SUPPORTING INFORMATION

Arsenic Toxicity: Carbonate's Counteraction Revealed

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TABLE OF CONTENTS

Supporting information 1

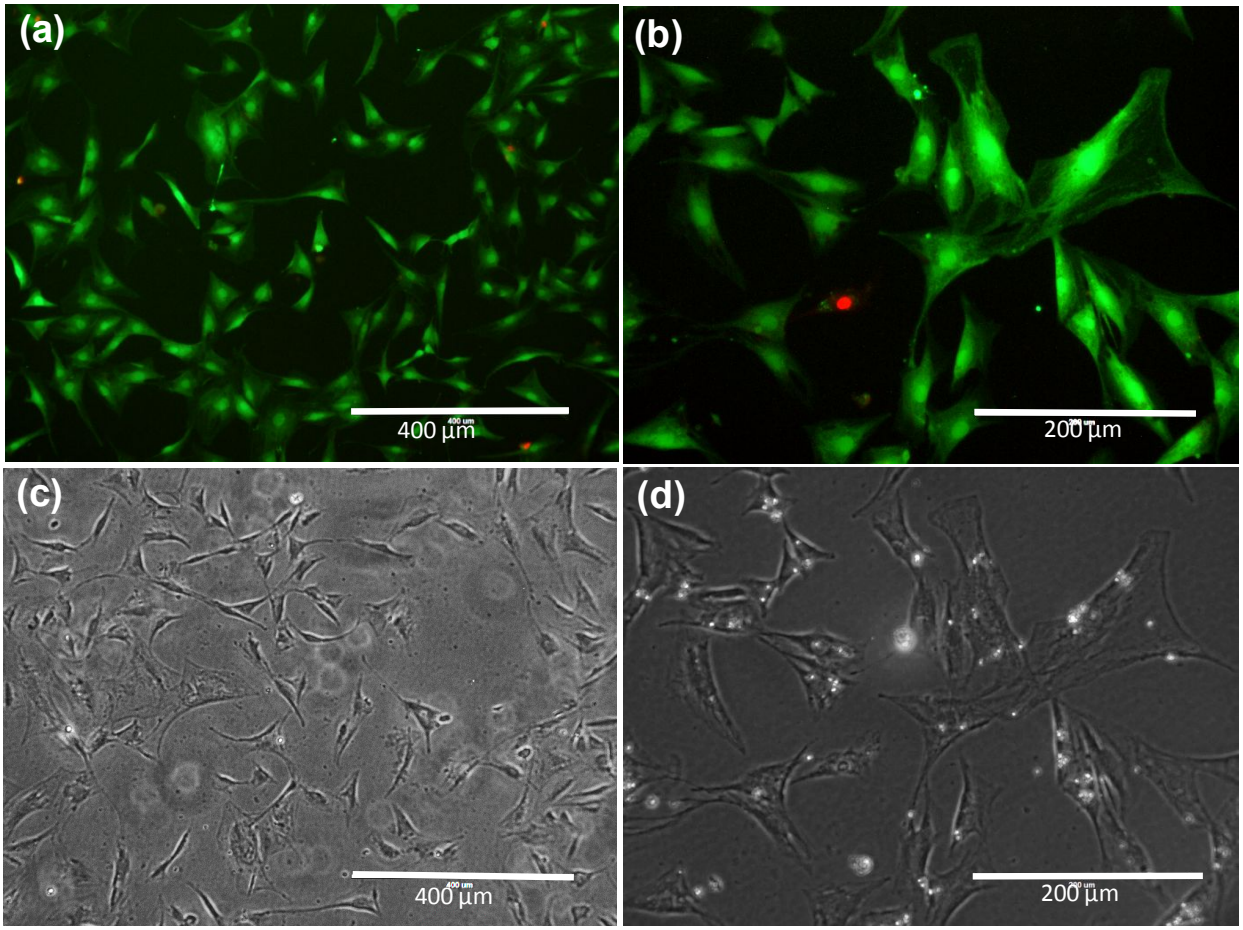

Figure S1. Control experiment for live dead staining assay – $CaCO_3$ treatment. (a) and (b) Fluorescence microscopy image of IEC–6 cells treated with 40 ppm of calcium carbonate at two different magnifications. 40 ppm of $CaCO_3$ used for the studies was found to be non-toxic to the cells. (c) and (d) Phase contrast microscopy images showing precipitates of $CaCO_3$ on the surface of the cells.

