



Ain Shams University
Faculty of Science
Chemistry Department

**Radiolabeling of Some Pharmaceutical
Compounds with Technetium-99m for
Diagnostic Purposes**

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Radiolabeling of Some Pharmaceutical Compounds with Technetium-99m for Diagnostic Purposes

This work has been carried out to study the labeling of some anti-inflammatory pharmaceuticals (diclofenac and dipyrrone) and antibiotics (amikacin) with technetium-99m to produce radiolabeled compounds and study their imaging ability of the septic and aseptic inflammation.

^{99m}Tc -amikacin was successfully labeled with Technetium - 99m by direct labeling technique. A radiochemical yield of $95\pm 3\%$ was obtained by adding ^{99m}Tc to $250\mu\text{g}$ amikacin in the presence of $25\mu\text{g}$ $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$ at pH 5 for 15 min. Biodistribution studies in mice were carried out in experimentally induced septic and aseptic inflammation in the left thigh using *E.coli*, and turpentine oil, respectively. ^{99m}Tc -amikacin discriminates well between septic and a septic foci showing high T/NT ratio (7.5 ± 0.3) in the infectious lesion and abscess to normal muscle ratio when compared with the uptake of septic foci at 2 hour post injection.

^{99m}Tc -diclofenac was successfully labeled with Technetium-99m by direct labeling technique. A radiochemical yield of $96\pm 2\%$ was obtained by adding ^{99m}Tc to $100\mu\text{g}$ diclofenac in the presence of $50\mu\text{g}$ $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$ at pH7 for 30 min. Biodistribution studies in mice were carried out in experimentally

induced septic and aseptic inflammation in the left thigh using *E.coli*, and turpentine oil. ^{99m}Tc -diclofenac is a good inflammation imaging agent. Higher uptake ($T/NT=3.7 \pm 0.02$) in the sterile inflamed muscle injected with turpentine oil than that of infected muscle injected with bacteria was observed.

^{99m}Tc -dipyron was prepared at pH 5 with a radiochemical yield of $95.5 \pm 2\%$ by adding ^{99m}Tc to $100\mu\text{g}$ dipyron in the presence of $25\mu\text{g}$ $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$ for 30 min. Biodistribution studies in mice were carried out in experimentally induced septic and aseptic inflammation in the left thigh using *E.coli* and turpentine oil. ^{99m}Tc -dipyron is a good inflammation imaging agent as its accumulation in the inflammation sites remained with T/NT nearly (5.5 ± 0.03) up to 1 hour in the sterile inflamed muscle injected with turpentine oil which was higher than that of infected muscle injected with bacteria.

CONTENTS	Page
LIST OF FIGURES.....	I
LIST OF TABLES	V
AIM OF WORK.....	VII

CHAPTER I

INTRODUCTION

I.1. General considerations.....	1
I.2. Nuclear medicine	3
I.2.1. Nuclear medicine radiotherapy	4
I.2.2. Nuclear medicine imaging	4
I. 3. A radiopharmaceutical	5
I.3.1. Therapeutic radiopharmaceuticals	6
I.3.2. Diagnostic radiopharmaceuticals	8
I.3.3. Characteristics of ideal Diagnostic radiopharmaceutical	9
I.4. Factors Influencing the Design of New Radiopharmaceuticals	11
I.5. Characterstics of radionuclides used for diagnosis in nuclear Medicine.....	14
I.5.1. Chemistry and radiochemistry of technetium-99m	16
I.6. Labeling of pharmaceutical compounds with technetium-99m	24
I.6.1. Direct labeling method	27
I.6.2. Transchelation (ligand exchange) labeling method	27
I.6.3. Labeling with bifunctional chelating agents	28

