MICHAEL JOHN WARING

Curriculum vitae

Born: 8 November 1939 in Lancaster, England. **British citizen**

Education:

1949-58:	Friends' School, Lancaster
1958-64:	University of Cambridge, Downing College (Scholar)
1960:	Natural Sciences Tripos, Part I: First Class
1961:	Natural Sciences Tripos, Part II (Biochemistry): First Class
1961-64:	Research student (MRC) in Chemical Microbiology, Department of Biochemistry.

Degrees: B.A. (1961) Ph.D. (1964) M.A. (1965) Sc.D. (1975)

Employment:

1964-65:	Fellow of the Carnegie Institution of Washington Department of Terrestrial Magnetism, Washington DC, USA
1965-67:	University Demonstrator in Biochemistry, Cambridge University
1967-90	University Lecturer in Pharmacology, Cambridge University
1965-	Fellow and Lecturer in Biochemistry, Jesus College. College posts held: Tutor, Director of Studies in Biological Sciences and Medicine, Librarian, Steward.
1975-	Hon Visiting Consultant, Cancer Research Laboratory, Auckland, New Zealand
1990-99	Reader in Chemotherapy, Cambridge University
1999-2004	Professor of Chemotherapy, Cambridge University

Honours and external appointments

1975,1978:	British Council Exchange Fellow, CSIC, Spain
1977:	Fellow, International Union Against Cancer
1977:	EMBO Research Fellow, Madrid
1979,1982:	Royal Society Exchange Fellow, Spain
1983:	Visiting Professor, H.C. Ørsted Institute, Copenhagen
1984:	Royal Society Exchange Fellow, Poland
1985:	Visiting Professor, Université du Québec, Montréal
1989:	Visiting Professor, Institut Pasteur, Paris
1991:	Visiting Professor, Université de Paris
1992:	Visiting Scientist, California Institute of Technology
1995 -	*Membre Correspondant du Muséum National d'Histoire Naturelle*, Paris
1998:	Visiting Professor, University of Texas at Austin
1999:	Visiting Associate in Chemistry, California Institute of Technology
1999:	Rex Williamson Lecturer, Deakin University, Geelong, Australia
2002:	Board of Governors, Witan Hall
2003:	Visiting Professor, California Institute of Technology
2003:	Advisory Board, Center for Molecular Medicine & Drug Development, Karachi
2005:	Governor, Sevenoaks School
2007:	Fellow of the Royal Society of Chemistry

Societies, Committees etc:

1965- Biochemical Society
1965- Monumental Brass Society
1967- Cambridge Philosophical Society
1968- British Pharmacological Society
1995- Cambridge Centre for Molecular Recognition
1997- Founder Member and Steering Committee, *International Society for the Study of Drug-Nucleic Acid Interactions*

Editorial Boards:

Biochemical Journal (1974)
Antimicrobial Agents & Chemotherapy (1978-91)
Molecular Pharmacology (1979-98)
Oncology Research [incorporating Anti-Cancer Drug Design] (1984 -)
Journal of Molecular Recognition (1987 -); **Editor** 1991-98
Biochimica et Biophysica Acta (1996-2003)
Current Medicinal Chemistry: Anti-Cancer Agents (2000 -)
The Open Cancer Journal (2007 -)
Drug Design, Development and Therapy (2007 -)

Organiser for International Meetings:

British Biophysical Society, London (1980)
NATO-FEBS Advanced Study Institute, Fontevraud (1986)
International Congress on DNA-Ligand Interactions, Padova (1987)
International Conference on Drug-DNA Interactions, Cambridge (1989)
CNRS Conferences J. Monod 'Drugs Acting on Nucleic Acids', Roscoff (1991), Aussois (1994)
International Conference on DNA Recognition, Copenhagen (1993)
International Conference on Ligands Acting on Nucleic Acids, Ascona (1996).
International Symposium on Drug Regulation of Gene Expression, Bressanone-Brixen (1999)
NATO Advanced Research Workshop, Kiev, Ukraine (2001)
First International Conference on Drug Design & Discovery, Dubai, UAE (2008)

Advisory Panels for Research Councils, Academic Bodies etc.

MRC, BBSRC, AICR, Cancer Research Campaign (site visits)
Human Frontier Science Program
The Danish National Research Foundation
Australian Research Council
US National Science Foundation
New Zealand Medical Research Council
Auckland Medical Research Foundation
Minority Biomedical Research Support Program (U.S. National Institutes of Health)
The Israel Science Foundation
Health Research Board of Ireland
Cambridge Colleges Hospitality Scheme for Central and Eastern European Scholars
Stoke Mandeville Burns and Reconstructive Surgery Research Trust
Membre des Experts de l'INSERM

Plenary and Guest Lecturer

Pontifical Academy of Sciences, Sesquicentenary Working Group on Molecular Mechanisms of Carcinogenic and Antitumour Activity (Vatican City, 1986)
Physico-Chemistry of DNA and Molecular Mechanisms of Genome Functioning (Tbilisi, 1987)
Nucleic Acid Interactions (Padova, 1987)
Molecular Basis of Specificity in DNA-Antitumour Drug Interactions (Annecy, 1988)
South African Biochemical Society (George, 1988)
American Association for Cancer Research (San Francisco, 1989)
Recent Advances of Chemistry and Molecular Biology in Cancer Research (Peking,1991)
CUHK Faculty of Medicine Tenth Anniversary Symposium 'Cancer Today' (Hong Kong, 1992)
Analysis of Structure of Biomacromolecules and Interactions with Cytotoxic Agents (Brno, 1993)
Cambridge Centre for Molecular Recognition (1994)
Pharmaceutical Design: Nucleic Acid Binding Drugs (Palo Alto, 1994)
Young Scientist's View of Molecular Biotechnology (Liège, 1995)
Modified Nucleic Acids: Chemistry and Applications (Cold Spring Harbor, 1996)
Xèmes Journées Franco-Belges de Pharmacochimie (Luxembourg, 1996)
Third Gauss Symposium (Peking, 1997)
Nobel Workshop 'Gene-Targeted Drugs: Function and Delivery' (*rapporteur*; Stockholm, 1998)
Rex Williamson Guest Lecturer, Deakin University (Geelong, Australia, 1999)
Opening lecturer, Mendel Centenary Conference on DNA (Brno, 2000)
Symposium in Honour of Prof. J.William Lown (Wake Forest University, NC, 2001)
Keynote speaker, 2nd Oxford Symposium on Targeting Topoisomerase (University, MS, 2001)
Key Speaker, NATO ARW on Frontiers in Molecular-Scale Science & Technology (Kiev, 2001)
Opening lecturer, Micro- and Nanostructures of Biological Systems (Halle, 2002)
Symposium in Honour of Claude Hélène (Muséum National d'Histoire Naturelle, Paris, 2003)
Opening lecturer, Royal Society of Chemistry Nucleic Acids Forum (London, 7/7/2005)
Guest Lecturer, Centre of Excellence in Molecular Medicine, Lodz, Poland (2005)
Keynote Lecturer, Pharmaceutical Societies meeting, Tainan, Taiwan (December 2005)
Session Chairman, 17th Conversation on Biomolecular Structure and Dynamics, Albany, New York (June 2007)

Recent Grant Support

Cancer Research Campaign: £101 000 for 3 years (active since 1977)
Association for International Cancer Research: £70 000 for 3 years (active since 1993)
Wellcome Trust: £102 000 for equipment
European Union: £692 000 for 3 years (shared with six other centres)
Sir Halley Stewart Trust: £48 000 for 5 years
U.S. National Institutes of Health: $40 000 for 4 years
American Cancer Society: $30 000 for 3 years

PUBLICATIONS

Papers and Reviews

1 M.J. Waring: The effects of antimicrobial agents on RNA polymerase (abstract). *J. Gen. Microbiol*. **33**, x (1963)

2 M.J. Waring: Complex formation with DNA and inhibition of *Escherichia coli* RNA polymerase by ethidium bromide. *Biochim. Biophys. Acta* **87**, 358-361 (1964)

3 W. Fuller & M.J. Waring: A molecular model for the interaction of ethidium bromide with DNA. *Ber. Bunsenges. Physik. Chem*. **68**, 805-808 (1964)

4 M.J. Waring: The effects of antimicrobial agents on RNA polymerase. *Mol. Pharmacol*. **1**, 1-13 (1965)

5 M.J. Waring: Complex formation between ethidium bromide and nucleic acids. *J. Mol. Biol*. **13**, 269-282 (1965)

6 R.J. Britten & M.J. Waring: 'Renaturation' of the DNA of higher organisms. *Carnegie Inst. Wash. Yearbook* **64**, 316-333 (1965)