Supporting information 2

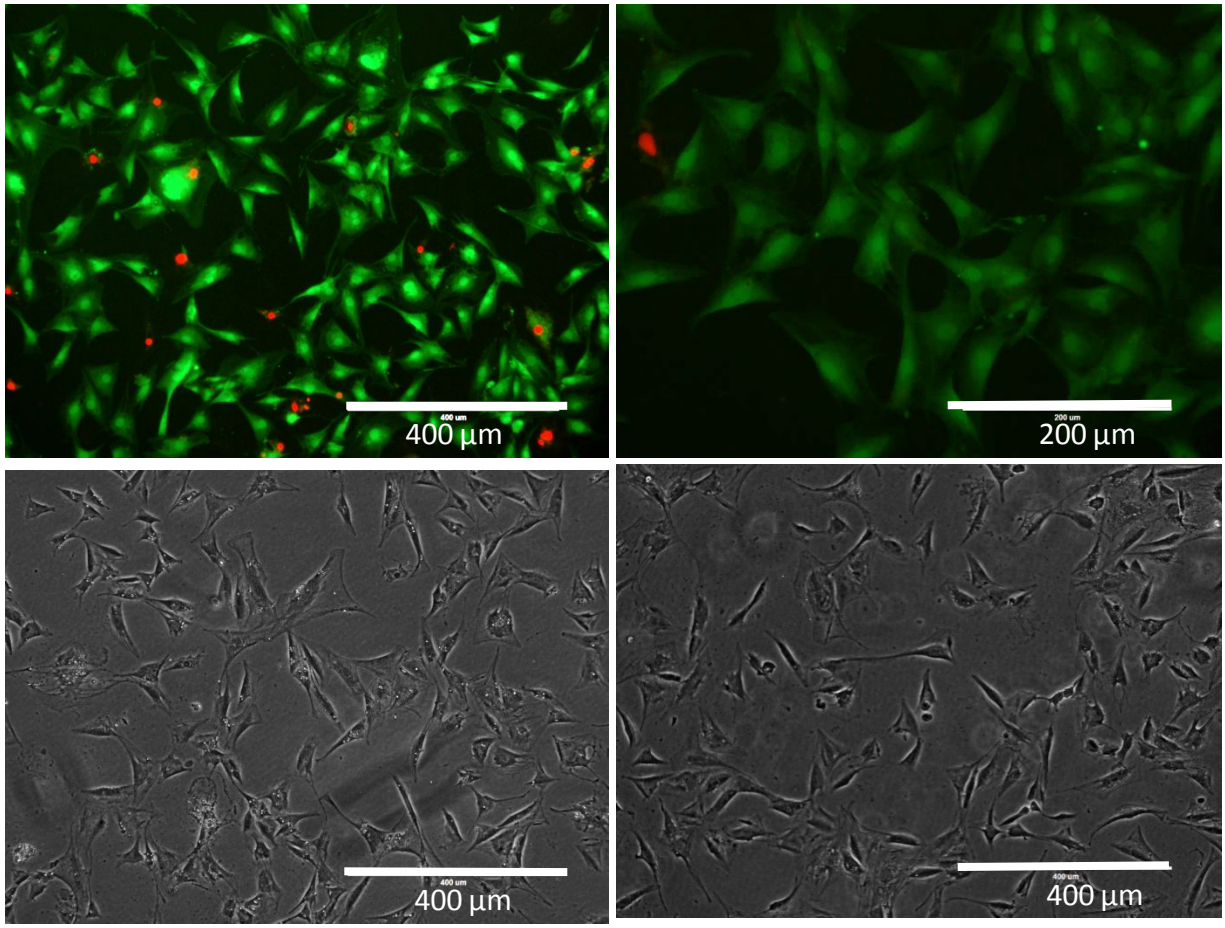

Figure S2. Control experiment for live dead staining assay – Na_2CO_3 treatment. Fluorescence microscopy images (a and b) and phase contrast microscopy image (c and d) of IEC–6 cells with 40 ppm of sodium carbonate. 40 ppm of sodium carbonate used for the studies was found to be non-toxic to the cells.

