Salivary proteinaceous substances are known to play important roles in the formation of the salivary pellicle. The aim of this study was to investigate some aspects of the interfacial behaviour of selected purified salivary proteins, as well as human saliva secretions, using time-resolved *in situ* ellipsometry. Hydrophobic methylated silica and hydrophilic pure silica were used as test substrates. Experiments were performed *in vitro*, preferentially in the low concentration range, with samples of fresh human whole resting saliva, parotid resting saliva and submandibular/sublingual resting saliva. The protein fractions investigated were human MUC5B, PRP-1, PRP-3 and statherin, as well as bovine submaxillary mucin (BSM). The results indicate that the amount of material adsorbed was strongly related to the protein concentration in the range investigated for both pure proteins and secretions. Generally, a larger amount of material was adsorbed onto hydrophobic surfaces than onto hydrophilic ones. However, pure PRP-1 adsorbed in similar amounts to both hydrophilic and hydrophobic surfaces in the concentration range investigated and BSM adsorbed in larger amounts at high concentrations on hydrophilic surfaces. Comparison of the observed adsorption rates for salivary secretions and calculated diffusion rates for individual proteins suggested initial adsorption of low-molecular-weight proteins/peptides. On hydrophilic surfaces the data indicate adsorption of proteins with diffusion rates corresponding to those of statherin, PRP-3 and PRP-1. MUC5B adsorbs at a later stage from both HWS and the individual secretions, which can be explained by a “Vroman effect”-like phenomenon. On hydrophobic surfaces, adsorption rates were found to be faster than those calculated for any of the proteins, and thus smaller proteins/peptides appear to be involved. The similar adsorption behaviour of PRP-1 and parotid saliva (HPS) on hydrophilic surfaces may suggest that long aPRPs account for a substantial portion of the film-forming capacity of HPS. Effects of added electrolyte could be explained by general screening effects and specific Ca$^{2+}$ binding to serine phosphates in aqueous solutions, but were complex in phosphate buffer. Inter-individual differences in amounts adsorbed from HWS, HPS and HSMSLS, respectively, were not found to be statistically significant.