Supplement to the paper:
V. I. Popenko, O. G. Leonova, V. I. Salyanov, N. N. Orlova, P. V. Spirin, V. S. Prasolov, and Yu. M. Evdokimov
"Dynamics of Penetration of "Rigid" Nanostructures of Double-Stranded DNA Complexed with Gadolinium into *CHO* Cells"

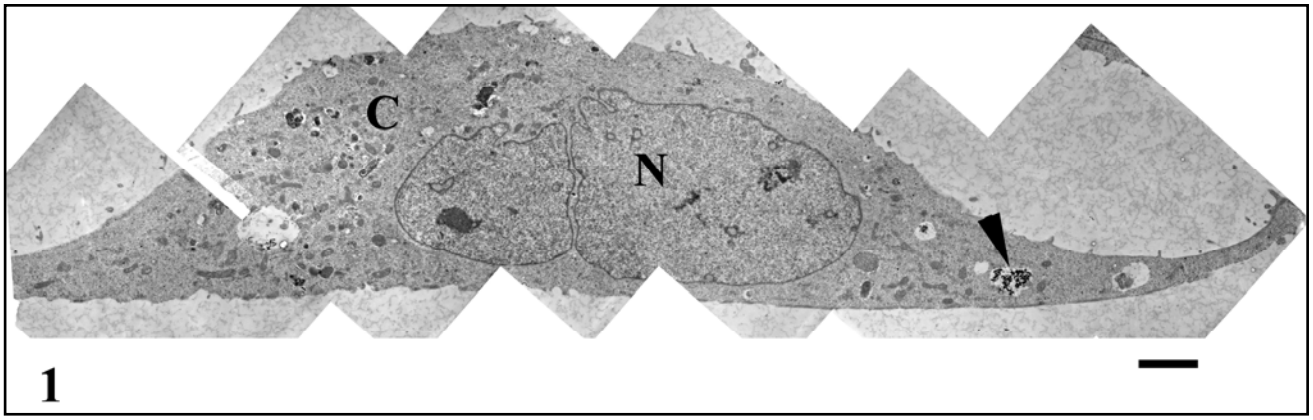

Fig.1. CHO cell of sample incubated with NS--Gd nanostructures for 1 h with small accumulations of NS--Gd particles in cytoplasm. The number of such cells is less than 5% of the population. Here and below, N stands for nucleus and C, for cytoplasm, arrows indicate NS--Gd outside cells and short arrows, NS--Gd inside cells. Scale bar is 2 μm.

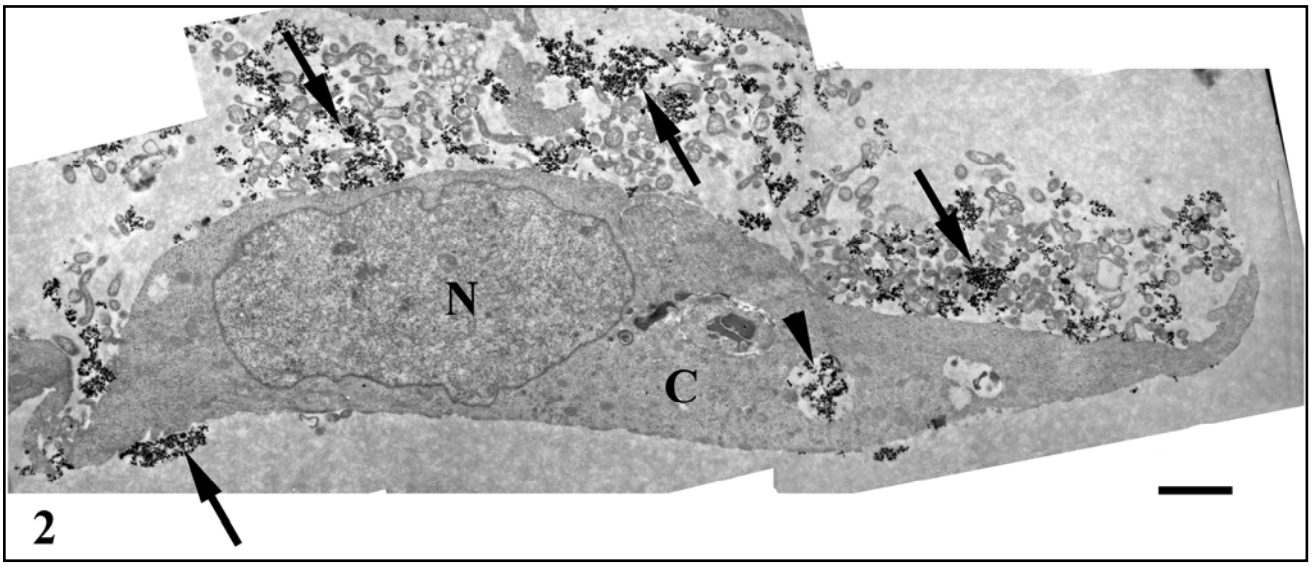

Fig. 2. CHO cell of sample incubated with NS--Gd nanostructures for 3h. NS--Gd nanostructures are observed in about 50% of the population. Cavities with NS-Gd structures are ~0.5 – 2 μm in size. Scale bar is 2 μm.

