“Supporting Information”

MXene assisted ablation of cells with a pulsed near-infrared laser

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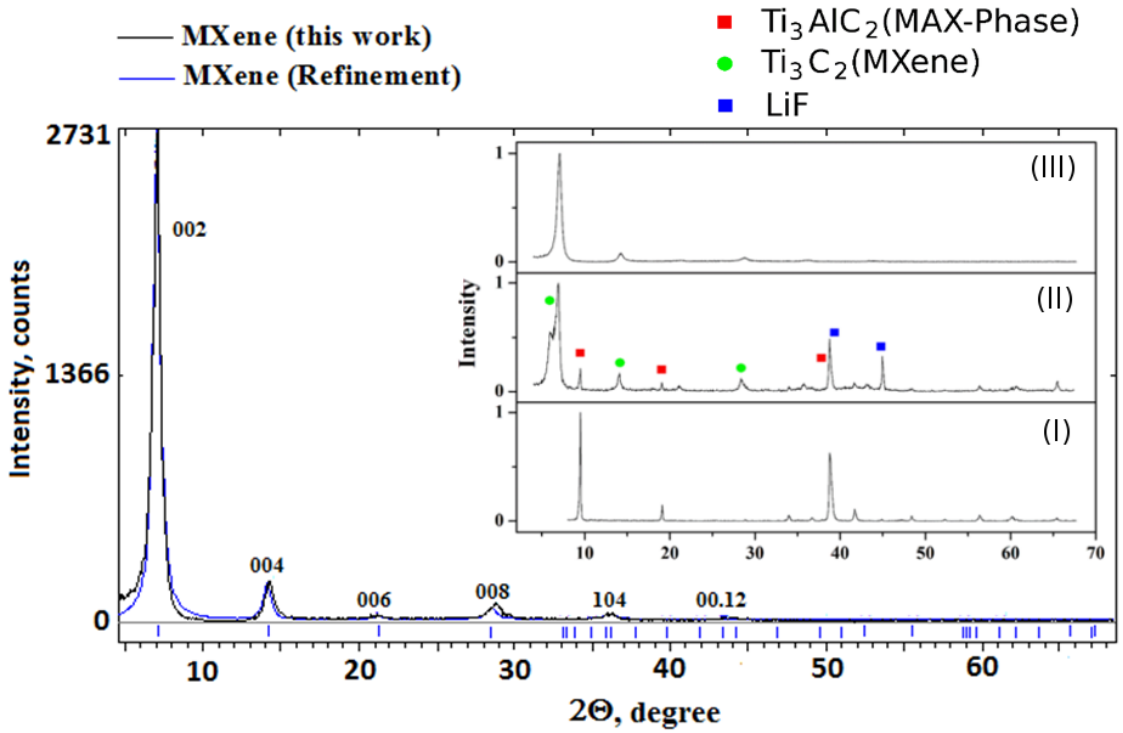


Figure S1. Refinement of XRD pattern of final Ti3C2Tx MXene specimen. The insert shows evolution of XRD pattern during synthesis stages (I) XRD pattern of initial Ti3AlC2 MAX Phase, (II) XRD pattern of multilayered MXene after etching via MILD method, (III) XRD pattern of final Ti3C2Tx MXene after delamination and cleaning.

