



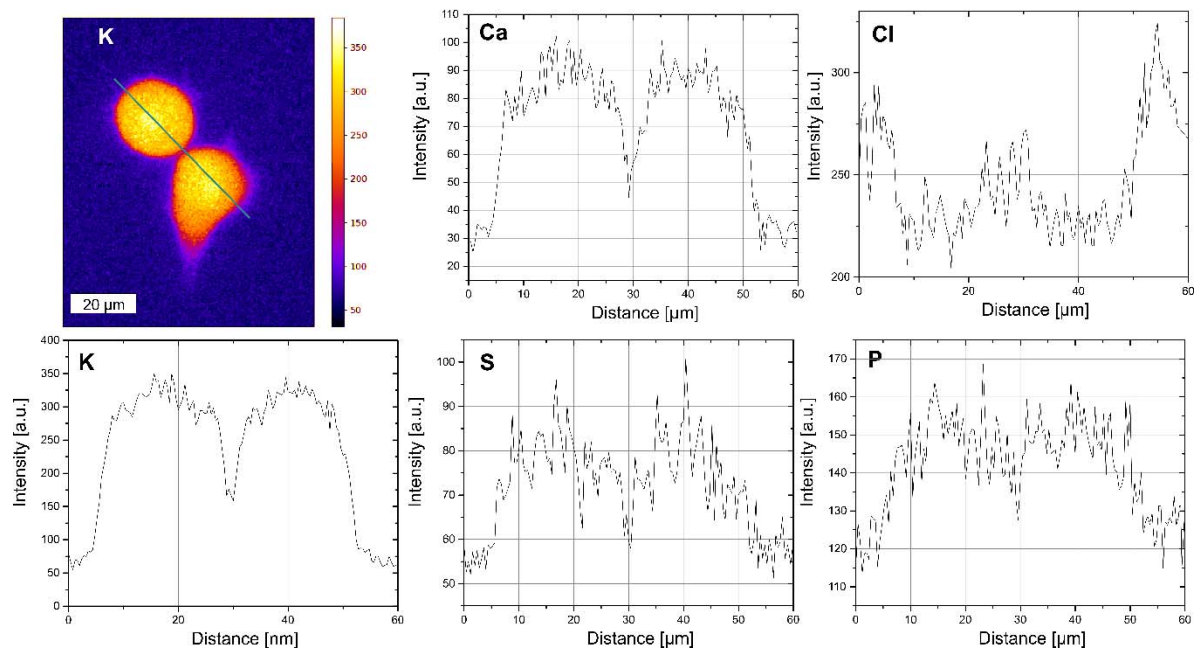
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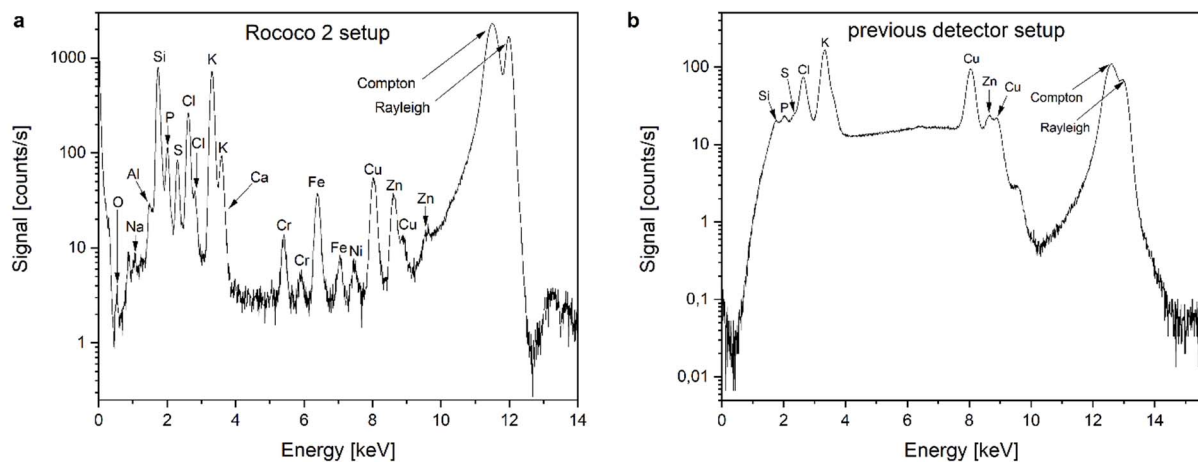
**Supporting information for article:**

