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[\[PDF \(2769K\)\]](#) [\[References\]](#)**Polycationic protamine for water-insoluble complex formation with DNA**[Tadao FUKUSHIMA](#)<sup>1)</sup>, [Jun OHNO](#)<sup>2)</sup>, [Tohru HAYAKAWA](#)<sup>3)</sup>, [Rieko IMAYOSHI](#)<sup>4)</sup>, [Minoru KAWAGUCHI](#)<sup>1)</sup>, [Yutaka DOI](#)<sup>5)</sup>, [Keiichi KANAYA](#)<sup>6)</sup> and [Makoto MITARAI](#)<sup>7)</sup>

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**Abstract:**

The DNA/protamine complex was prepared by a reaction between DNA and protamine sulfate solutions with stirring, and its cell viability, antibacterial effect and histopathological responses were examined. A water-insoluble white powder, DNA/protamine complex, with a porous structure was obtained. The molar binding ratio of the complex prepared from a solution containing equal amounts of DNA and protamine sulfate by weight was 0.038 and the efficiency of complex formation was 61%. In a cell culture test using MC-3T3-E1 mouse osteoblast cells, the complex showed less cytotoxicity than protamine sulfate alone and cell viabilities were more than 98%. A porous disk could be prepared easily and showed an antibacterial effect against *Staphyrococcus aureus*, *Porphyromonas gingivalis* and *Prevotella intermedia* in an antibacterial sensitivity test and a mild tissue response *in vivo* test. These results suggested that the DNA/protamine complex could be a useful biodegradable biomaterial with antibacterial effects.

**Key words:**

[Protamine](#), [DNA](#), [DNA/protamine complex](#)

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