7 M.J. Waring: Structural requirements for the binding of ethidium to nucleic acids. *Biochim. Biophys. Acta* **114**, 234-244 (1966)

8 M.J. Waring: Cross-linking and intercalation in nucleic acids. *Symp. Soc. Gen. Microbiol*. **16**, 235-265 (1966)

9 M.J. Waring & R.J. Britten: Nucleotide sequence repetition: a rapidly reassociating fraction of mouse DNA. *Science* **154**, 791-794 (1966)

10 L.V. Crawford & M.J. Waring: Supercoiling of polyoma virus DNA measured by its interaction with ethidium bromide. *J. Mol. Biol.* **25**, 23-30 (1967)

11 L.V. Crawford & M.J. Waring: The supercoiling of papilloma virus DNA. *J. Gen. Virology* **1**, 387-390 (1967)

12 M.J. Waring & L.V. Crawford: Uncoiling of DNA upon intercalation of ethidium. *V Int. Congr. Chemotherapy*, Vienna (1967), **6**, 591-595

13 M.J. Waring: Intercalation into DNA. *Naunyn-Schmiedebergs Arch.Pharmacol. Exp. Path*. **259**, 91-97 (1968)

14 M.J. Waring: Recent studies on intercalating drugs (abstract). *Hoppe-Seylers Z. Physiol. Chem*. **349**, 954 (1968)

15 M.J. Waring: Uncoiling of bacteriophage ØX174 replicative form DNA by ethidium, daunomycin and actinomycin (abstract). *Biochem. J*. **109**, 28P (1968)

16 M.J. Waring: Drugs which affect the structure and function of DNA. *Nature* **219**, 1320-1325 (1968)

17 M.J. Waring: Nucleic Acids. *Ann. Reports Chem. Soc. for 1967*, **64**(B), 439-509 (1968)

18 M.J. Waring: Brass rubbing. *YMCA World*, 22-23 (1968)

19 M.J. Waring: Nucleic Acids. *Ann. Reports Chem. Soc.* for 1968, **65**(B), 551-575 (1969)

20 M.J. Waring: Distortion of DNA structure and function by intercalating drug molecules *Proc. IV Int. Congr. Pharmacol.*, Basel (1969), **1**, 308-317. Schwabe, Basel.

21 M.J. Waring: Antimicrobial drugs which inhibit nucleic acid synthesis. [6th FEBS Meeting, Madrid, 1969]; *FEBS Symp*. **21**, 143-153 (1970). Academic Press, London.

22 M.J. Waring: Drugs and DNA: uncoiling of the double helix as evidence of intercalation. *Humangenetik* **9**, 234-236 (1970)

23 M.J. Waring: Variation of the supercoils in closed circular DNA by binding of antibiotics and drugs: evidence for molecular models involving intercalation. *J. Mol. Biol*. **54**, 247-279 (1970)

24 M.J. Waring: Brass rubbing - the art and history. *Visitors' Guide to East Anglia*, 4-5 (1970)

25 M.J. Waring: Binding of drugs to closed circular DNA: uncoiling of the double helix as evidence of intercalation. *Studia Biophysica*, Berlin **24/25**, 257-263 (1970)

26 M.J. Waring: Binding of drugs to supercoiled circular DNA: evidence for and against intercalation. *Prog. Mol. and Subcellular Biol.* (ed F.E. Hahn), **2**, 216-231 (1971). Springer-Verlag Heidelberg.

27 M.J. Waring: Antibiotic tools (book review), *Nature* **231**, 473-474 (1971)

28 J. Fok & M.J. Waring: Breakdown of pulse-labelled RNA in *Bacillus megaterium* revealed by exposure to the antibiotics mithramycin, chromomycin and nogalamycin. *Mol. Pharmacol*. **8**, 65-74 (1972)

29 M.J. Waring & J.W. Chisholm: Uncoiling of bacteriophage PM2 DNA by binding of steroidal diamines. *Biochim. Biophys. Acta* **262**, 18-23 (1972)

30 M.J. Waring: Intercalation of drugs into DNA. *M&B Laboratory Bulletin* **10**, 34-39 (1972)

31 M.J. Waring: Interaction of indazole analogues of lucanthone and hycanthone with closed circular duplex DNA. *J. Pharmacol. Exp. Ther.* **186**, 385-389 (1973)

32 W. Müller, D.M. Crothers & M.J. Waring: A non-intercalating proflavine derivative. *European J. Biochem*. **39**, 223-234 (1973)

33 M.J. Waring: Peptides. Structure and function (meeting report). *Nature New Biol*. **243**, 34 (1973)

34 M.J. Waring: Studies with closed circular duplex DNA as a probe for conformational alterations. *Studia Biophysica,* Berlin **40**, 151-157 (1973)

35 M.J. Waring & A.Makoff: Breakdown of pulse-labelled RNA and polysomes in *Bacillus megaterium*: actions of streptolydigin, echinomycin and triostins. *Mol. Pharmacol.* **10**, 214-224 (1974)

36 M.J. Waring: DNA intercalation by antimalarials. *ERO Technical Report* **5-74**, 122-128, 148-154 (1974)

37 M.J. Waring: Drug receptors (book review). *Nature* **248**, 460-461 (1974)

38 G. Luck, H. Triebel, M.J. Waring & Ch. Zimmer: Conformation-dependent binding of netropsin and distamycin to DNA and DNA model polymers. *Nucleic Acids Research* **1**, 503-530 (1974)

39 L.P.G. Wakelin & M.J. Waring: The unwinding of circular DNA by phenanthridinium drugs: structure-activity relations for the intercalation reaction. *Mol. Pharmacol.* **10**, 544-561 (1974)

40 M.J. Waring: Stabilization of two-stranded ribohomopolymer helices and destabilization of a three-stranded helix by ethidium bromide. *Biochem. J.* **143**, 483-486 (1974)

41 M.J. Waring & L.P.G. Wakelin: Echinomycin: a bifunctional intercalating antibiotic. *Nature* **252**, 653-657 (1974)

42 K.W. Kohn, M.J. Waring, D. Glaubiger & C.A. Friedman: Intercalative binding of ellipticine to DNA. *Cancer Res.* **35**, 71-76 (1975)

43 M.J. Waring: Ethidium and propidium. In *Antibiotics III Mechanism of Action of Antimicrobial and Antitumour Agents* (eds J.W. Corcoran & F.E. Hahn), 141-165 (1975) Springer-Verlag, Heidelberg.

44 M.J. Waring:Stacking interactions.*Chemistry & Industry*, February 1975, 105-113 (1975)

45 M.J. Waring: Structural constraints in the binding of drugs to DNA. *Topics in Infectious Diseases, Vol 1: Drug-receptor Interactions in Antimicrobial Chemotherapy*, Symposium, Vienna, September 4-6, 1974 (eds J. Drews & F.E. Hahn) 77-90 (1975) Springer-Verlag, Wien.

46 M.J. Waring & S.M. Henley: Stereochemical aspects of the interaction between steroidal diamines and DNA. *Nucleic Acids Research* **2**, 567-586 (1975)

47 M.J. Waring, L.P.G. Wakelin & J.S. Lee: Quinoxaline antibiotics (echinomycin and triostin A) as bifunctional DNA-intercalating agents. **Abstract No 107**, *10th FEBS Meeting*, Paris (1975)

48 M.J. Waring, L.P.G. Wakelin & J.S. Lee: A solvent-partition method for measuring the binding of drugs to DNA. Application to the quinoxaline antibiotics echinomycin and triostin A. *Biochim. Biophys. Acta*. **407**, 200-212 (1975)

49 J.P.G. Ballesta, M.J. Waring & D. Vázquez: Specific release of ribosomal proteins by nucleic acid-intercalating agents. *Nucleic Acids Research* **3**, 1307-1322 (1976)

50 L.P.G. Wakelin & M.J. Waring: The binding of echinomycin to DNA. *Biochem. J*. **157**, 721-740 (1976)

51 L.P.G. Wakelin, M. Romanos, E.S. Canellakis & M.J. Waring: Diacridines as bifunctional DNA-intercalating agents. *Studia Biophysica,* Berlin **60**, 111-118 (1976)

52 Z. Balcarova, V. Kleinwächter, M. Waring, L.P.G. Wakelin & G. Löber: Properties of phenosafranine complexes with DNAs. *Studia Biophysica,* Berlin **60**, 119-124 (1976)

53 M.J. Waring: DNA-binding characteristics of acridinylmethanesulphonanilide drugs: comparison with antitumour properties. *Europ. J. Cancer* **12**, 995-1001 (1976)

54 G. Ughetto & M.J. Waring: Conformation of the DNA-binding peptide antibiotic echinomycin based on energy calculations. *Mol. Pharmacol*. **13**, 579-584 (1977)

55 M.J. Waring: Structural and conformational studies on quinoxaline antibiotics in relation to the molecular basis of their interaction with DNA. In *Drug action at the Molecular Level,* Biological Council Symposium, London, 12-13 April 1976 (ed G.C.K. Roberts) pp 167-189 (1977). Macmillan, London.

