

Supporting Information

C60 Fullerene Localization and Membrane Interactions in RAW 264.7 Immortalized Mouse Macrophages

Kristen A. Russ,¹ Paolo Elvati,² Tina L. Parsonage,^{3,4} Ariel Dews,¹ James A. Jarvis,^{3,4} Myah Ray,¹ Brandon Schneider,¹ Peter J.S. Smith,^{3,4} Philip T. F. Williamson,^{3,4} Angela Violi,^{2,5†} Martin Philbert^{1‡}*

¹ Toxicology Program, School of Public Health, University of Michigan, Ann Arbor, MI

² Mechanical Engineering, University of Michigan, Ann Arbor, MI

³ Centre for Biological Science, University of Southampton, Highfield Campus, SO17 1BJ

⁴ Institute for Life Sciences, University of Southampton, Highfield Campus, SO17 1BJ

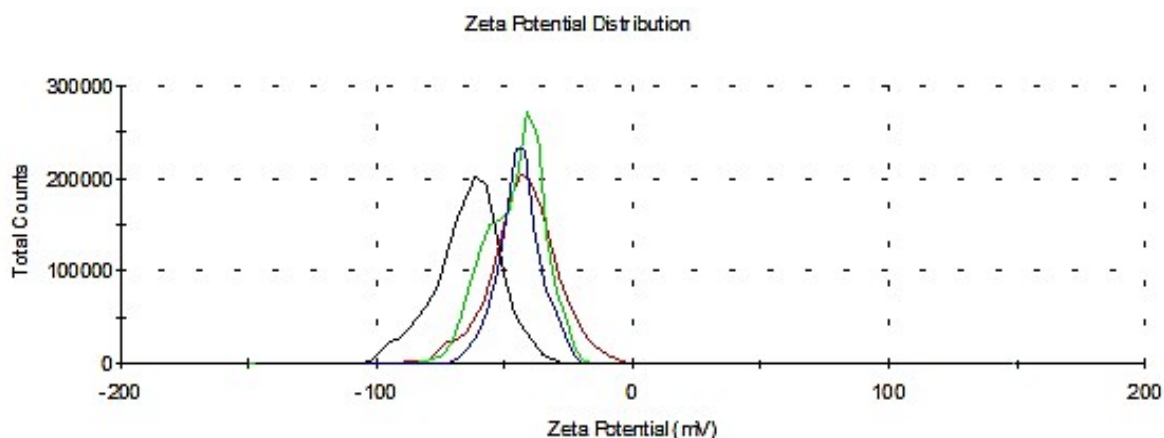
⁵ Chemical Engineering, Biomedical Engineering, Biophysics, University of Michigan, Ann Arbor MI

* P.T.Williamson@soton.ac.uk

† avioli@umich.edu

‡ philbert@umich.edu

(A)



(B)