I.7. ^{99m}Tc-radiopharmaceuticals	31
I.7.1. Pertechnetate ion ($^{99m}\text{TcO}_4^-$).....	31
I.7.2. ^{99m}Tc-labeled colloids and particulates	31
I.7.3. ^{99m}Tc-complexes for skeletal imaging	32
I.7.4. ^{99m}Tc-complexes for renal imaging	32
I.7.5. ^{99m}Tc-complexes for hepatobiliary imaging	33
I.7.6. ^{99m}Tc-complexes for myocardial imaging	36
I.7.7. ^{99m}Tc-complexes for lung imaging	36
I.7.8. ^{99m}Tc-complexes for brain imaging.....	38
I.7.9. ^{99m}Tc-complexes of proteins.....	40
I.7.10. ^{99m}Tc-complexes for inflammation and infection scintigraphic detection.....	40
I.7.10.1. Inflammation.....	41
I.7.10.2. Non Steroidal Anti Inflammatory Drugs (NSAIDs)...	42
I.7.10.3. Antibiotics.....	42
I.7.10.3.1 Aminoglycoside antibiotics.....	43
I.7.10.4. Scintigraphic detection of infection and inflammation..	44
I.8. Nuclear medicine imaging of inflammation and bacterial infection.....	50
I.8.1. Characteristics of the ideal radiopharmaceutical for infection imaging.....	52

CHAPTER II

EXPERIMENTAL

II.1. Chemicals.....	53
II.2. Equipment	54
II.3. Animals	55
II.4. Radioactive Material	55
II.5. Bacteria	55
II.6. Labeling of ligands (Amikacin, Diclofenac and dipyrone).....	56
II.6.1. Preparation of stock solution of $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$	56
II.6.2. Kit preparation and labeling	56
II.6.3. Analysis of the reaction mixture (radiochemical purity	
and labeling yield).....	57
II.6.3.1. Ascending paper chromatography analysis	57
II.6.3.1.1. Determination of free pertechnetate ($^{99\text{m}}\text{TcO}_4^-$)....	57
II.6.3.1.2. Determination of reduced hydrolyzed-$^{99\text{m}}\text{Tc}$.....	58
II.6.3.1.3. Determination of $^{99\text{m}}\text{Tc}$-ligand complex.....	58
II.6.3.2. Electrophoresis analysis.....	60
II.6.3.3. HPLC analysis	61
II.6.3.3.1. HPLC for $^{99\text{m}}\text{Tc}$-Amikacin	61
II.6.3.3.2. HPLC for $^{99\text{m}}\text{Tc}$- diclofenac	61
II.6.3.3.3. HPLC for $^{99\text{m}}\text{Tc}$-dipyrone	61
II.6.4. Study of the factors affecting the percent labeling yield of	
$^{99\text{m}}\text{Tc}$-ligand complexes.....	62
II.6.4.1. Effect of pH of the reaction mixture	62
II.6.4.2. Effect of $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$ content.....	62
II.6.4.3. Effect of ligand amount	63

II.6.4.4. Effect of reaction time.....	63
II.6.4.5. <i>In-vitro</i> stability study.....	63
II.7. Biological evaluation of ^{99m} Tc-ligand complexes	64
II.7.1. Induction of infectious foci	64
II.7.2. Induction of non-infected (sterile) inflammation.....	64
II.7.3. Study of the biological distribution.....	64
II.7.3.1. In normal mice.....	64
II.7.3.2. In inflammation bearing mice.....	65
II.8. Statistical analysis.....	66

CHAPTER III

RESULTS AND DISCUSSION

III.1. Labeling of the ligands.....	67
III.2. Factors affecting the percent labelling yield of ^{99m} Tc-Amikacin, ^{99m} Tc-Diclofenac, and ^{99m} Tc-dipyrrone complex.....	69
III.2.1. Effect of pH of the reaction medium.....	69
III.2.1.1. Amikacin.....	69
III.2.1.2. Diclofenac	69
III.2.1.3. Dipyrrone.....	72
III.2.2. Effect of SnCl ₂ ·2H ₂ O content.....	72
III.2.2.1. Amikacin.....	74
III.2.2.2. Diclofenac.....	75
III.2.2.3. Dipyrrone.....	78
III.2.3. Effect of ligand amount	79