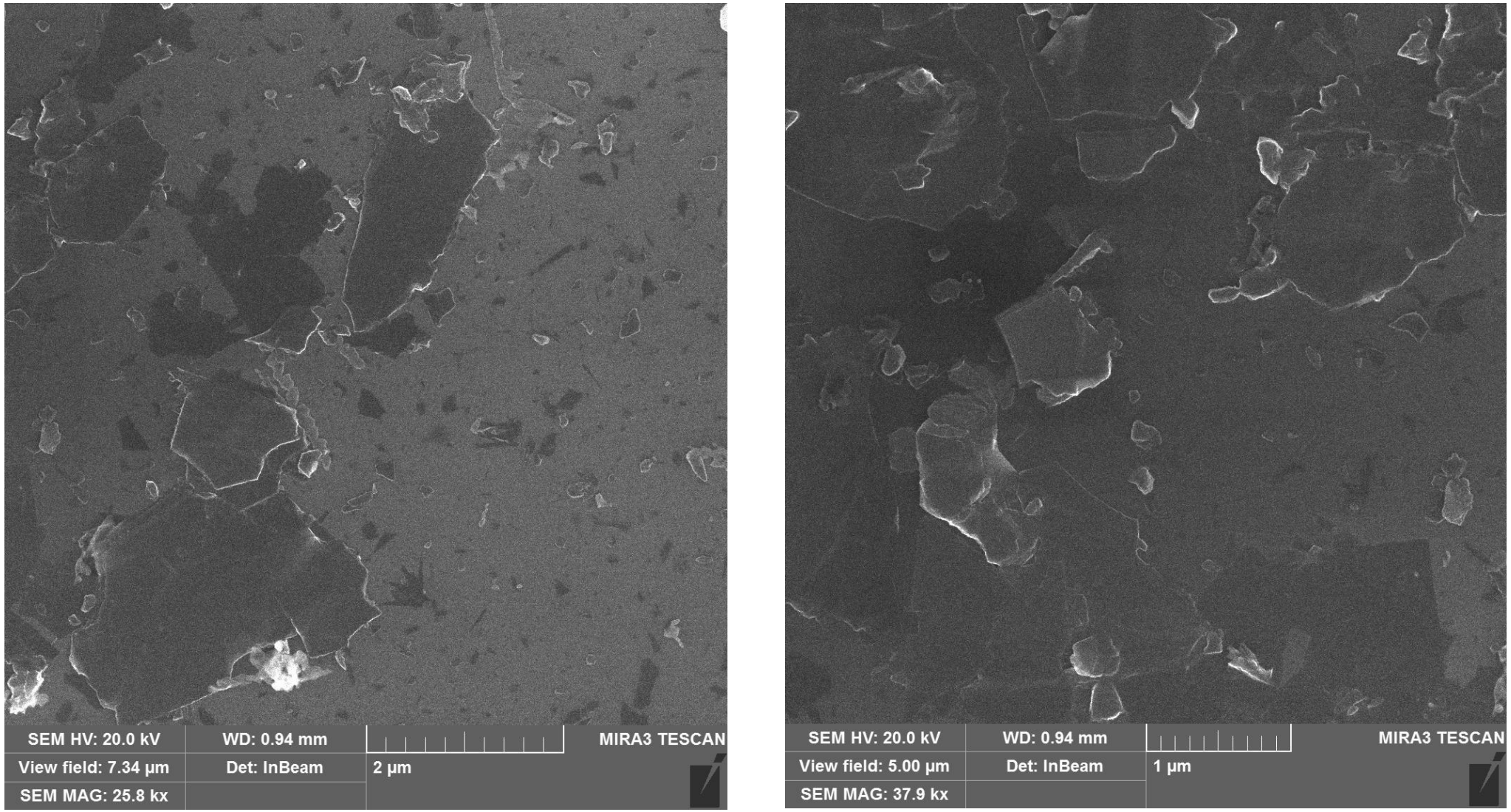


Figure S2. Representative SEM images of $Ti_3C_2T_x$ MXene flakes used in the study.

