BIOACTIVITY ASSESSMENT OF GRAPHENE QUANTUM DOTS ON HEK293T CELLS

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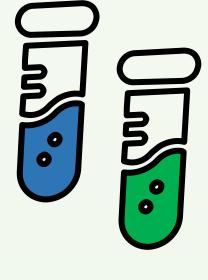
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INTRODUCTION CHARACTERISTICS USES Optoelectronics, Exhibits stable fluorescence Sensors, Bioimaging, Low toxicity Drug Delivery, Energy, Good water solubility Environmental 02 03 Detection **MODIFICATION DEFINITION POSSIBILITIES** 04 01 Zero-dimensional material Improvement of Composed of graphene properties for extended sheets <100 nm application Cytotoxic effects of blue (B-GQD) and green graphene quantum dots (G-GQD)

METHODS

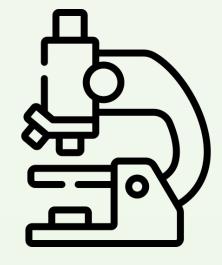
Cell Treatment

HEK293T cells (10⁵ cells/mL), 48-hours cultivation Treated after 24 hours with B-GQDs and G-GQDs Concentrations (2,5; 5 and 10 μg/mL)



Tests

- 1. MTT colorimetric assay
- 2. Apoptosis/necrosis, fluorescent microscopy
- 3. Autophagy detection, fluorescent microscopy



Cell viability (%) 120,00 80,00 40,00 20,00 C1 (2,5 μg/ml) C2 (5 μg/ml) C3 (10 μg/ml) PC NC (5-FU 100 μg/ml) ■ B-GQDs ■ G-GQDs

Figure 1. Viability of HEK293T cells measured by MTT assay after treatment with B-GQDs and G-GQDs (*p<0.001).

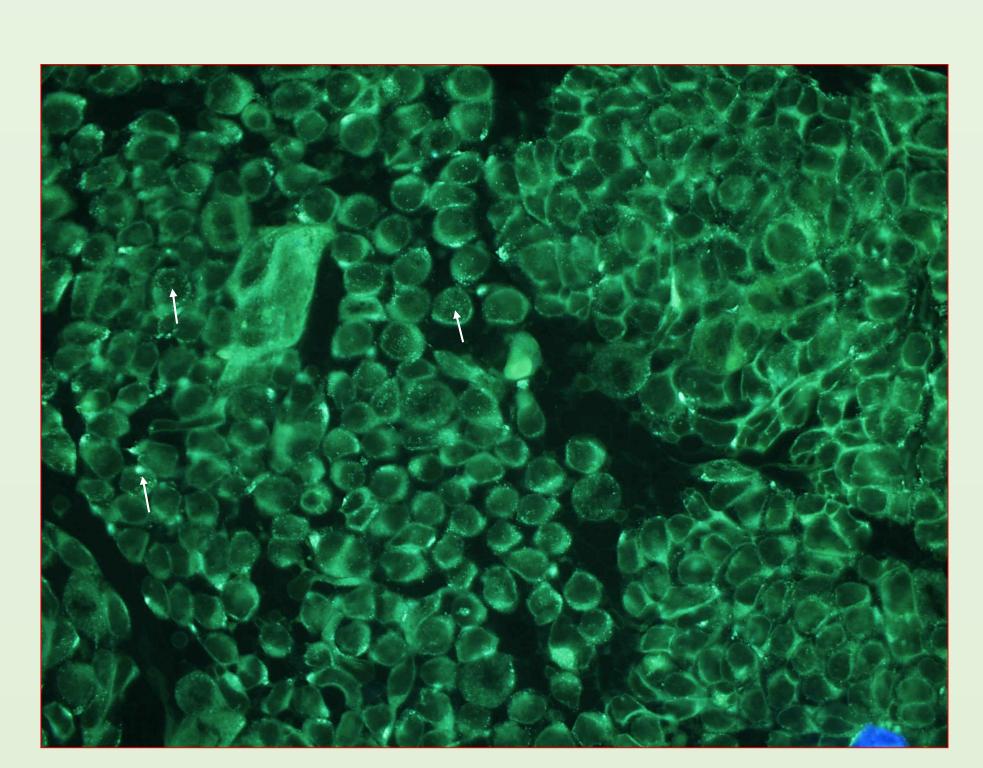


Figure 4. Autophagosomes in HEK293T cells after treatment with GQDs (400x).

