Supporting Information

Mo_2CT_x MXene–Based Non-Enzymatic Electrochemical Sensor for Selective Detection of Hydrogen Peroxide in Colon Cancer Cells

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List of Supplementary Figures

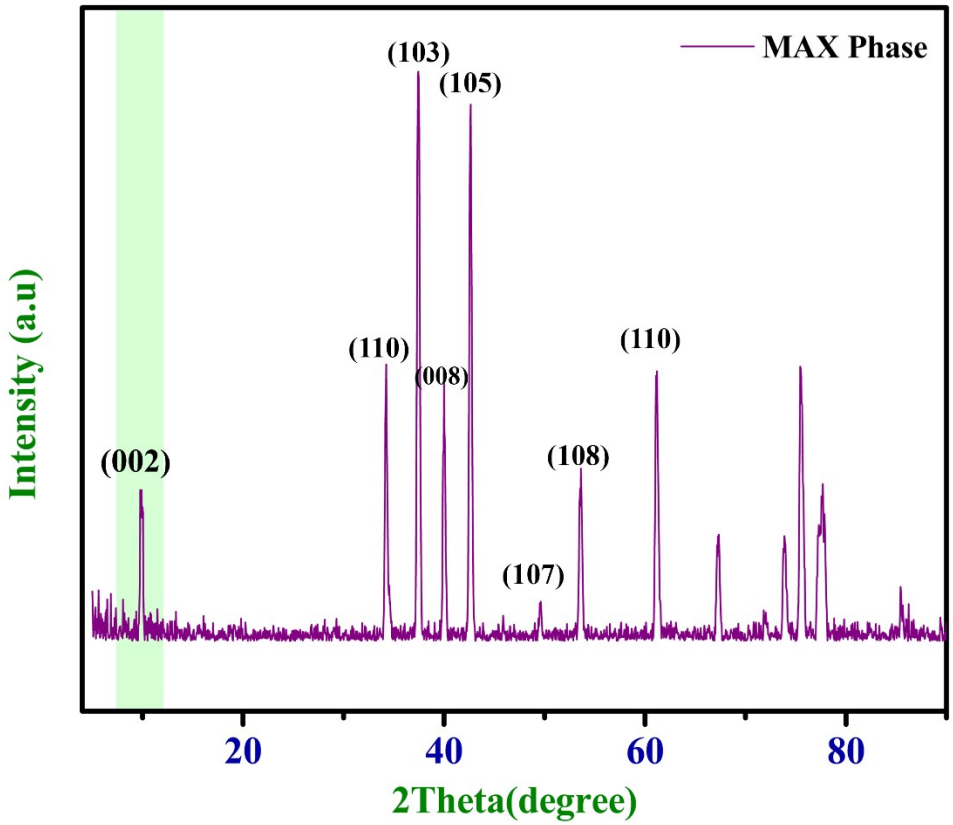

Figure S1. XRD data of Mo_2Ga_2C MAX phase.