56 V. Kleinwächter, Z. Balcarova, J. Koudelka, G. Löber, K.E. Reinert, L.P.G. Wakelin & M.J. Waring: Characterization of different modes of phenosafranine binding to double-helical DNA. *Studia Biophysica,* Berlin **67**, 53-54 (1978)

57 H.T. Cheung, J. Feeney, G.C.K. Roberts, D.H. Williams, G. Ughetto & M.J. Waring: The conformation of echinomycin in solution. *J. Amer. Chem. Soc*. **100**, 46-54 (1978)

58 Z. Balcarova, V. Kleinwächter, J. Koudelka, G. Löber, K.E. Reinert, L.P.G. Wakelin & M.J. Waring: Interaction of phenosafranine with nucleic acids and model polyphosphates II. Characterisation of phenosafranine binding to DNA. *Biophys. Chem*. **8**, 27-40 (1978)

59 J.S. Lee & M.J. Waring: Bifunctional intercalation and sequence specificity in the binding of quinomycin and triostin antibiotics to DNA. *Biochem. J.* **173**, 115-128 (1978)

60 J.S. Lee & M.J. Waring: Interaction between synthetic analogues of quinoxaline antibiotics and nucleic acids. Changes in mechanism and specificity related to structural alterations. *Biochem. J.* **173**, 129-144 (1978)

61 P. Costantino, P. De Santis, G. Ughetto & M.J. Waring: Circular dichroism studies on the echinomycin-DNA complex. *FEBS Lett.* **88**, 349-352 (1978)

62 L.P.G. Wakelin, M. Romanos, T.K. Chen, D. Glaubiger, E.S. Canellakis & M.J. Waring: Structural limitations on the bifunctional intercalation of diacridines into DNA. *Biochemistry* **17**, 5057-5063 (1978)

63 M.J. Waring: Relationship between biological activity and receptor binding for drugs which interact with DNA. *Aust. J. Pharm. Sci.* **8**, 20-21 (1979)

64 L.P.G. Wakelin, T.S. Creasy & M.J. Waring: Equilibrium constants for the binding of an homologous series of monofunctional and bifunctional intercalating diacridines to calf thymus DNA. *FEBS Letters* **104**, 261-265 (1979)

65 M.J. Waring, A. Gonzalez, A. Jiménez & D. Vázquez: Intercalative binding to DNA of antitumour drugs derived from 3-nitro-1,8-naphthalic acid. *Nucleic Acids Research* **7**, 217-230 (1979)

66 M.J. Waring: Echinomycin, triostin and related antibiotics. In *Antibiotics, Vol 5/Part 2, Mechanism of Action of Antieukaryotic and Antiviral Compounds* (ed F.E. Hahn) 173-194 (1979) Springer-Verlag, Heidelberg.

67 M.J. Waring: Bis-intercalative binding to DNA of diacridines and quinoxaline antibiotics. *Aust. J. Pharm. Sci*. **8**, 65-71 (1979).

68 M.J. Waring: Inhibiting protein synthesis (book review). *Cell* **18**, 229-230 (1979)

69 M.J. Waring: Sequence-specificity in the binding of quinoxaline antibiotics and synthetic derivatives to DNA. *Interferon Scientific Memoranda*, pp 12-14**,** October (1979)

70 S.G. Bradley, D. Gauvreau & M.J. Waring: Regulation of echinomycin biosynthesis by *Streptomyces echinatus. Developments in Industrial Microbiology* **21**, 245-253 (1980)

71 R.H. Shafer & M.J. Waring: DNA bis-intercalation: application of theory to the binding of echinomycin to DNA. *Biopolymers* **19**, 431-443 (1980)

72 L.P.G. Wakelin & M.J. Waring: Kinetics of drug-DNA interaction: dependence of the binding mechanism on structure of the ligand. *J. Mol. Biol.* **144**, 183-214 (1980)

73 M.J. Waring: Very important peptides (book review). *Cell* **21**, 591-592 (1980)

74 K.R. Fox, R.K. Olsen & M.J. Waring; Interaction between synthetic analogues of quinoxaline antibiotics and nucleic acids. Role of the disulphide cross-bridge and D-amino acid centres in des-N-tetramethyl-triostin A. *Brit. J. Pharmacol*. **70**, 25-40 (1980)

75 R.G. McR. Wright, L.P.G. Wakelin, A. Fieldes, R.M. Acheson & M.J. Waring: Effects of ring substituents and linker chains on the bifunctional intercalation of diacridines into DNA. *Biochemistry* **19**, 5825-5836 (1980)

76 K.R. Fox, D. Gauvreau, D.C. Goodwin & M.J. Waring: Binding of quinoline analogues of echinomycin to DNA: role of the chromophores. *Biochem. J*. **191**, 729-742 (1980)

77 M.J. Waring: Specificity in the binding of intercalating peptide antibiotics to DNA. *Abstracts, Brit. Biophys. Soc. Winter Meeting*, Imperial College London 16-18 December (1980)

78 M.J. Waring: Bleomycin. Chemical, biochemical and biological aspects (book review). *Aust. J. Pharm. Sci.* **9,** 119 (1980)

79 G. Bojesen, D. Gauvreau, D.H. Williams & M.J. Waring: Characterization of eight antibiotics of the quinomycin group by field desorption mass spectrometry. *Chem. Commun*. 46-47 (1981)

80 W.R. Wilson, B.C. Baguley, L.P.G. Wakelin & M.J. Waring: Interaction of the antitumour drug m-AMSA (4'-(9-acridinylamino)-methanesulphon-m-anisidide) and related acridines with nucleic acids. *Mol. Pharmacol.* **20**, 404-414 (1981)

81 M.A. Viswamitra, O. Kennard, W.B.T. Cruse, E. Egert, G.M. Sheldrick, P.G. Jones, M.J. Waring, L.P.G. Wakelin & R.K. Olsen: The structure of TANDEM, a quinoxaline antibiotic analogue and its implication for bifunctional intercalation into DNA. *Nature* **289**, 817-819 (1981)

82 M.J. Waring: DNA modification and cancer. *Ann. Rev. Biochem.* **50**, 159-192 (1981)

83 K.R. Fox, L.P.G. Wakelin & M.J. Waring: Kinetics of the interaction between echinomycin and DNA. *Biochemistry* **20**, 5768-5779 (1981)

84 L.P.G. Wakelin, A. Adams, C. Hunter & M.J. Waring: Interaction of crystal violet with nucleic acids. *Biochemistry* **20**, 5779-5787 (1981)

85 M.J. Waring & K.R. Fox: Sequence-specific binding of quinoxaline antibiotics to DNA revealed by kinetic analysis. *Interferon Scientific Memoranda*, 17 March (1981)

86 K.R. Fox, N.L. Harrison & M.J. Waring: Changes in contour length of polydeoxynucleotide fragments: direct evidence for bifunctional intercalative binding of antibiotic ligands. *FEBS Letters* **133**, 305-310 (1981)

87 M.J. Waring & Ch. Zimmer: Nucleic acids: interaction with drugs and carcinogens. *Comments Mol. & Cell. Biophys.* **1**, 129-131 (1981)

88 K.R. Fox & M.J. Waring: Kinetics of dissociation of quinoxaline antibiotics from DNA. *Biochim. Biophys. Acta* **654**, 279-286 (1981)

89 M.P. Williamson, D. Gauvreau, D.H. Williams & M.J. Waring: Structure and conformation of fourteen antibiotics of the quinoxaline group determined by ^{1}H NMR. *J. Antibiotics* **35**, 62-66 (1982)

90 G. Dougherty & M.J. Waring: The interaction between prothidium dibromide and DNA at the molecular level. *Biophys. Chem.* **15**, 27-40 (1982)

91 K.R. Fox, R.K. Olsen & M.J. Waring: Equilibrium and kinetic studies on the binding of des-N-tetramethyltriostin A to DNA. *Biochim. Biophys. Acta* **696**, 315-322 (1982)

92 M.J. Waring: Evaluation of new anticancer drugs. *Current Chemotherapy & Immunotherapy* (Proc. 12th Int. Congr. Chemotherapy, Florence, July 1981), eds P. Periti & G.G. Grassi, Vol 2, pp 1370-1372 (1982)