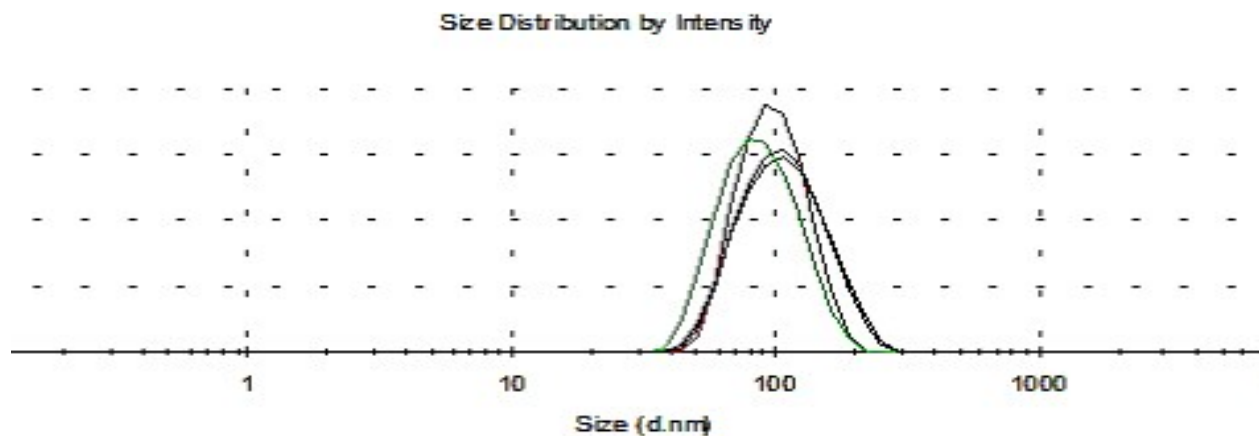


Figure S1. Characterization of C₆₀ Fullerenes and Terbium-Endohedral Fullerenes. (A) Zeta potential of C₆₀ fullerenes and terbium-endothedral fullerenes. The average zeta potential of the C₆₀ fullerenes (red, blue, green) was -44.3 mV, with -64.3 mV for the terbium-endothedral fullerenes (black). The similar sign and measurement of the zeta potential predict that the particles behave similarly. (B) Size distribution of C₆₀ fullerenes and terbium-endothedral fullerenes by the Malvern Zetasizer. The average aggregate size of C₆₀ fullerenes (red, blue, green) was 91.13 nm, with 99.31 nm for the terbium-endothedral fullerenes (black).