Supporting information 3

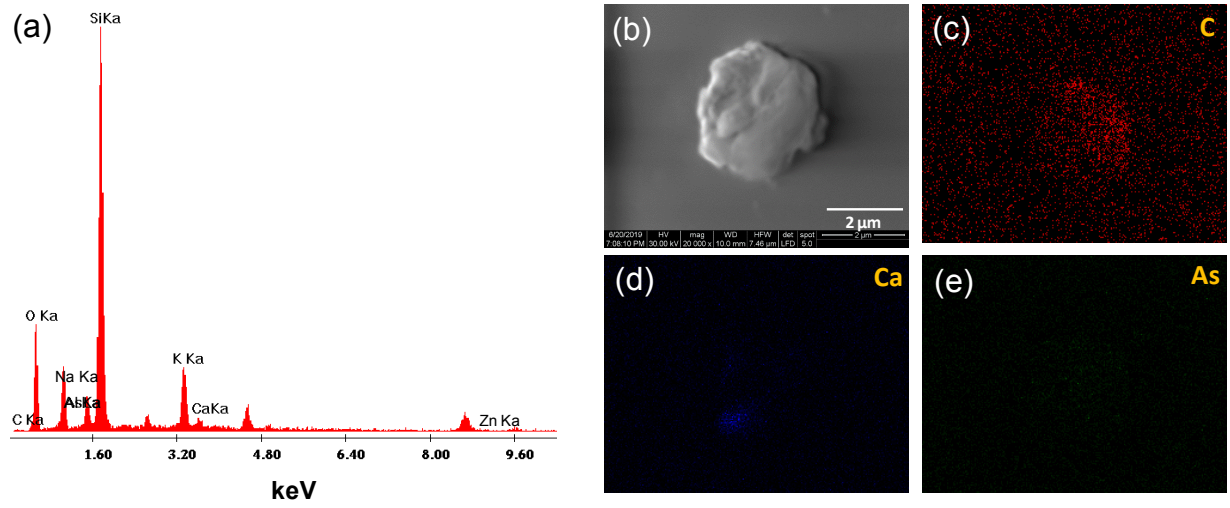

Figure S3. Characterization and chemical composition of the precipitates formed on cells during $CaCO_3$ treatment. EDS spectrum (a) and the SEM image (b) of the precipitate along with (c-e) elemental maps are shown. No complexes of arsenic were formed as *As* is absent. Scale bars in c-e are the same as in b.