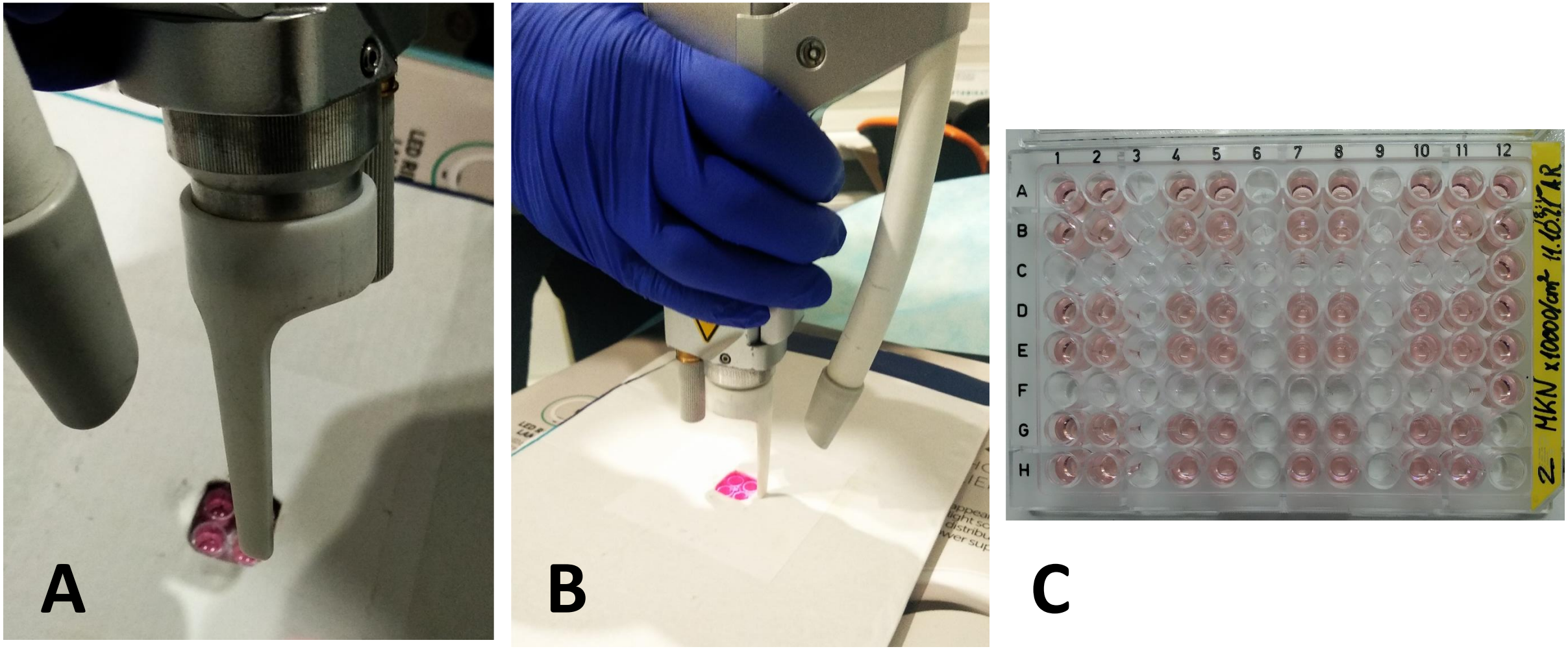


Figure S3. The setup of the laser irradiation experiments as explained in the text. (A – standardization of distance from the laser emitting tip to the plate; B – experiment procedure; C – general view of plate with cells for PPT)