93 M.B. Hossain, D. van der Helm, R.K. Olsen, P.G. Jones, G.M. Sheldrick, E. Egert, O. Kennard, M.J. Waring & M.A. Viswamitra: Crystal and molecular structure of the quinoxaline antibiotic analogue TANDEM (des-N-tetramethyl triostin A). *J. Amer. Chem. Soc.* **104**, 3401-3408 (1982)

94 D. Gauvreau & M.J. Waring: Quantitative determination of echinomycin by disc agar diffusion assay. *Eur. J. Appl. Microbiol. Biotechnol.* **15**, 104-110 (1982)

95 R.H. Shafer & M.J. Waring: DNA bis-intercalation: theoretical analysis, including cooperativity, of the interaction of echinomycin analogs with DNA. *Biopolymers* **21**, 2279-2290 (1982)

96 J. Formica & M.J. Waring: Nitrogen metabolism and culture conditions for the biogenesis of echinomycin congeners by *Streptomyces echinatus.* Abstract No 614, *22nd Interscience Conference on Antimicrobial Agents and* Chemotherapy (American Society for Microbiology, Miami Beach, Florida, 4-6 October 1982)

97 A.D.B. Malcolm, J.R. Moffatt, K.R. Fox & M.J. Waring: Differential inhibition of a restriction enzyme by quinoxaline antibiotics. *Biochim. Biophys. Acta* **699**, 211-216 (1982)

98 D. Gauvreau & M.J. Waring: Directed biosynthesis of novel derivatives of echinomycin by *Streptomyces echinatus*. Purification and characterisation of ten antibiotics. *Proc. 26th Annual Meeting of the Canadian Federation of Biological Societies,* Ottawa, p 106 (1983)

99 W.A. Denny, B.C. Baguley, B.F. Cain & M.J. Waring: Antitumour acridines. In *Molecular Aspects of Anti-Cancer Drug Action* (eds S. Neidle & M.J. Waring), Macmillan, London, pp 1-34 (1983)

100 M.J. Waring & K.R. Fox: Molecular aspects of the interaction between quinoxaline antibiotics and nucleic acids. In *Molecular Aspects of Anti-Cancer Drug Action* (eds S. Neidle & M.J. Waring), Macmillan, London, pp 127-156 (1983)

101 A. Baez, F.R. Gonzalez, D. Vazquez & M.J. Waring: Interaction between a 3-nitrobenzothiazolo(3,2-a)quinolinium antitumour drug and DNA. *Biochem. Pharmacol*. **32**, 2089-2094 (1983)

102 A. Cornish, K.R. Fox & M.J. Waring: Preparation and DNA-binding properties of substituted triostin antibiotics. *Antimicrob. Agents Chemother*. **23**, 221-231 (1983)

103 D. Gauvreau & M.J. Waring: Biosynthèse dirigée de nouveaux dérivés d'échinomycine par *Streptomyces echinatus* et élucidation structurale. *Comptes-rendus du 5lième congrès, Association Canadienne-Francaise pour l'Avancement des Sciences*, Trois-Rivières, Québec, p 158 (1983)

104 D. Gauvreau & M.J. Waring: Etudes sur la biosynthèse d'antibiotique par des suspensions de protoplastes et de cellules en période de repos de *Streptomyces echinatus. Comptes-rendus du 5lième congrès, Association Canadienne-Francaise pour l'Avancement des Sciences,* p 158 (1983)

105 K.R. Fox, A. Cornish, R.C. Williams & M.J. Waring: The use of radiolabelled triostin antibiotics to measure low levels of binding to DNA. *Biochem. J*. **211**, 543-551 (1983)

106 S. Santikarn, S.J. Hammond, D.H. Williams, A. Cornish & M.J. Waring: Characterisation of novel antibiotics of the triostin group by fast atom bombardment mass spectrometry. *J. Antibiotics* **36**, 362-364 (1983)

107 J.V. Formica & M.J. Waring: Effect of phosphate and amino acids on echinomycin biosynthesis by *Streptomyces echinatus*. *Antimicrob. Agents Chemother*. **24**, 735-741 (1983)

108 D. Doddrell, D.H. Williams, D.G. Reid, K.Fox & M.J. Waring: Application of a simple technique for the sole observation of NMR resonances of protons which are directly bonded to nitrogen. *J. Chem. Soc. Chem. Commun*. 218-220 (1983)

109 K.R. Fox & M.J. Waring: Kinetic studies on receptor binding of quinoxaline antibiotics. *Brit. J. Pharmacol.* **79**, 345P (1983)

110 D. Gauvreau, M.J. Waring, G. Bojesen & D.H. Williams: Characterisation of ten antibiotics of the quinomycin group by field desorption mass spectrometry. *Proc. 31st Annual Conference on Mass Spectrometry and Allied Topics*, Boston, pp 62-63 (1983)

111 A. Cornish, M.J. Waring & R.D. Nolan: Conversion of triostins to quinomycins by protoplasts of *Streptomyces echinatus. J. Antibiotics* **36**, 1664-1670 (1983)

112 M.J. Waring: Specificity in the recognition of DNA nucleotide sequences by antitumour antibiotics. *Abstracts, 3rd FAOB Congress*, Bangkok, Thailand, p 47 (1983)

113 M.J. Waring, K.R. Fox & S. Haylock: Structural requirements for DNA intercalation and their relevance to drug design. In *Cancer Chemotherapy and Selective Drug Development*, (eds. K.R. Harrap, W. Davis and A.H. Calvert), pp 377-382 (1984). Martinus Nijhoff, Boston.

114 G.M. Sheldrick, J.J. Guy, O. Kennard, V. Rivera & M.J. Waring: Crystal and molecular structure of the DNA-binding antitumour antibiotic triostin A. *J. Chem. Soc. Perkin II*, 1601-1605 (1984)

115 D. Gauvreau & M.J. Waring: Directed biosynthesis of novel derivatives of echinomycin by *Streptomyces echinatus.* Part I. Effect of exogenous analogues of quinoxaline-2-carboxylic acid on the fermentation. *Can. J. Microbiol*. **30**, 439-450 (1984)

116 D. Gauvreau & M.J. Waring: Directed biosynthesis of novel derivatives of echinomycin. Part II. Purification and structure elucidation. *Can. J. Microbiol*. **30**, 730-738 (1984)

117 K.R. Fox & M.J. Waring: Stopped-flow kinetic studies on the interaction between echinomycin and DNA. *Biochemistry* **23**, 2627-2633 (1984).

118 C.M.L. Low, H.R. Drew & M.J. Waring: Sequence-specific binding of echinomycin to DNA: evidence for conformational changes affecting flanking sequences. *Nucleic Acids Res*. **12**, 4865-4879 (1984).

119 K.R. Fox & M.J. Waring: Evidence of different binding sites for nogalamycin in DNA revealed by association kinetics. *Biochim. Biophys. Acta* **802**, 162-168 (1984).

120 K.R. Fox & M.J. Waring: Kinetic evidence for redistribution of actinomycin molecules between potential DNA binding sites. *Eur. J. Biochem.* **145**, 579-586 (1984).

121 D. Gauvreau & M.J. Waring: Studies on antibiotic biosynthesis by protoplasts and resting cells of *Streptomyces echinatus.* Part I: The synthesis of echinomycin. *Can. J. Microbiol*. **30**, 721-729 (1984).

122 M.J. Waring, K.R. Fox & C.M.L. Low: Molecular biological mechanism of action of bifunctional intercalating antibiotics. *Studia Biophysica* **104**, 111-112 (1984).

123 K.R. Fox & M.J. Waring: DNA structural variations produced by actinomycin and distamycin as revealed by DNAase I footprinting. *Nucleic Acids Res*. **12**, 9271-9285 (1984).

124 C.M.L. Low, R.K. Olsen & M.J. Waring: Sequence preferences in the binding to DNA of triostin A and TANDEM as reported by DNAase I footprinting. *FEBS Letters* **176**, 414-420 (1984).

125 K.R. Fox & M.J. Waring: Kinetic evidence that echinomycin migrates between potential DNA-binding sites. *Nucleic Acids Res.* **13**, 595-603 (1985).

126 A. Cornish, K.R. Fox, S. Santikarn, M.J. Waring & D.H. Williams: Incorporation of fluorotryptophan into triostin antibiotics by *Streptomyces triostinicus*. *J. Gen. Microbiol*. **131**, 561-570 (1985).

127 R.M. Acheson, G.N. Taylor, M.J. Waring, S. Haylock & G. Abel: The intercalative DNA binding and antitumour activity of some bis-acridines related to nitracrine. *Chemico-Biological Interactions* **53**, 371-375 (1985).

