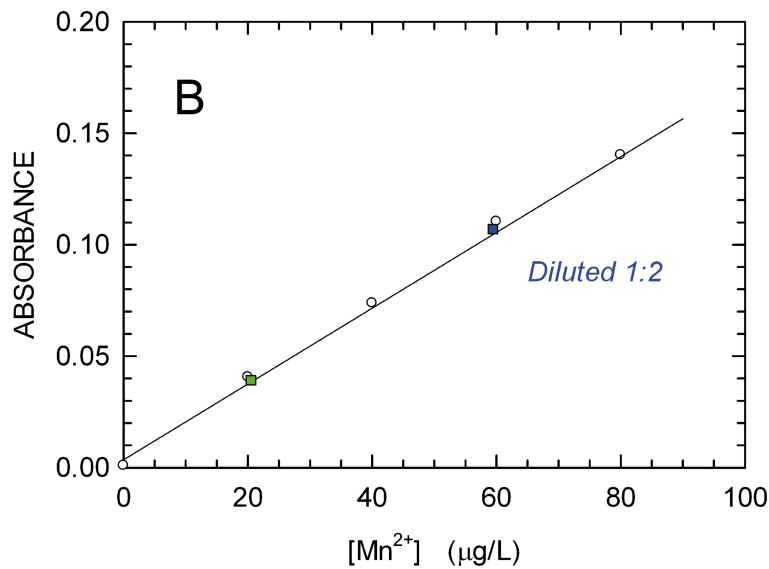
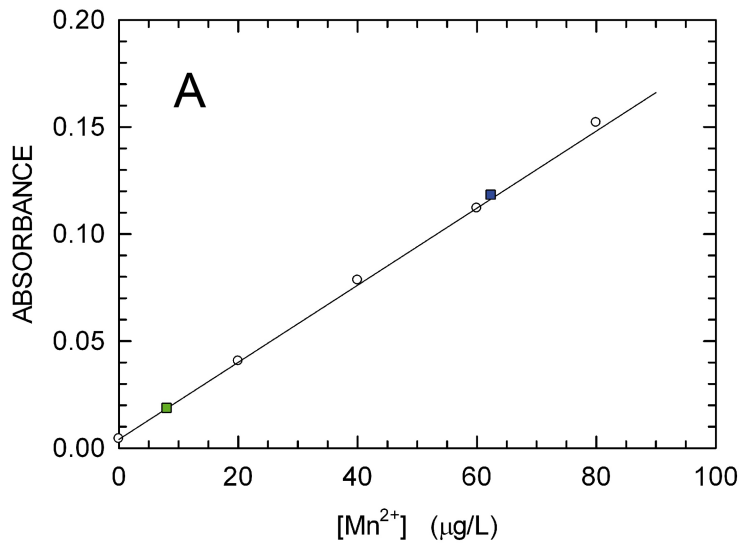


Supplementary Figure S1

Manganese and growth of *Deinococcus radiodurans*. Growth kinetics of *D. radiodurans* in TGY liquid medium (green circles, squares, and triangles) or in the same medium supplemented with 5 μM MnCl₂ (blue circles, squares, and triangles). The growth kinetics was determined for 3 independent cultures (3 different single colonies were used) of each sample (green symbols: TGY medium; blue symbols: TGY medium supplemented with 5 μM MnCl₂). The horizontal bars represent the mean of the final Absorbance values determined for the two groups of cultures (the error bars indicate standard deviation). The experimental mean values were compared by the Student's t test (***) indicates $P < 0.001$).



Supplementary Figure S2

Manganese levels in cells of *Deinococcus radiodurans*. Cultures of *D. radiodurans* were grown for 15 and 19 h (Panels a and b, respectively) in TGY medium, or in the same medium supplemented with 5 µM MnCl₂. The content of Mn²⁺ in whole cells grown in TGY (green squares) or in medium supplemented with 5 µM MnCl₂ (blue squares) was determined by atomic absorption spectroscopy, and compared with appropriate standards (open circles). The analyses were performed using 1 mL of each cell suspension (in ultrapure water). The number of cells per mL was determined on sample aliquots, and the volume of a single cell was assumed as equal to 8 µm³. It should be noted that the cells volume accounted for about 0.1% of the sample volume. To avoid underestimation of the Mn²⁺ concentration in cells grown for 19 h in manganese-enriched medium, the sample was diluted 1:2 with ultrapure water.