Supporting information 4

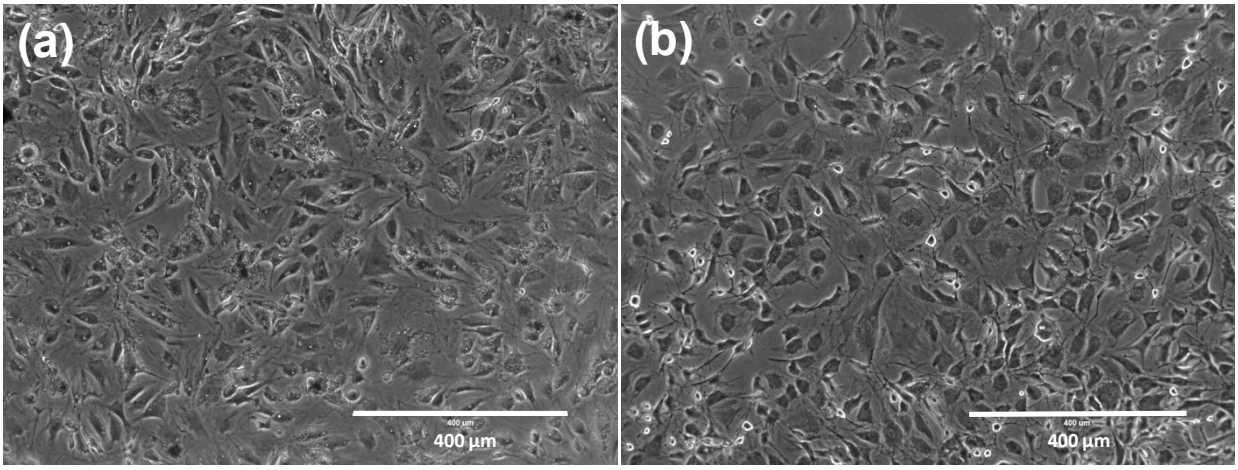

Figure S4. Phase-contrast images of control experiment for morphological study - 40 ppm of calcium carbonate and sodium carbonate. Treatment of IEC-6 cells with (a) 40 ppm of calcium carbonate and (b) 40 ppm of sodium carbonate (control experiments). Precipitates of $CaCO_3$ were found on the surface of the cells. 40 ppm of $CaCO_3$ and Na_2CO_3 used for the studies did not alter the cellular morphology.

Supporting information 5

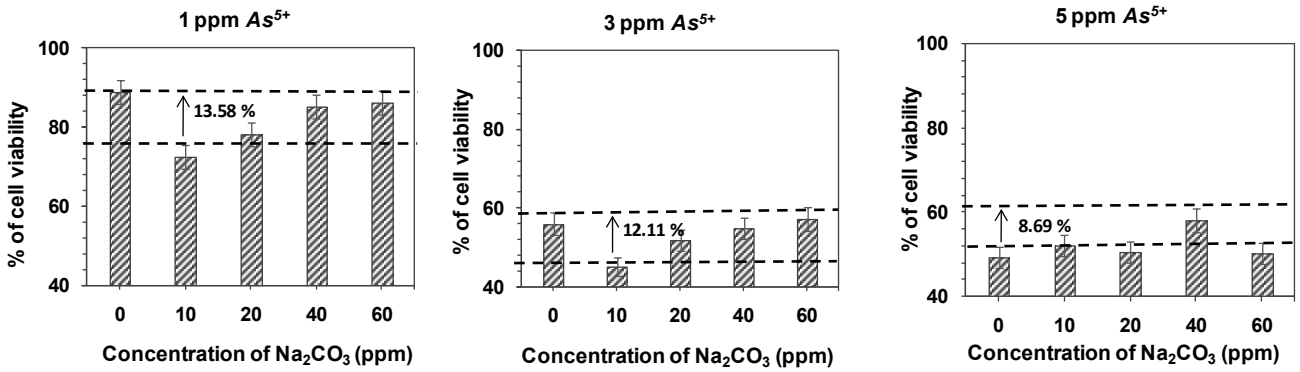

Figure S5. Effect of Na_2CO_3 on the toxicity induced by varying concentrations (1 ppm, 3 ppm and 5 ppm) of arsenate (As^{5+}). The percentage of cell viability was measured using the MTT assay. The difference between the heights of dashed lines represent the percentage of increase in viability of the cells.

