

## 研究課題別事後評価結果

1. 研究課題名： ゲノム構築における DNA トポロジーの役割

2. 個人研究者名

Canela Andres (京都大学白眉センター 特定准教授)

3. 事後評価結果

In this study, Canela Andres has done lots of experiments to understand the molecular functions of the evolutionary conserved structural maintenance of the chromosome (SMC) protein complex which plays an essential role in the genome folding including DNA loop extrusion. His work in both mammalian cell lines and *E. coli* has revealed the consequence of the interaction between SMC complexes and Topoisomerase type II (TOP2); TOP2 is necessary for compaction of the chromatin mediated by cohesion, a member of the SMC complexes in mammals, and MukBEF, a member of the SMC complexes in bacteria, and TopoIV bind to highly transcribed regions, especially the ribosomal RNA operons that are domain boundaries in *E. coli*. The data presented are of high quality. His findings suggest a new model in which how MukBEF and TopoIV function in transcription.

His work demonstrates that the function of MukBEF at its binding sites on the genome is not promoting the formation of structural domains like cohesion in mammals, but rather preventing them, which suggests that these domains are not regulatory structures, but DNA torsions generated by high transcription and replication.

People can get the impression that he always tries very hard to make good interactions with other members of this research area of PRESTO, which has led good, fruitful and stabilizing collaborations in this research area to help the progress of his own and other research. Now it is very important for him to write up at least a couple of papers based on these new and exciting findings.