III.2.3.1. Amikacin.....	81
III.2.3.2. Diclofenac.....	81
III.2.3.3. Dipyrone.....	84
III.2.4. Effect of reaction time	84
III.2.4.1. Amikacin.....	86
III.2.4.2. Diclofenac.....	86
III.2.4.3. Dipyrone.....	86
III.2.5. <i>In-vitro</i> stability study	90
III.2.5.1. Amikacin.....	90
III.2.5.2. Diclofenac.....	90
III.2.5.3. Dipyrone.....	91
III.2.6. Electrophoresis analysis	91
III.2.6.1. Amikacin.....	91
III.2.6.2. Diclofenac.....	91
III.2.6.3. Dipyrone.....	94
III.2.7. HPLC analysis of ^{99m} Tc-ligands	94
III.2.7.1. HPLC analysis of ^{99m} Tc-amikacin	94
III.2.7.2. HPLC analysis of ^{99m} Tc-diclofenac	94
III.2.7.3. HPLC analysis of ^{99m} Tc-dipyrone	98
III.3. Inflammation imaging study.....	100
III.3.1. ^{99m} Tc-amikacin	101
III.3.1.1. In normal mice.....	101
III.3.1.2. In sterile inflammation bearing mice	102
III.3.1.3. In bacterial inflammation bearing mice.....	105
III.3.2. ^{99m} Tc-diclofenac.....	105
III.3.2.1. In normal mice.....	105
III.3.2.2. In sterile inflammation bearing mice.....	108
III.3.2.3. In bacterial inflammation bearing mice.....	111

III.3.3. ^{99m}Tc-dipyron	114
III.3.3.1. In normal mice	114
III.3.3.2. In sterile inflammation bearing mice	114
III.3.3.3. In bacterial inflammation bearing mice	116
Summary and conclusion	122
REFERENCES	130

List of Figures

	Page
Figure (1) Selected technetium chemical reactions.....	18
Figure (2) Decay scheme of technetium-99m.....	21
Figure (3) Decay scheme of molybdenum-99.....	22
Figure (4) Decay scheme of ^{99}Mo and $^{99\text{m}}\text{Tc}$ radionuclides.....	23
Figure (5) The strategy for labeling of proteins with metal ions using bifunctional chelating agent.....	30
Figure (6) Structures of some pharmaceuticals for kidney imaging and renal function study after labeling with $^{99\text{m}}\text{Tc}$.....	34
Figure (7) Structures of some iminodiacetic acid (IDA) analogues suggested as hepatobiliary imaging agents after labeling with $^{99\text{m}}\text{Tc}$.....	35
Figure (8) Structures of some $^{99\text{m}}\text{Tc}$-radiopharmaceuticals used for brain perfusion imaging.....	39
Figure (9) Chemical structure of amikacin.....	48
Figure (10) Chemical structure of diclofenac.....	49
Figure (11) Chemical structure of dipyrone.....	49

Figure (12)	The reported structure of ^{99m}Tc-ciprofloxacin complex.....	52
Figure (13)	Radiochemical analysis pattern	59
Figure (14)	Effect of pH on the labeling yield of ^{99m}Tc-amikacin complex.....	70
Figure (15)	Effect of pH on the labeling yield of ^{99m}Tc-diclofenac complex.....	71
Figure (16)	Effect of pH on the labeling yield of ^{99m}Tc-dipyron complex.....	73
Figure (17)	Effect of Sn(II) content on the labeling yield of ^{99m}Tc-amikacin complex.....	76
Figure (18)	Effect of Sn(II) content on the labeling yield of ^{99m}Tc-diclofenac complex.	77
Figure (19)	Effect of Sn(II) content on the labeling yield of ^{99m}Tc-dipyron complex.....	80
Figure (20)	Effect of amikacin amount on the labeling yield of ^{99m}Tc-amikacin complex.....	82
Figure (21)	Effect of diclofenac amount on the labeling yield of ^{99m}Tc-diclofenac complex.	83