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Phosphorylation of Inositols

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PHOSPHORYLATION OF INOSITOLS

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Chemical synthesis of inositol phosphates which are involved in a newly discovered intracellular transduction system is required. For this purpose, phosphorylation is a crucial step. However, phosphorylation of inositol derivatives which involve vicinally situated hydroxyl functions is quite difficult because of steric crowding and easy formation of cyclic phosphate. This problem was solved by the following two methods. One method consists of the reaction of an inositol derivative with butyllithium and tetrabenzyl pyrophosphate. By this reaction, various inositol polyphosphates were obtained in good yields. The other involves a new phosphitylating agent, 2-diethylamino-1,3,2-benzodioxaphosphine. Thus, inositols were first treated with the phosphoramidite in the presence of tetrazole and the resulting phosphites were oxidized by mCPBA to give the corresponding phosphates in excellent yields.

Synthesis of some biologically important inositol phosphates using the present methods will be also discussed.