

## Supporting Information

# Pyrenyl–Carbon Nanostructures for Scalable Enzyme Electrocatalysis and Biological Fuel Cells

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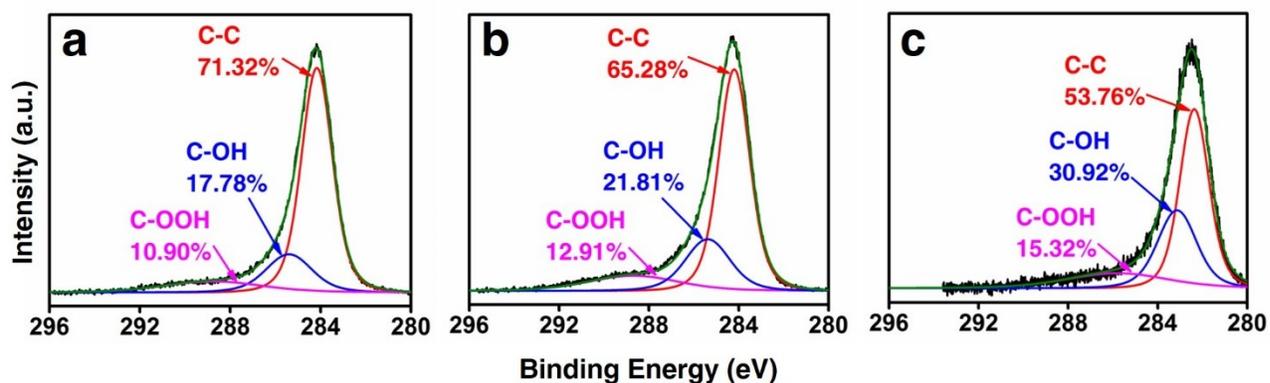
**XPS analysis of the enzyme assembly on MWNT/Py modified electrodes.**

**Table S1.** Relative sensitivity factor (RSF) values for different core level elements present in the MWNT/Py bioelectrodes.

Element	RSF
O 1s	2.93
C 1s	1
N 1s	1.8
Au 4f	17.12

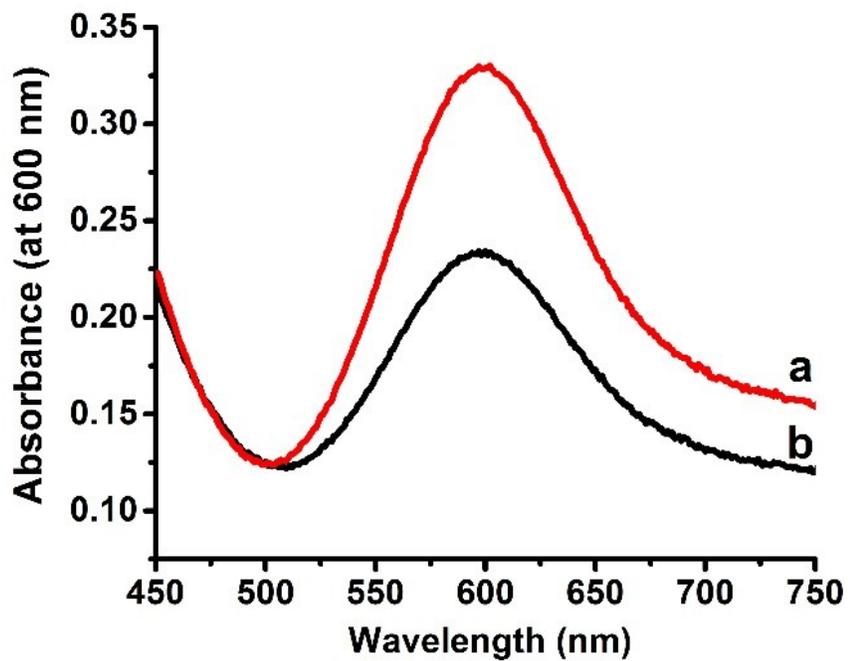
**Table S2.** Stepwise elemental concentration for MWNT/Py-enzyme modification. XPS analysis on graphite plate was done as it is. However, for the MWNT, MWNT/Py, and MWNT/Py-BOD modifications, we used a gold substrate to distinguish the properties free from the graphitic background.

Element	Elemental Concentration (%)			
	Graphite plate	MWNT	MWNT/Py	MWNT/Py-BOD
O 1s	7.4	6.1	9.5	15.2
C 1s	92.6	92.5	87.9	72.6
N 1s	0.0	0.0	0.0	11.8
Au 4f	0.0	1.3	2.6	0.4



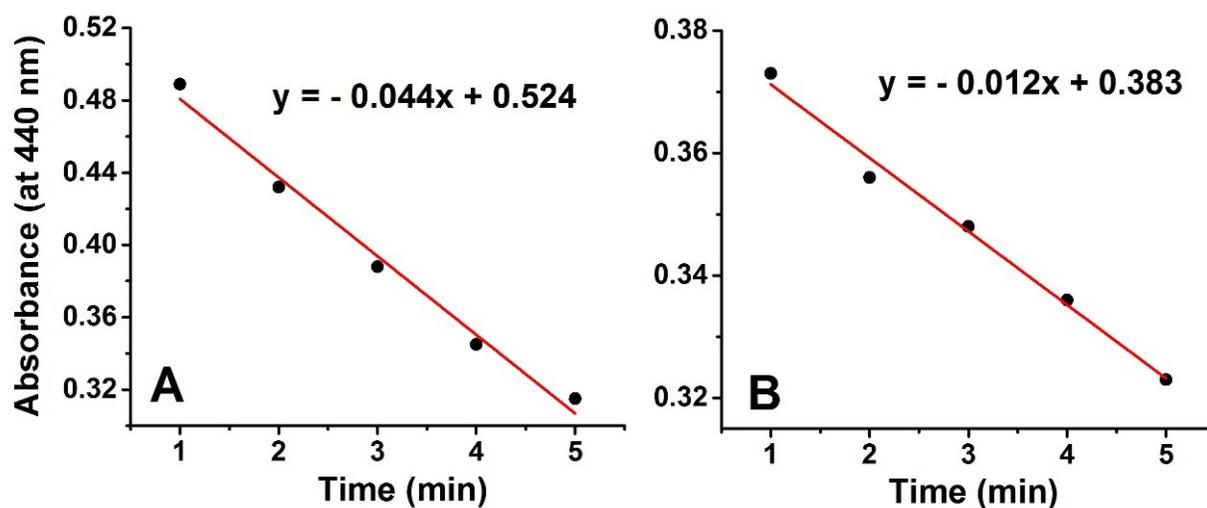
**Figure S1.** XPS spectra of C1s peaks for (a) graphite plate, and gold substrate coated (b) MWNT, and (c) MWNT/Py surfaces and their deconvolutions.

Absorbance based quantitation of BOD attached to MWNT/Py surface.



**Figure S2.** UV-vis spectra of BOD present in phosphate buffer (pH 7.0) (a) before and (b) after covalent attachment on the MWNT/Py modified graphite plate electrodes.

Activity of covalently attached BOD on MWNT/Py modified electrodes versus the unmodified graphite plates.



**Figure S3.** Absorbance change with time for the oxidation of bilirubin catalyzed by the BOD immobilized on **(A)** MWNT/Py modified and **(B)** unmodified graphite plate electrodes.