (s) 1.32 ± 0.02 (i)	133 ± 3 (s) 71.2 ± 1 (i)	72.5 ± 3 (s) 40.0 ± 3 (i)

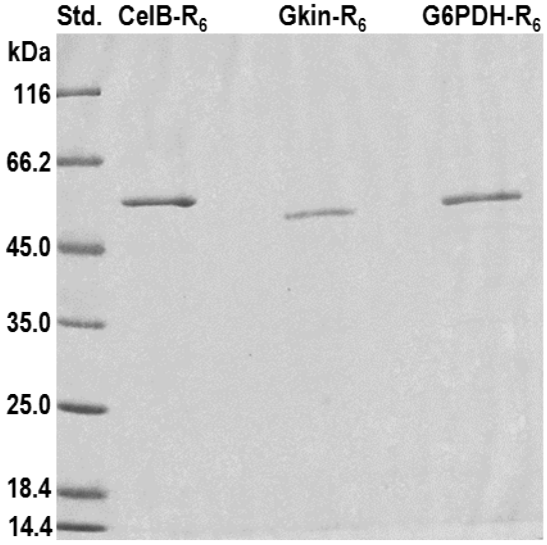

Fig. S1 SDS-PAGE analysis of the isolated enzymes. CelB-R_6 (3.3 µg), GKin-R_6 (2.1 µg), and G6PDH-R_6 (3.1 µg) were loaded. The expected molecular masses of the recombinant enzymes were 58 kDa for CelB-R_6, 47 kDa for GKin-R_6, and 55 kDa for G6PDH-R_6. Std. = molecular mass standard proteins. The SDS-PAG contained 11 % acrylamide and was stained with Coomassie Blue.

Table S2 Zeta potentials of the recombinant enzymes at pH 7.0.

Enzyme	**Zeta Potential** (mV)
CelB	-17.5 ± 1.5
CelB-R_6	-10.9 ± 1.3
ADPGK-R_6	-9.4 ± 1.8
G6PDH-R_6	-8.7 ± 0.8

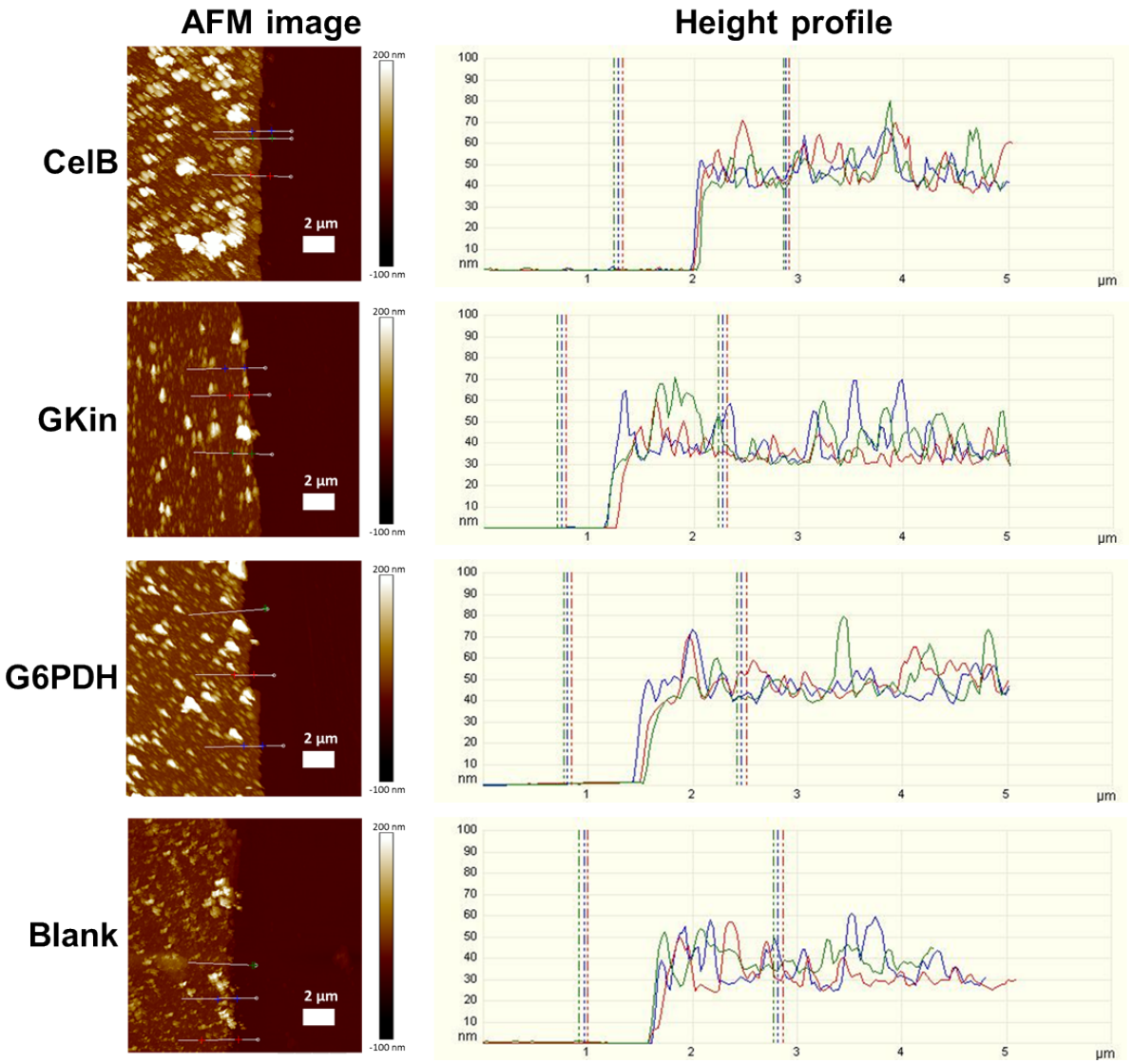

Fig. S2 AFM measurements of silica-enzyme films deposited on a silicon wafer. Representative AFM images and height profiles collected during step height measurement for the three enzyme bearing coatings and the enzyme-free sample (Blank). In the AFM images the enzyme-protamine-silica$_2$ film is on the left part and the selectively removed trench is located on the right part.