

## Corrigendum

# Corrigendum to “Toxicity of Graphene Shells, Graphene Oxide, and Graphene Oxide Paper Evaluated with *Escherichia coli* Biotests”

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Received 30 May 2015; Accepted 12 October 2015

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The paper titled “Toxicity of Graphene Shells, Graphene Oxide, and Graphene Oxide Paper Evaluated with *Escherichia coli* Biotests” [1] contains textual errors we wish to correct. The corrections are as follows.

In Section “2.1. Graphene-Family Nanomaterials” the sentence “Aqueous suspensions of GS and GO (from  $10^{-3}$  to  $2 \times 10^{-5}$  mg/L) ...” has numerical errors. The correct sentence is as follows: “... (from 1000 to 20 mg/L)...”

In Section “2.6. Efflux of Intracellular DNA Content” the sentence “The plasmid-containing *E. coli* K12 TG1 *lac::lux* strain was cultured in mid-exponential growth phase with ampicillin and then separated from its cultivation medium and incubated with aqueous GO suspensions at concentrations of  $1.25 \times 10^{-4}$ ,  $5 \times 10^{-4}$ , and  $2 \times 10^{-3}$  mg/L for 60 min, ...” has numerical errors. The correct sentence is as follows: “... at concentrations of 125, 500, and 2000 mg/L...”

In Section “2.7. Zeta Potential Measurement” the sentence “A bacterial suspension ( $3.7 \times 10^8$  CFU/mL) was mixed with serially diluted GO aqueous suspensions to a final concentration from  $3.1 \times 10^{-5}$  to  $5 \times 10^{-4}$  mg/L” has numerical errors. The correct sentence is as follows: “... to a final concentration from 31.25 to 500 mg/L.”

In Section “3.1.1. GFN Toxicity Assessment Using a Bacterial Bioluminescence Inhibition Assay” the sentence “In the current system containing  $3.7 \times 10^8$  CFU/mL cells, GO toxicity was characterized by EC50 values of  $1.13 \pm 0.05 \times$

$10^{-4}$ ,  $1.04 \pm 0.03 \times 10^{-4}$ , and  $7.92 \pm 0.24 \times 10^{-5}$  mg/L ...” has numerical errors. The correct sentence is as follows: “... by EC50 values of  $113.1 \pm 4.52$ ,  $104.2 \pm 3.12$ , and  $79.2 \pm 2.37$  mg/L...”

The sentence “At the 60th min of measurement these values varied from  $1.13 \pm 0.05 \times 10^{-4}$  to  $2.55 \pm 0.10 \times 10^{-5}$  mg/L ...” has numerical errors. The correct sentence is as follows: “... values varied from  $113.1 \pm 4.52$  to  $25.5 \pm 1.01$  mg/L...”

In Figure 4 legend designations have numerical errors: “1:  $10^{-3}$  mg/L; 2:  $5 \times 10^{-4}$  mg/L; 3:  $2.5 \times 10^{-4}$  mg/L; 4:  $1.25 \times 10^{-4}$  mg/L; 5:  $6.25 \times 10^{-5}$  mg/L; 6:  $3.13 \times 10^{-5}$  mg/L; 7:  $1.56 \times 10^{-5}$  mg/L; 8:  $7.81 \times 10^{-6}$  mg/L; 9:  $3.91 \times 10^{-6}$  mg/L; C: control; wp: white paper, bp: black paper, GO-P: graphene oxide paper.”

The correct designations are as follows: “1: 1000 mg/L; 2: 500 mg/L; 3: 250 mg/L; 4: 125 mg/L; 5: 62.5 mg/L; 6: 31.25 mg/L; 7: 15.62 mg/L; 8: 7.81 mg/L; 9: 3.91 mg/L; C: control; wp: white paper; bp: black paper; GO-P: graphene oxide paper.”

The x-axis values of GO in Figure 5 should be corrected to the following: from 0 to 250 mg/L.

In Table 2 the values of EC50 (mg/L content) should be replaced by those shown in the corrected table.

In Section “3.1.2. GFN Bioactivity in a Fluorescent Cell Assay” the sentence “In contrast, bacterial cells treated with GO suspensions became red-fluorescent after 60 min in

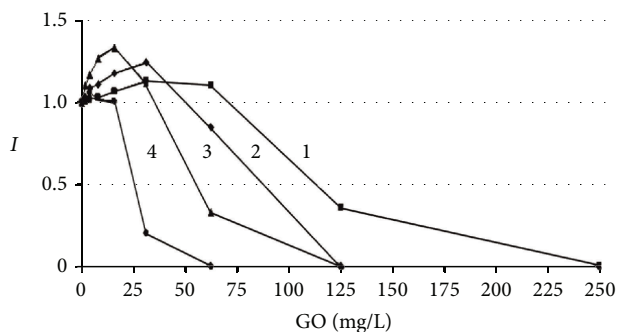


FIGURE 5

TABLE 2: Dose-dependent and time-dependent GO aqueous suspensions toxicity in bacterial bioluminescence inhibition assay characterized by EC50 value (mg/L content) at varying bacterial cell number in the sample.