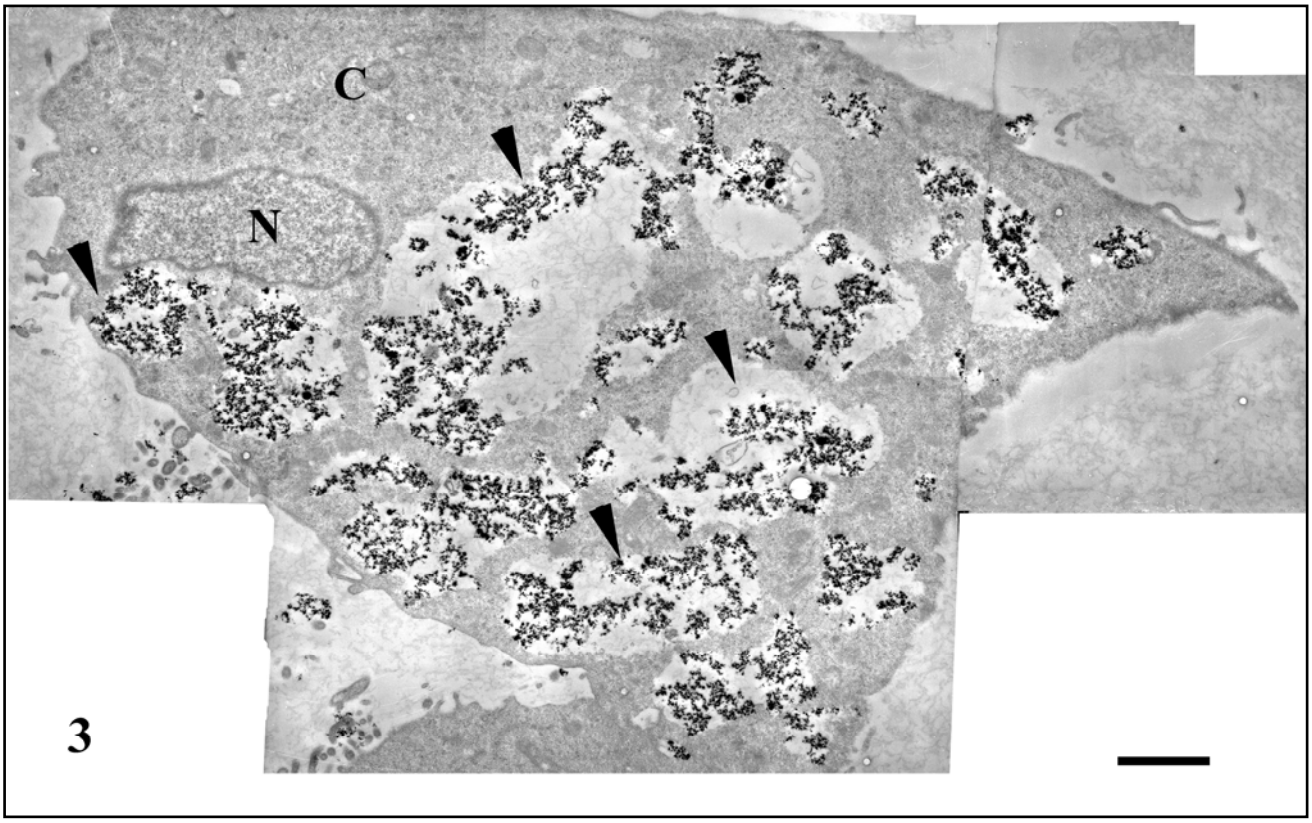

Fig. 3. CHO cell of sample incubated with NS--Gd nanostructures for 12 h. Cell morphology does not change significantly, although the number of NS--Gd inside of the cells increases. Cytoplasmic membrane remains undamaged. Scale bar is 2 μm.