Supporting information 6

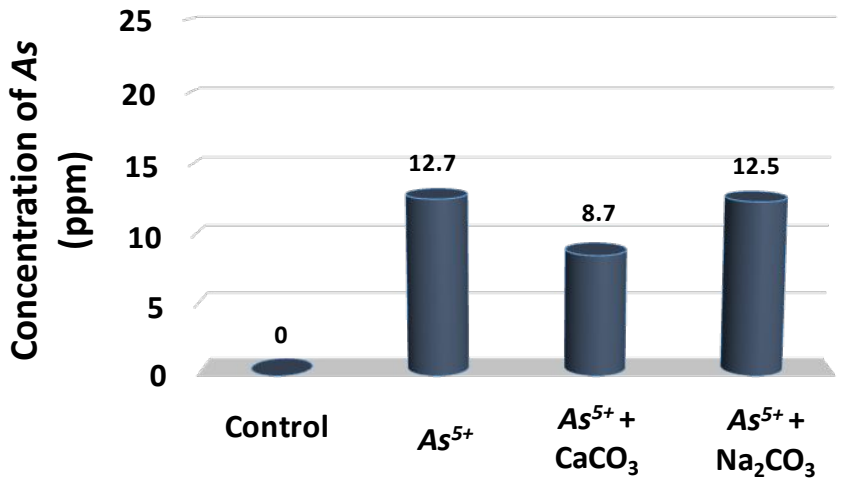

Figure S6. A comparative analysis of As^{5+} concentration in cells in presence of 40 ppm of $CaCO_3$ and Na_2CO_3.

Supporting information 7

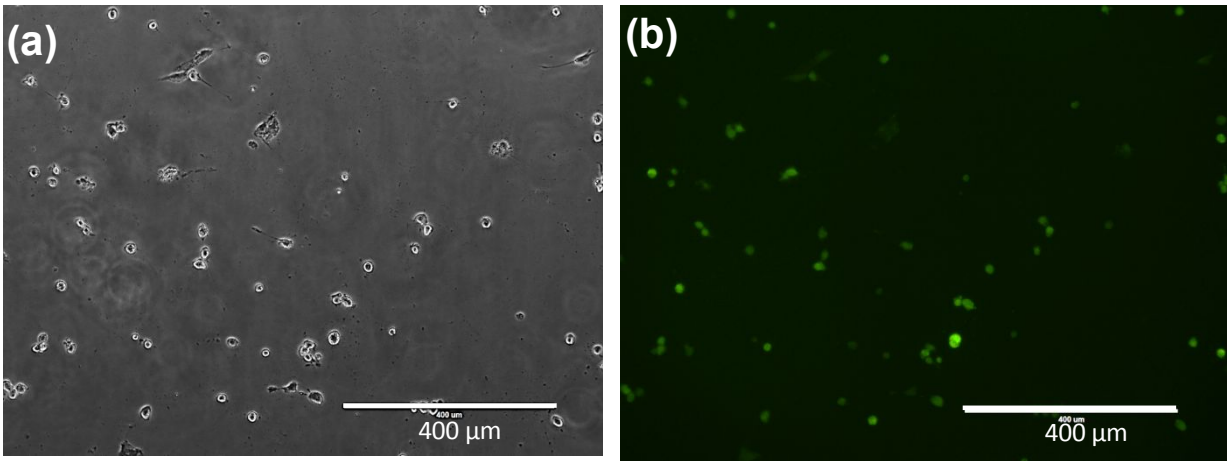

Figure S7. Control experiment for ROS staining. IEC – 6 cells treated with 1 mM hydrogen peroxide for 1 h induced ROS production and showed fluorescence on staining. (a) Phase contrast microscopy image. (b) Fluorescence microscopy image.

