GS02-4 The recognition of abasic site using the electrostatic interaction with DNA phosphate part

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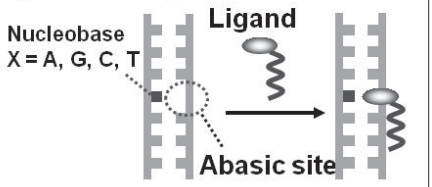
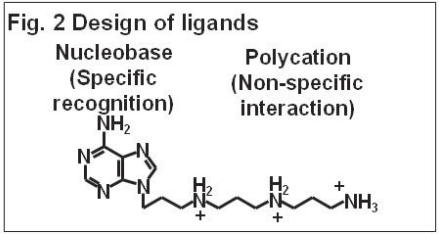
It is known that DNA damages relate to many diseases. Therefore, recognition and detection of the damage is important for future genetic diagnosis, elucidation of the mechanism between the DNA damage and disease, and therapy. In this study, we attempted to develop selective ligands for an abasic site, a representative DNA damages (Fig.1).

Fig. 1 The recognition of an abasic site



In order to achieve selective recognition of an abasic site, we designed compounds which have a polycation site as a non-specific binding part for DNA phosphate backbone and a nucleobase part as a specific recognition part (Fig. 2). The ligands with A, G, C or T together with the polycation part were synthesized and tested for stabilization of abasic site-containing duplexes. It was revealed that the each ligand significantly stabilized the abasic site-containing duplexes with the corresponding complementary base.

Fig. 2 Design of ligands



In conclusion, the validity of the design concept has been supported in that the plolycation part produce a non-selective affinity and the nucleobase part play a role for selective binding within the abasic site. We are now attempting expansion of this concept for detection of other DNA damages.