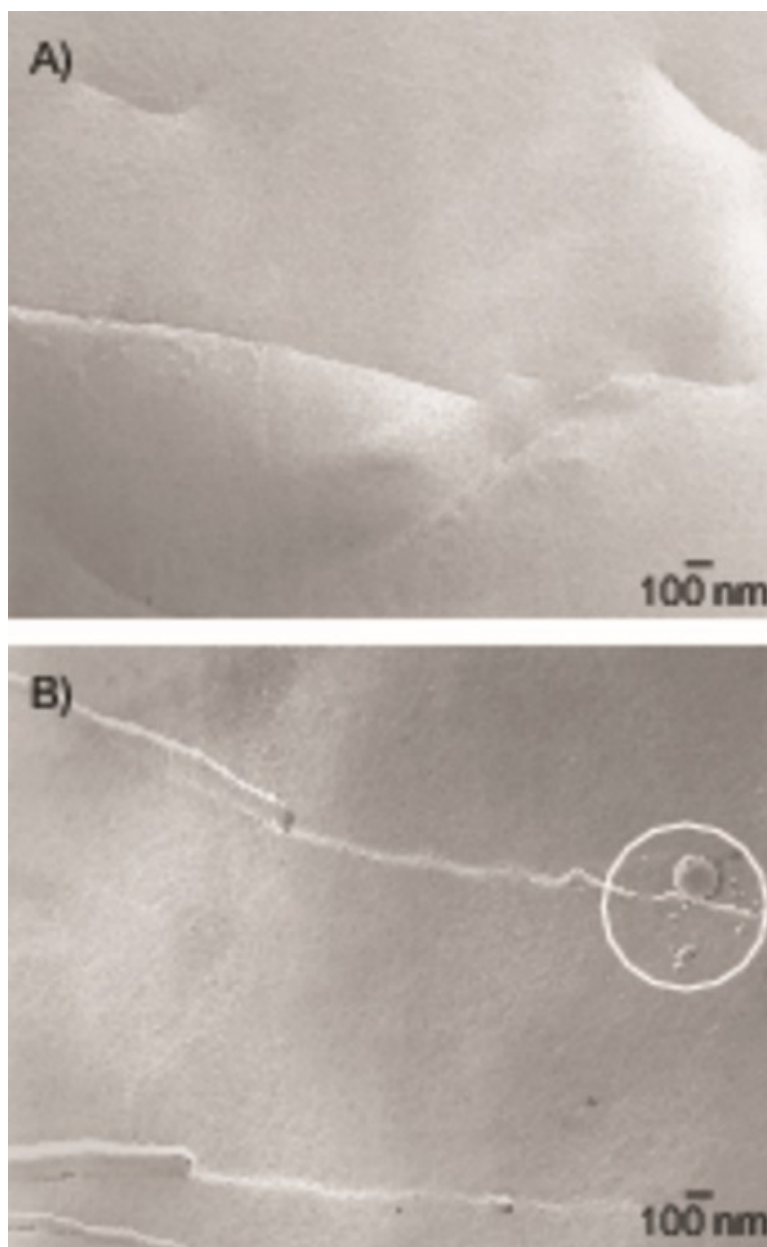
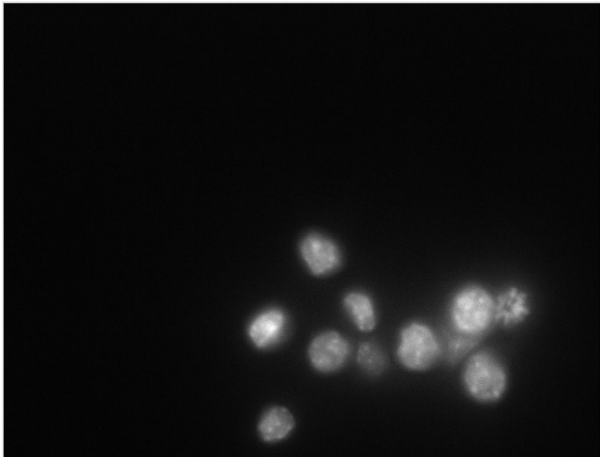
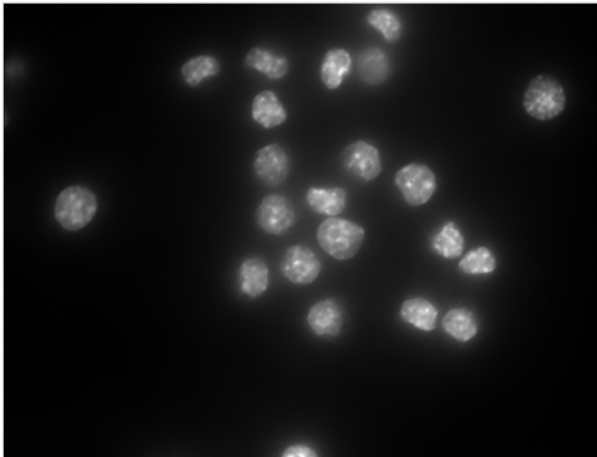
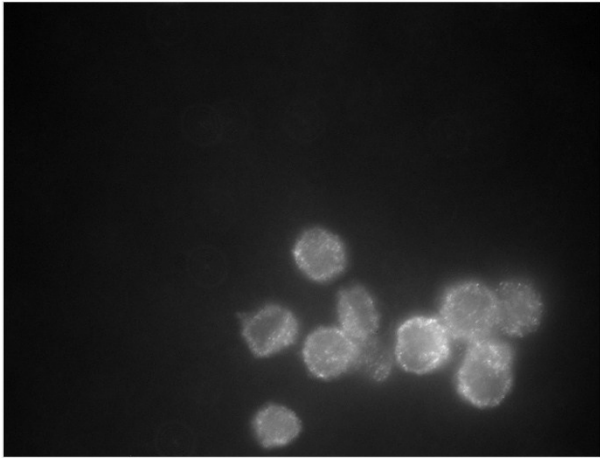
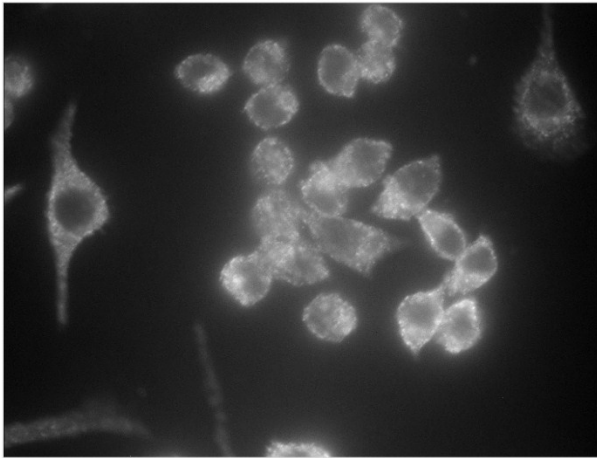
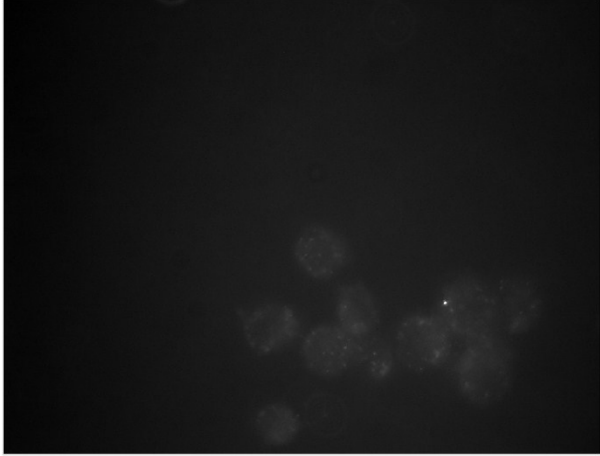
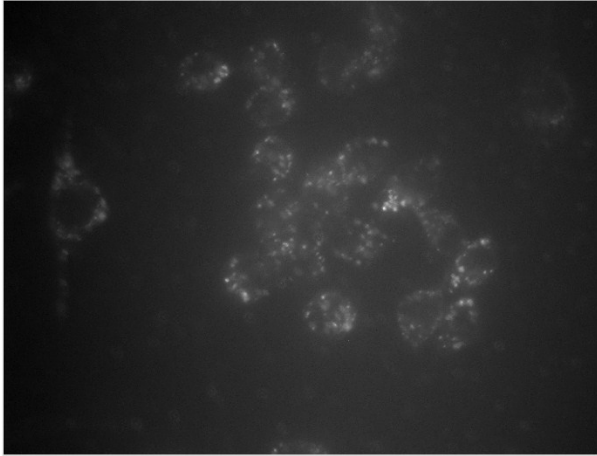


