

4',6-Diamidino-2-phenylindole (DAPI) induces bundling of Escherichia coli FtsZ polymers inhibiting the GTPase activity

Nova, Esteban

Montecinos, Felipe

Brunet, Juan E.

Lagos, Rosalba

Monasterio, Octavio

FtsZ (Filamentous temperature sensitivity Z) cell division protein from Escherichia coli binds the fluorescence probe DAPI. Bundling of FtsZ was facilitated in the presence of DAPI, and the polymers in solution remained polymerized longer time than the protofilaments formed in the absence of DAPI. DAPI decreased both the maximal velocity of the GTPase activity and the Michaelis-Menten constant for GTP, indicating that behaves like an uncompetitive inhibitor of the GTPase activity favoring the GTP form of FtsZ in the polymers. The results presented in this work support a cooperative polymerization mechanism in which the binding of DAPI favors protofilament lateral interactions and the stability of the resulting polymers. © 2007 Elsevier Inc. All rights reserved.