Understanding the role of SAMHD1 in HIV1/2 pathogenesis: A new therapeutic/vaccine approach

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There have been many Global efforts in the development for a safe and effective vaccine for HIV, which all failed. Therefore, antiretroviral drugs are currently the only option to treat HIV patients, yet these are viral targets and are susceptible for alteration by mutation. SAMHD1, is a human protein that is recently identified and is found in myeloid cells that restrict HIV-1 replication. It depletes the dNTPs pool for viral cDNA synthesis that will therefore prevent the viral replication in the cells. The viral accessory protein Vpx gene exists only in SIV/HIV-2 particles. It has been recently shown in SIV that can induce proteosomal degradation of SAMHD1, which will then lead to a decrease in the dNTPs and cause HIV infection in myeloid cells. The protein expression and interaction between Vpx and SAMHD1 remain unclear to date. Understanding this regulation will be instrumental for the development of novel anti-HIV-1 vaccine strategies since overcoming SAMHD1 increases the adaptive immune response during HIV-1 infection. Accordingly, we analyzed the role of SAMHD1 protein expression in HIV1/2 infected patients. We then evaluated the effect of Vpx gene in HIV1/2 patient and then profiling of the immune response in HIV-2 patients. We showed the true expression of SAMHD1 from HIV-2 patient. In addition, we reported the different cytokines and interferon response in HIV-2 patients. We defined for the first time the mechanism SAMHD1 and vpx from HIV-2 patient and its restriction. It is expected that studying the mechanisms underlying SAMHD1-mediated HIV restriction will shed light on the innate immune response against Retroviruses and assist in the future development of more effective anti-HIV interventions.

Biography

Maha A Al-Mozaini gained ample experience in both immunology and virology research during her PhD training at the Imperial College, UK, and Post-doctoral Research Fellowship at the Infectious Disease Division of Massachusetts General Hospital, Harvard Medical School. Accordingly, she has established “Immunocompromised Host Research Section” to investigate the molecular and immunological mechanisms of immune deficiency in patients from HIV infected persons and recipients of solid organ/Bone Marrow transplantation. In addition, she is an Associate Professor at King Saud University. She was awarded several prestigious recognitions such as: (1) Scholarship for fellowship 2008, from the Dubai-Harvard Foundation for Medical Research (2) Scholarship for the International AIDS Society meeting in 2011, Rome, Italy (3) Global Clinical Scholars Research Training Program Certificate (2014), Harvard Medical School, Boston, MA. her research is funded by King Abdulaziz City for Science and Technology

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