

**Defining the Behavior of Key Components of the Nuclear Pore Complex (NPC). Study of the mechanisms involved during the binding between specific Karyopherins and FG-Nups.**

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The Nuclear Pore Complex (NPC) is the main mediator of exchange between the nucleus and the cytoplasm in all eukaryotic cells. As small molecules pass through the NPCs unchallenged, large molecules are excluded unless chaperoned across by transport factors collectively termed Karyopherins or Kaps. The translocation of the complexes Kap/transported proteins occurs thanks to the specific affinity/binding between Kaps and particular nucleoporins (constituent proteins of the NPCs) sharing a degenerate multiply-repeated "Phe-Gly" motif and called FG-Nups. The mechanisms involved during this binding have been studied by AFM and QCM-D and by using specific FG-Nups self-assembled monolayers, synthesized in our laboratory. The establishment of the binding process was followed by QCM-D by observing the change in frequency and dissipation (a measure of the viscosity of the total adsorbed layer) during adsorption of Kaps on these specific FG-Nups SAMs. AFM was used to obtain the adhesion forces between two layers of FG-Nups and between FG-Nups and interacting (Kaps) or non-interacting proteins. In all cases, and in order to better understand the nature of the binding, the effects of changes in environmental parameters such as the pH or the ionic strength were investigated.