128 M.J. Waring: Actions of antitumour antibiotics at the molecular level. *Abstracts, Joint Meeting Med. Chem.*, Rimini, 18-18a (1985).

129 K.R. Fox, C. Brassett & M.J. Waring: Kinetics of dissociation of nogalamycin from DNA: comparison with other anthracycline antibiotics. *Biochim. Biophys. Acta* **840**, 383-392 (1985).

130 D. Gauvreau, I.E. Swift & M.J. Waring: Studies on antibiotic biosynthesis by protoplasts and resting cells of *Streptomyces echinatus*. Part II: Effect of chromophore precursors. *Can. J. Microbiol.* **32**, 363-372 (1986).

131 M.J. Waring: Overview of the interaction between chemotherapeutic agents and DNA. *Drugs Exptl. Clin. Res.* **12**, 441-453 (1986).

132 C.M.L. Low, K.R. Fox & M.J. Waring: DNA sequence-selectivity of three biosynthetic analogues of the quinoxaline antibiotics. *Anti-Cancer Drug Design* **1**, 149-160 (1986).

133 K.R. Fox & M.J. Waring: Nucleotide sequence preferences of nogalamycin investigated by DNAase I footprinting. *Biochemistry* **25**, 4349-4356 (1986).

134 C.M.L. Low, K.R. Fox, R.K. Olsen & M.J. Waring: DNA sequence recognition by under-methylated analogues of triostin A. *Nucleic Acids Res.* **14**, 2015-2033 (1986).

135 K.R. Fox & M.J. Waring: Footprinting reveals that nogalamycin and actinomycin shuffle between DNA binding sites. *Nucleic Acids Res.* **14**, 2001-2014 (1986).

136 C.M.L. Low, H.R. Drew & M.J. Waring: Echinomycin and distamycin induce rotation of nucleosome core DNA. *Nucleic Acids Res.* **14**, 6785-6801 (1986).

137 R.K. Olsen, K. Ramasamy, K.L. Bhat, C.M.L. Low & M.J. Waring: Synthesis and DNA-binding studies of [Lac^2 ,Lac^6]TANDEM, an analogue of des-N-tetramethyltriostin A (TANDEM) having L-lactic acid substituted for each L-alanine residue. *J. Amer. Chem. Soc.* **108**, 6032-6036 (1986).

138 J.R. Brown, K.R. Fox, M.J. Waring & S. Neidle: Nucleic acid binding drugs, Part XV. DNA sequence preferences for the anti-cancer drug mitoxantrone and related anthraquinones revealed by DNAase I footprinting. *FEBS Letters*, **202**, 289-294 (1986).

139 M.J. Waring: Sequence-specific interactions between antibiotics and DNA. *Abstracts, Antibiotics 1986 Meeting*, Granada 19-24 June (1986).

140 J. Portugal & M.J. Waring: Antibiotics which can alter the rotational orientation of nucleosome core DNA. *Nucleic Acids Res*. **14**, 8735-8754 (1986).

141 K.R. Fox & M.J. Waring: Footprinting at low temperatures: evidence that ethidium and other simple intercalators can discriminate between different nucleotide sequences. *Nucleic Acids Res*. **15**, 491-507 (1987).

142 M.J. Waring: Dynamic aspects of antibiotic-DNA interaction. *DNA-ligand Interactions: from Drugs to Proteins.* (eds. W. Guschlbauer & W. Saenger) pp 113-126 (1987) Plenum Press, New York.

143 K.R. Fox, G.W. Grigg & M.J. Waring: Sequence-selective binding of phleomycin to DNA. *Biochem. J.* **243**, 847-851 (1987).

144 J. Portugal & M.J. Waring: Comparison of binding sites in DNA for berenil, netropsin and distamycin: a footprinting study. *Eur. J. Biochem.* **167**, 281-289 (1987).

145 M.J. Waring: Recognition of DNA by quinoxaline antibiotics. *In Molecular Mechanisms of Carcinogenic and Antitumour Activity* (eds C. Chagas & B. Pullman) Pontifical Academy of Sciences, Vatican City *Scripta Varia* **70**, 317-337 (1987).

146 K.R. Fox & M.J. Waring: The use of micrococcal nuclease as a probe for drug binding sites on DNA. *Biochim. Biophys. Acta* **909**, 145-155 (1987).

147 K. Ford, K.R. Fox, S. Neidle & M.J. Waring: DNA sequence preferences for an intercalating porphyrin compound revealed by footprinting. *Nucleic Acids Res*. **15**, 2221-2234 (1987).

148 J. Portugal & M.J. Waring: Interaction of nucleosome core particles with distamycin and echinomycin: analysis of the effect of DNA sequences. *Nucleic Acids Res.* **15**, 885-903 (1987).

149 M.J. Waring: Sequence-specific antibiotics which alter the conformation of DNA. *Abstracts, Int. Symp. Phys. Chem. of DNA*, Tbilisi, 46-47 (1987).

150 J.B. Chaires, K.R. Fox, J.E. Herrera, M. Britt & M.J. Waring: Site and sequence specificity of the daunomycin-DNA interaction. *Biochemistry* **26**, 8227-8236 (1987).

151 J. Portugal & M.J. Waring: Analysis of the effects of antibiotics on the structure of nucleosome core particles determined by DNAase I cleavage. *Biochimie* **69**, 825-840 (1987).

152 J. Portugal & M.J. Waring: Hydroxyl radical footprinting of the sequence-selective binding of netropsin and distamycin to DNA. *FEBS Letters* **225**, 195-200 (1987).

153 M.J. Waring: Quinoxaline antibiotics and sequence-specific interactions with DNA and nucleosomes. *Abstracts, Int. Congr. Nucleic Acid Interactions,* Padova, p 15 (1987).

154 J.B. Chaires, J. Herrera, M. Britt, K.R. Fox & M.J. Waring: Sequence specificity of the daunomycin-DNA interaction. *Biochem. Pharmacol*. **37**, 1785-1786 (1988)

155 J. Portugal & M.J. Waring: Assignment of DNA binding sites for 4',6-diamidine-2-phenylindole and bisbenzimide (Hoechst 33258) : a comparative footprinting study. *Biochim. Biophys. Acta* **949**, 158-168 (1988)

156 K.R. Fox, H. Davies, G.R. Adams, J. Portugal & M.J. Waring: Sequence-specific binding of luzopeptin to DNA. *Nucleic Acids Res.* **16**, 2489-2507 (1988)

157 J. Portugal, K.R. Fox, M.J. McLean, J.L. Richenberg & M.J. Waring: Diethyl pyrocarbonate can detect a modified DNA structure induced by the binding of quinoxaline antibiotics. *Nucleic Acids Res.* **16**, 3655-3670 (1988)

158 M.J. McLean & M.J. Waring: Chemical probes reveal no evidence of Hoogsteen base-pairing in complexes formed between echinomycin and DNA in solution. *J. Molec. Recognition,* **1**, 138-151 (1988)

159 M.J. Waring: The use of chemical probes to study conformational changes associated with binding of quinoxaline antibiotics to DNA. *Abstracts, Symp. Local Changes in DNA Structure and their Biological Implications,* Brno 6-9 July (1988).

160 E. Smékal, M.J. Waring, N. Bajaj & N. Kubová: Some benzophenanthridine alkaloids as DNA binding probes. *Abstracts, Symp. Local Changes in DNA Structure and their Biological Implications,* Brno, 6-9 July (1988).

161 M.J. McLean, A. Dar & M.J. Waring: Differences between sites of binding to DNA and strand cleavage for complexes of bleomycin with iron or cobalt. *J. Molec. Recognition* **1**, 184-192 (1989).

162 M.J. Waring: Recognition of DNA by antibiotics. *Abstracts, Recognition Studies in Nucleic Acids,* Sheffield University, 16-21 April (1989).

163 T.V. Alfredson, M.E. Adaskaveg, T. Sheehan, M.J. Waring & A.H. Maki: HPLC analysis of quinoxaline antibiotics and their analogs using novel mathematical treatments of UV diode array detector data. *Abstracts, 13th Symp. Column Liquid Chromatography,* Stockholm, 25-30 June (1989), p. 194.

164 N.P. Kalamangalam & M.J. Waring: Sequence specific binding of the anthracycline antibiotics to DNA. *Abstracts, Sixth Conversation in Biomolecular Stereodynamics,* Albany, New York, 6-10 June (1989),

165 C. Bailly, R. Houssin, P. Colson, C. Houssier, C. Rivalle, E. Bisagni, J.P. Henichart & M.J. Waring: DNA-binding properties of a distamycin-ellipticine hybrid. *Abstracts, Int. Conf. Drug-DNA Interactions,* Cambridge, 11-15 September (1989).