**X-ray fluorescence analysis of metal distributions in cryogenic biological samples using large-acceptance-angle SDD detection and continuous scanning at the Hard X-ray Micro/Nano-Probe beamline P06 at PETRA III**

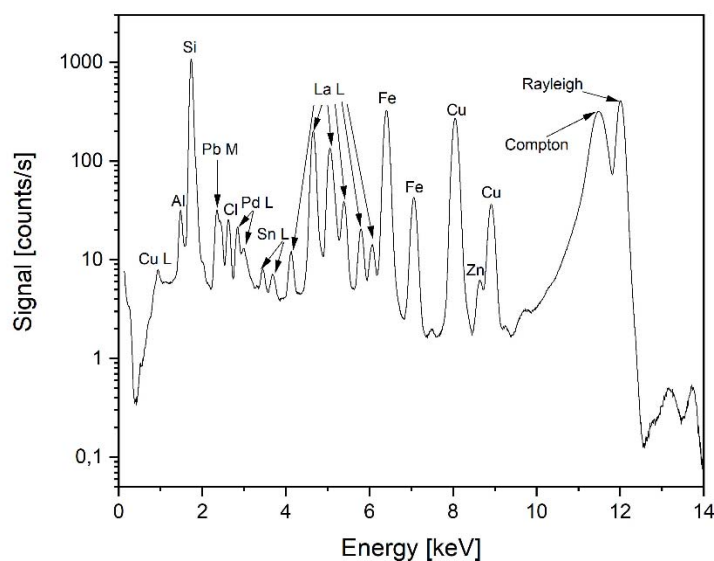
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**Figure S1** Intensity line profiles across the cells shown in figure 5. The position of the line profile is shown in the potassium map.



**Figure S2** Comparison of XRF sum spectra over 100 pixels obtained on similar single HeLa cells with the new Rococo 2 setup (a) and the previously used setup with a low acceptance angle of 0.066 Sr (b). Exposure time was 0.1 s for the Rococo 2 setup and 1.5 s for the previous setup. The spectra were collected using an X-ray focus size of 300 nm x 300 nm with an excitation energy of 12 keV (left) and 600 nm x 530 nm with an excitation energy of 13 keV (right). For the spectrum of the prior detector setup a much larger background is evident while only a fraction of the elemental peaks in the Rococo 2 spectrum could be resolved.



**Figure S3** XRF sum spectrum over 100 pixels obtained with the Rococo 2 detector on the thin film XRF reference sample „RF17-200-S4218-41“ (AXO Dresden, Germany). The sample contains thin films of the following elements: Pb, La, Pd, Mo, Cu and Fe. XRF peaks for all the listed elements could be except for Mo. The Mo  $L\alpha$  has an energy of 2.29 keV and thus is in the energy range of the spectrum but cannot be seen due to an overlap with the low-energy tail of the Pb  $M\alpha$  peak. The concentration of Mo was the lowest of the elements with 50 ppm, followed by Pd with 95 ppm. As the L transition peaks of Pd could be clearly resolved, a sample and element depending trace order of magnitude of the detection limit between 50 – 95 ppm can be estimated. The lowest resolved peak is Cu  $L\alpha$  with an energy of 0.93 keV. Exposure time was 10 s per pixel, spot size was 300 nm x 300 nm and excitation energy was 12 keV.