RESULTS

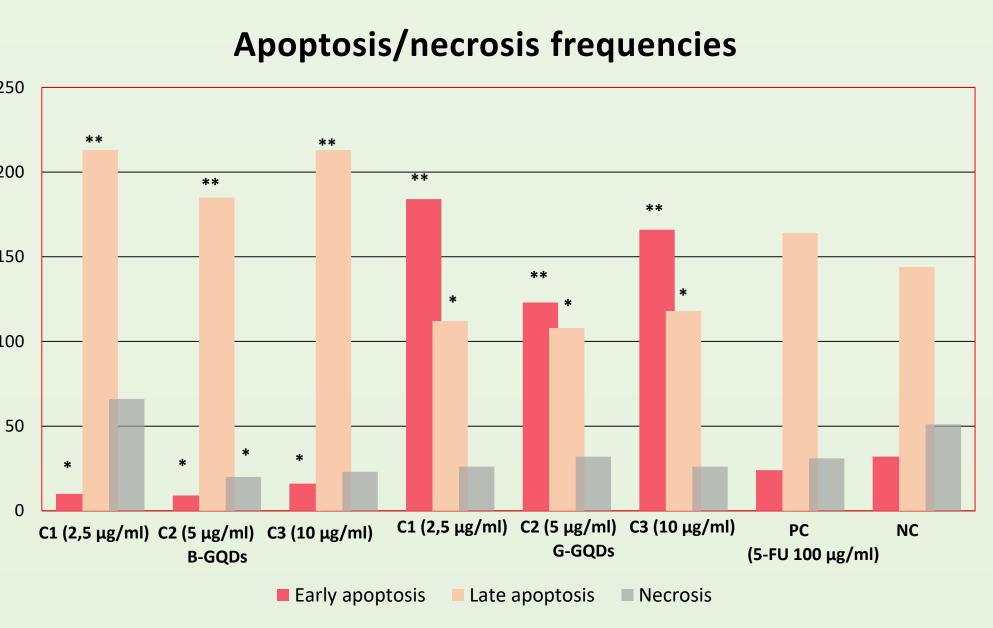


Figure 2. Effects of B-GQDs and G-GQDs treatment on apoptosis and necrosis induction in HEK293T cells (*p<0.05 statistically significant decrease compared to NC; **p<0.05 statistically significant increase compared to NC).

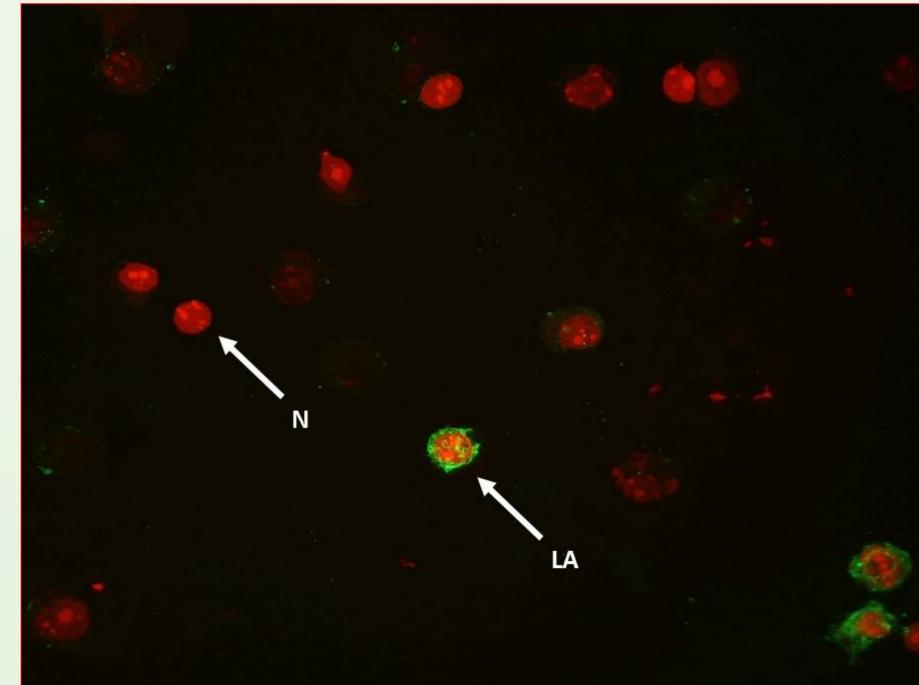


Figure 3. Apoptotic/necrotic HEK293T cells after treatment with GQDs. N (Necrosis) and LA (Late Apoptosis) (400x).

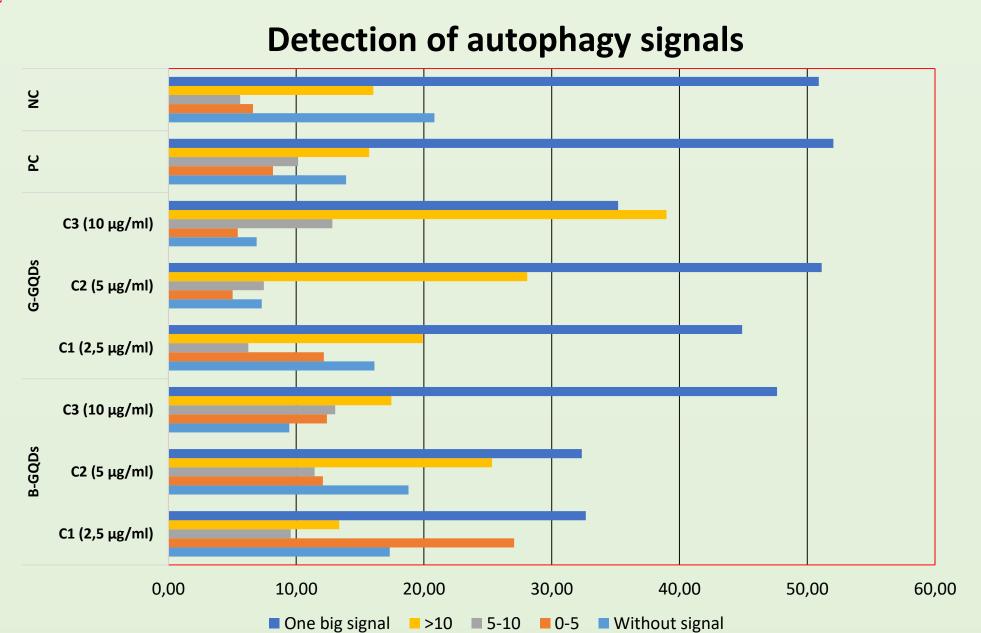


Figure 5. Distribution (%) of categorized autophagosomes in HEK293T cells after B-GQDs and G-GQDs treatment.

CONCLUSION

Commercial B-GQDs and G-GQDs in applied concentrations induced cytotoxicity by favouring apoptosis as a key event for this effect.

