

This article was downloaded by:

On: 27 January 2011

Access details: *Access Details: Free Access*

Publisher *Taylor & Francis*

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Nucleosides, Nucleotides and Nucleic Acids

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713597286>

Two-Dimensional ¹H-N.M.R. Assignment of Short Duplex Oligodeoxyribo-Nucleotides Which May Be Used as Potential Targets for Anticancer Drugs

J. W. Lown^a; C. C. Hanstock^a; R. C. Bleackley^b; J. -L. Imbach^c; B. Rayner^c; J. J. Vasseur^c

^a Department of Chemistry, University of Alberta, Edmonton ^b Department of Biochemistry, University of Alberta, Edmonton, Canada ^c Department of Chemistry, Université des Sciences et Techniques du Languedoc, Montpellier, France

To cite this Article Lown, J. W. , Hanstock, C. C. , Bleackley, R. C. , Imbach, J. -L. , Rayner, B. and Vasseur, J. J.(1985) 'Two-Dimensional ¹H-N.M.R. Assignment of Short Duplex Oligodeoxyribo-Nucleotides Which May Be Used as Potential Targets for Anticancer Drugs', *Nucleosides, Nucleotides and Nucleic Acids*, 4: 1, 285

To link to this Article: DOI: 10.1080/07328318508077891

URL: <http://dx.doi.org/10.1080/07328318508077891>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

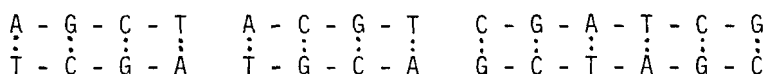
TWO-DIMENSIONAL ¹H-N.M.R. ASSIGNMENT OF SHORT DUPLEX OLIGODEOXYRIBO-NUCLEOTIDES WHICH MAY BE USED AS POTENTIAL TARGETS FOR ANTICANCER DRUGS

J. W. Lown,^a C. C. Hanstock,^a R.C. Bleackley,^b J.-L. Imbach,^c B. Rayner,^c and J. J. Vasseur.^c

^aDepartment of Chemistry, University of Alberta, Edmonton, Alberta, T6G 2G2, ^bDepartment of Biochemistry, University of Alberta, Edmonton, Alberta T6G 2H7, Canada and ^cDepartment of Chemistry, Université des Sciences et Techniques du Languedoc, 34060 Montpellier, France.

Summary High-field NMR, methods have been developed for assigning proton resonances of duplex oligodeoxyribonucleotides which may be applied to the analysis of their complexes with anticancer agents.

The self complementary oligomers which have been examined by ¹H-



nmr spectroscopy include the above. The duplex nature of the oligomers under the ¹H-NMR conditions was confirmed by labelling the 5'-end with ³²P-phosphate using T4 polynucleotide kinase and butt-end joining employing the absolute specificity of T4 ligase for double stranded DNA. Analysis was done by running the samples on polyacrylamide electrophoretic gels with visualisation of the spots by autoradiography.

Complete nmr assignment of the ¹H chemical shifts and coupling constants was achieved. The assignments were secured using NOE difference measurements, and two dimensional COSY and INADEQUATE experiments. Spectrum simulation confirmed the experimental values of chemical shifts and coupling constants. The techniques for the assignment outlined together with ³¹P and 2-D heteronuclear shift correlation permit an approach to a systematic analysis of more complex single strand and duplex oligodeoxyribonucleotides.

The complexation of the oligomer d(CG)₄ with the anticancer drugs mitoxantrone and ametantrone was examined using the above techniques. The spectra provided evidence for intercalative binding complementing our previous studies with electron microscopy.