

## Biochemical characterization of an ADP-dependent DNA ligase from the hyperthermophilic archaeon *Aeropyrum pernix* K1

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### Abstract

A gene encoding for a putative ATP-dependent DNA ligase from the aerobic hyperthermophilic archaeon *Aeropyrum pernix* K1 was cloned and the biochemical characteristics of the resulting recombinant protein was examined. The gene (APE1094) from *A. pernix* coding a 69-kDa protein showed a 39-61% identity with other ATP-dependent DNA ligases from the archaea. Normally DNA ligase is activated by NAD<sup>+</sup> or ATP<sup>1,2)</sup>. There has been no report about the other activators for DNA ligase. The recombinant ligase was a monomeric protein and catalyzed strand joining on a singly nicked DNA substrate in presence of ADP and a divalent cation (Mg<sup>2+</sup>, Mn<sup>2+</sup>, Ca<sup>2+</sup> and Co<sup>2+</sup>) at high temperature. The optimum temperature and pH for nick closing activity<sup>3)</sup> were above 70°C and 7.5, respectively. The ligase remained stable for 60 min of treatment at 100°C, and the half-life was about 25 min at 110°C.

### References

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