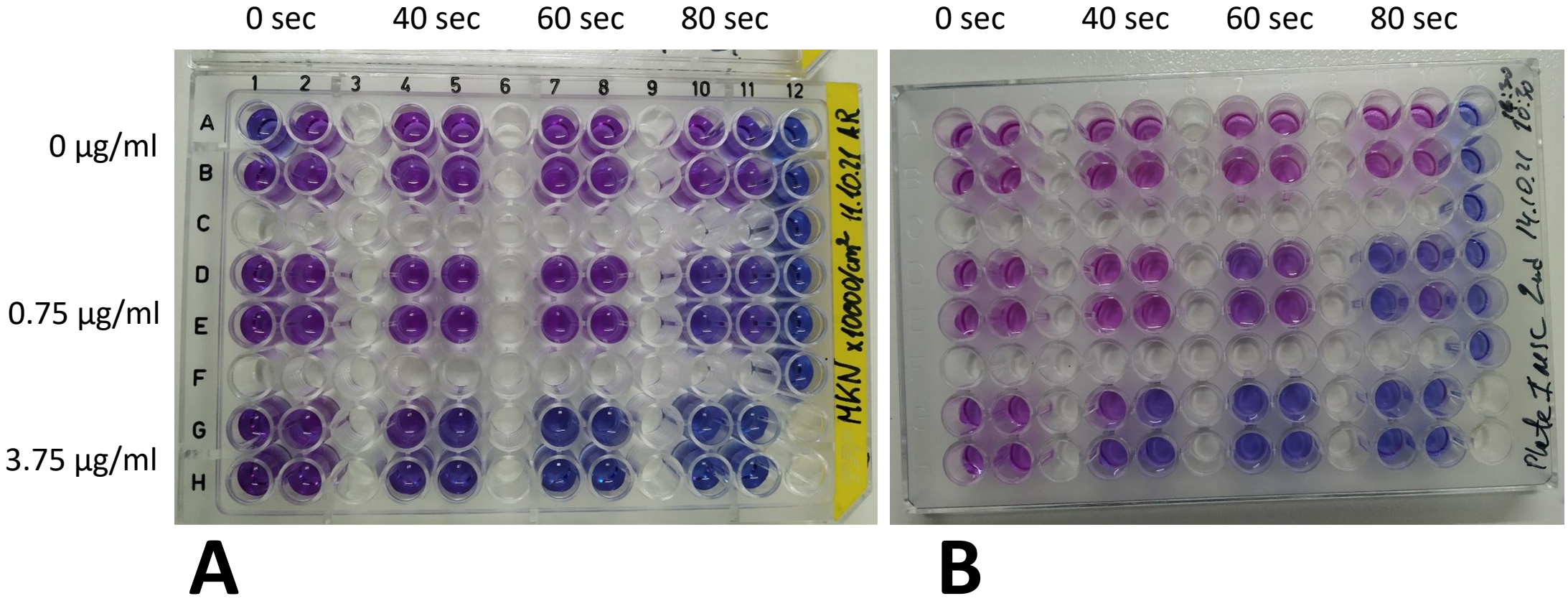


Figure S4. The cells, grown in 96 well plates in 200 µl of complete cell culture medium, were loaded with MXenes and irradiated with pulsed 1064 nm laser as indicated, followed by incubation with resazurin at 15 µg/ml final concentration. **A**, stably transformed gastric cancer cells MKN-28, constitutively overexpressing CEACAM-1 tumor marker (MKN28-CEACAM1-4L); **B**, 100 µl aliquots from the cell culture plate with human umbilical cord mesenchymal stem cells, treated similarly as in **A**, were transferred to a fresh plate for measurement optical density (absorbance). Control wells without cells (only medium) were in the right columns. Note gradual changes of the color from blue (resazurin) to pink (resorufin) by alive cells.