| Sample | Identity | Function |
|--------|---|---|
| 1 | Gi10957459 (DR_B0067) | Nuclease (extracellular) |
| 2 | Gi15805352 (DR_0323) | 50S ribosomal L5 protein |
| 3 | Gi15807484 (DR_2499) | Nucleoside diphosphate kinase |
| 4 | Gi15806486 (DR_1473) Gi15807160 (DR_2166) | Phage shock protein A Purine nucleoside phosphorylase |
| 5 | Gi15806271 | Hypothetical DR-1252 protein |
| 6 | Gi15807721 (DR_A0053) Gi15806895 (DR_1895) | Acetyl-CoA transferase Alanine dehydrogenase |
| 7 | Gi15805322 Gi15807570 (DR_2588) | Hypothetical DR-0291 Iron ABC transporter |
| 8 | Gi15807484 (DR_2499) | Nucleoside diphosphate kinase |
| 9 | Gi15805079 (DR_0038) | Serine-OH methyl transferase |
| 10 | Gi15806798 (DR_1797) | NusA |
| 11 | Gi10957459 (DR_B0067) | Nuclease (extracellular) |
| 12 | Gi15807466 (DR_2480) | Acetyl-CoA transferase |
| 13 | Gi15805352 (DR_0323) | 50S ribosomal L5 protein |
| 14 | Gi15807039 (DR_2045) | 50S ribosomal L1 protein |
| 15 | Gi15807036 | Hypothetical DR-2042 |
| 16 | Gi94984602 (Accession WP_011529639.1) | Unnamed protein product [<i>Deinococcus geothermalis</i> DSM 11300] |
| 17 | Gi970087 (clone pKDR1- Accession BAA09937.1) | Catalase |
| 18 | Gi15806739 (DR_1736) | 2',3'-cyclic 2'phosphodiesterase |
| 19 | Gi 7331218 - | Human Keratin 1 (contamination) |

| | | |
|----|--|---|
| 20 | Gi15806191 | Hypothetical DR-1172 |
| 21 | Gi15807375 (DR_2384) | Phenylacetic acid degradation protein (PaaB) |
| 22 | Gi 294678507 - | Hypothetical protein RCAP_rcc02988 [<i>Rhodobacter capsulatus</i> SB 1003] |
| 23 | Gi15807944 (DR_A0283) | Serine Protease |
| 24 | Gi15806798 (DR_1797) | NusA |
| 25 | Gi15806580 (DR_1571) | Peptide ABC transporter |
| 26 | Gi15805713 | Hypothetical DR-0686 |
| 27 | Gi15807466 (DR_2480) Gi15805338 (DR_0309) | Acetyl-CoA acetyltransferase Elongation factor Tu |
| 28 | Gi15807826 (DR_A0157) | Phosphate ABC transporter |
| 29 | Gi15807039 (DR_2045) | 50S ribosomal L1 protein |
| 30 | Gi15807570 (DR_2588) | Iron ABC transporter |
| 31 | Gi15805727 (DR_0700) | V-type ATPase subunit A |
| 32 | Gi361132441 - | Chain A, Metalloproteinase, light chain (<i>Mus Musculus</i>) |
| 33 | Gi5542160 - | Chain L, Campath-1h, light chain (<i>Homo sapiens</i>) |
| 34 | Gi15807049 (DR_2055) | Endopeptidase F |
| 35 | Gi15805338 (DR_0309) | Elongation factor Tu |
| 36 | Gi11387153 (DR_2059) | Glycine-tRNA-ligase |
| 37 | Gi15807492 (DR_2507) | Medium fatty acid CoA ligase |
| 38 | Gi15807619 (DR_0126) | DnaJ |
| 39 | Gi15806494 | Hypothetical DR-1481 |
| 40 | Gi15805727 (DR_0700) | V-type ATPase subunit A |
| 41 | Gi15806081 (DR_1061) | NADPH-quinone oxidoreductase |
| 42 | Gi15807095 | Hypothetical DR-2101 |
| 43 | NI | NI |

