

## **Detoxification of methylmercury in nanoparticulate HgSe in tissues of subantarctic seabird from XAFS analysis and STEM-HAADF imaging**

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Mercury is a global contaminant which readily bioaccumulates in aquatic organisms and biomagnifies in marine food webs mainly as neurotoxic methylmercury (MeHg). Being high in the food webs, seabirds are particularly exposed to MeHg. Total mercury concentration in seabird commonly reaches several hundreds ppm in liver and several tens ppm in muscle and kidney. Resistance to such high amounts of toxic mercury is thought to be achieved by detoxification in association with Se through biomineralization as HgSe, similarly to marine mammals.<sup>1</sup> This hypothesis was tested on the southern giant petrel *Macronectes giganteus* using Hg L<sub>3</sub>-edge X-ray absorption spectroscopy (HR-XANES and EXAFS) and transmission electron microscopy in STEM-HAADF mode coupled to elemental mapping (EDS). HgSe precipitates have been identified in liver (that contains 1499 ppm Hg), kidneys (414 ppm), and pectoral muscle (89 ppm). Grain size is comprised between 5 and 40 nm, and is smaller in kidneys and muscle than in liver. A possible mechanism of formation will be discussed.

1. Arai et al. *Environ. Sci. Technol.* 2004, 38, 6468-6474.