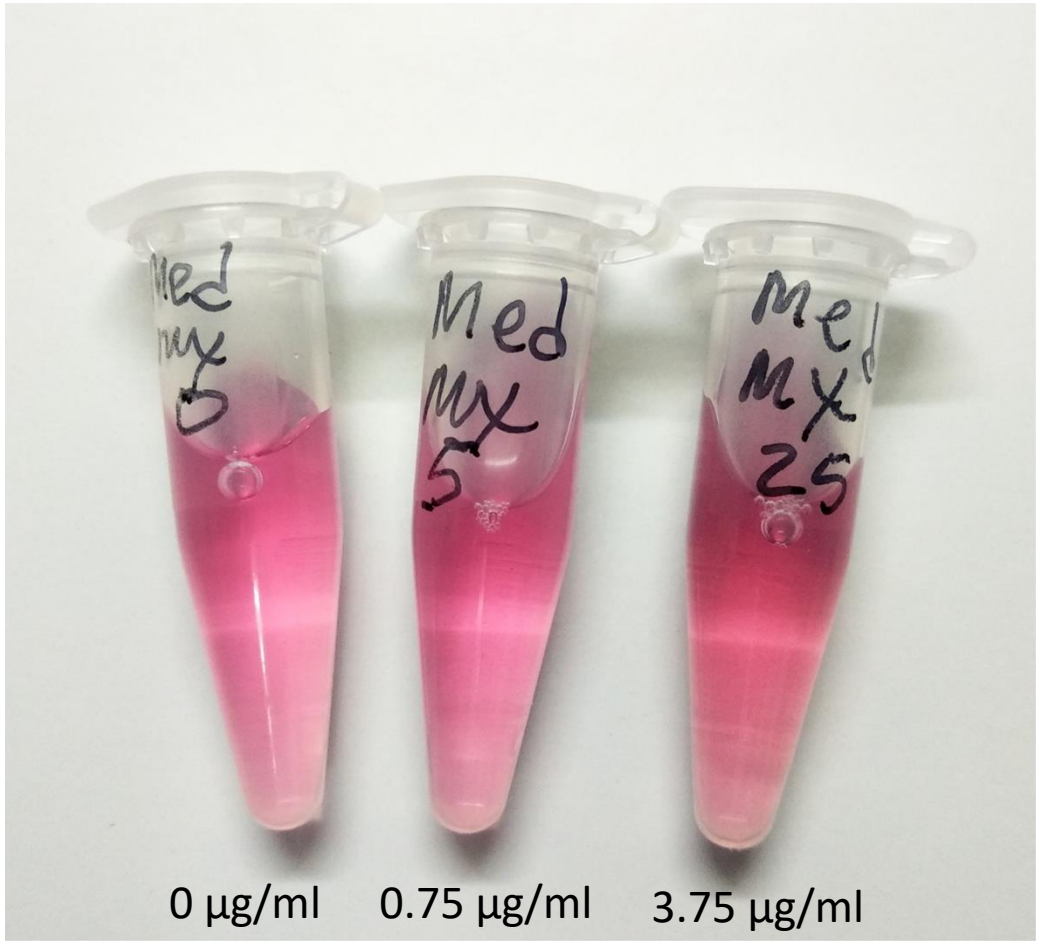


Figure S5. 1 ml of the solutions of the MXenes at the final working concentration in the complete cell culture medium as indicated was compared. Note darker appearance of the solution at the higher concentration of MXenes (3.75 µg/ml).

