Introduction: An organic thin film can be deposited on a solid substrate by various techniques such as self-assembly, thermal evaporation, electro deposition and Langmuir-Blodgett (LB) technique. The LB-technique is one of the most promising techniques for preparing such thin films as it enables the precise control of the monolayer thickness, homogeneous deposition of the monolayer over large areas and can be deposited on almost any kind of solid substrate. Molecular thin films were deposited by aligning bacteriorhodopsin (bR) on to FTO glass using the LB technique. Methods: The bR suspension was mixed with dimethylformamide (DMF) and water. The mixture was vigorously agitated and then this emulsion was carefully applied onto the aqueous surface (pH 5.5, at room temperature) to form a monolayer film of bR. After evaporation of the solvent, the monolayer of bR was compressed to the surface pressure of 20 mN/m, which was previously determined as the target pressure for optimal deposition of bR. The bR LB films were fabricated by depositing bR monolayer on to FTO glass with the dipping speed of 5 mm/min for the upward stroke. The absorption spectrum of bR LB films was measured to confirm the deposition of bR on to FTO glass. Results: Surface pressure–area per molecule (π–A) isotherms of bR monolayers at room temperature shows that stable monolayers of bR is formed at the air–water interface. The LB film deposition processes of bacteriorhodopsin are characterized by UV–vis spectroscopy. Conclusion: The results indicate that high quality and uniform bR film has been deposited on FTO glass. The bR monolayer films by LB technique can use for bioelectronics applications especially in bio-photocells and protein holographic memories.