# بسم الله الرحمن الرحيم

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تم رفع هذه الرسالة بواسطة / حسام الدين محمد مغربي

بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

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| ملاحظات : لا يوجد |

# Radiolabeling, Chemical and Biological Evaluation of Some Drugs for Nuclear Medicine Applications

*Thesis*

*Submitted for the Degree of PhD in Chemistry*

*Presented by*

**Fatma Elzahraa Ahmed Mohamed Hafez**

*B.Sc. (Chemistry / Physics) 2001*

*M.Sc. (Analytical Chemistry) 2009*

*Supervised by*

**Prof. Dr. Salah Abdel Ghani Abo-El-Enein**

*Professor of Physical Chemistry*

*Faculty of Science, Ain Shams University*

**Prof. Dr. Fouad Ibrahim El Hosiny**

*Professor of Physical Chemistry*

*Faculty of Science, Ain Shams University*

**Prof. Dr. Gehad Genidy Mohamed**

*Professor of Inorganic and Analytical Chemistry*

*Faculty of Science, Cairo University*

**Prof. Dr. Abeer Mohamed Amin**

*Professor of Radiochemistry, Hot Labs Center,*

*Egyptian Atomic Energy Authority*

**Dr. Hanan Abd El-Aziz Abd El-Razek Elsabagh**

*Lecturer of Radiochemistry, Hot Labs Center,*

*Egyptian Atomic Energy Authority*

*Chemistry Department*

*Faculty of Science, Ain Shams University*

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*Ain Shams University*
*Faculty of Science*
*Chemistry Department*

# APPROVAL SHEET

## Radiolabeling, Chemical and Biological Evaluation of Some Drugs for Nuclear Medicine Applications

A Thesis Submitted By
**Fatma Elzahraa Ahmed Mohamed Hafez**

For Ph.D. Degree in Chemistry

This thesis has been approved by:

**Prof. Dr. Salah Abdel Ghani Abo-El-Enein**
Professor of Physical Chemistry, Faculty of Science, Ain Shams University

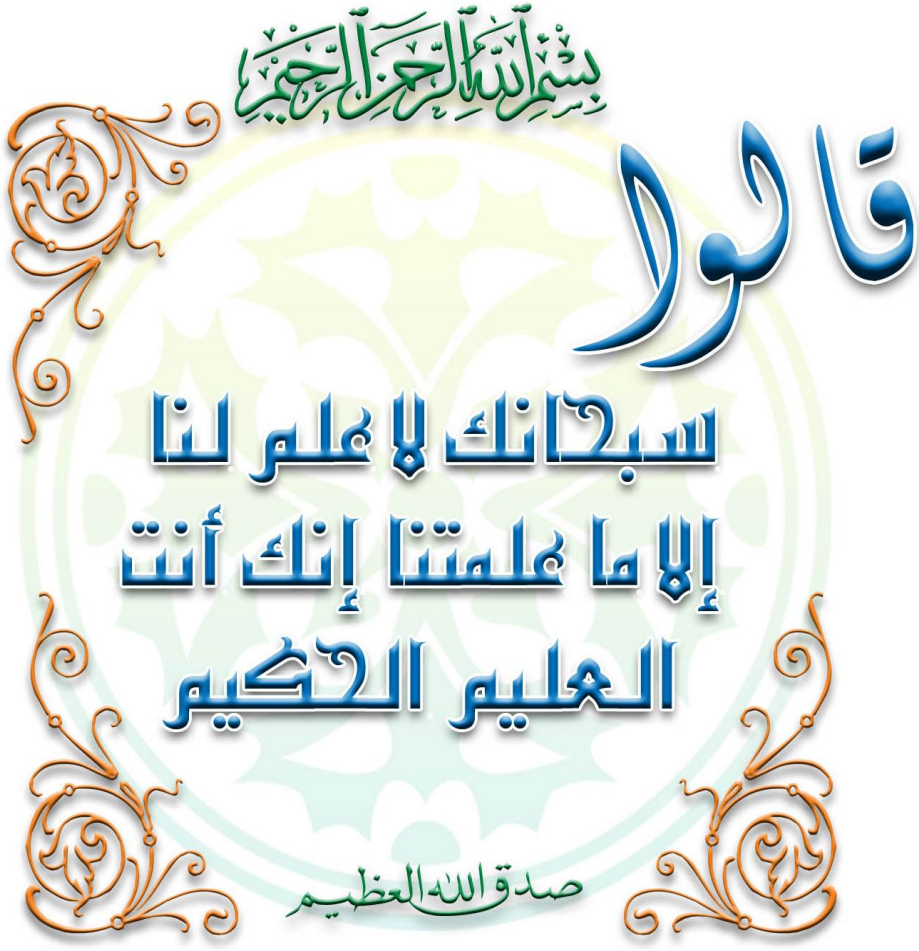
**Prof. Dr. Fouad Ibrahim El Hosiny**
Professor of Physical Chemistry, Faculty of Science, Ain Shams University

