

Appendix S1. Artificial sweat (6, 9) consisting of deionized water, 0.5 % (v/v) sodium chloride ((Acros Organics, Morris Plains, NJ, USA), 0.1% (v/v) lactic acid (Sigma Chemical co, St Louis, MO, USA) and 0.1% (v/v) urea (Sigma Chemical Co.) was prepared as described in (7). The pH was adjusted with ammonia (Scharlau Chemie, Barcelona, Spain). The solution was kept in the refrigerator. Solutions of 0.1 M cysteine (ICN Biomedicals, Aurora, OH, USA), 0.1 M glutathione (ICN Biomedicals), 0.1 M penicillamine (Acros Organics, Morris Plains, NJ, USA), 0.5 M nitric acid (Scharlau Chemie, Sentmenat, Spain), 0.1 mM sodium hydroxide (Acros Organics) and 1% lactic acid (Sigma Chemical Co.) were prepared in deionized water. For the amino acid solutions the pH was adjusted with nitric acid. For sample analysis, gold standard containing chloroauric acid corresponding to 1000 ppm gold (BDH Laboratory Supplies, Poole, UK) and samples were diluted in Suprapur nitric acid (Merck, Darmstadt, Germany). Ethanol (Kemetyl, Haninge, Sweden) was used for cleaning the metal discs before extraction.

Appendix S2. Gold-plated titanium earrings (Blomdahl Medical AB, Halmstad, Sweden), with a mean weight of 161 mg/ring and a surface area of 0.77 cm² were extracted in the different solutions (9). One earring was placed in 5 ml solution in a polypropylene test tube. The test tubes were placed on a rocker and constantly shaken gently during extraction. The following extraction solutions were used: (i) artificial sweat (pH 5.0–7.5); (ii) nitric acid, 0.5 M (pH 1); (iii) lactic acid, 1% (pH 1); (iv) sodium hydroxide, 0.1 mM (pH 10); (v) glutathione, 0.1 M in deionized water (pH 1.2–9.2); (vi) penicillamine, 0.1 M in deionized water (pH 7.2–9.2); and (vii) cysteine, 0.1 M in deionized water (pH 7.0–9.5). Extracts were analysed on days 4 or 5. See Table I.

Appendix S3. Eleven metal discs (Allgemeine Gold- und Silberscheideanstalt AG, Pforzheim, Germany) with a thickness of 1 mm and diameter of 15 mm (surface area 4 cm²) made of gold alloys frequently used for jewellery were used to study the release of gold in cysteine solution. The compositions of the metal discs were specified by the supplier. The aim was that the discs would be as similar as possible to the ones used in the previously performed study (7). The gold content varied between 8 and 18 carat (33.3–75% gold). The gold content, type of alloy and amount of other metals in the alloys are shown in Table II. One piece of gold foil (24 carat) with an area of 2.0 cm² was also included to study the release rate from pure gold.

Appendix S4. The extraction medium was analysed using an atomic absorption spectrometer (AAS) with a detection limit of $<0.003 \mu\text{g Au/ml}$. The spectrometer used was an AAnalyst 800 (Perkin-Elmer, Norwalk, USA) equipped with a graphite furnace and a gold hollow cathode lamp. Absorption of gold was measured at 242.8 nm and the spectral bandwidth was 0.7 nm. Samples were analysed using Zeeman background correction. Samples were diluted in 0.5 M nitric acid and 20 μl of each sample was injected, together with a matrix modifier (0.005 mg palladium + 0.003 mg magnesium nitrate). Standard samples (0 (blank sample)- 0.05 ppm gold) were prepared by diluting the gold standard solution in 0.5 M nitric acid.