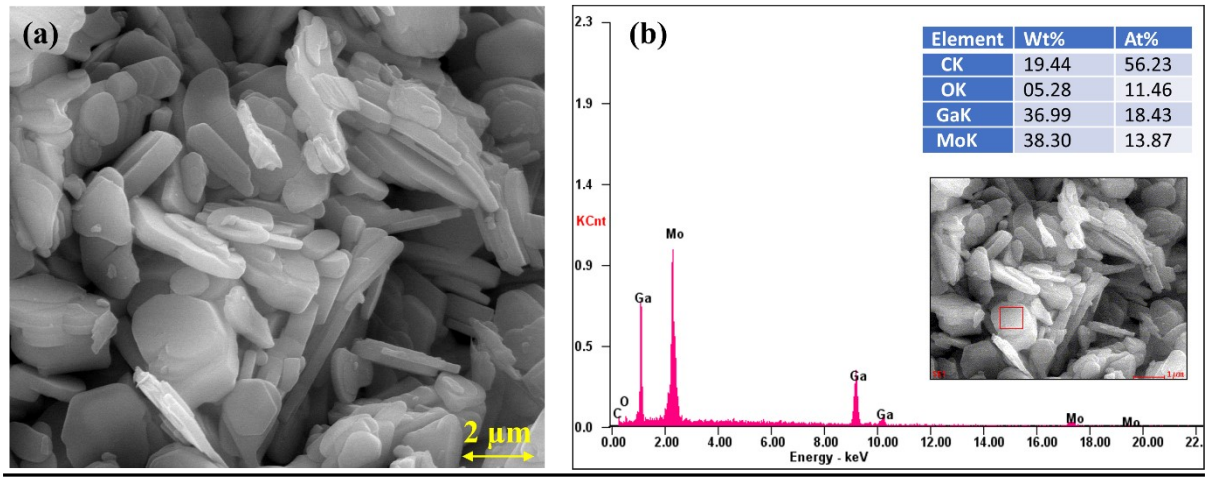

Figure S2. (a) SEM micrographs of Mo_2Ga_2C MAX phase precursor (Scale bar - 2 µm), (b) EDAX spectrum of Mo_2Ga_2C MAX phase. Inset: Table shows the list of elements and their wt% and at% along with SEM micrograph of Mo_2Ga_2C.

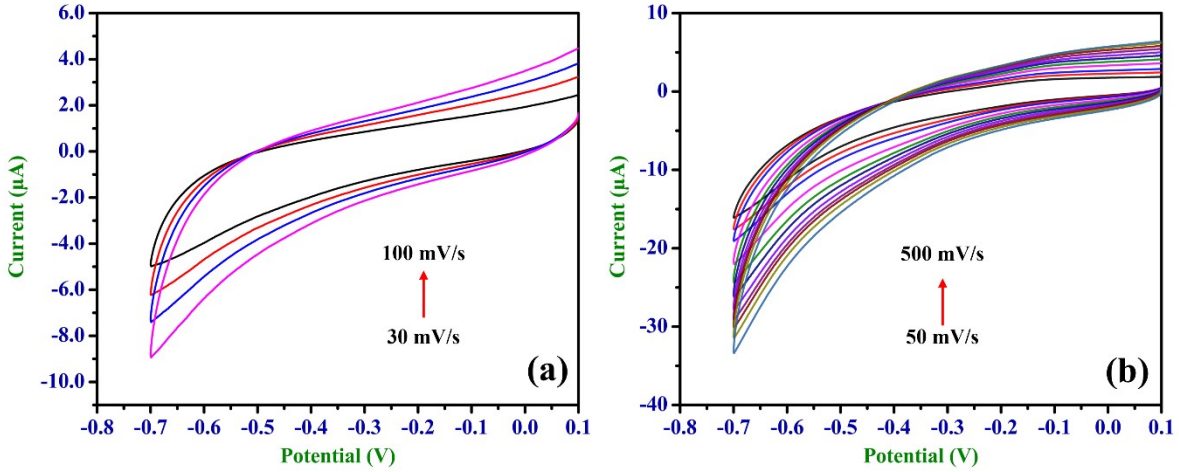

Figure S3. (a) CVs were recorded at different scan rates using an MX-GCE (without H_2O_2) in 0.1 M PBS (pH=7.4) from 30 mV/s to 100 mV/s. (b) CVs were recorded at different scan rates from 50 mV/s to 500 mV/s using an MX-GCE in 0.1 M PBS (pH=7.4) containing 284 mM H_2O_2.

