resultados indicam que a resistência à CDDP na linhagem SCC-25 pode estar associada ao aumento da expressão dos genes AKR1C1, CCND1, CCND3 e ERCC1, bem como à redução da expressão do gene SLC31A1, o que sugere que esses genes desempenham um papel na quimiorresistência. Esses achados reforçam o potencial desses genes como biomarcadores para um futuro painel de predição de resistência à cisplatina no CCECO. No entanto, novos estudos devem ser realizados em outras linhagens de tumores, assim como em modelos animais, para validar esses resultados.

Palavras-chave: Biomarcadores, Câncer de cabeça e pescoço, Cisplatin, Quimiorresistência.

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A BORON COMPLEX DESIGNED FOR FLUORINE-18 LABELING AIMING FOR PET IMAGING APPLICATION

Mariana Almeida Figueira [a],
Joaldo Garcia Arruda [a], Victor Maia Miranda [a],
Pedro Paulo Corbi [b], Luiz Antônio Sodré Costa [c],
Fabio Luiz Navarro Marques [d],
Victor Marcelo Deflon [a]

[a] *Universidade de São Paulo (USP), São Carlos, SP, Brazil*
[b] *Universidade Estadual de Campinas (UNICAMP), Campinas, SP, Brazil*
[c] *Universidade Federal de Juiz de Fora (UFJF), Juiz de Fora, MG, Brazil*
[d] *Universidade de São Paulo (USP), São Paulo, SP, Brazil*

A B S T R A C T

Introduction/Justification: Positron emission tomography (PET) is a rapidly expanding clinical modality worldwide due to the availability of compact medical cyclotrons and automated chemistry for the production of radiopharmaceuticals. Despite the availability of various positron-emitting radionuclides such as carbon-11 [11C], fluorine-18 [18F], and gallium-68 [68Ga], 18F has gained more importance and preeminence in research and diagnostic nuclear medicine due to its appropriate half-life of 110 min. Currently, 18F-fluorodeoxyglucose [18F]FDG is the most used radiopharmaceutical for the detection of various neurological disorders and cancer diseases. Since standard 18F-fluorination methods to form carbon-fluorine bonds have some limitations, such as low yield and the requirement for harsh reaction conditions, inorganic approaches, including the formation of boron-fluorine-18 bonds, have the potential to give high specific activities at room temperature, forming a bond that is stable in vivo. The boron complex is planned to be used in fluorine-18 labeling, aiming to develop a potential radiopharmaceutical for PET. **Objectives:** This work aims to produce a new boron compound with a trivalent and tetradentate chelating agent, relatively stable in air and in solution, but reactive in the presence of fluoride ions, to form an inert fluorinated species, aiming for its use in fluor-18 labeling and application in PET imaging. **Materials and Methods:** A tetradentate trivalent chelator, named 3-((bis-(2-hydroxyethyl)amino)methyl)-2-hydroxy-5-methylbenzaldehyde (abbreviated as H3L), was synthesized as previously described and used to prepare a neutral tetracoordinated boron complex, named [BL], by its equimolar quantitative reaction with boric acid in acetonitrile under reflux conditions overnight, as a white solid, which was filtered, dried, and characterized. By spectroscopic monitoring, the formation of a new species was observed in methanol solution from [BL] and NaF, supposedly forming Na[BFL]. The structures of the [BL] molecule and of the [BFL]1- anion were theoretically calculated by DFT methods. **Results:** The H3L free ligand and the boron complex were satisfactorily characterized by diverse techniques, including mass spectrometry, FT-IR, UV-Vis, and NMR spectroscopies (1H, 13C, and 11B) and single crystal X-ray diffraction. The complex [BL] was formed upon deprotonation of three hydroxyl groups in the free ligand, whose oxygens formed the coordination sphere together with the nitrogen atom. The coordination compound has a distorted tetrahedral coordination geometry, which might favor the formation of the bond between the boron atom and the fluoride ion, which is a strong nucleophile, by weakening the boron-nitrogen bond but keeping the oxygen donor atoms strongly coordinated to the boron center. **Conclusion:** Both, the free ligand and the boron complex have been successfully synthesized and characterized. The complex forms a new species in the presence of fluoride. X-ray diffraction on a single crystal of [BL] confirms its structure. The boron center is tetracoordinate with the ligand L3-, which coordinates trianionically and tetradentate through one nitrogen and three oxygen donor atoms. The obtained boron complex exhibited reactivity upon fluoride in solution, resulting in the formation of a novel species, confirming its potential application in [18F]fluoride labeling.

Keywords: Boron, Fluorine-18, Polyvalent chelator, Radiopharmaceutical.

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PREPARATION OF PHOSPHATIDYLSERINE LIPOSOMES FOR 99MTC RADIOPHARMACEUTICALS ENCAPSULATION

Larissa Estessi de Souza [a],
Mara Souza Junqueira [b], Dainele Paula Faria [c],
Giovani Marino Faveiro [d], Roger Chammas [a],
Fabio Luiz Navarro Marques [c]

[a] *Hospital Israelita Albert Einstein, São Paulo, SP, Brazil*
[b] *Centro de Pesquisa Translacional em Oncologia (LIM/24), Instituto do Câncer do Estado de São Paulo, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo (HCFMUSP), São Paulo, SP, Brazil*