Interaction of protein synthesis initiation factor 2 from Xenopus laevis oocytes with GDP and GTP analogs

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The structural specificity of the purified protein synthesis initiation factor 2 (eIF-2) from X. laevis ovary towards analogs of GTP and GDP was studied. The relative affinity of the structural analogs was measured by their capacity to inhibit the formation of the [3H]GDP·eIF-2 binary complex. The results obtained demonstrate that modifications in the ribose moiety are well tolerated by eIF-2 which binds dGTP, 2?,3?-dialdehyde GTP (oGTP) and 2?,3?-dialdehyde GDP (oGDP) and even the dinucleotide cytidylyl(5?-3?)guanosine 5?-triphosphate (pppGpC). Substitution in the polyphosphate chain by phosphorothioate groups in the ? and ? positions (GDP?S or GTP?S) does not abolish the affinity for the nucleotides and the presence of an imido group between the ? and ? phosphates in guanyl-5?-yl imidodiphosphate (GppNHp) still permits a weaker but significant binding. Guanine 5?-O-(2-fluorodiphosphate) (GDP?F) has an affinity considerably lower than GDP?S. Methylation of position 7 of the guanine (7