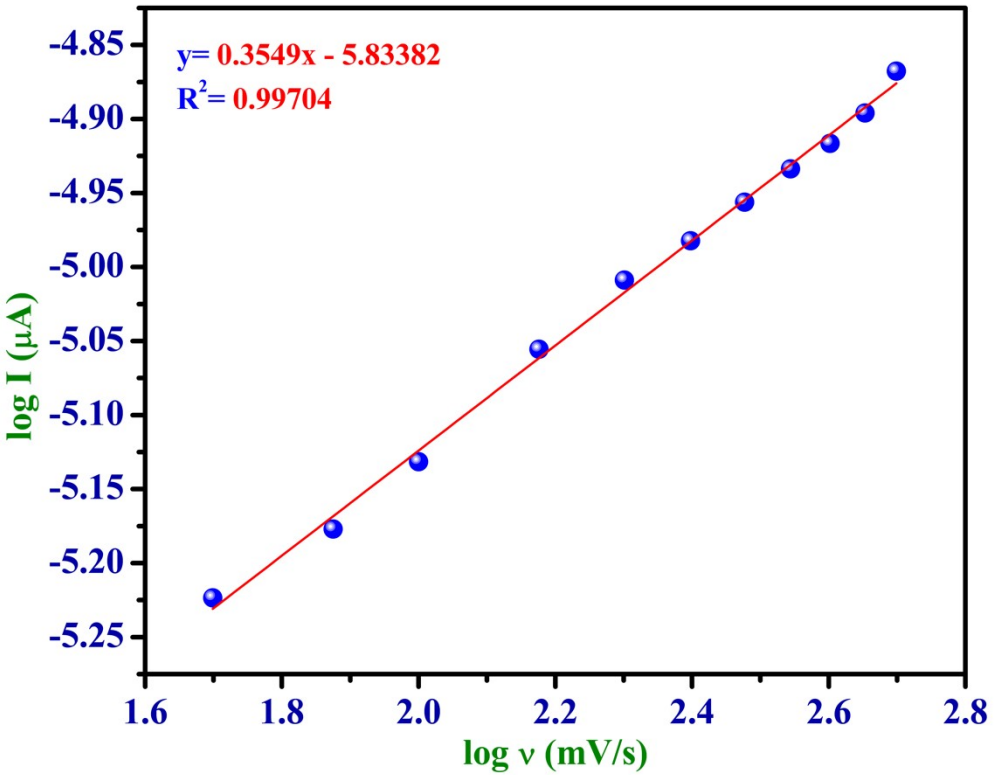

Figure S4. Linear plot of log I (μA) vs log ν (mV/s) with different scan rates at a fixed potential of -0.45 V.

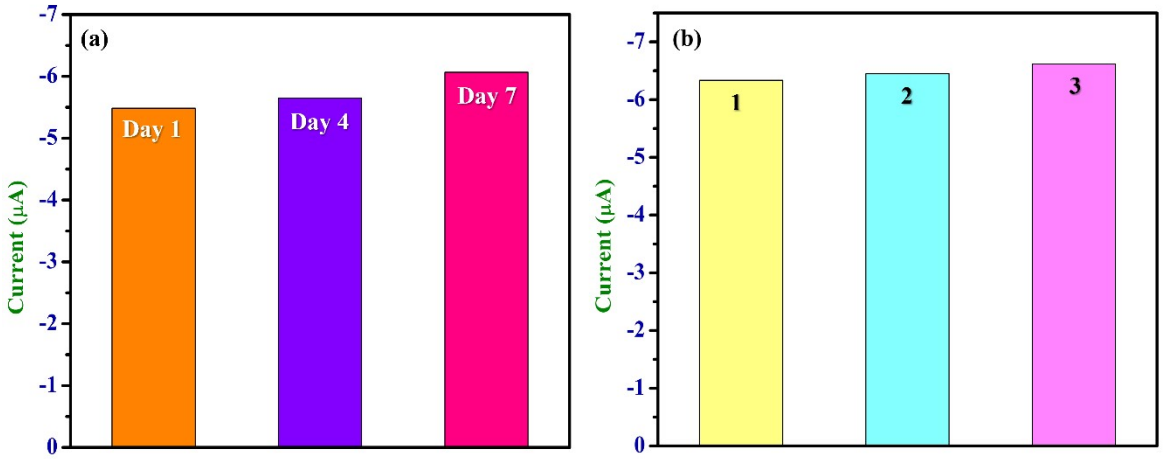

Figure S5. (a) CVs were recorded using MX-GCE in 0.1 M PBS (pH=7.4) at a scan rate of 50 mV/s on day 1, day 4, and day 7. (b) CVs were recorded using MX-GCE in 0.1 M PBS at a scan rate of 50 mV/s (n=3) for intra-day stability measurements.

