Labeling of some pharmaceutical compounds of expected biological applications

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This study focuses on the design, development, and synthesis of technetium and iodine radiopharmaceutical agents for imaging and therapy applications in nuclear medicine. In conjunction with a bioactive molecule, the use of iodine and technetium can be powerful tools in targeting disease, since 99mTc presents ideal nuclear decay properties. The pendant approach was implemented in the design of the radiopharmaceuticals. The two major components of this strategy, the biologically active molecule and a radioactive element, were explored. Studies of the interaction of the technetium and iodine with a bioactive molecule with receptor specific interactions constitute a significant segment of this work.Chapter 1 presents brief accounts on the importance of the 99mTc and radioiodine radiopharmaceuticals, their preparation, and their metallation by using different routes. This introduction also includes the availability and affordability of both 99mTc and radioiodine, some literature survey on formulating radiopharmaceuticals for diagnosing a large number of diseases affecting the bones and major organs of the body such as the heart, brain, liver, kidney and thyroid.Chapter 2 (experimental) is concerned with the different procedures and techniques used in the labeling of aripiprazole, oxybutynin and nebivolol. This chapter includes the description of the instruments used for analysis such as HPLC. Various factors affecting the radiochemical yield were studied. These factors include the following: drug amount, tin(II) amount, pH and reaction time.Chapter 3 (results and discussion) involved the insertion of a radioactive isotope of iodine (125I) into a known biologically active compound (Aripiprazole). The inclusion of radioiodine was initially met