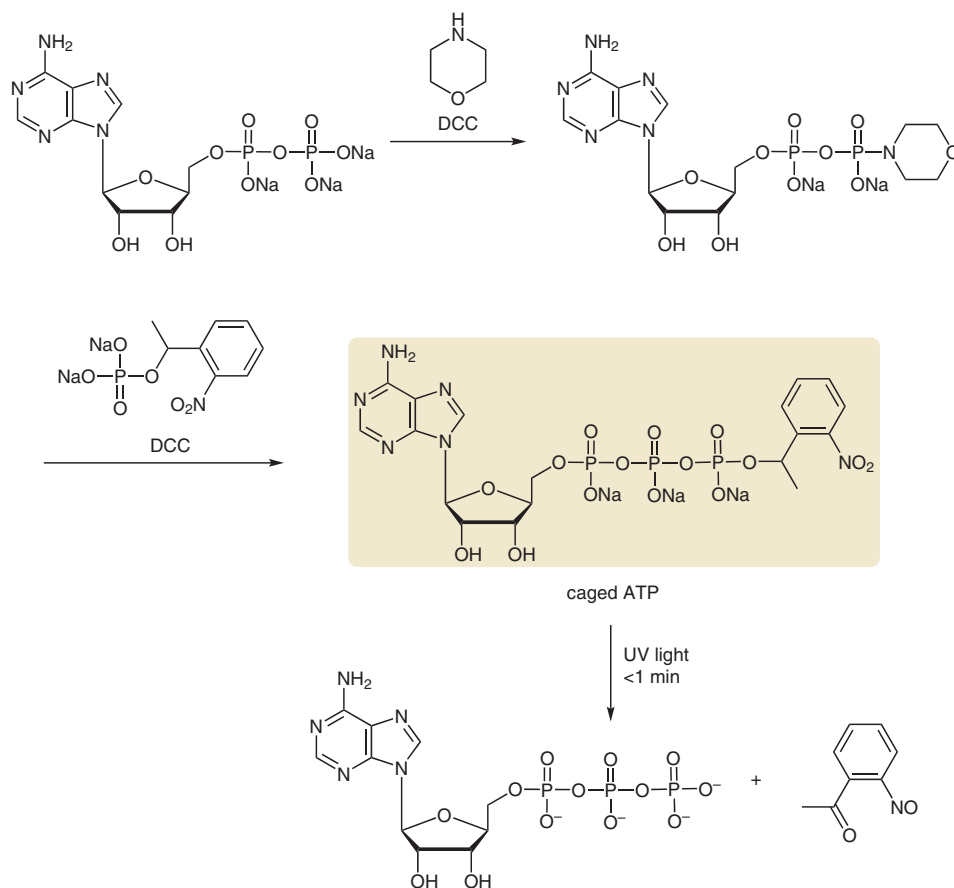


J. H. KAPLAN, B. FORBUSH III, J. F. HOFFMAN* (YALE UNIVERSITY, NEW HAVEN, USA)
Rapid Photolytic Release of Adenosine 5'-Triphosphate from a Protected Analogue: Utilization by the Sodium:Potassium Pump of Human Red Blood Cell Ghosts
Biochemistry **1978**, *17*, 1929–1935.

Synthesis of Photo-Caged ATP



Significance: The release of inorganic phosphate from ATP is crucial to numerous life processes from cell movement to cell signaling. In 1978, Kaplan et al. expanded the concept of photolabile protecting groups to ATP and demonstrated the controlled release of ATP to activate Na⁺/K⁺ pumps in resealed red blood cell ghosts.

Comment: The photolabile 'caged phosphate' was coupled to ADP through a DCC mediated phosphorylation. Upon irradiation with UV light, the caged ATP is photolyzed, releasing ATP and a reactive nitrosoketone. The ATPase inhibition of the Na⁺/K⁺ pump caused by the nitrosoketone by-product can be reversed by incorporating glutathione into the assay.

SYNFACTS Contributors: Dirk Trauner, Anna C. Impastato
Synfacts 2020, 16(05), 0601 Published online: 20.04.2020
DOI: 10.1055/s-0040-1707485; Reg-No.: T02420SF

© 2020, Thieme. All rights reserved.
Georg Thieme Verlag KG, Rüdigerstraße 14, 70469 Stuttgart, Germany

Category

Chemistry in
Medicine and
Biology

Key words

photocaging

ATP

DCC coupling

Synfact
Classic