Molecular cloning and hormonal regulation of PiT-1, 
a sodium-dependent phosphate cotransporter from rat parathyroid glands
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The extracellular concentration of inorganic phosphate (Pi) is an important determinant of parathyroid cell function. The effects of Pi may be mediated through specific molecules in the parathyroid cell membrane, one candidate molecule for which would be a Na+-dependent Pi cotransporter. A cDNA encoding a Na+-Pi cotransporter, termed rat PiT-1, has now been isolated from rat parathyroid. The 2890-bp cDNA encodes a protein of 681 amino acids that shows sequence identities of 97 and 93% with the type III Na+-Pi cotransporters mouse PiT-1 and human PiT-1, respectively. Expression of rat PiT-1 in Xenopus oocytes revealed that it possesses Na+-dependent Pi cotransport activity. PiT-1 mRNA is widely distributed in rat tissues and is most abundant in brain, bone, and small intestine. The amount of PiT-1 mRNA in the parathyroid of vitamin D-deficient rats was reduced compared with that in normal animals, and increased markedly after administration of 1,25-dihydroxyvitamin D3. Furthermore, the abundance of PiT-1 mRNA in the parathyroid was much greater in rats fed a low-Pi diet than in those fed a high-Pi diet. Thus, rat PiT-1 may contribute to the effects of Pi and vitamin D on parathyroid function.