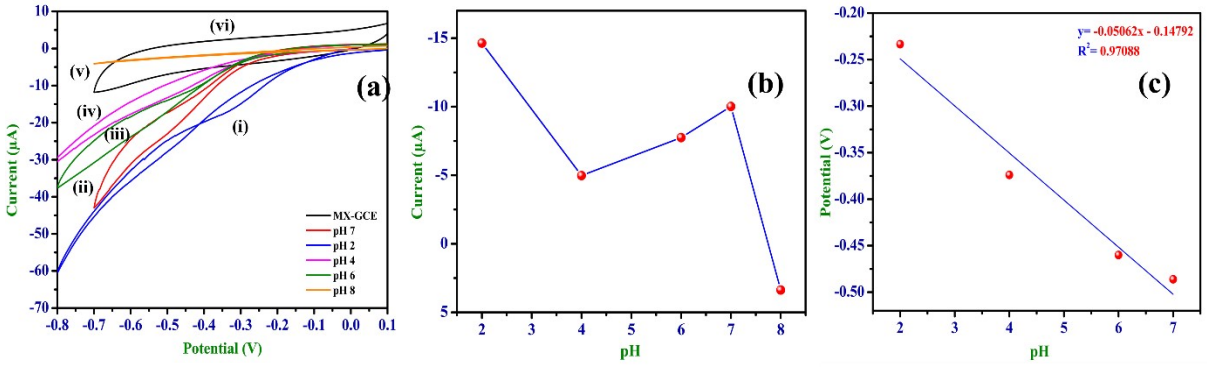

Figure S6. (a) CVs were recorded using a MX-GCE in the presence of 284 mM H_2O_2 with various buffer solutions at different: pH = (i) 2, (ii) 7.4, (iii) 6, (iv) 4, (v) 8, in comparison with CVs recorded with MX-GCE in the absence of H_2O_2 in 0.1 M PBS (pH = 7.4) at a scan rate of 50 mV/s. (b) Cathodic current response vs different pH in the presence of 284 mM H_2O_2. (c) A linear plot shows the corresponding H_2O_2 reduction potential vs different pH in the presence of 284 mM H_2O_2.

