

**Karyotyping of chromosomes in human bronchial epithelial cells transformed by
high energy Fe ions**

**Samrawit Yeshitla^{1,4}, Ye Zhang^{1,2}, Seongmi Park⁴, Michael T. Story⁴, Booby Wilson³,
Honglu Wu¹**

¹NASA Johnson Space Center, Houston, TX, USA, ²Wyle Laboratories, Houston, TX, USA,

**³Texas Southern University, Houston, TX, USA, ⁴University of Texas southwestern, Dallas
TX, USA,**

Lung cancer induced from exposure to space radiation is believed to be one of the most significant health risks for long-term space travels. In a previous study, normal human bronchial epithelial cells (HBECs), immortalized through the expression of Cdk4 and hTERT, were exposed to gamma rays and high energy Fe ions for the selection of transformed clones induced by low- and high-LET radiation. In this research, we analyzed chromosome aberrations in these selected clones for genomic instability using the multi-color fluorescent in situ hybridization (mFISH), as well as the multi-banding in situ hybridization (mBAND) techniques. In most of the clones, we found chromosomal aberrations involving translocations between different chromosomes, with several of the breaks occurred in the q-arm of chromosome 3. We also identified copy number variations between the transformed clones and the parental HBEC cells regardless of the exposure condition. Our results indicated that the chromosomal aberrations in low- and high radiation-induced transformed clones are inadequately different from spontaneous soft agar growth. Further analysis is underway to reveal the genomic instability in more transformed clones
