

RESEARCH ARTICLE

# Haplotype CGC from XPD, hOGG1 and ITGA2 polymorphisms increases the risk of nasopharyngeal carcinoma in Malaysia

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## Abstract

### Background

8-oxoG, a common DNA lesion resulting from reactive oxygen species (ROS), has been shown to be associated with cancer initiation. hOGG1 DNA glycosylase is the primary enzyme responsible for excision of 8-oxoG through base excision repair (BER). Integrins are members of a family of cell surface receptors that mediate the cell-cell and extracellular matrix (ECM) interactions. Integrins are involved in almost every aspect of carcinogenesis, from cell differentiation, cell proliferation, metastasis to angiogenesis. Loss of ITGA2 expression was associated with enhanced tumor intravasation and metastasis of breast and colon cancer. XPD gene encodes DNA helicase enzyme that is involved in nucleotide excision repair (NER). It is shown in previous research that XPD homozygous wildtype Lys/Lys genotype was associated with higher odds of NPC.

### Methods

We conducted a 1 to N case-control study involving 300 nasopharyngeal carcinoma (NPC) cases and 533 controls matched by age, gender and ethnicity to investigate the effect of hOGG1 Ser326Cys, ITGA2 C807T and XPD Lys751Gln polymorphisms on NPC risk. Linkage disequilibrium and haplotype analysis were conducted to explore the association of allele combinations with NPC risk. Restriction fragment length polymorphism (RFLP-PCR) was used for DNA genotyping.

### Results

No significant association was observed between hOGG1 Ser326Cys and ITGA2 C807T polymorphisms with NPC risk after adjustment for age, gender, ethnicity, cigarette smoking, alcohol and salted fish consumption. Lys/Lys genotype of XPD Lys751Gln polymorphism was associated with increased NPC risk (OR = 1.60, 95% CI = 1.06–2.43). Subjects with