CORRELATION OF APOBEC3A AND APOBEC3B GENE EXPRESSION IN HNSCC TCGA STUDY

Fabio Lapenta[1]

[1]University of Nova Gorica

Human papillomavirus (HPV) is a human onco-virus involved in the progress of cervical and oropharyngeal cancers. In persistent HPV infection, a group of cytosine deaminases, Apolipoprotein B mRNA editing catalytic polypeptide-like family 3 (APOBEC 3), involved in viral restriction and DNA modification, take part in the accumulation of particular mutational signatures in the genome of the ghost cell, leading ultimately to high level of DNA damage, HPV integration and in turn oncogenesis. Two members in this family of enzymes, APOBEC3A and APOBEC3B (A3A and A3B, respectively) have been associated to the accumulation of mutational burden in several malignant processes. The difference between the activity and the role of A3A and A3B has however not been clearly defined yet.

Here, we set up to analyse the expression profile of head and neck cancer patients from The Cancer Genome Atlas (TCGA) and individuate genes correlated either to A3A or A3B. Preliminary results showed a difference in the two sets of genes in regards to their presence in HPV cancers. Specifically, genes whose expression correlates to A3A appeared to be generally down-regulated in HPV-positive patients. GO analysis of these genes revealed an enrichment of genes associated to epidermal differentiation (cornification) and innate immunity. Both processes are known to be actively down-regulated by HPV in order to escape the anti-viral response of the host and to promote cell proliferation. On the contrary, genes that correlated to A3B were strongly associated to cell cycle, chromosome organization, DNA replication and DNA repair and were over-expressed in HPV-positive cancer patients. This suggests a distinction between the roles of the two enzymes, with A3A being more involved in the antiviral response and thus present only in HPV-negative cancers, while A3B less involved in the antiviral defence mechanism and more represented in HPV cancer patients.