



Immunohistochemical Expression of Stem Cell Marker Musashi 1(Msi-1) in Colorectal Carcinoma and Its Correlation With various pathologic Parameters

Thesis

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**التعبير المناعي الهيستوكيميائي موساشي ١ (Msi-1)
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العوامل المرضية**

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٢٠١٧

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

لَسْبِقَانِكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

صدق الله العظيم

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List of Abbreviations

ABC	: Avidin-biotin-enzyme complex
ACF	: Aberrant crypt foci
AJCC	: American Joint Committee of Cancer
ANOVA	: Analysis of variance
APC	: Adenomatous polyposis coli
AS	: Additive score
BAX	: Bcl-2-associated X protein
BE	: Barrett's esophagus
BMI	: Body mass index
BMP	: Bone morphogenetic protein
CBCCs	: Crypt base columnar cells
CC-IC	: Colon cancer initiating cell
CD	: Cluster of differentiation
CEA	: Carcinoembryonic antigen
c-myc	: Avian myelocytomatosis virus oncogene cellular homolog
CRC	: Colorectal carcinoma
CSCs	: Cancer stem cells
DAB	: Diaminobenzidine
DC	: Differentiated cell
dd h2O	: Double -distilled water
DNA	: Deoxy ribonucleic acid
EAC	: Esophageal adenocarcinoma
EMT	: Epithelial mesenchymal transition
EpCAM	: epithelial cell adhesion molecule
Eph/ephrin	: Erythropoietin-producing human hepatocellular receptor/ Eph receptor-interacting proteins
FAP	: Familial adenomatous polyposis
FOLFIRI	: Combination of 5-fluorouracil, leucovorin, and irinotecan
FOLFOX	: Combination of 5-fluorouracil, leucovorin, and oxaliplatin
H&E	: Hematoxylin and Eosin
H2O2	: Hydrogen peroxide
HGF	: Hepatocyte growth factor
hMLH1	: human mutL homolog 1
HNPCC	: Hereditary non-polyposis colorectal cancer
HPs	: Hyperplastic polyps
IBD	: Inflammatory bowel disease

List of Abbreviations

ICD	: Intracellular domain
IEN	: Intraepithelial neoplasm
IGF2	: Insulin-like growth factor
IL-6	: Interleukin 6
ISCs	: Intestinal stem cells
ISEMFs	: Intestinal subepithelial myofibroblasts
IUCC	: International Union for Cancer Control
K-ras	Kirsten rat sarcoma viral oncogene
Lgr5	Leucine rich repeat-containing G-protein coupled receptor 5
MAC staging system	: Modified Astler-Coller staging system
MAP kinase	: Mitogen-activated protein kinase,
MMPs	: Matrix metalloproteinase 7
MSI	: Microsatellite instability
Msi-1	: Musashi 1
MyoD	: Myogenic determination factor
NCI	: National cancer institute
NEC	Neuroendocrine carcinoma
NET	: Neuroendocrine tumor
NICD	: Notch Intracellular domain
P VALUE	: Probability factor value
PC	Progenitor r cell
PCR	Polymerase chain reaction
PPARs	: Peroxisome proliferator-activated receptors
RNA	: Ribonucleic acid
SA	: Serrated adenoma
SAC	: Serrated adenocarcinoma
SCC	: Squamous cell carcinoma
SCs	: Stem cells
SD	: Standard deviation
SHH	Sonic hedgehog
SPSS	: Statistical Package for Social Sciences
SSA	: Sessile serrated adenoma
TB	: Tumor budding
TBS	: Tris-buffered saline
TDLU	: Terminal ductal lobular unit
TDs	: Tumor deposits
TGF-β	: Transforming growth factor beta
TGF-β II	: Transforming growth factor beta receptor-II
TNF-α	: Tumor necrosis factor α
TSA	: Traditional serrated adenoma
U.S	: United states

List of Abbreviations

UK	: United kingdom
WCRF-AICR	: The World Cancer Research Fund/American Institute for Cancer Research
WHO	: World health organization
Wnt pathway	wingless-related integration site

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Introduction

Colorectal carcinoma (CRC) is a multifactorial disease with many documented genetic and non-genetic risk factors (*Sharafeldin et al., 2015*).

CRC is a commonly diagnosed and a highly lethal malignancy in both men and women (*Murat et al., 2016*). It is considered the 3rd most common cancer in men and the 2nd in women (*Ferlay et al., 2015*).

Since 1998, colorectal carcinoma (CRC) incidence increased at a rate of 1.6 % per year (*American cancer society, 2011*). Nowadays, the estimated new cases per year are 746,000 cases in men and about 614,000 cases in women. This represents 10% of total cancers in men and 9.2 % of total cancers in women (*Ferlay et al., 2015*).

In Egypt, The incidence is estimated to be around 2.5 per 100,000 (*Ibrahim et al., 2014*) with male to female ratio 3: 1 (*Mahfouz et al., 2014*). Moreover, patients under age of 40 reported relatively higher rates than those in the United States for the same age group (*Gado et al., 2014*).

Despite the progress made in the last few years in its management, it still remains a major health problem (*Yan et al., 2016*). And a leading cause of cancer-related morbidity and mortality worldwide (*Ho MY et al., 2016*).