Targeting of MuLV Gag to the plasma membrane is mediated by PI(4,5)P2 and PhosphatidylSerine

Elise Hamard-Peron, Franceline Juilliard, Js Saad, C Roy, Philippe Roingeard, Michael Summers, Jean-Luc Darlix, C. Picart, Delphine Muriaux

Retrovirology

BioMed Central

Oral presentation

Targeting of MuLV Gag to the plasma membrane is mediated by PI(4,5)P_2 and PhosphatidylSerine

E Hamard-Peron[1], F Juilliard[1], JS Saad[2,3], C Roy[4], P Roingeard[5], Michael F Summers[2], JL Darlix[1], C Picart[4] and D Muriaux*[1,6]

Address: [1]LaboRetro, InsermU758, ENS de Lyon, IFR128, 69364 Lyon, France, [2]Howard Hughes Medical Institute and Department of Chemistry and Biochemistry, University of Maryland Baltimore County, 1000 Hilltop Circle, Baltimore, Maryland 21250, USA, [3]Department of Microbiology, University of Alabama at Birmingham, 845 19th street south, Birmingham, AL 35294, USA, [4]CNRS-UMR 5235, Université de Montpellier 2, Montpellier, France, [5]Inserm U966, Université François Rabelais, Tours, France and [6]CNRS-UMR 5628, LMGP, 3 parvis L. Neel, 38016 Grenoble, France

* Corresponding author

from Frontiers of Retrovirology: Complex retroviruses, retroelements and their hosts
Montpellier, France. 21-23 September 2009

Published: 24 September 2009

Retrovirology 2009, **6**(Suppl 2):O15 doi:10.1186/1742-4690-6-S2-O15

This abstract is available from: http://www.retrovirology.com/content/6/S2/O15

Membrane targeting by the modern human immunodeficiency viruses is dependent on the plasma membrane-located phospholipid PI(4,5)P_2. In order to determine if evolutionarily distant retroviruses are targeted by a similar mechanism, we generated mutant Gag constructs in the matrix (MA) domain of the Murine Leukemia Virus (MuLV) and examined their binding to membrane models and phenotypes in cell culture. Mutations in the MA polybasic region altered Gag localization, membrane binding and virion production. In addition, we show that MA binds with good affinity to all the phosphatidylinositol phosphates but displays a strong specificity for PI(4,5)P_2 only if enhanced by phophatidylserine. Virus production was strongly impaired by PI(4,5)P_2 depletion under 5ptaseIV overexpression. Our results suggest that the N-terminal polybasic region of MA is essential for Gag targeting to the plasma membrane and Gag cellular trafficking. The binding of the MA domain to PI(4,5)P_2 appears to be a conserved feature among retroviruses, despite the fact that the MuLV-MA domain is structurally different from that of HIV-1 and -2 and lacks a readily identifiable PI(4,5)P2 binding cleft.