166 M.J. McLean, F. Seela & M.J. Waring: Echinomycin-induced hypersensitivity to osmium tetroxide of DNA fragments incapable of forming Hoogsteen base pairs. *Proc. Natl. Acad. Sci. USA,* **86**, 9687-9691 (1989).

167 L.P.G. Wakelin & M.J. Waring: DNA intercalating agents. In *Comprehensive Medicinal Chemistry*, Vol. 2 (ed P.G. Sammes) pp 703-724 (1990) Pergamon Press, Oxford.

168 N.P.S. Bajaj, M.J. McLean, E. Smekal & M.J. Waring: Sequence-selective, pH-dependent binding to DNA of benzophenanthridine alkaloids. *J. Molec. Recognition*, **3**, 48-54 (1990).

169 T.V. Alfredson, A.H. Maki, M.E. Adaskaveg, J.L. Excoffier & M.J. Waring: Liquid chromatographic investigation of quinoxaline antibiotics and their analogues by means of ultraviolet diode array detection. *J. Chromatography* **507**, 277-292 (1990).

170 E. Smekal, N. Kubova, M.J. Waring & N.P.S. Bajaj: Binding and sequence analysis of complexes of benzophenanthridine alkaloids with DNA, poly $(dG\text{-}dC)_2$ and poly $(dA\text{-}dT)_2$. *Scripta medica, Brno* **63**, 185 (1990).

171. T.V. Alfredson, A.H. Maki, M.E. Adaskaveg, J.L. Excoffier & M.J. Waring: Multiple peak formation and interconversion in the reversed-phase liquid chromatography of triostin A and its analogs. *Abstracts, 14th Int. Symp. Column Liquid Chromatography*, Boston, 23-25 May (1990), p. 34.

172 J.B. Chaires, J.E. Herrera & M.J. Waring: Preferential binding of daunomycin to 5'(A/T)CG and 5'(A/T)GC sequences revealed by footprinting titration experiments. *Biochemistry*, **29**, 6145-6153 (1990).

173 M.J. Waring: DNA bis-intercalators. *J. Cancer Res. Clin. Oncol*., **116**, 1107 (1990).

174 C. Bailly, C. OhUigin, C. Rivalle, E. Bisagni, J.P. Henichart & M.J. Waring: Sequence-selective binding of an ellipticine derivative to DNA. *Nucleic Acids Res*. **18**, 6283-6291 (1990).

175 M.J. Waring: The molecular basis of specific recognition between echinomycin and DNA. In *Molecular Basis of Specificity in Nucleic Acid-Drug Interactions* (23rd Jerusalem Symp. on Quantum Chem. & Biochem., eds. B. Pullman & J. Jortner), pp. 225-245 (1990), Kluwer, Dordrecht.

176 M.J. Waring: DNA sequence recognition by echinomycin, triostin and related antibiotics. *Abstracts, DNA-drug targeting colloquium*, Villejuif, 13-14 December (1990).

177 C Bailly, R. Houssin, G. Gosselin, J.L. Imbach, J.W. Lown, M.J. Waring & J.P. Henichart: Sequence-specific binding of two netropsin-bithiazole hybrid molecules to DNA. A DNAase I footprinting study. *Abstracts, DNA-drug targeting colloquium*, Villejuif, 13-14 December (1990).

178 T.V. Alfredson, A.H. Maki & M.J. Waring: Optically detected magnetic resonance spectroscopy of quinoline peptide-DNA complexes. *Abstracts, Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy*, Chicago, 3-10 March (1991).

179 A.H. Maki, T.V. Alfredson & M.J. Waring: Phosphorescence and ODMR studies of DNA interactions with intercalating peptides. *Int. Symp. Innovative Fluorescence Methodologies in Biochemistry and Medicine*, Monteporizo Catone (Rome), 23-26 September (1991).

180 M.J. Waring: Binding of antibiotics to DNA. In *Host-Guest Molecular Interactions: from Chemistry to Biology* (Ciba Foundation Symp. No. 158), pp. 128-146, Wiley, London (1991).

181 T.V. Alfredson, A. Lim, A.H. Maki & M.J. Waring: Phosphorescence and optically detected magnetic resonance studies of quinoline peptide-nucleic acid complexes. *Biophys. J.* **59**, 605a (1991).

182 T.V. Alfredson, W.C. Lam, A.H. Maki & M.J. Waring: Application of ODMR to the study of DNA complexes of bisintercalating antibiotics and their biosynthesised derivatives. *Applied Magnetic Resonance* **2**, 159-178 (1991).

183 B. Plouvier, C. Bailly, R. Houssin, K.E. Rao, J.W. Lown, J.P. Henichart & M.J. Waring: DNA sequence specific recognition by a thiazole analogue of netropsin: a comparative footprinting study. *Nucleic Acids Res.* **19**, 5821-5829 (1991).

184 T.V. Alfredson, A.H. Maki & M.J. Waring: Optically detected triplet-state magnetic resonance studies of the DNA complexes of the bisquinoline analogue of echinomycin. *Biochemistry* **30**, 9665-9675 (1991).

185 M.J. Waring: DNA sequence recognition by echinomycin, triostin and related antibiotics. *Abstracts, Int. Symp. Chem. Mol. Biol. Cancer Res.*, Beijing, 23-26 July (1991), pp 13-14.

186 T.V. Alfredson, A.H. Maki & M.J. Waring: Conformational heterogeneity of quinoxaline peptides in solution. *Biopolymers* **31**, 1689-1708 (1991).

187 C. Bourdouxhe, P. Colson, C. Houssier, J.S. Sun, T. Montenay-Garestier, C. Hélène, C. Rivalle, E. Bisagni, M.J. Waring, J.P. Hénichart & C. Bailly: Binding of a distamycin-ellipticine hybrid molecule to DNA and chromatin. Spectroscopic, biochemical and molecular modelling investigations. *Biochemistry* **31**, 12385-12396 (1992).

188 C. Bailly, J.S. Sun, P. Colson, C. Houssier, C. Hélène, M.J. Waring & J.P. Hénichart: Design of a sequence-specific DNA-cleaving molecule which conjugates a copper-chelating peptide, a netropsin residue, and an acridine chromophore. *Bioconjugate Chem.* **3**, 100-103 (1992).

189 A.H. Maki, T.V. Alfredson & M.J. Waring: The photoexcited triplet state provides a quantitative measure of intercalating drug-DNA binding energies *SPIE Vol.* **1640** *Time-Resolved Laser Spectroscopy in Biochemistry III*, 485-497 (1992).

190 M.J. Waring: The search for better anti-cancer drugs. *Proc. Symp. Cancer Today*, pp. 16-17, Chinese University of Hong Kong (1992).

191 M.J. Waring: Echinomycin: two lectures. *Pathologie Biologie* **40**, 1022-1034 (1992).

192 C. Bailly, W.A. Denny, L.E. Mellor, L.P.G. Wakelin & M.J. Waring: Sequence specificity of the binding of 9-aminoacridine- and amsacrine-4-carboxamides to DNA studied by DNAase I footprinting. *Biochemistry* **31**, 3514-3524 (1992).

193 C. Bailly, C. O'hUigin, R. Houssin, P. Colson, C. Houssier, C. Rivalle, E. Bisagni, J.P. Hénichart & M.J. Waring: DNA-binding properties of a distamycin-ellipticine hybrid molecule. *Mol. Pharmacol.* **41**, 845-855 (1992).

194 C. Bailly, P. Colson, C. Houssier, R. Houssin, D. Mrani, G. Gosselin, J.L. Imbach, M.J. Waring, J.W. Lown & J.P. Hénichart: Binding properties and DNA sequence-specific recognition of two bithiazole-linked netropsin hybrid molecules. *Biochemistry* **31**, 8349-8362 (1992).

195 F. Bailly, C. Bailly, M.J. Waring & J.P. Hénichart: Selective binding to AT sequences in DNA by an acridine-linked peptide containing the SPKK motif. *Biochem. Biophys. Res. Commun*. **184**, 930-937 (1992).

196 C. Marchand, C. Bailly, M. McLean, S.E. Moroney & M.J. Waring: The 2-amino group of guanine is absolutely required for specific binding of the anti-cancer antibiotic echinomycin to DNA. *Nucleic Acids Res.* **20**, 5601-5606 (1992).

197 M.J. Waring: Conformational adjustments associated with the binding of drugs to DNA. In *Recent Advances of Chemistry and Molecular Biology in Cancer Research* (eds. D. Qianhuan, M.A. Armour and Z. Qingying) pp 21-27. Science Press, Beijing, and Springer-Verlag, Heidelberg (1993).

