

Principal Researcher	Akio Sugino			Number of Researchers	5	
Research Institution • Department • Title	Professor, Graduate School of Frontier Biosciences, Osaka University			Location of Institution	Suita	
Title of Project	Molecular Dynamics at the Eukaryotic Chromosomal DNA Replication Forks					
Abstract of Research Project	<p>Chromosomal DNA replication is an essential process for the cell to accurately maintain its genetic information through many generations. However, this process does not go smoothly in S phase during cell cycle and DNA replication apparatus always faces in danger of its dissociation from the replication fork due to either DNA damages or formation of secondary structure after unwinding of double-stranded DNA. In this study, we investigate the molecular dynamics at the replication forks, where the replication apparatus often dissociates, is disrupted, and re-assembles, using <i>Saccharomyces cerevisiae</i>, <i>Xenopus</i> egg, mouse and human cells by <i>in vitro</i> reconstitution of the replication apparatus with the purified replication proteins. Furthermore, we will investigate the molecular mechanism of dysfunctional consequences of these processes.</p>					
References	<p>1) S. Waga, T. Msuda, H. Takisawa, and A. Sugino. DNA polymerase ϵ is required for coordinated and efficient chromosomal DNA replication in <i>Xenopus</i> egg extracts. <i>Proc. Natl. Acad. Sci., USA</i>, 98, 4978-4983 (2001).</p> <p>2) T. Ohya, Y. Kawasaki, S. Hiraga, S. Kanbara, K. Nakajo, N. Nakashima, A. Suzuki, and A. Sugino. The DNA polymerase domain of $\text{pol}\epsilon$ is required for rapid, efficient, and highly accurate chromosomal DNA replication, telomere length maintenance, and normal cell senescence in <i>Saccharomyces cerevisiae</i>. <i>J. Biol. Chem.</i>, 277, 28099-28108 (2002).</p>					
Term of Project	Fiscal years 2003-2007 . (5years)					
Budget Allocation (in thousand of yen)	FY2003	FY2004	FY2005	FY2006	FY2007	TOTAL
	22,500	17,000	17,000	17,000	12,800	86,300
Homepage Address	http://www.biken.osaka-u.ac.jp/biken/hukusei/new/SuginoLab.html					