Supplementary Materials: Stimuli-Responsive Biosensor of Glucose on Layer-by-Layer Films Assembled through Specific Lectin-Glycoenzyme Recognition

Huiqin Yao, Qianqian Gan, Juan Peng, Shan Huang, Meilin Zhu and Keren Shi

Table S1. The surface concentration of GOD (Γ^*, mol·cm^{-2}) for {Con A/GOD}$_n$ with different number of bilayers (n).

{Con A/GOD}$_n$	Q (C) × 10^7	Γ^*, (mol·cm^{-2}) × 10^{11}
$n = 1$	1.559	1.010
$n = 3$	3.685	2.387
$n = 5$	5.555	3.598
$n = 7$	6.468	4.190

According to the equation of $Q = NAF\Gamma^*$ based on the Faraday's law, where N is the number of electrons transferred (1), A is the geometric area of PG electrode (0.16 cm^2) and F is the Faraday constant (96487 C·mol^{-1}).
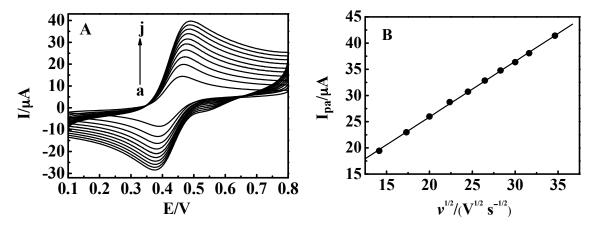

Figure S1. (**A**) CVs of 0.5 mM Fc(COOH)$_2$ in pH 4.0 buffers for {Con A/GOD}$_5$ films at different scan rates (V·s^{-1}): (**a**) 0.01, (**b**) 0.02, (**c**) 0.03, (**d**) 0.04, (**e**) 0.05, (**f**) 0.06, (**g**) 0.07, (**h**) 0.08, (**i**) 0.09 and (**j**) 1.0; (**B**) Effect of scan rate (*v*) on the I$_{pa}$ of Fc(COOH)$_2$ for {Con A/GOD}$_5$ films.
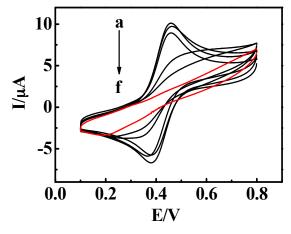

Figure S2. CVs of 0.5 mM Fc(COOH)$_2$ for {Con A/GOD}$_5$ films at 0.1 V·s^{-1} in buffers at pH (**a**) 4.0, (**b**) 4.5, (**c**) 5.0, (**d**) 6.0, (**e**) 7.0, and (**f**) 8.0.
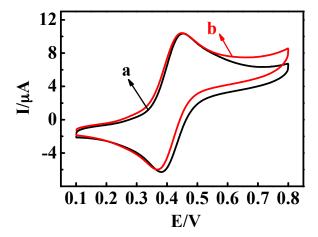
Figure S3. CVs of 0.5 mM Fc(COOH)$_2$ at 0.1 V·s^{-1} for bare PG electrode in buffers at pH (**a**) 4.0 and (**b**) 8.0.
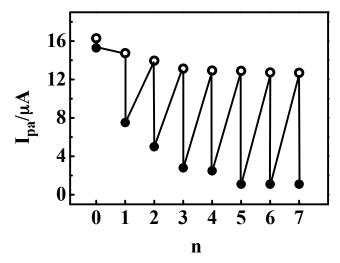

Figure S4. Influence of the number of bilayers (*n*) for {Con A/GOD}$_n$ films on CV reduction peak current (I$_{pa}$) of 0.5 mM Fc(COOH)$_2$ in buffers at pH 4.0 (○) and 8.0 (●) at 0.1 V·s^{-1}.
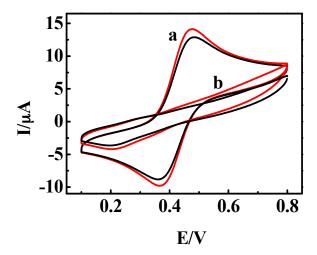

Figure S5. CVs of 0.5 mM Fc(COOH)$_2$ at 0.1 V·s^{-1} for {Con A/GOD}$_4$/Con A (red) and {Con A/GOD}$_5$ (black) films in buffers at pH (**a**) 4.0 and (**b**) 8.0, respectively.
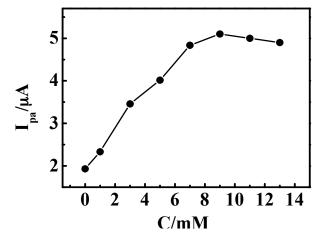
Figure S6. Dependence of CV electrocatalytic oxidation peak current (I_{pa}) at 0.005 V·s^{-1} on concentration of glucose at {Con A/GOD}$_5$ film electrodes in pH 4.0 solutions containing 0.5 mM Fc(COOH)$_2$ and glucose.
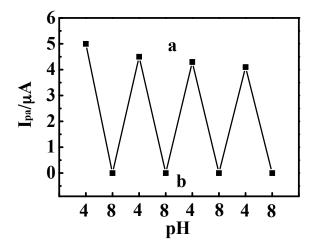

Figure S7. Dependence of CV catalytic oxidation peak current (I_{pa}) at 0.005 V·s^{-1} on solution pH switched between pH 4.0 and 8.0 for the same {Con A/GOD}$_5$ films. The solution contained 0.5 mM Fc(COOH)$_2$ and 7.0 mM glucose.
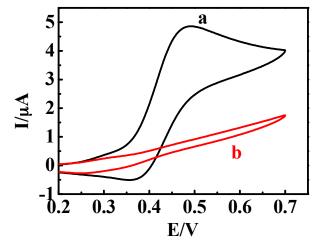

Figure S8. CVs of {Con A/GOD}$_5$ films at 0.005 V·s^{-1} in solutions containing 0.5 mM Fc(COOH)$_2$, 7.0 mM glucose at pH (**a**) 4.0 and (**b**) 8.0, which tuned by alternate addition of 10 mM ethyl butyrate and 6 mM urea into unbuffered solutions containing 5 units·mL^{-1} esterase and 15 units·mL^{-1} urease.