


Experiment Report Form

	Reconstitution of aluminium and iron core in horse spleen apoferritin	Experiment number:
Beamline:	Date of experiment: from: 26/11/2010 to: 27/11/2010	Date of report: 17/11/2011
Shifts:	Local contact(s): Emanuela di Cola	<i>Received at ESRF:</i>
Names and affiliations of applicants: Gabriele Ciasca, Marina Rodio, Gaetano Campi, Nicola Poccia, Alessandro Ricci.		

In this study [1] we investigate the uptake of iron and aluminium by apoferritin. In particular, we provide the first evidence that apoferritin is able to bind in vitro the physiological form of aluminium, Al(OH)₄⁻, to reach an Al/Fe atomic ratio of about 0.15. Mass spectrometry analysis shows that the Al content increases linearly as a function of Al concentration in solution. These findings provide a better understanding of the Al uptake in vivo, confirming that the metal content of ferritin depends on the metal bio-availability.

G. Ciasca, M. Chiarpotto, G. Campi, B. Bocca, M. Rodio, A. Pino, A. Ricci, N. Poccia, C. Rossi, A. Alimonti, et al., Journal of Nanoparticle Research pp. 1-7 (2011), ISSN 1388-0764, URL <http://dx.doi.org/10.1007/s11051-011-0294-2>.

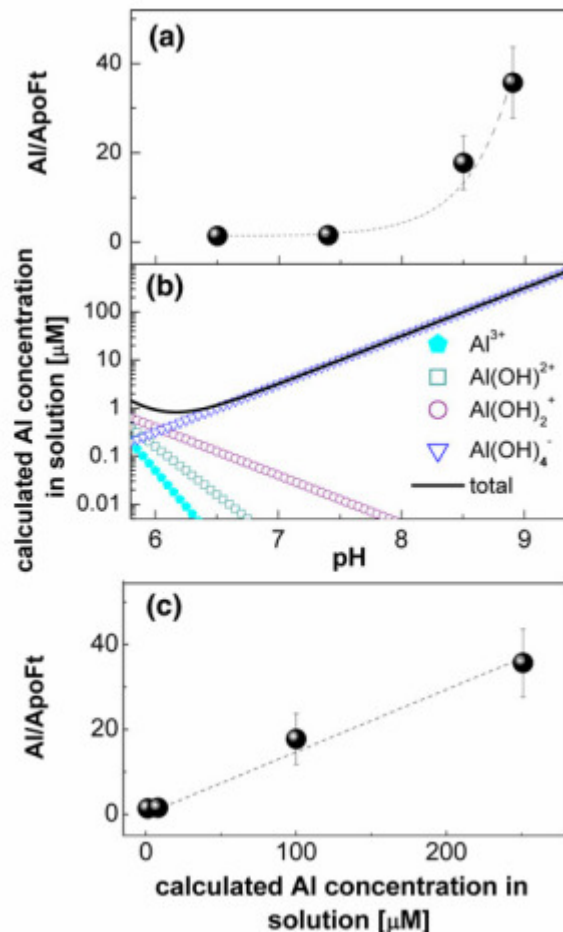


Fig. 1 a Number of Al atoms mineralized into the apoferritin cavity (Al/ApoFt) as a function of the solution pH, b concentration of Al ionic species in water solution as a function of pH values (a semi-log scale is used). Concentrations have been calculated according to the method reported in (Martin 1986), c number of mineralized Al atoms (Al/ApoFt) plotted against Al concentration in the reaction solution calculated in Fig. 2c

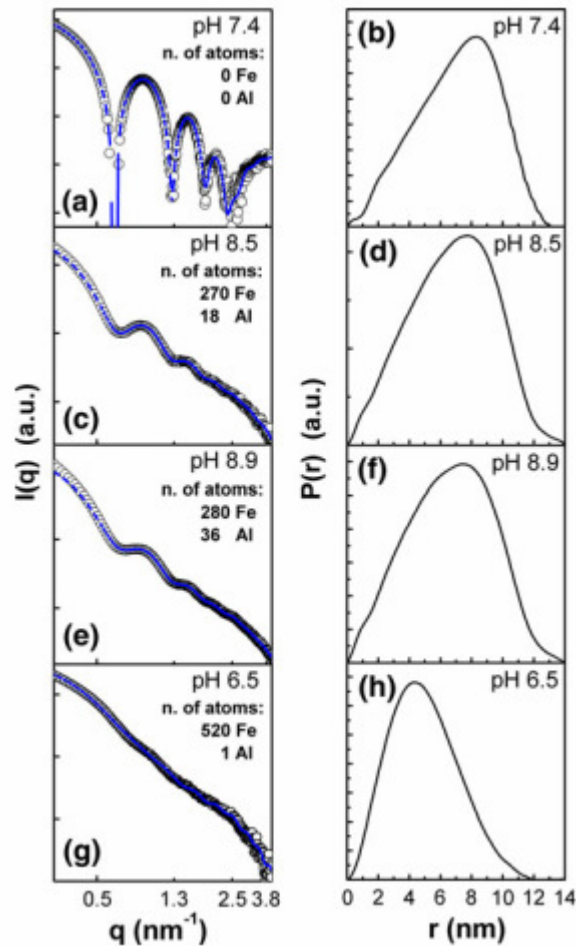


Fig. 2 Left panels Scattering profiles of native (panel a) and incubated apoferritins (panels c, e, g) as a function of the metal content (a log–log scale is used). The experimental data are displayed as open dots. The fits, obtained using the software GNOM, are displayed as broken lines; (right panels: b, d, f, h) Pair distribution functions obtained transforming the SAXS profile by means of the regularized transform software GNOM