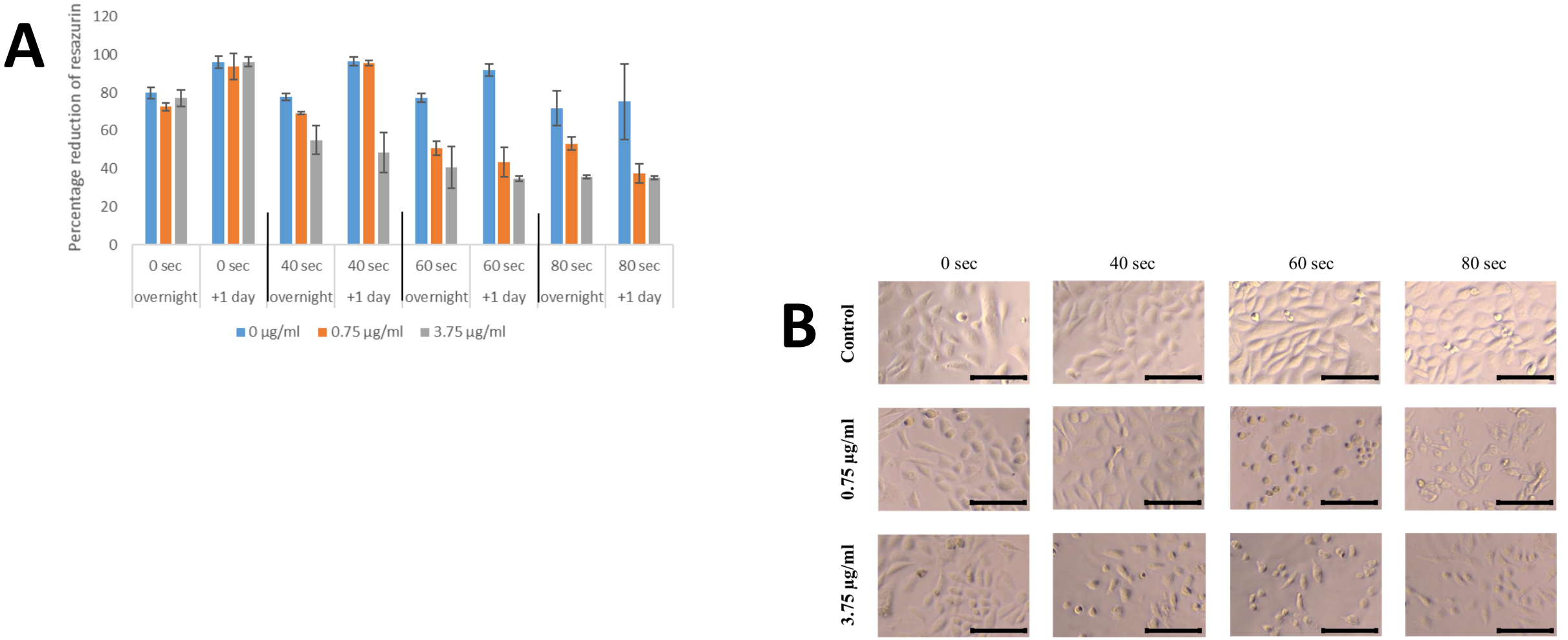
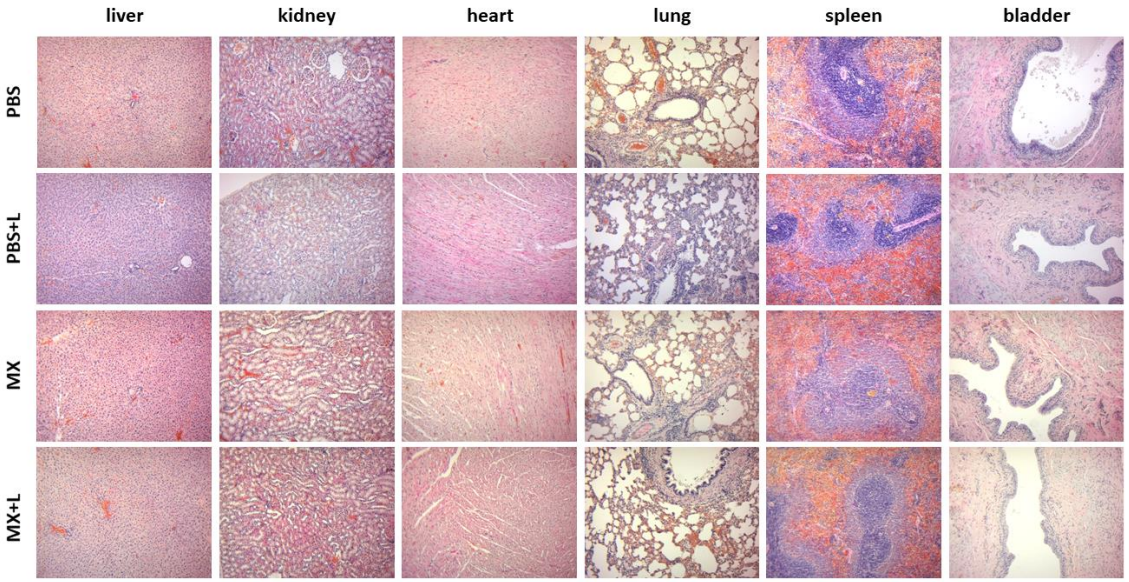
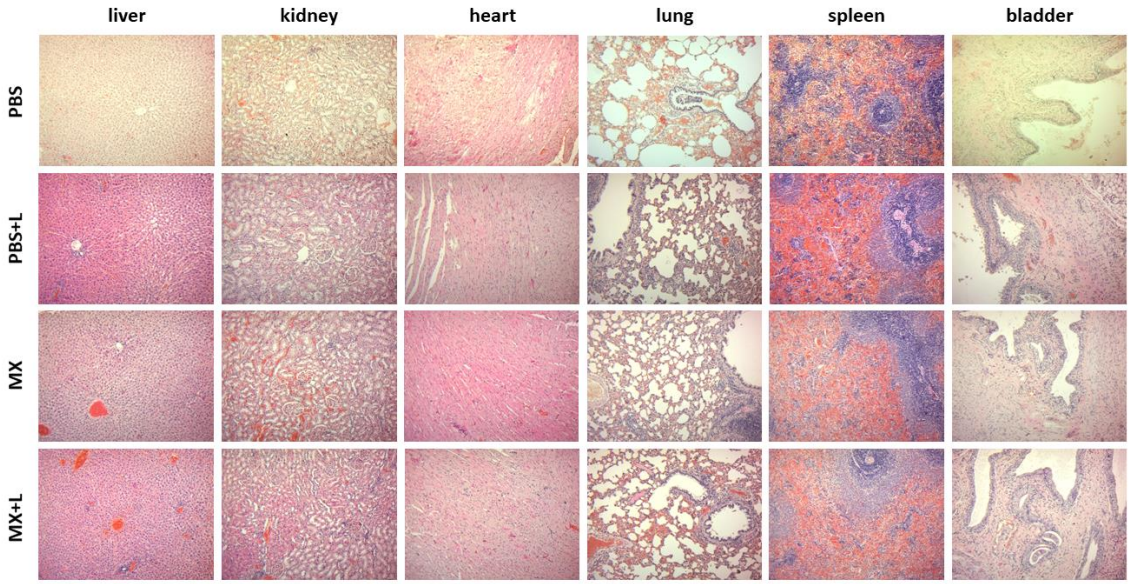