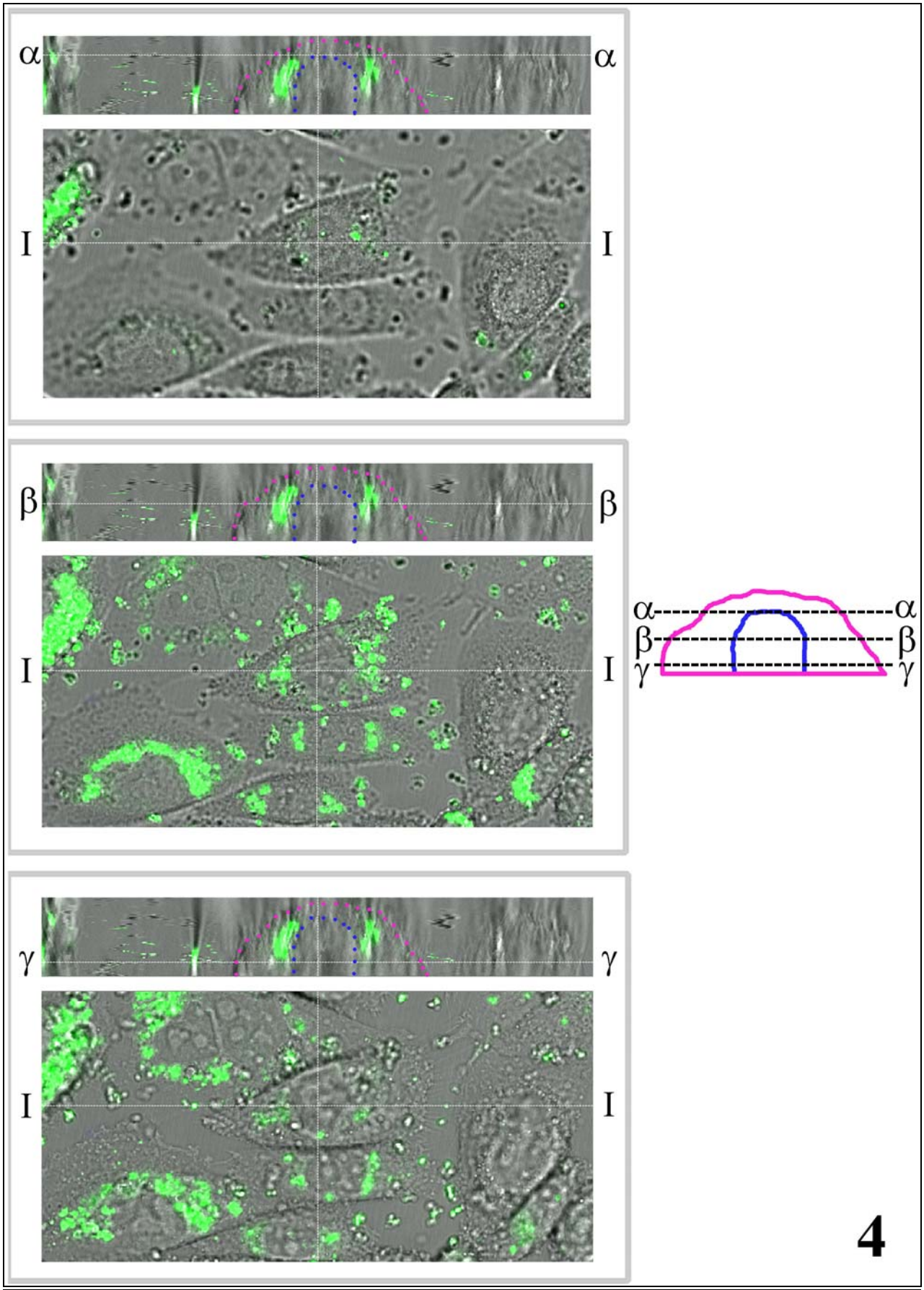

Fig. 4. Confocal microscopy of CHO cells of sample incubated with NS--Gd nanostructures for 24 h. NS-Gd nanostructures were identified in Leica TCS SP5 confocal microscope using SYBR Green I fluorescent dye. Optical sections at the levels α - α (at the top), β - β (in the middle) и γ - γ (at the bootom) along Z axis are shown. Above each optical section a corresponding cross section along I-I line is shown.. The boundaries of the nucleus and the cell are marked by blue and violet colors, respectively. A schematic drawing of the cell and optical section levels is shown on the right side. It is clearly seen that NS--Gd nanostructures are located inside the cells, in the cytoplasm.