Figure S2. Freeze-Fracture Transmission Electron Microscopy on RAW 264.7 Cells. (A) Control cells. (B) Cells exposed to 0.5 $\mu\text{g/mL}$ terbium-encapsulated fullerenes. Fullerenes entering the membrane space are circled.



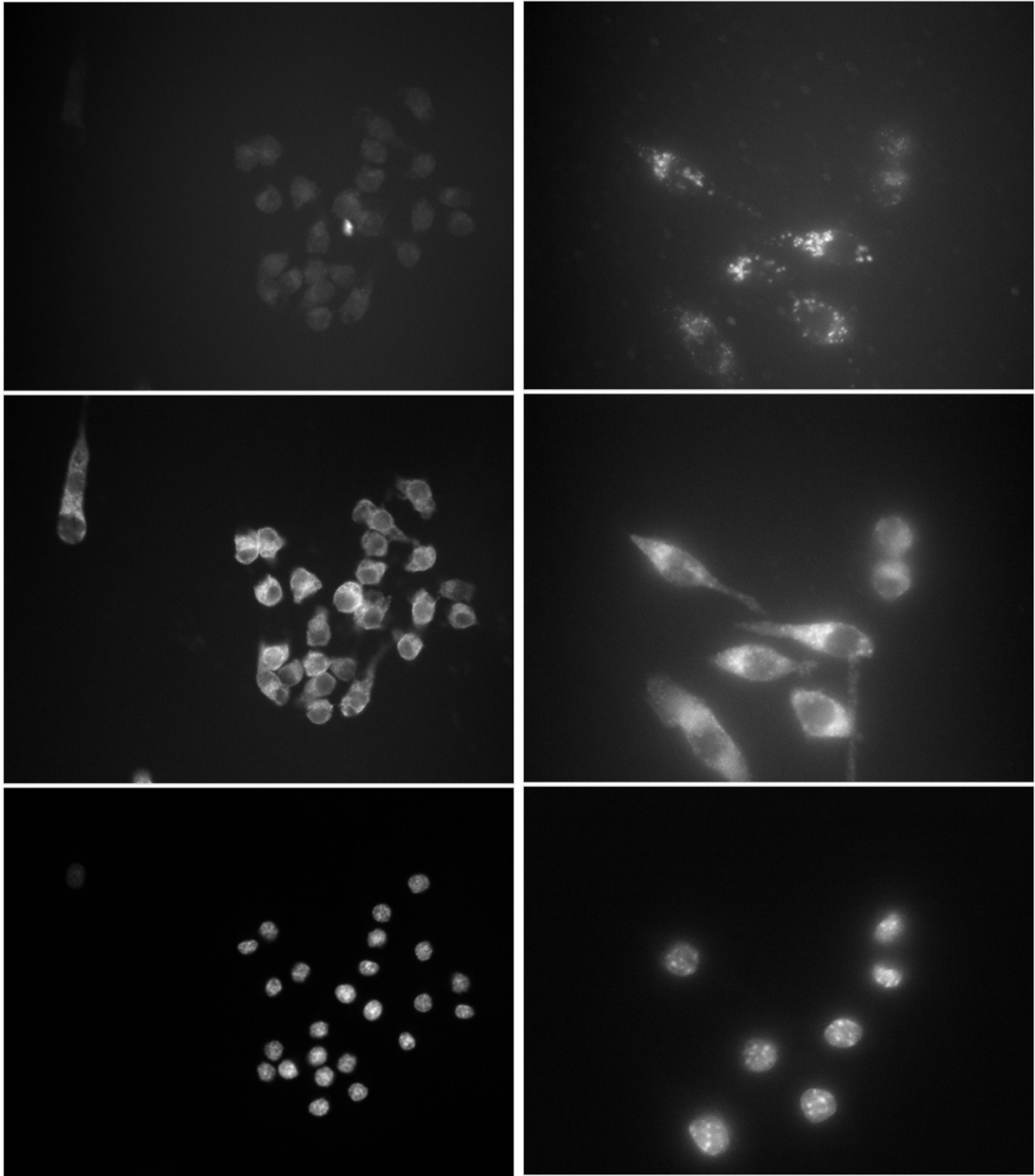


Figure S3. Red (top), green (middle) and blue (bottom) channel of the epifluorescent images of immortalized RAW 264.7 macrophages shown in Figure 3 of the main text.