198 C. Bailly, A.W. Cuthbert, D. Gentle, M.R. Knowles & M.J. Waring: Sequence-selective binding of amiloride to DNA. *Biochemistry* **32**, 2514-2524 (1993).

199 C. Bailly & M.J. Waring: Footprinting studies on the sequence-selective binding of tilorone to DNA. *Antiviral Chem. & Chemotherapy* **4**, 113-126 (1993).

200 M.J. Waring: Echinomycin and related quinoxaline antibiotics. In *Molecular Aspects of Anticancer Drug-DNA Interactions* (eds. S. Neidle & M.J. Waring), Vol. **1**, pp213-242. Macmillan, London (1993).

201 M.J. Waring: DNA recognition: from bis-intercalators to multivalent hybrid molecules. *Abstracts, First International CIRBIOM Symp* "Control of gene expression and cancer chemotherapy", Nice, 4-5 February (1993).

202 C. Bailly & M.J. Waring: Preferential intercalation at AT sequences in DNA by lucanthone, hycanthone and indazole analogs. A footprinting study. *Biochemistry* **32**, 5985-5993 (1993).

203 C. Bailly, C. Marchand & M.J. Waring: New binding sites for antitumor antibiotics created by relocating the purine 2-amino group in DNA. *J. Amer. Chem. Soc.* **115**, 3784-3785 (1993).

204 M.J. Waring: Determinants of sequence-selective binding of small molecules to DNA. Abstract L34, *Analysis of Structure of Biomacromolecules and their Interactions with Environmental Cytotoxic Agents*, Academy of Sciences of the Czech Republic, Brno, 19-22 July (1993).

205 D.S. Pilch, M.J. Waring, J.S. Sun, M. Rougée, C.H. Nguyen, E. Bisagni, T. Garestier & C. Hélène: Characterization of a triple helix-specific ligand: BePI (1-[(amino)propylamino]-4-methyl-5H-9-methoxy-benzo[e]pyrido [4,3-b] indole) intercalates into both double- and triple-helical DNA. *J. Mol. Biol.* **232**, 926-946 (1993).

206 M.J. Waring: Biophysical mechanisms in the molecular recognition of DNA. *Abstracts 2nd Gauss Symposium*, Munich, 2-7 August (1993).

207 E.W. Sayers & M.J. Waring: Footprinting titration studies on the binding of echinomycin to DNA incapable of forming Hoogsteen base pairs. *Biochemistry **32***, 9094-9107 (1993).

208 M.J. Waring: Sequence-recognition elements and conformational changes associated with binding of small molecules to DNA. *Abstracts, March Symp. DNA-drug interactions*, Madrid, pp. 33-34 (1993).

209 S. Flock, F. Bailly, C. Bailly, M.J. Waring, J.P. Henichart, P. Colson & C. Houssier: Interaction of two peptide-acridine conjugates containing the SPKK peptide motif with DNA and chromatin. *J. Biomolec. Struct. Dyn.* **11**, 881-900 (1994).

210 C. Bailly, D. Gentle, F. Hamy, M. Purcell & M.J. Waring: Localized chemical reactivity in DNA associated with the sequence-specific bis-intercalation of echinomycin. *Biochem. J.* **300**, 165-173 (1994).

211 M.J. Waring & C. Bailly: DNA recognition by intercalators and hybrid molecules. *J. Mol. Recognition* **7**, 109-122 (1994).

212 M.J. Waring & C. Bailly: The purine 2-amino group as a critical recognition element for binding of small molecules to DNA. *Gene,* **149**, 69-79 (1994).

213 M.J. Waring: Rational drug design (Book review). *Trends Biotechnol.* **12**, 33 (1994).

214 C. Bailly, D. E. Graves, G. Ridge & M.J. Waring: Use of a photoactive derivative of actinomycin to investigate shuffling between binding sites on DNA. *Biochemistry* **33**, 8736-8745 (1994).

215 B. Plouvier, R. Houssin, B. Hecquet, P. Colson, C. Houssier, M.J. Waring, J.P. Henichart & C. Bailly: Antitumour combilexin: A thiazole-containing analogue of netropsin linked to an acridine chromophore. *Bioconjugate Chem.* **5**, 475-481 (1994).

216 C. Bailly, I.O. Donkor, D. Gentle, M. Thornalley & M.J. Waring: Sequence-selective binding to DNA of *cis* and *trans* butamidine analogues of the anti-*Pneumocystis carinii* pneumonia drug pentamidine. *Mol. Pharmacol.* **46**, 313-322 (1994).

217. G. Ridge, C. Bailly, D.E. Graves & M.J. Waring: Daunomycin modifies the sequence-selective recognition of DNA by actinomycin. *Nucleic Acids Res.* **22**, 5241-5246 (1994).

218 P. Fossé, B. René, J-M. Saucier, J-P. Hénichart, M.J. Waring, P. Colson, C. Houssier & C. Bailly: Stimulation of site-specific topoisomerase II-mediated DNA cleavage by an N-methylpyrrole-carboxamide-anilinoacridine conjugate: Relation to DNA binding. *Biochemistry* **33**, 9865-9874 (1994).

219. C. Bailly, C. Michaux, P. Colson, C. Houssier, J.S. Sun, T. Garestier, C. Hélène, J.P. Hénichart, C. Rivalle, E. Bisagni & M.J. Waring: Reaction of a biscationic distamycin-ellipticine hybrid ligand with DNA. Mode and sequence-specificity of binding. *Biochemistry* **33**, 15348-15364 (1994).

220. C. Bourdouxhe, P. Colson, C. Houssier, J.P. Henichart, M.J. Waring, W.A. Denny & C. Bailly: Design of composite drug molecules: Mutual effects on binding to DNA of an intercalator, amsacrine, and a minor groove binder, netropsin. *Anti-Cancer Drug Design* **10**, 131-154 (1995).

221 G.M. Sheldrick, A. Heine, K. Schmidt-Bäse, E. Pohl, P.G. Jones, E. Paulus & M.J. Waring: Structures of quinoxaline antibiotics. *Acta Cryst.* B**51**, 987-999 (1995).

222. C. Bailly & M.J. Waring: Comparison of different footprinting methodologies for detecting binding sites for a small ligand on DNA. J. *Biomolec. Struct. Dynamics* **12**, 869-898 (1995).

223. I. Bonnard, N. Bontemps, S. Lahmy, B. Banaigs, G. Combaut, C. Francisco, P. Colson, C. Houssier, M.J. Waring & C. Bailly: Binding to DNA and cytotoxic evaluation of ascididemin, the major alkaloid from the mediterranean ascidian *Cystodytes dellechiajei*. *Anti-Cancer Drug Design* **10**, 333-346 (1995).

224. C. Bailly, F. Hamy & M.J. Waring: Quantitative DNAase I footprinting experiments on the binding of echinomycin to DNA fragments containing closely spaced CpG sites. *Biophys. J.* **68**, A407 (1995).

225. C. Bailly & M.J. Waring: Transferring the purine 2-amino group from guanines to adenines in DNA changes the sequence-specific binding of antibiotics. *Nucleic Acids Res*. **23,** 885-892 (1995).

226. C. Bailly, N.E. Møllegaard, P.E. Nielsen & M.J. Waring: The influence of the 2-amino group of guanine on DNA conformation. Uranyl and DNAase I probing of inosine/diaminopurine substituted DNA. *EMBO J.* **14**, 2121-2131 (1995).

227. C. Bailly & M.J. Waring: The purine 2-amino group as a critical recognition element for specific DNA cleavage by bleomycin and calicheamicin. *J. Amer. Chem. Soc*. **117**, 7311-7316 (1995).

228. M.J. Waring & C. Bailly: Experiments to probe how the 2-amino group of guanine influences DNA nucleotide sequence recognition by antibiotics and other ligands. *J. Biomolec. Struct. Dynamics* **12**, a254 (1995).

229. L. Sheh, H.W. Chang, C.W. Ong, S.L. Chen, C. Bailly, R.C.M. Linssen & M.J. Waring: Synthesis, DNA binding, and sequence specificity of DNA alkylation by some novel cyclic peptide-chlorambucil conjugates. *Anti-Cancer Drug Design* **10**, 373-388 (1995).

230. C. Bailly, C. Marchand, C.H. Nguyen, E. Bisagni, T. Garestier, C. Hélène & M.J. Waring: Localised chemical reactivity in double-stranded DNA associated with the intercalative binding of benzo[e]pyridoindole and benzo[g]pyridoindole triple helix-stabilising ligands. *Eur. J. Biochem.* **232**, 66-76 (1995).