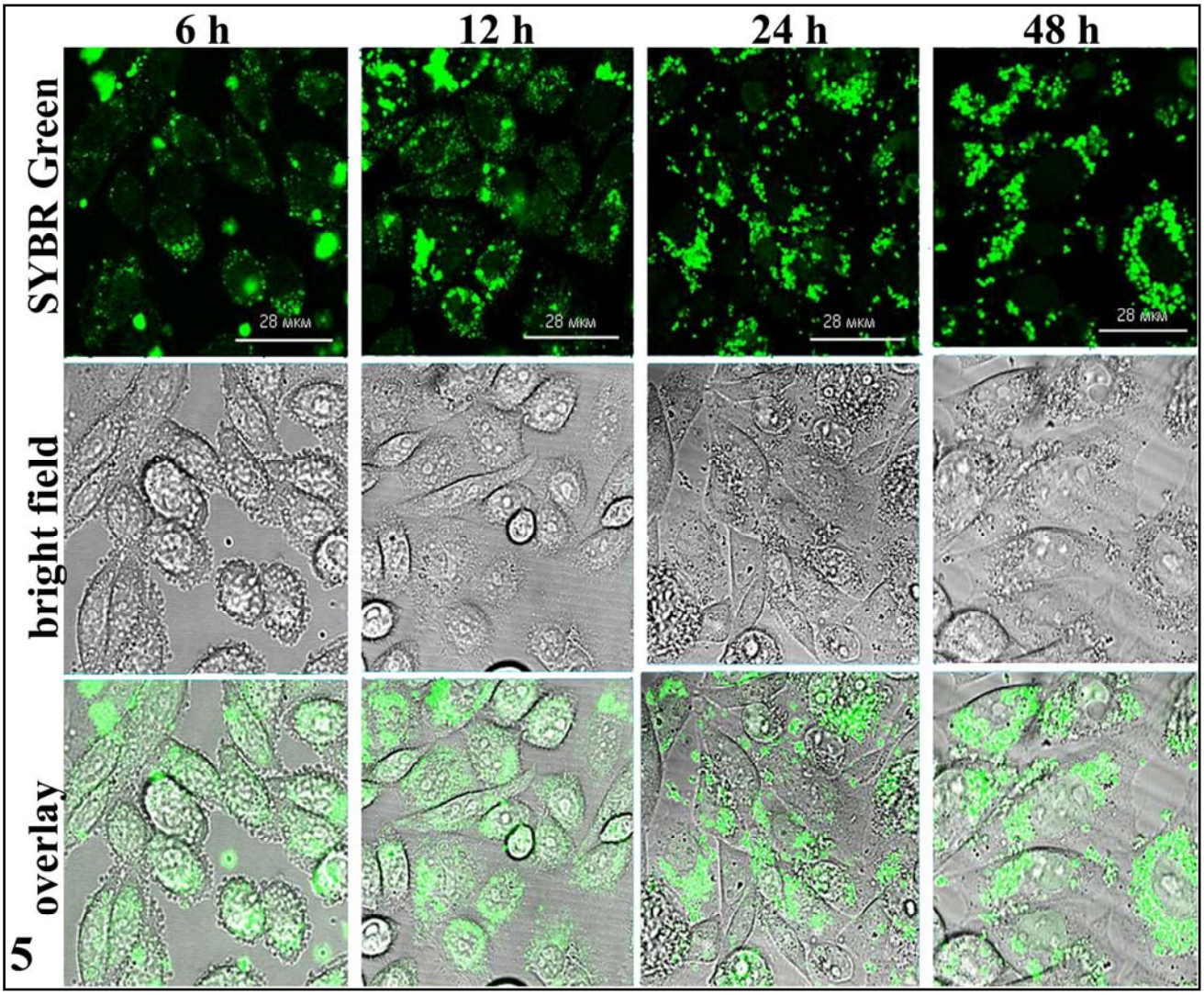

Fig. 5. An increase in incubation time leads to an increase in the number of NS--Gd inside of the cells. NS-Gd nanostructures were identified in Leica TCS SP5 confocal microscope using SYBR Green I fluorescent dye (upper row). In the middle row one can see bright field images of the same cells. Bottom row shows overlapped images. Separated large particles 0.5 and more μm in size are situated on the Petri dish bottom and on the cell surfaces. Many small fluorescent NS--Gd particles are located inside the cells.