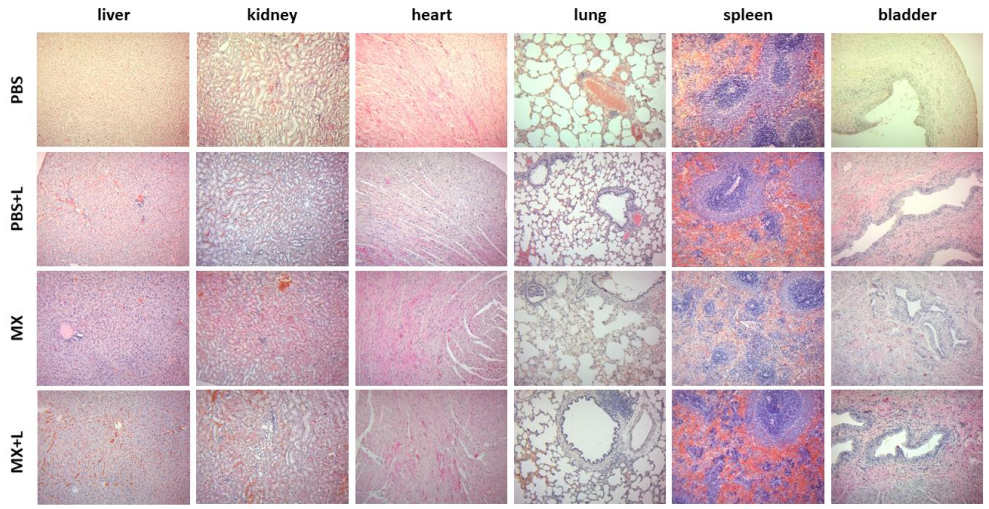
Figure S6. Comparison of the photothermal effect by Ti_3C_2 MXenes in CHO cells immediately after laser exposure and one day after laser exposure. **A**, a side-by-side comparison of the resazurin reduction assay immediately after the laser exposure (marked overnight) and one day after laser exposure (marked +1 day); **B**, optical images of the cells taken after one day post exposure. Two different concentrations of MXenes (0.75 µg/ml and 3.75 µg/ml) and various laser irradiation exposure times (0 sec, 40 sec, 60 sec and 80 sec) were employed as marked. The error bars = 100 µm.



