FUNCTIONAL CONSEQUENCES OF C-TERMINAL MODIFICATION OF RECA PROTEIN FROM PSEUDOMONAS AERUGINOSA

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Bacterial recA gene is evolutionary significant. To date this gene was cloned for 45 or more species including both gram-negative and positive bacteria. For 24 of them nucleotide sequences have been determined [1].

Three statements are important to understand the main goal of this study.

1. On the one hand, C-termini of all known RecA proteins including 20—25 last amino acids (AA) appear to be variable. On the other hand, all known termini are characterized by negative charge.

2. Truncated RecA proteins lacking 20—25 AA from C-terminus conserve the activities necessary to provide recombination, repair and SOS-response that are the basic features of the problem.

3. The length of C-terminus of known RecA proteins (with a one known exclusion) varies as ± 6AA.

PvuII fragment of DNA from *P.aeruginosa* bearing the recA gene lacks 21 codons from 3'-end of the gene. Cloning this fragment into SmaI and HindII sites of the pUC19 vector in two possible orientations results in fusion of the recA 3'-terminus with four occasional nucleotide sequences that gives the following AA alterations in RecA proteins instead of the last 21AA LLAKSGPVKADAEEVADAEAD: for pPA14-GTELEFTGRRFTTS, for pPA15-GDPQESTCRHASLA, for pPA16-DSRGSPGTELEFTGRRFTTTS, for pPA17-TCRHASLA. An analogous cloning into the ClaI site of pBR322 gave plasmid pPA37 with 1AA-R instead of those 21AA. Plasmids pPA14, 15, 16 and 37 show the same repair, recombination and SOS characteristics as a control pPA183, bearing the $recA_{Pa}$ of w.t., whereas the modification of *C*-terminus in PPA17 results in more active expression of SOS functions. This modification as well as a w.t. variant differs from other by the two alternations of *C*-end. It is hydrophobic and has a positive charge.

These data are consistent with the idea that *C*-terminus of RecA protein may be involved in modulating a conformational change that affects RecA protein interactions with DNA [1]. The results of the study have been presented at the conference "RecA and relation problems", Saclay, France (1990).

Reference

1. Roca A.I., Cox M.M. //Crit.Rev.Biochem and Mol.Biol. 1990. V.25. P. 415.