THE INFLEUENCE OF GARLIC AS AN ANTICARCINOGENIC AGENT ON APOPTOTIC POTENTIAL DURING ORAL CARCINOGENESIS IN ALBINO RATS

Thesis
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(Oral Pathology)

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To my great parents
&
my whole precious
family

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i-LIST OF ABBREVIATIONS

WORDS	ABBREVIATIONS
Dimethylbenz[a]anthracene	DMBA
Organosulfur compounds	OSCs
diallyl sulfide	DAS
diallyl disulfide	DAD
diallyl trisulfide	DAT
S-allyl cysteine	SAC
S-allyl mercaptocysteine	SAMC
glutathione-S-transferase	GST
N-methyl-N-nitrosourea	MNU
N-methyl-N-nitro-N-nitroso-guanidine	MNUG
nuclear factor kappa B	NF-kB
reactive oxygen species	ROS
N-methyl-N-benzylntrosamine	MBN
glutathion peroxidase	GPx
Deoxyribonucleic acid	DNA
Reduced glutathione	GSH

WORDS	ABBREVIATIONS
Tissue transglutaminase	tTG
mitochondrial membrane potential	MMP
Tumor necrosis factor-α	TNF-α
cyclin-dependent kinases	CdKs
Cystein proteases-caspases	CASP
death receptor-mediated pathway	Fas receptor

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Oral cancer

Carcinoma of the oral cavity is a devastating illness that might result from life style, nutritional and environmental insults with severe impaction on the function as well as cosmetic appearance of the affected individuals ***(Notani, 2000).*** It was found that environmental factors play a major role in the etiology of more than 80% of human malignancies that account for 7 millions deaths per year worldwide ***(Thilly, 2003).***

Among many risk factors, tobacco and alcohol are the major causes of oral carcinogenesis being involved in more than 75% of oral cancer in USA, France and Italy ***(Ning, et al., 2002).***

Carcinogenesis is a multistage process consisting of three major steps: initiation, promotion and progression. In the initiation stage, the normal cell is subjected to DNA damage, either due to environmental factors including chemicals, radiation and viruses or due to genetic affection (***Kusama et al., 1996, Park et al., 2002 and Magonetti et al., 2006).***

The pervious factors induce mutation in the genome of the somatic cells with activation of growth-promoting oncogenes, inactivation of cancer suppressor genes or alterations of genes that regulate apoptosis. The expression of altered gene products leads to clonal expansion of the transformed somatic cells (promotion) and then with additional mutations (progression), a malignant neoplasm is established (fig. 1) ***(Kumar et al., 2003 and Sarkar, 2004)***

Stem cell biology research provided new insights in the cancer pathogenesis and the possible involvement of stem cells in head and neck tumors, considering cancer as a stem-cell disorder ***(Bianchini et al., 2008***).

Since carcinogenesis is considered a multistep process, in which accumulation of genetic alterations are required to transform a normal cell into a cancer cell ***(Braakhuis et al., 2005),*** only long time residents of the mucosa, most likely the stem cells have the ability to accumulate the genetic hits that will result in cancer development ***(Owens and Watt, 2003 and Lee & Herlyn, 2007).***

Accordingly, when the stem cell acquires one or more genetic alterations, it will form a patch in the mucosal epithelium with genetically altered daughter cells ***(Gollins, 2001 and pardal et al., 2005)***. As a result of this process, cancer stem cell escapes the normal control mechanisms and gains growth advantages where the patch starts to expand and areas of the normal epithelium will be replaced by cell populations that become more genetically aberrant forming a malignant clone that progress into carcinoma ***(Forastiere et al., 2001 and Costea et al., 2006).***