| | | |
|----|--------------------------|--|
| 44 | Gi15806965 (DR_1967) | Enoyl-acyl reductase |
| 45 | Gi6459090 (DR_1337) | Transaldolase |
| 46 | Gi15807812 (DR_A0143) | 3-hydroxybutyryl-CoA dehydrogenase |
| 47 | Gi15807570 (DR_2588) | Iron ABC transporter |
| 48 | Gi15807560 (DR_2577) | S-layer protein |
| 49 | Gi15807431 (DR_2444) | Nucleic acid binding protein HRDC family |
| 50 | Gi15806800 (DR_1799) | Translation IF-2 |
| 51 | Gi15805124 (DR_0083) | 2-oxoglutarate dehydrogenase E2 component |
| 52 | Gi15806525 (DR_1513) | 30S ribosomal S2 protein |
| 53 | Gi15806739 (DR_1736) | 2',3'-cyclic 2'phosphodiesterase |
| 54 | Gi15807551 (DR_2567) | N-acetylmuramoyl-L-Ala amidase |
| 55 | Gi15806336 (DR_1318) | Acyl-CoA dehydrogenase |
| 56 | Gi15806868 (DR_1868) | Penicillin binding protein 2 |
| 57 | Gi15806445 (DR_1428) | Acetyl-CoA acetyl transferase |
| 58 | Gi15806102 (DR_1082) | Light-repressed protein A |
| 59 | Gi15807254 (DR_2263) | DNA-binding stress response protein Dps family |
| 60 | Gi15806769 | Hypothetical DR-1768 |
| 61 | Gi15805608 | Hypothetical DR-0581 |
| 62 | Gi15805608 | Hypothetical DR-0581 |
| 63 | Gi15806486 (DR_1473) | Phage shock protein A |
| 64 | Gi15807111 (DR_2117) | Adenylate kinase |
| 65 | Gi15806218 (DR_1199) | Protease I |
| 66 | Gi15807039 (DR_2045) | 50S ribosomal L1 protein |
| 67 | Gi15805872 (DR_0846) | Bacterioferritin comigratory protein |
| 68 | Gi15807466 | Acetyl-CoA acetyltransferase |

| | | |
|--|-----------|--|
| | (DR_2480) | |
|--|-----------|--|

Supplementary Table 1

Spots (1-68) collected after 2D electrophoresis of protein extracts isolated from cells grown for 15 or 19 h in TGY medium or in the same medium supplemented with 5 μ M MnCl₂. The corresponding gene identities and functions are also indicated. NI: not identified.

| Spot | Feature | Identity | Function |
|------|-----------------|--|---|
| 1 | Only in Control | Gi10957459 (DR_B0067) | Nuclease (extracellular) |
| 2 | Only in Control | Gi15805352 (DR_0323) | 50S ribosomal L5 protein |
| 4 | Over in Control | Gi15806486 (DR_1473) Gi15807160 (DR_2166) | Phage shock protein A Purine nucleoside Pase |
| 25 | Only in Control | Gi15806580 (DR_1571) | Peptide ABC transporter |
| 28 | Only in Control | Gi15807826 (DR_A0157) | Phosphate ABC transporter |
| 29 | Only in Control | Gi15807039 (DR_2045) | 50S ribosomal L1 protein |

Supplementary Table ST2

Effect of manganese towards *D. radiodurans* proteome. Proteins selectively expressed after 15 h of growth in TGY medium not supplemented with manganese (control medium). Proteins detected in spots absent in the other gel (relative to TGY medium supplemented with manganese) are indicated as "Only in Control". Proteins detected in spots whose intensity was at least 2-fold higher or lower than the matched spot on the other gel (relative to TGY medium supplemented with manganese) are indicated as "Over in Control".

| Spot | Feature | Identity | Function |
|------|------------|---|-------------------------------------|
| 6 | Only in Mn | Gi15807721 (DR_A0053) Gi15806895 (DR_1895) | AcCoA transferase Alanine-DH |
| 9 | Only in Mn | Gi15805079 (DR_0038) | Serine-OH methyl transferase |
| 10 | Only in Mn | Gi15806798 (DR_1797) | NusA |
| 31 | Only in Mn | Gi15805727 (DR_0700) | V-type ATPase subunit A |
| 34 | Only in Mn | Gi15807049 (DR_2055) | Oligo Endopeptidase F |
| 36 | Only in Mn | Gi11387153 (DR_2059) | Glycine-tRNA-ligase |
| 37 | Only in Mn | Gi15807492 (DR_2507) | Medium fatty acid CoA ligase |
| 38 | Only in Mn | Gi15807619 (DR_0126) | DnaJ |

Supplementary Table ST3

Effect of manganese towards *D. radiodurans* proteome. Proteins selectively expressed after 15 h of growth in TGY medium supplemented with 5 μ M MnCl₂. Proteins detected in spots absent in the other gel (relative to TGY control medium) are indicated as "Only in Mn".

