



شبكة المعلومات الجامعية  
التوثيق الإلكتروني والميكروفيلم

# بسم الله الرحمن الرحيم



**MONA MAGHRABY**



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# شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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# جامعة عين شمس

## التوثيق الإلكتروني والميكروفيلم

### قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



### يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



**MONA MAGHRABY**



# **Relation of FDG uptake of breast cancer and the histologic and the biologic characteristics of the tumor**

Thesis

**Submitted for Partial Fulfillment of Master Degree of Radiology**

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## LIST OF ABBREVIATIONS

<b>ACR</b>	American College of Radiology
<b>ACS</b>	American Cancer Society
$A_{inj}$	Injected activity
$A_{mea}$	Measured activity
<b>ANS</b>	axillary nodal status
<b>BGO</b>	Bismuth germinate
<b>BI-RADS</b>	Breast imaging-Reporting and Data System
<b>BRCA</b>	Breast cancer gene
<b>Bsa</b>	Body surface area
<b>BSGI</b>	Breast-specific gamma imaging
<b>Bw</b>	Body weight
<b>CC</b>	Cranio-caudal
<b>ceCT</b>	Contrast-enhanced Computed Tomography
<b>cLCIS</b>	Classic LCIS
<b>CT</b>	Computed Tomography
<b>DCIS</b>	Ductal carcinoma insitu
<b>ER</b>	Estrogen receptor
$^{18}\text{F}\text{DG}$	$^{18}\text{F}$ -fluorodeoxyglucose
$^{18}\text{F}\text{-FLT}$	$^{18}\text{F}$ -fluorothymidine
$^{18}\text{F}\text{-MISO}$	$^{18}\text{F}$ -misonidazole
<b>GLUT</b>	Glucose transporters
<b>GSO</b>	Gadolinium silicate

<b>HER2</b>	Human epidermal growth factor receptor 2
<b>HRT</b>	Hormone replacement therapy
<b>IBC</b>	Inflammatory breast cancer
<b>IDC</b>	Invasive ducal carcinoma
<b>ILC</b>	Invasive lobular carcinoma
<b>Ki-67</b>	Ki-67 labelling index
<b>Lbm</b>	Lean body mass
<b>LCIS</b>	Lobular carcinoma insitu
<b>LM</b>	Latero-medial
<b>LSO</b>	Lutetium oxyorthosilicate
<b>Max</b>	Maximum
<b>MIP</b>	Maximum intensity projection
<b>ML</b>	Medio-lateral
<b>MLO</b>	Medio-lateral-oblique
<b>MM</b>	Mammography
<b>MRI</b>	Magnetic Resonance Imaging
<b>NOS</b>	Not otherwise specified
<b>NST</b>	No special type
<b>P53</b>	Tumor protein p 53
<b>PEM</b>	Positron emission mammography
<b>PERCIST</b>	Positron Emission tomography Response Criteria In Solid Tumors
<b>PET</b>	Positron Emission Tomography
<b>pLCIS</b>	Pleomorphic LCIS
<b>PR</b>	Progesteron receptor
<b>pTS</b>	Pathologic tumor size

<b>ROI</b>	Region of Interest
<b>SLNB</b>	Sentinel lymph node biopsy
<b>SUV</b>	Standardized Uptake Value
<b>Tc-99m</b>	Technetium
<b>TDLU</b>	Terminal duct lobular units
<b>TNM</b>	Tumor-node-metastasis
<b>TNR</b>	Tumor to normal background ratio
<b>US</b>	Ultrasonography
<b>W</b>	Weight
<b>WHO</b>	World Health organization
<b><math>\Gamma</math></b>	Photons

## INTRODUCTION

Breast cancer is considered the most common type of cancer and the second leading cause of cancer-related death among women. It affects more than 1 million women worldwide. The significant increase in number of cases worldwide could be attributed to modern lifestyle. (**Abdulrahman and Rahman, 2012**). (**Taghipour et al., 2016**).

The wide clinical success of PET/CT imaging in cancer relies mainly on the accumulation kinetics of <sup>18</sup>F-fluorodeoxyglucose (FDG) that allows evaluation of the whole body without the need for complex mathematical analysis of tracer blood-tissue exchange (**Scussolini et al., 2019**)

Knowledge of the factors affecting the uptake is important when interpreting FDG PET/CT scans. (**Groheux et al., 2011**)

The incidence of breast cancer is increasing recently, yet the mortality rates are decreasing because of earlier diagnosis and new treatment strategies that include the molecular impact of breast cancer (**Ekmekcioglu et al., 2013**).

Outcomes for breast cancer vary according to the histological type, degree of disease, and patient's age. Approximately 30% of patients have recurrence within 15 years after initial treatment if later stage at the time of diagnosis (stage III) and hormone-receptor-positive. (**Ferlay et al., 2012**).

The prognostic factors include histological type, tumor nuclear grade, tumor size, and preoperative tumor-nodes-metastasis (TNM), hormone receptor and immunohistochemical molecular markers in the specimens (**Choi et al., 2012**).

Early diagnosis and accurate follow-up of these patients affect the management plan. Also early diagnosis of recurrence is important for planning future therapeutic strategies which, if initiated immediately, target either to cure or to prolong disease-free survival and to improve the quality of life (**Israel and Kuten, 2007**). Conventional imaging techniques include X-ray mammography, ultrasonography (US), computed tomography (CT) and magnetic resonance imaging (MRI). Nuclear medicine techniques also have an increasing role in diagnosing and staging of breast cancer. Previously, only bone scintigraphy was used for detection and follow-up of bone metastases. Other non-radiographic methods included clinical and physical examination,