**Prof. Dr. Gehad Genidy Mohamed**
Professor of Inorganic and Analytical Chemistry, Faculty of Science, Cairo University

**Prof. Dr. Abeer Mohamed Amin**
Professor of Radiochemistry, Hot Labs Center, Egyptian Atomic Energy Authority

**Dr. Hanan Abd El-Aziz Abd El-Razek Elsabagh**
Lecturer of Radiochemistry, Hot Labs Center, Egyptian Atomic Energy Authority

Head of Chemistry Department
**Prof. Dr. Ayman Ayoub bdel-Shafi**

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Fatma Elzahraa Hafez

# EGY.ASE Studies

Dear Author(s)

The journal editorial board hereby informs you with pleasure that your submitted article entitled **"Radiolabeling, chemical and biological evaluation of Lidocaine in nuclear medicine application".**

**Author(s): Fatma A.Hafez, H. Abd El-Aziz, A.M. Amin, G.G. Mohamed and F.I. El- Hosiny.**
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journal.

Regards

**Ass. Prof Nour Eldeen Ahmed Abd ElSatar**

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# List of Abbreviations

BDH.....British Drug Houses

CAT .....Chloramine-T

CT .....Computed tomography

EC.....Electron capture

Epin .....Epinephrine

FDG .....Fluorodeoxyglucose

fMRI .....Functional magnetic resonance imaging

HPLC.....High-performance liquid chromatography

IT .....Isomeric transition

LET.....Linear energy transfer

Lido.....Lidocaine

NODCAR.....National Organization for Drug Control and Research

PET.....Positron emission tomography

SG-TLC .....Silica gel thin-layer chromatography

SPECT.....Single-photon emission computed tomography

Vera .....Verapamil

# ABSTRACT

**Candidate Name:** Fatma ELzahraa Ahmed Mohamed Hafez

**Title of Thesis:** Radiochemical and Biological Characterization of some Radiolabeled Drugs for Nuclear Medicine Applications

**Degree (PhD):** The PhD of Science in Chemistry, Faculty of Science, Ain Shams University, 2022.

This study aims to develop potential radiopharmaceuticals for non-invasive cardiac imaging by exploiting the advantages of drugs that can act on the heart. Lidocaine hydrochloride, Verapamil hydrochloride and Epinephrine were successfully labeled with radioactive iodine ($^{125}$I) using Chloramine-T via an electrophilic substitution reaction.$^{125}$I-Lidocaine, $^{125}$I-Verapamil, and $^{125}$I-Epinphrine gave maximum labeling yields of 93.2 % ± 0.1, 95.4 % ± 0.4 and 96% ± 0.8, respectively. Biodistribution studies showed that the maximum uptake of radioidonated Lidocaine, Verapamil of mice was 19.8 % and 18.3 %, respectively, at 60 min post injection while the maximum uptake of radioidonated Epinephrine was 18.6% at 180 min post injection.

# List of Contents

Title Page No.

# List of Contents cont...

Title Page No.

# List of Tables

Table No. Title Page No.

# List of Figures

# List of Figures cont...

# List of Figures cont...

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**Keywords:** Radiopharmaceuticals, Radioiodination, Lidocaine, Verapamil, Epinephrine, Heart imaging, Biodistribution.