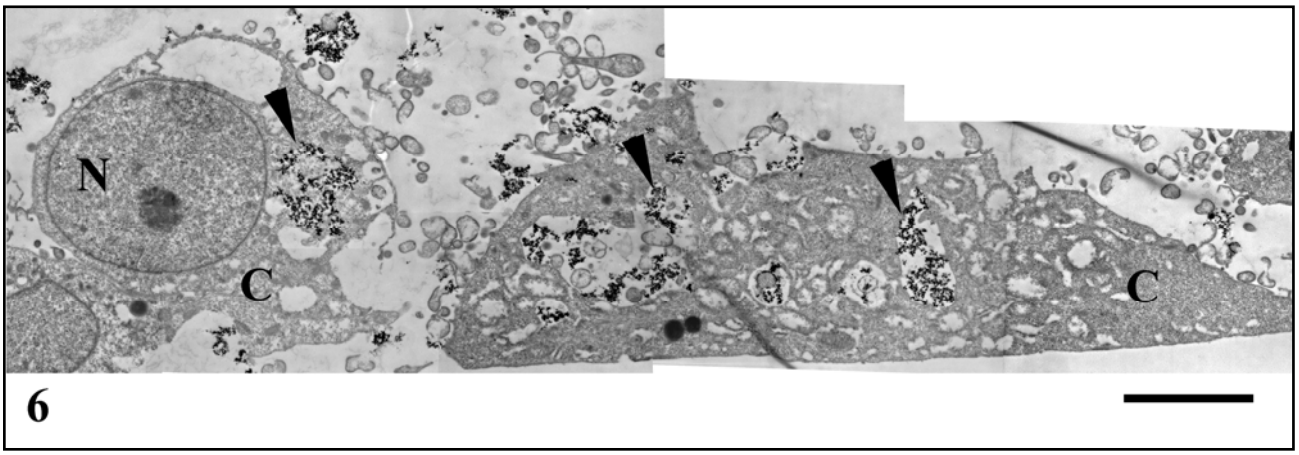

Fig. 6. CHO cells of sample incubated with NS--Gd nanostructures for 72 h. A significant portion of the cells dies. Many NS--Gd particles are observed inside the survived cells. The cell with broken cytoplasmic membrane is seen at the left. Scale bar is 5 μm.

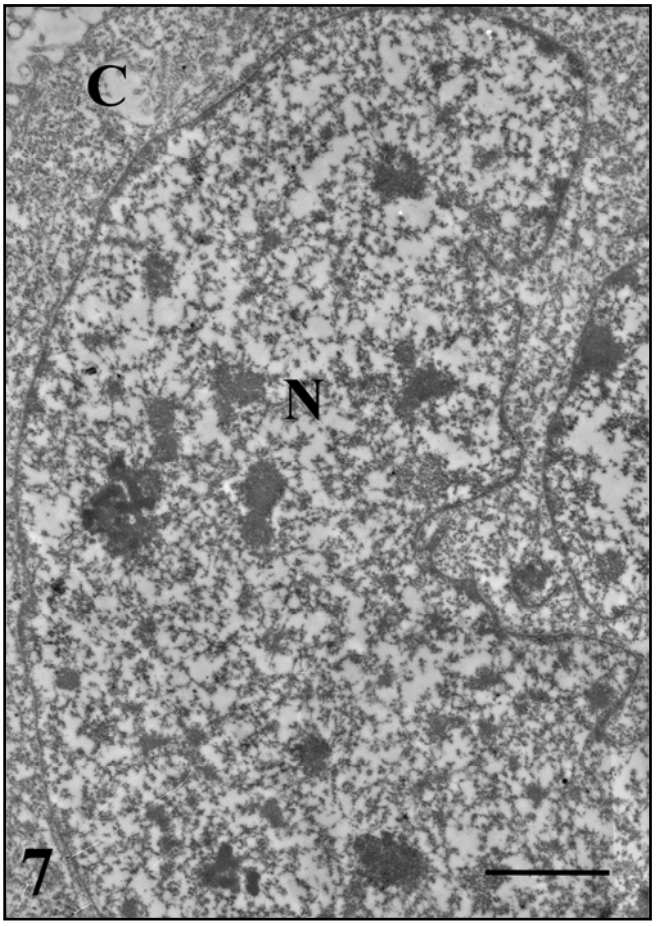

Fig. 7. CHO cell of the sample not incubated with NS--Gd nanostructures after irradiation. The cells were removed from substrate without a scraper by trypsin. The procedure allowed for the complete exclusion of mechanical damage to cells in the process of sample preparation; however, it resulted in a loss of the characteristic spindle-like shape and some swelling of the cytoplasm and nuclear structures. It is well seen that cytoplasmic membrane is not damaged. Scale bar is 2 μm.