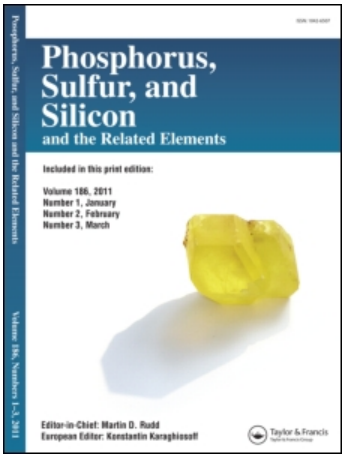

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Design and Development of New Hydroxy Methyl Phosphine Based Bifunctional Chelating Agents (BFCAs) for Use in Radiopharmaceutical Applications

S. R. Karra[a]; R. Schibli[a]; H. Gali[a]; K. V. Katti[a]; W. A. Volkert[a]
[a] Center for Radiological Research, University of Missouri-Columbia, Columbia, MO, USA

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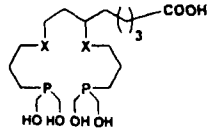
Design and Development of New Hydroxy Methyl Phosphine Based Bifunctional Chelating Agents (BFCAs) for Use in Radiopharmaceutical Applications

KARRA S.R., R. SCHIBLI, H. GALI, K.V. KATTI and W.A. VOLKERT

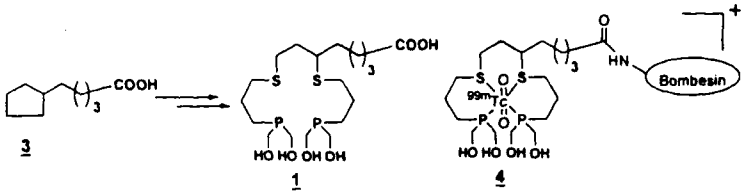
Center for Radiological Research, 306 Business Loop, Rm. 106 University of Missouri-Columbia, Columbia, MO 65211, USA

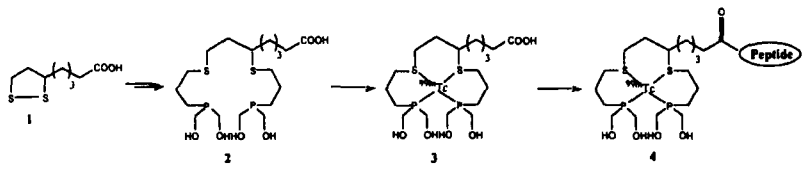
Hydroxymethyl phosphine compounds are water-soluble and moderately air stable. This class of compounds have the potential for use in variety of catalytic and biomedical appliations.[1] As part of our ongoing program to utilize the hydroxymethyl phosphine ligands for applications in Nuclear Medicine, we are interested to develop tetradentate hydroxy methyl phosphine-based Bifunctional Chelating Agents (BFCAs) **1** and **2**. Site-directed biomolecules such as receptor-avid peptides and proteins modified with these BFCAs can be used as vehicles or specific delivery of diagnostic (e.g., ^{99m}Tc) and therapeutic radionuclides (e.g.,^{188}Re and ^{186}R) to target cancer cells.[2]



1 X = S
2 X = NH

We have now developed a six step route for the synthesis of **1** from DL-Thioctic acid **3**. The ^{99m}Tc complex of **1** was conjugated to a 14 amino acid peptide, Bombesin for which specific receptors were expressed on a variety of cancer cell lines.





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(b) DuBois, D.L.; Miedaner, A. *J. Am. Chem. Soc.*, **109,** 113 **(1987).** ***Commun.***, 1863 **(1994).**
[2] Fishchmann, A.J.; Babich, J.W.; Strauss, J.W.; *J. Nucl. Med.*, **34,** 2253 (1993).