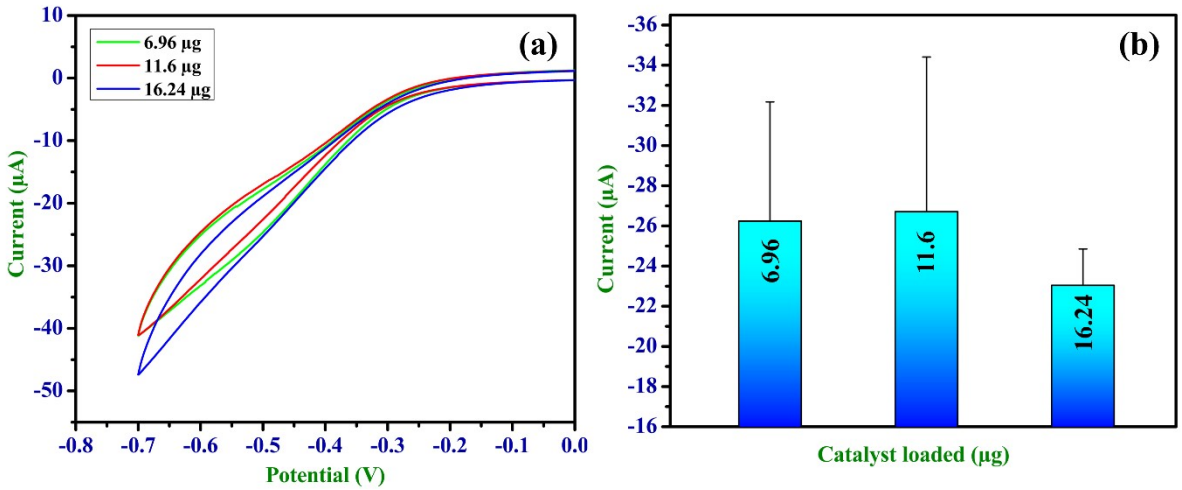

Figure S7. (a) CVs were recorded using an MX-GCE modified with different amount of catalyst (6.96, 11.6, 16.24 µg) in 0.1 M PBS (pH 7.4) in the presence of 284 mM H_2O_2 at a scan rate of 50 mV/s. (b) Corresponding bar plot of cathodic current vs different catalyst concentrations in 0.1 M PBS (pH = 7.4) in the presence of 284 mM H_2O_2 with standard deviation (SD) of 5.94 × 10^{-6}, 7.70 × 10^{-6}, 1.81 × 10^{-6} for 6.6 µg, 11.6 µg, and 16.2 µg, respectively.

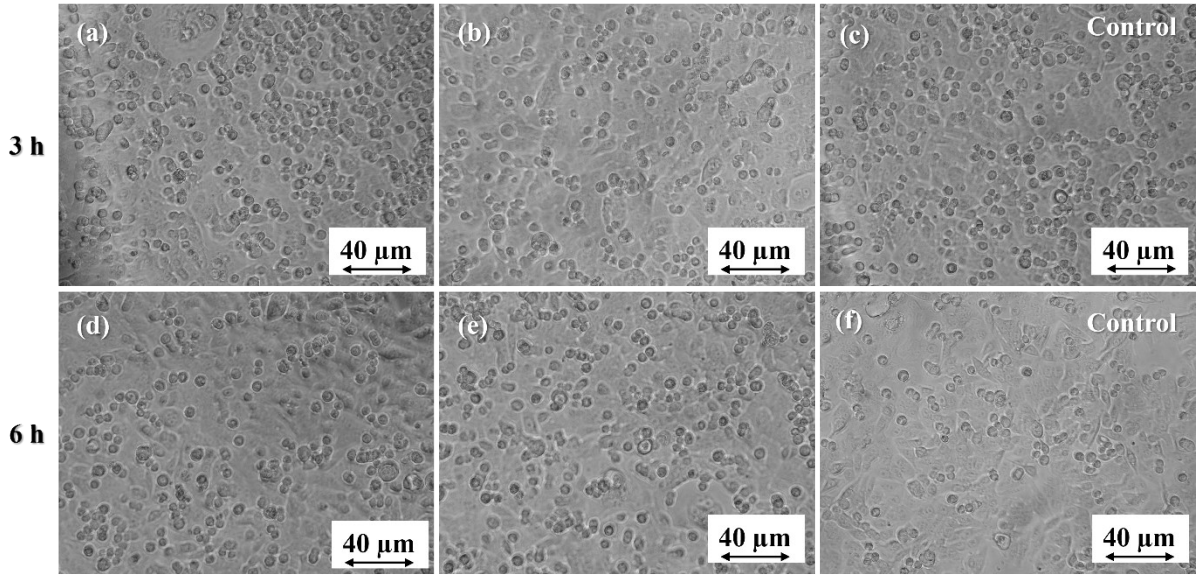

Figure S8. Phase contrast optical microscopy images of SW480 colorectal cancer cells following treatment with 0.5 mM ascorbic acid for 3 h at 37 °C, (a,b) different fields of view

from AA-treated SW480 cells for 3 h, (c) untreated controls (SW480 cells) without 0.5 mM AA for 3 h at 37 °C, (d, e) different fields of view from AA-treated SW480 cells for 6 h, and (e) untreated controls without 0.5 mM AA for 6 h at 37 °C.