Supporting information 8

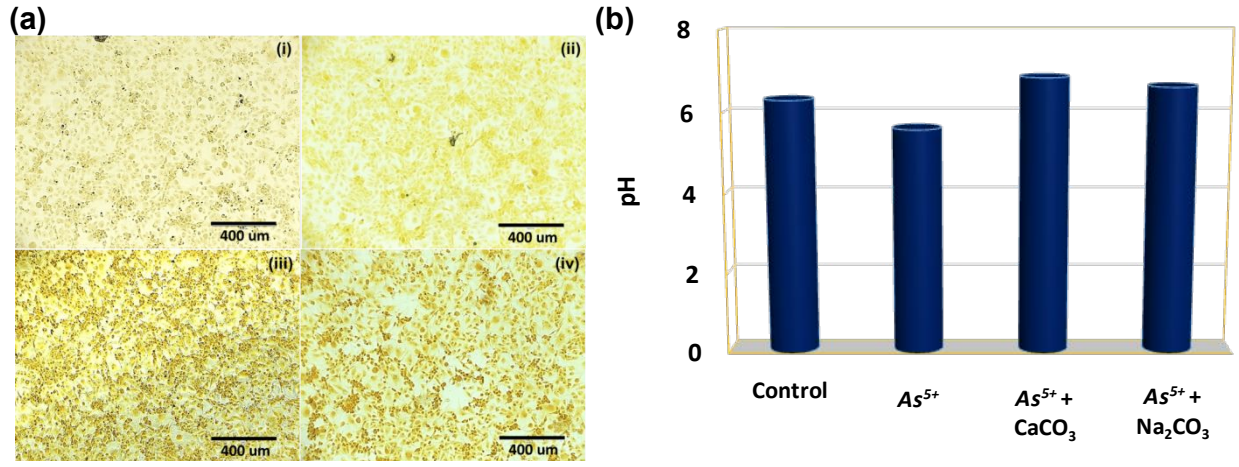

Figure S8. pH profiling of treated cells using bromothymol blue (a) Bright-field optical microscopy images of cells stained with BTB; (i) Control (ii) 3 ppm As^{5+} (iii) 3 ppm As^{5+} + 40 ppm $CaCO_3$ (iv) 3 ppm As^{5+} + 40 ppm Na_2CO_3. (b) Histogram of the pH distribution for treated cells.

Supporting information 9

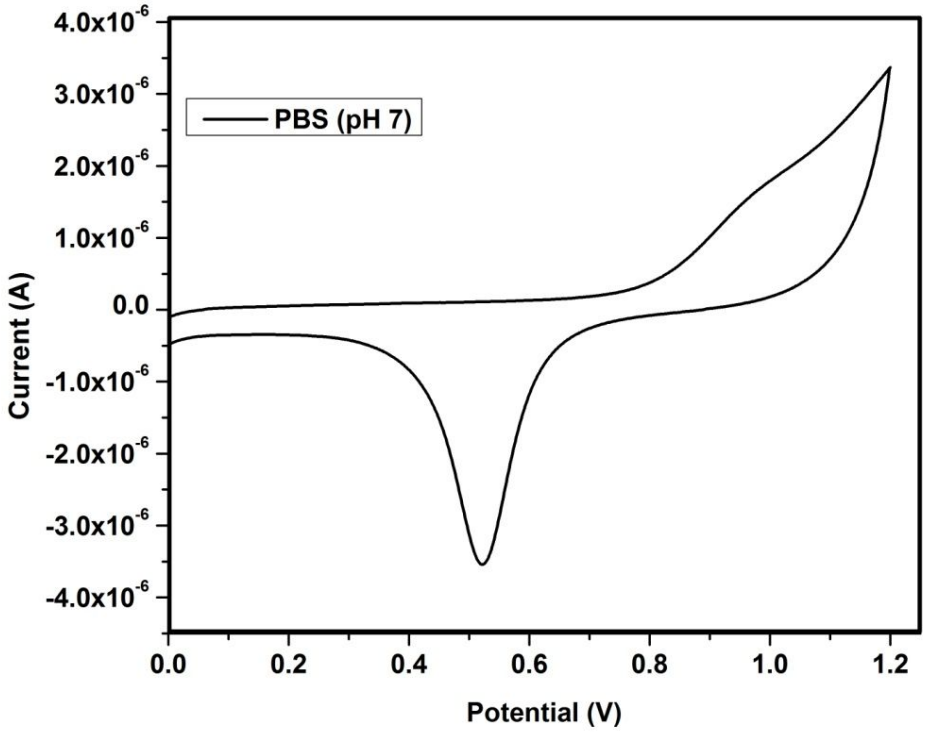

Figure S9. CV curve of PBS (pH=7) used in the cyclic voltammetry experiment demonstrating H_2O_2 decomposition by $CaCO_3$.