

Supporting Information

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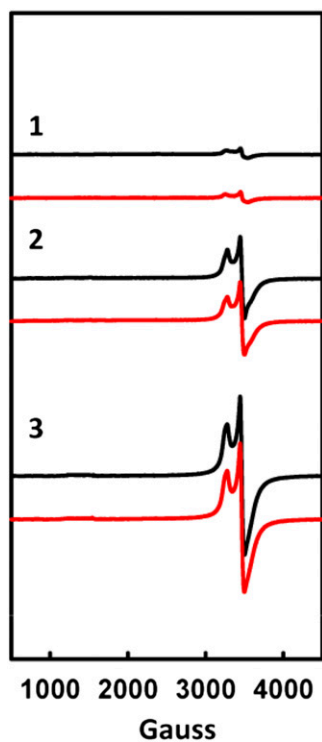


Fig. S1. Stability of cofactor-deficient molybdenum-iron (MoFe) proteins upon europium(II) diethylenetriaminepentaacetate [Eu(II)-DTPA] treatment. Perpendicular-mode EPR spectra of $\Delta nifH$ (1), $\Delta nifB\Delta nifZ$ (2), and $\Delta nifB$ (3) MoFe proteins before (black) and after (red) incubation with Eu(II)-DTPA. Samples were prepared by incubating MoFe proteins with Eu(II)-DTPA, followed by the removal of Eu(II)-DTPA and the addition of $\text{Na}_2\text{S}_2\text{O}_4$ (see *Materials and Methods*).

Table S1. Substrate-reducing activities of cofactor-deficient MoFe proteins in Eu(II)-DTPA-driven reactions

| Products | Activities | | |
|------------------------------------|---------------------------|--------------------------------|---------------------------|
| | <i>ΔnifB</i> MoFe protein | <i>ΔnifBΔnifZ</i> MoFe protein | <i>ΔnifH</i> MoFe protein |
| From H ⁺ | | | |
| H ₂ | 20,017 ± 4,014 | 59,142 ± 6,974 | 150,626 ± 20,147 |
| From N ₂ H ₄ | | | |
| NH ₃ | ND | 8,910 ± 967 | 27,175 ± 2,401 |
| H ₂ | 9,184 ± 1,011 | 38,732 ± 4,120 | 87,306 ± 9,307 |
| From N ₃ ⁻ | | | |
| NH ₃ | 15,100 ± 2,713 | 31,407 ± 4,944 | 118,649 ± 17,049 |
| H ₂ | ND | 8,727 ± 994 | 17,799 ± 2,194 |
| From C ₂ H ₂ | | | |
| C ₂ H ₄ | 9,185 ± 1,004 | 36,019 ± 2,984 | 110,827 ± 10,090 |
| C ₂ H ₆ | ND | ND | 5,921 ± 713 |
| H ₂ | 5,152 ± 813 | 14,179 ± 704 | 40,008 ± 1,490 |
| From C ₂ H ₄ | | | |
| C ₂ H ₆ | ND | 5,149 ± 417 | 17,174 ± 891 |
| H ₂ | 16,674 ± 2,097 | 39,603 ± 3,319 | 126,521 ± 9,897 |

Activities are expressed in nanomole product/micromole protein per hour. See *Materials and Methods* for assay conditions. ND, not detectable.