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Glass is a viable substrate for atomic force microscopy of membrane proteins NAGARAJU CHADA, KRISHNA SIGDEL, TINA MATIN, RAGHAVENDAR REDDY SANGANNA GARI, CHUNFENG MAO, LINDA RANDALL, GAVIN KING, University of Missouri, Columbia, MO — Since its invention in the mid-1980s, the atomic force microscope (AFM) has become an invaluable complementary tool for studying membrane proteins in near-native environments. Historically, mica is the most common substrate utilized for biological AFM. Glass being amorphous, transparent, and optically homogeneous has its own set of advantages over mica and has the potential to broaden the use the AFM into fields that require high quality non-birefringent optical access. The use of silanized glass as AFM substrates has been reported as a means to fine tune surface chemistry. However, such coatings usually require hours of additional preparation time and can lead to increased surface roughness. In this work, we present a simple technique for preparing borosilicate glass as a substrate for two membrane systems: non-crystalline translocons (SecYEG) of the general secretary system from *E. coli*, and bacteriorhodopsin (BR) from *H. salinarum*. For both these membrane proteins, quantitative comparisons of the measured protein structures on glass versus mica substrates show agreement. An additional advantage of glass is that lipid coverage is rapid ($<$ 10 minutes) and complete (occupying the entire surface). A goal is to study the bacterial export system using recently developed precision measurement techniques such as ultra-stable AFM.

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