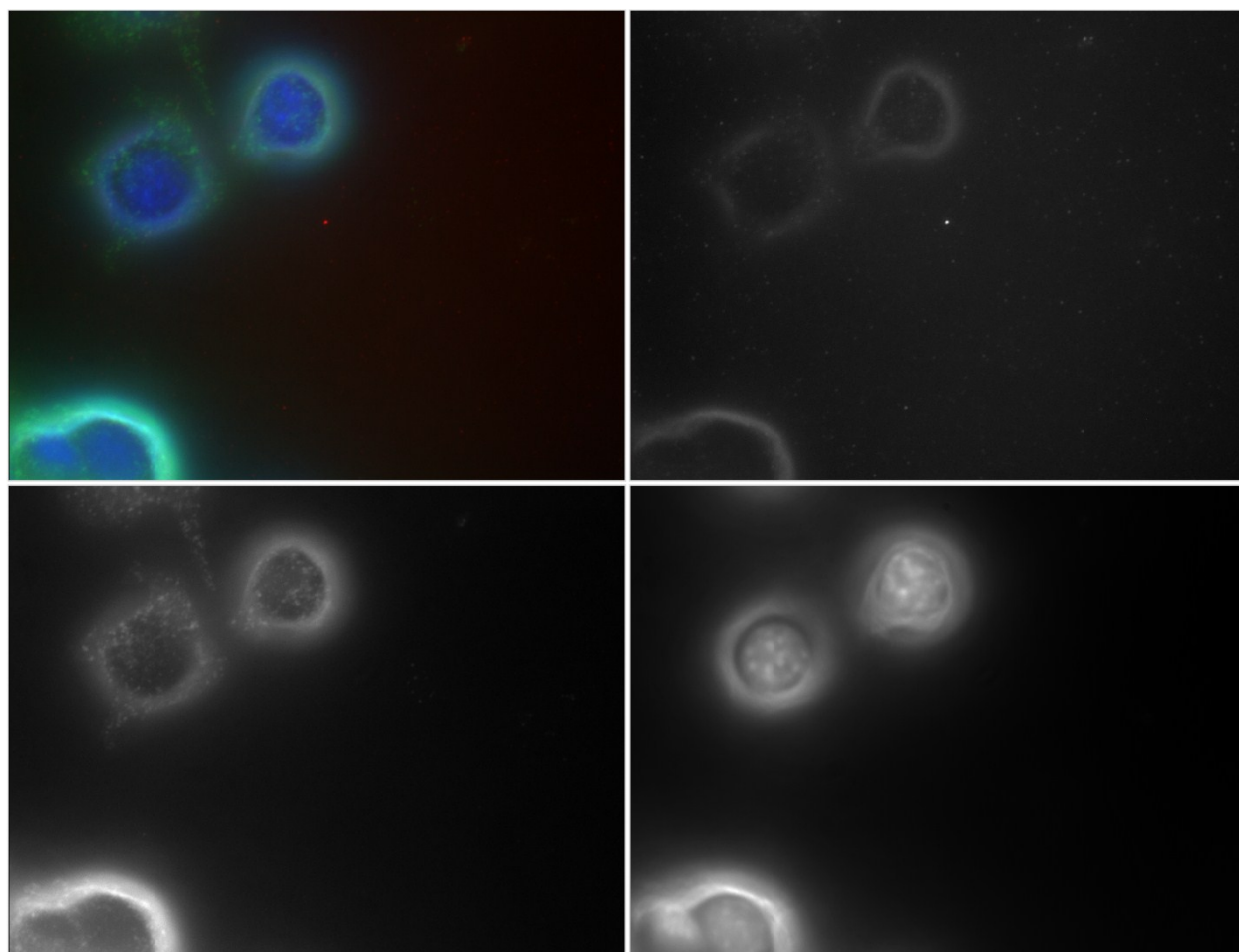


Figure S4. Epifluorescent image (top left) and its red (top right), green (bottom left), and blue (bottom right) channels of the control cells with undetectable intracellular fullerene (red channel).