

**POSTER 44****INTRACELLULAR INTERACTIONS BETWEEN APOBEC3G, RNA, AND HIV-1 Gag: APOBEC3G IS A MONOMER THAT FORMS MULTIMERS IN ASSOCIATION WITH RNA**

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Host restriction factor APOBEC3G (A3G) blocks human immunodeficiency virus type 1 (HIV-1) replication by hypermutation, and by inhibiting DNA synthesis and provirus formation. Previous reports have suggested that A3G is a dimer and its virion incorporation is mediated through interactions with viral or nonviral RNAs and/or HIV-1 Gag. We have now employed a bimolecular fluorescence complementation assay (BiFC) to analyze the intracellular A3G-A3G, A3G-RNA, and A3G-HIV-1 Gag interactions in living cells by reconstitution of yellow fluorescent protein (YFP) from its N- or C-terminal fragments. The results obtained with catalytic domain 1 and 2 (CD1 and CD2) mutants indicate that A3G/A3G and A3G/HIV-1-Gag multimerization is dependent on an intact CD1 domain, which is required for RNA binding. A mutant HIV-1 Gag that exhibits reduced RNA binding also failed to reconstitute BiFC with wild-type A3G, indicating a requirement for both HIV-1 Gag and A3G to bind to RNA for their multimerization. Addition of a non-specific RNA binding peptide (P22) to the N-terminus of a CD1 mutant of A3G restored BiFC and virion incorporation, but failed to inhibit viral replication, indicating that the mutations in CD1 resulted in additional defects that interfere with A3G's antiviral activity. These studies indicate that A3G is a monomer that forms dimers upon binding to RNA; RNA binding by one of the A3G molecules is sufficient for dimerization, suggesting that conformational changes in A3G upon RNA binding lead to protein-protein interactions that stabilize the dimers.