**Canine distemper: DNA vaccine studies** (14-Aug-1999)

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**Abstract**

Canine distemper is a highly infectious, acute or subacute, febrile viral disease of dogs and other carnivores, which occurs world-wide. The disease is caused by canine distemper virus (CDV), a member of the genus morbillivirus which belongs to the paramyxovirus family.

The currently used vaccines against canine distemper have a number of drawbacks. They may induce immunosuppression or neurological disorders. Even cases of vaccine-induced distemper have been reported. Furthermore, these vaccines are not particularly satisfactory in terms of efficacy since cases of distemper in vaccinated dogs are not rare. Therefore we developed a DNA vaccine to overcome these limitations.

We constructed expression plasmids containing the N-, the F- or the H-protein. N and H were chosen, because they contain epitopes important for cell mediated immune responses, and F and H are the viral surface glycoproteins inducing neutralizing antibodies. The nucleotide sequences for these constructs were derived from the virulent A75/17-CDV, which is known to induce demyelinating distemper in the dog. The N-protein construct was first tested in mice for the induction of an immune response. The expression plasmid pCI/N induced antibodies against the recombinant CDV N-protein as well as a CDV specific CTL response. In the following study five dogs were immunized with all three expression plasmids and two dogs served as non vaccinated controls. The immunized dogs had detectable amounts of CDV neutralizing antibodies. All dogs then were challenged by experimental infection with virulent A75/17-CDV. All immunized dogs were protected, whereas the non vaccinated dogs developed distemper with neurological symptoms. The unprotected dogs also developed lymphopenia and leukopenia whereas the vaccinated dogs had normal blood cell counts. CDV antigen was detected in the unprotected dogs in blood and in CSF cells. The histopathological examinations showed distemper lesions in various tissues in the unprotected dogs. Non of the vaccinated dogs showed distemper lesions in all examined tissues.

We believe that experience gained with this vaccine in the natural host is useful for developing a DNA vaccine against other morbilliviruses such as measles or rinderpest.

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