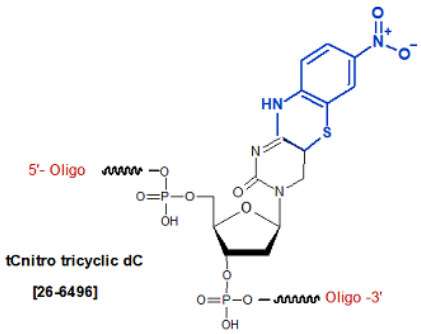
tCnitro tricyclic dC

Category	Structural Studies
Modification Code	tCnitro
Reference Catalog Number	26-6496
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	440.32



tricyclic fluorescent dC analogs, tC and tC_o and FRET-acceptor tC_{nitro} The tricyclic fluorescent nucleoside analogs, 1,3-diaza-2-oxophenothiazine, tC, and 1,3-diaza-2-oxophenoxazine, tCo, are deoxycytidine analogs that have been shown to base pair faithfully with dG with virtually no disruption of the normal duplex structure(1-5). This means that the stability of the DNA duplex is not compromised as compared to the control regardless of DNA sequence. The fluorescence quantum yield of tC is essentially unchanged between single stranded and double stranded DNA - 0.21 for single stranded DNA and 0.19 for duplex DNA. Also, the fluorescence characteristics of tC are not sensitive to neighboring base combinations. tCo has been shown to be the brightest fluorescent nucleoside analogue in duplex context reported so far and even retains the majority of its fluorescence when surrounded by guanine residues. Indeed, tCo has been reported to be 25-50 times brighter than 2-aminopurine. The base analogue tCnitro is a FRET-acceptor together with tCO (or tC) as the donor molecule. This constitutes the first ever description of a nucleobase FRET-pair. This novel FRET-pair provides a unique tool for investigations of nucleic acid containing systems. tCnitro is virtually non-fluorescent under normal conditions.
Additional Recommended Reading Glen Report 22.13.
References Ward, D.C., Reich, E., Stryer, L. Journal of Biological Chemistry, 1969, 244, 1228-1237. Berry, D.A., Jung, K.Y., Wise, D.S., Sercel, A.D., Pearson, W.H., Mackie, H., Randolph, J.B., Somers, R.L. Tetrahedron Letters, 2004, 45, 2457-2461. Wilhelmsson, L. M., Holmen, A., Lincoln, P., Nielsen, P. E., Norden, B. Journal of the American Chemical Society, 2001, 123, 2434-2435. Sandin, P., Wilhelmsson, L.M., Lincoln, P., Powers, V.E.C., Brown, T., Albinsson, B. Nucleic Acids Research, 2005, 33, 5019-5025. Sandin, P., Borjesson, K., Li, H., Martensson, J., Brown, T., Wilhelmsson, L.M., Albinsson, B. Nucleic Acids Research, 2008, 36, 157-167. Engman, K.C., Sandin, P., Osborne, S., Brown, T., Billeter, M., Lincoln, P., Norden, B., Albinsson, B., Wilhelmsson, L.M. Nucleic Acids Research, 2004, 32, 5057-5095. Lin, K., Jones, R.J., Matteucci, M. Journal of the American Chemical Society, 1995, 117, 3873-3874.

Borjesson, K., Preus, S., El-Sagheer, A.H., Brown, T., Albinsson, B., Wilhelmsson, L.M. Journal of the American Chemical Society, 2009, 131, 4288-4293. Preus, S., Borjesson, K., Kilsa, K., Albinsson, B., Wilhelmsson, L.M. Journal of Physical Chemistry B, 2010, 114(2), 1050-1056. Borjesson, K., Sandin, P., Wilhelmsson, L.M. Biophysical Chemistry, 2009, 139, 24-28. Stengel, G., Gill, J.P., Sandin, P., Wilhelmsson, L.M., Albinsson, B., Norden, B., Millar, D. Biochemistry, 2007, 46(43), 12289-12297. Sandin, P., Stengel, G., Ljungdahl, T., Borjesson, K., Macao, B., Wilhelmsson L.M. Nucleic Acids Research, 2009, 37(12), 3924-3933. Stengel, G., Purse, B.W., Wilhelmsson, L.M., Urban, M., Kuchta, R.D. Biochemistry, 2009, 48(31), 7547-7555. Stengel, G., Urban, M., Purse, B.W., Kuchta, R.D. Analytical Chemistry, 2010, 82, 1082-1089.