

Principal Researcher	Toshio Yanagida			Number of Reserchers	3	
Research Institution • Department • Title	Professor, Soft Biosystem group, Laboratories for Nanobiology, Graduate School of Frontier Biosciences, Osaka University			Location of Institution	Suita, Osaka	
Title of Project	Single-molecule analysis of chemotactic signaling					
Abstract of Research Project	<p>Chemotaxis, the process by which cells sense and respond directionally to chemical gradients, operates in a range of biological processes including immunity, neuronal patterning, and morphogenesis. The paramount business of chemosensory system is the detection of the faint, information-bearing signals in a noisy environment. The molecular mechanisms by which cells sense chemical gradients remains to be elucidated.</p> <p>In this research, behaviors of individual bio-molecules in chemosensory system will be experimentally monitored at the single-molecule level and theoretically interpreted to understand the mechanism of directional sensing. Techniques including imaging technique of single molecules in 3D and real time will be developed to visualize and manipulate single molecules in living cells. In addition to clarifying unique operation of the bio-molecules experimentally, new theoretical models will be established. Thereby, ingenious algorithm that governs the molecular signaling system will be elucidated. These researches will give a breakthrough in the research fields of biological molecules and cells.</p>					
References	<p>Ueda, M., Sako, Y., Tanaka, T., Devreotes, P. N. & Yanagida, T: Single molecule analysis of chemotactic signaling in <i>Dictyostelium</i> cells. <i>Science</i> 294, 864-867 (2001).</p> <p>Ishijima, A. & Yanagida, T.: Single Molecule Nano-Bioscience. <i>Trends in Biochemical Sciences</i>.26, 438-444 (2001)</p>					
Term of Project	Fiscal years 2003-2007 . (5years)					
Budget Allocation (in thousand of yen)	FY2003	FY2004	FY2005	FY2006	FY2007	TOTAL
	26,300	16,400	16,400	12,300	12,300	83,700
Homepage Address	http://www.phys1.med.osaka-u.ac.jp/					