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Motion observation and SPR measurements of kinesin motility on microtubules A. SIKORA, D. OLIVEIRA, K. KIM, WPI-AIMR, Tohoku University, Japan, A.L. LIAO, WPI-AIMR, Tohoku University, Japan and Materials Science and Engineering, Texas A&M University, M. UMETSU, T. ADSCHIRI, WPI-AIMR, Tohoku University, Japan, W. HWANG, Materials Science and Engineering; Department of Biomedical Engineering, Texas A&M University, W. TEIZER, WPI-AIMR, Tohoku University, Japan; Materials Science and Engineering and Department of Physics and Astronomy, Texas A&M University — Motor proteins convert chemical energy directly into mechanical work with high efficiency (∼50%). One of these proteins, kinesin, is used in the cell to transport organelles. It "walks" along biopolymer tracks called microtubules and, depending on the type, can reach speeds of a few micrometers per second. Kinesin can carry intracellular cargo over long distances against several piconewtons of loads and is barely limited by the cargo size. Motion of streptavidin-coated quantum dots carried by kinesin on microtubules will be presented. We have expressed biotinylated Kinesin-1 using *Escherichia coli*. Attachment to quantum dots was performed using the strong binding affinity between streptavidin and biotin. Microtubules, labeled with rhodamine, allow visualization by fluorescence microscopy. The measured speed of our kinesin fits well with results found in the literature. Surface Plasmon Resonance (SPR) measurements allow the identification and strength evaluation of bonding. Using this technique, we will present results on the binding between our expressed kinesin and microtubule.

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