3 days



7 days



14 days

Figure S7. Histological panel of target organs 3, 7 and 14 days after MXene injection and laser exposure. Numbers of days indicate time after injection followed by laser irradiation

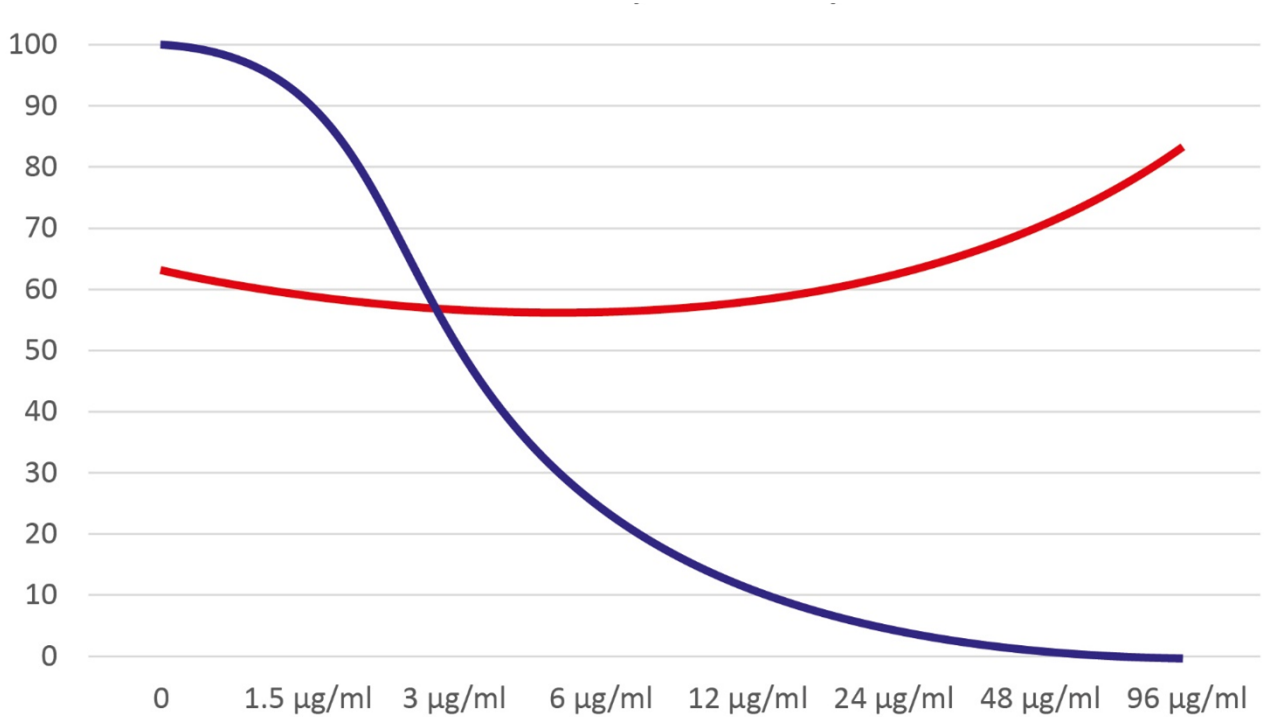


Figure S8. Comparison of the ideal approximation of a typical sigmoid dose-response relationship (toxicity curve) (■) and the quadratic trendline of the graph for the data point Day 1 with MSC cells shown on Fig. 2 of the manuscript (■).