| Spot | Feature | Identity | Function |
|------|-----------------|--------------------------|------------------------------|
| 11 | Only in Control | Gi10957459 (DR_B0067) | Nuclease (extracellular) |
| 12 | Over in Control | Gi15807466 (DR_2480) | AcCoA acetyltransferase |
| 13 | Only in Control | Gi15805352 (DR_0323) | 50S ribosomal L5 protein |
| 40 | Only in Control | Gi15805727 (DR_0700) | V-type ATPase subunit A |
| 41 | Only in Control | Gi15806081 (DR_1061) | NADPH-quinone oxidoreductase |
| 44 | Over in Control | Gi15806965 (DR_1967) | Enoyl-acyl reductase |
| 45 | Over in Control | Gi6459090 (DR_1337) | Transaldolase |
| 46 | Over in Control | Gi15807812 (DR_A0143) | 3-OH butyryl-CoA DH |
| 47 | Only in Control | Gi15807570 (DR_2588) | Iron ABC transporter |

Supplementary Table ST4

Effect of manganese towards *D. radiodurans* proteome. Proteins selectively expressed after 19 h of growth in TGY medium not supplemented with manganese (control medium). Proteins detected in spots absent in the other gel (relative to TGY medium supplemented with manganese) are indicated as "Only in Control". Proteins detected in spots whose intensity was at least 2-fold higher or lower than the matched spot on the other gel (relative to TGY medium supplemented with manganese) are indicated as "Over in Control".

| Spot | Feature | Identity | Function |
|-------------|----------------|---------------------------|---------------------------------------|
| 17 | Only in Mn | Gi970087 (clone pkDR1) | Catalase |
| 18 | Only in Mn | Gi15806739 (DR_1736) | 2'-3'-cyclic Pi-esterase |
| 21 | Only in Mn | Gi15807375 (DR_2384) | Phenyl-Ac degradation (PaaB) |
| 23 | Only in Mn | Gi15807944 (DR_A0283) | S-Protease |
| 24 | Over in Mn | Gi15806798 (DR_1797) | NusA |
| 48 | Only in Mn | Gi15807560 (DR_2577) | S-layer protein |
| 49 | Only in Mn | Gi15807431 (DR_2444) | Nucleic acid binding protein |
| 50 | Over in Mn | Gi15806800 (DR-1799) | Translation IF-2 |
| 51 | Only in Mn | Gi15805124 (DR_0083) | 2-oxoglutarate DH E2 component |
| 52 | Only in Mn | Gi15806525 (DR_1513) | 30S ribosomal S2 protein |
| 53 | Over in Mn | Gi15806739 (DR_1736) | 2',3'-cyclic 2' Pi esterase |
| 54 | Over in Mn | Gi15807551 (DR_2567) | N-acetylmuramoyl-L-Ala amidase |
| 55 | Only in Mn | Gi15806336 (DR_1318) | Acyl-CoA DH |
| 56 | Only in Mn | Gi15806868 (DR_1868) | Penicillin binding protein 2 |
| 57 | Over in Mn | Gi15806445 (DR_1428) | AcCoA acetyltransferase |
| 58 | Only in Mn | Gi15806102 (DR_1082) | Light-repressed protein A |
| 59 | Over in Mn | Gi15807254 (DR_2263) | DNA-binding stress response |
| 63 | Over in Mn | Gi15806486 (DR_1473) | Phage shock protein A |
| 64 | Over in Mn | Gi15807111 (DR_2117) | Adenylate kinase |
| 65 | Over in Mn | Gi15806218 (DR_1199) | Protease I |
| 67 | Over in Mn | Gi15805872 (DR_0846) | Bacterioferritin comigratory prot. |

Supplementary Table ST5

Effect of manganese towards *D. radiodurans* proteome. Proteins selectively expressed after 19 h of growth in TGY medium supplemented with 5 μ M MnCl₂. It should be noted that spots 18 and 53 did contain the same protein (DR_1736). However, a significantly different pI for these two esterases was observed, i.e. equal to 6-6.25 and 5.5-6 for the enzyme identified in spot 18 and 53, respectively (see Fig. 5b). Proteins detected in spots absent in the other gel (relative to TGY control medium) are indicated as "Only in Mn". Proteins detected in spots whose intensity was at least 2-fold higher or lower than the matched spot on the other gel (relative to TGY control medium) are indicated as "Over in Mn".