CLAIMS:

1. An isolated genetically engineered bacterium, wherein the bacterium has been transformed by at least one polynucleotide molecule; the at least one polynucleotide molecule comprising a heterologous mercury(II) reductase (*MerA*) gene, operably linked to at least one promoter, and comprising a mutation which confers the gene product improved catalytic efficiency of reducing ionic gold to elemental gold as gold nanoparticles when compared with wild type MerA, wherein the mutation encodes an amino acid substitution at a position selected from the group comprising V317S, A323D, A323D (delΔ324-365), A414E, G415I, E416C, L417I, I418D and A422N of the wild type MerA consisting of the amino acid sequence set forth in SEQ ID NO: 34.

2. The isolated bacterium of claim 1, wherein said at least one isolated bacterium comprises a G415I mutation which confers improved catalytic efficiency of reducing ionic gold to elemental gold as gold nanoparticles, ionic silver to elemental silver as silver nanoparticles, and reduced reductive capacity for mercury substrate when compared to a bacterium comprising a non-mutated *MerA* gene.

3. The isolated bacterium of any one of the previous claims, wherein the bacterium is selected from the group comprising *Chromobacterium violaceum*, *Pseudomonas fluorescens*, *P. aeruginosa* and *Eschericia coli* and/or wherein the bacterium is stable at pH 10.

4. A process for recovering elemental gold, as gold nanoparticles from ionic gold (Au^{3+}), said process comprising the steps of:

a) contacting the isolated genetically engineered bacterium according to any one of claims 1 to 3 with a leachate comprising ionic gold (Au^{3+}); and

b) recovering the elemental gold and/or silver nanoparticles from the leachate.

5. The process according to claim 4, wherein the said contact is performed in alkaline conditions.