<i>E. coli</i> K12 TG1 <i>lac::lux</i> , CFU per 1 mL	Time measurement		
	60 min	120 min	180 min
$3.70 \times 10^8$	$113.1 \pm 4.52$	$104.2 \pm 3.12$	$79.2 \pm 2.37$
$1.85 \times 10^8$	$88.1 \pm 2.64$	$82.0 \pm 3.27$	$56.7 \pm 1.69$
$9.25 \times 10^7$	$55.7 \pm 2.22$	$50.4 \pm 2.26$	$38.8 \pm 1.16$
$4.62 \times 10^7$	$25.5 \pm 1.01$	$24.9 \pm 0.99$	$22.8 \pm 0.89$

a dose-dependent manner, from  $48.8 \pm 1.9\%$  (at  $1.25 \times 10^{-4}$  mg/L GO) to  $93.0 \pm 2.8\%$  (at  $5 \times 10^{-4}$  mg/L GO) ...” has numerical errors. The correct sentence is as follows: “... from  $48.8 \pm 1.9\%$  (at 125 mg/L GO) to  $93.0 \pm 2.8\%$  (at 500 mg/L GO)...”

In Figure 6 legend, the *E. coli* K12 TG1 cells were treated with graphene shells suspensions at 1000 mg/L instead of  $10^{-3}$  mg/L and treated with graphene oxide suspension at 125 mg/L instead of  $1.25 \times 10^{-4}$  mg/L.

In Section “3.2.1. GO Validation as a Potential Oxidative Stress Inducer in *Lux*-Biotests” the sentence “The 1.2–1.5-fold light intensity growth only has been recorded at subtoxic GO concentrations ( $1.95 \times 10^{-6}$ – $10^{-3}$  mg/L)” has numerical errors. The correct sentence is as follows: “... at subtoxic GO concentrations (1.95–1000 mg/L).”

The sentence “In turn, GO concentrations of  $2 \times 10^{-3}$  mg/L or more were toxic ...” should be corrected to the following: “In turn, GO concentrations of 2000 mg/L or more were toxic ...”

In Section “3.2.2 Intracellular DNA Efflux Measurement in GO-Treated *Escherichia coli* Cells” the sentence “In turn, DNA levels in supernatants of cells exposed to GO at concentrations of  $1.25 \times 10^{-4}$ – $2 \times 10^{-3}$  mg/L ...” should be corrected to the following: “... 125–2000 mg/L...”

In Section “3.2.3. Effect of GO Treatment on Zeta Potential Properties of *Escherichia coli* Cells” the sentence “Finally, the GO concentration required for complete zeta potential neutralization was  $2.50 \times 10^{-4}$  mg/L, whereas concentrations in the range of  $3.13 \times 10^{-5}$ – $1.25 \times 10^{-4}$  mg/L ...” has numerical errors. The correct values are “... 250 mg/L...” and “... 31.25–125 mg/L ...,” respectively.

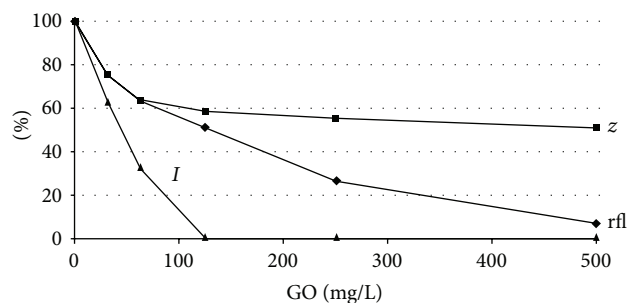


FIGURE 7

The x-axis values of GO in Figure 7 should be corrected to the following: from 0 to 500 mg/L.

These corrections do not influence the results, discussion, or conclusion of this work.

## References

- [1] L. V. Efremova, A. S. Vasilchenko, E. G. Rakov, and D. G. Deryabin, “Toxicity of graphene shells, graphene oxide, and graphene oxide paper evaluated with *Escherichia coli* biotests,” *BioMed Research International*, vol. 2015, Article ID 869361, 10 pages, 2015.