231. C. Bailly, A. Kénani & M.J. Waring: Analogue *versus* digital recognition of DNA by bleomycin: an effect of the carbohydrate moiety. *FEBS Lett.*. **372**, 144-147 (1995).

232. C. Bailly & M.J. Waring: Influence of the carbohydrate moiety of bleomycin on DNA cleavage and its modification by actinomycin. *Abstracts, NATO Workshop on DNA Cleavers and Chemotherapy of Cancer or Viral Diseases*, Toulouse, 11-14 September (1995).

233. C. Bailly, M.J. Waring & A.A. Travers: Effects of base substitutions on the binding of a DNA-bending protein. *J. Mol. Biol.* **253**, 1-7 (1995).

234. L. Kittler, U. Wähnert, B.C. Baguley, C. Bailly, M.J. Waring & G. Löber: Sequence-specific binding of antitumour bisquaternary ammonium heterocycles to DNA and inhibition of polymerase activity *in vitro*. *Anti-Cancer Drug Design* **11**, 101-115 (1996).

235. C. Bailly, F. Hamy & M.J. Waring: Cooperativity in the binding of echinomycin to DNA fragments containing closely spaced CpG sites. *Biochemistry* **35**, 1150-1161 (1996).

236. S. Routier, N. Cotelle, J-P. Catteau, J-L. Bernier, M.J. Waring, C. Bailly & J-F. Riou: Salen-anthraquinone conjugates. Synthesis, DNA-binding and cleaving properties, effects on topoisomerases and cytotoxicity. *Proc. Am. Assoc. Cancer Res.* **37**, 435 (1996).

237. C. Bailly, M. Braña & M.J. Waring: Sequence-selective intercalation of antitumour bis-naphthalimides into DNA. Evidence for an approach via the major groove. *Eur. J. Biochem.* **240**, 195-208 (1996).

238. S. Routier, J-L. Bernier, M.J. Waring, P. Colson, C. Houssier & C. Bailly: Synthesis of a functionalised salen-copper complex and its interaction with DNA. *J. Org. Chem.* **61**, 2326-2331 (1996).

239. C. Bourdouxhe-Housiaux, P. Colson, C. Houssier, M.J. Waring & C. Bailly: Interaction of a DNA-threading netropsin-amsacrine combilexin with DNA and chromatin. *Biochemistry* **35**, 4251-4264 (1996).

240. C. Marchand, C. Bailly, C.H. Nguyen, E. Bisagni, T. Garestier, C. Hélène & M.J. Waring: Stabilisation of triple helical DNA by a benzopyridoquinoxaline intercalator. *Biochemistry* **35**, 5022-5032 (1996).

241. C. Bailly, S. Routier, J-L. Bernier & M.J. Waring: DNA recognition by two mitoxantrone analogues: influence of the hydroxyl groups. *FEBS Lett.* **379**, 269-272 (1996).

242. C. Bailly, A. Minnock & M.J. Waring: A simple ligation assay to detect effects of drugs on the curvature/flexibility of DNA. *FEBS Lett.* **396**, 253-256 (1996).

243. C. Bailly, W.A. Denny & M.J. Waring: Molecular origins of selectivity in the interaction of amsacrine-4-carboxamide with GC-rich sequences in DNA. *Anti-Cancer Drug Design* **11**, 611-624 (1996).

244. Y. Pommier, G. Kohlhagen, C. Bailly, M. Waring, A. Mazumder & K.W. Kohn: DNA sequence- and structure-selective alkylation of guanine N2 in the DNA minor groove by ecteinascidin 743, a potent antitumor compound from the Caribbean tunicate *Ecteinascidin turbinata*. *Biochemistry* **35**, 13303-13309 (1996).

245. P. Helissey, C. Bailly, J.N. Vishwakarma, C. Auclair, M.J. Waring & S. Giorgi-Renault: DNA minor groove cleaving agents: Synthesis, binding and strand cleaving properties of anthraquinone-oligopyrrolecarboxamide hybrids. *Anti-Cancer Drug Design* **11**, 527-551 (1996).

246. S. Routier, N. Cotelle, J-P. Catteau, J-L. Bernier, M.J. Waring, J-F. Riou & C. Bailly: Salen-anthraquinone conjugates. Synthesis, DNA-binding and cleaving properties, effects on topoisomerases and cytotoxicity. *Bioorganic Med. Chem.* **4**, 1185-1196 (1996).

247. C. Bailly, D. Payet, A.A. Travers & M.J. Waring: PCR-based development of DNA substrates containing modified bases: An efficient system for investigating the role of the exocyclic groups in chemical and structural recognition by minor groove binding drugs and proteins. *Proc. Nat. Acad. Sci. U.S.A.* **93**, 13623-13628 (1996).

248. M.J. Waring & C. Bailly: The influence of the exocyclic amino group characteristic of GC base pairs on molecular recognition of specific nucleotide sequences in DNA by berenil and DAPI. *J. Mol. Recognition* **10**, 121-127 (1997).

249. J.P. Henichart, M.J. Waring, J.F. Riou, W.A. Denny & C. Bailly: Copper-dependent oxidative and topoisomerase II-mediated DNA cleavage by a netropsin/4'-(9-acridinylamino)methanesulfon-*m*-anisidide combilexin. *Mol. Pharmacol.* **51**, 448-461 (1997).

250. S. Jennewein & M.J. Waring: Footprinting of echinomycin and actinomycin D on DNA molecules asymmetrically substituted with inosine and/or 2,6-diaminopurine. *Nucleic Acids Res.* **25**, 1502-1509 (1997).

251. N. Boitte, N. Pommery, P. Colson, C. Houssier, M.J. Waring, J.-P. Hénichart & C. Bailly: Synthesis, DNA-binding and cytotoxic properties of a bis(netropsin)-anthracenedione conjugate. *Anti-Cancer Drug Design* **12**, 481-501 (1997).

252. C. Bailly & M.J. Waring: Diethylpyrocarbonate and osmium tetroxide as probes for drug-induced changes in DNA conformation *in vitro*. In *Drug-DNA Interaction Protocols* (ed. K.R. Fox), pp. 51-79, Humana Press, Totowa, N.J. (1997).

253. M.J. Waring & C. Bailly: Etude des règles qui gouvernent la reconnaissance entre les petites molécules et l'ADN. *J. Pharm. Belg.* **52**, 70-78 (1997).

254. C. Bailly, D. Perrine, J-C. Lancelot, C. Saturnino, M. Robba & M.J. Waring: Sequence-selective binding to DNA of bis(amidinophenoxy)-alkanes related to propamidine and pentamidine. *Biochem. J.* **323**, 23-31 (1997).

255. A. Alfieri, F. Animati, F. Arcamone, C. Bailly, A. Crisanti, M. Dentini, P. Felicetti, E. Iafrate, P Lombardi, S. Manzini, C. Rossi & M.J. Waring: Biological activity and DNA sequence specificity of synthetic carbamoyl analogues of distamycin. *Antiviral Chem. Chemother.* **8**, 243-254 (1997).

256. C. Bailly, A. Kénani & M.J. Waring: Altered cleavage of DNA sequences by bleomycin and its deglycosylated derivative in the presence of actinomycin. *Nucleic Acids Res.* **25**, 1516-1522 (1997).

257. N.E. Møllegaard, C. Bailly, M.J. Waring & P.E. Nielsen: Effects of diaminopurine and inosine substitutions on A-tract induced DNA curvature. Importance of the 3'-A-tract junction. *Nucleic Acids Res.* **25**, 3497-3502 (1997).

258. M.G. Thomas, C.E. Cook, Jr., K.W.P. Miller, M.J. Waring & E. Hagelberg: Molecular instability in the COII/tRNA^{Lys} intergenic region of the human mitochondrial genome: Multiple origins of the 9-bp deletion and three generations of heteroplasmy for expanded repeats. *Phil. Trans. R. Soc. Lond.* B **353**, 955-965 (1998).

259. C. Bailly, D. Suh, M.J. Waring & J.B. Chaires: Binding of daunomycin to diaminopurine and/or inosine-substituted DNA. *Biochemistry* **37**, 1033-1045 (1998).

260. C. Bailly, P. Colson, C. Houssier, E. Rodrigues-Pereira, M. Prudhomme & M.J. Waring: Recognition of specific sequences in DNA by a topoisomerase I inhibitor derived from the antitumor drug rebeccamycin. *Mol. Pharmacol.* **53,** 77-87 (1998).

261. C. Bailly & M.J. Waring: DNA recognition by quinoxaline antibiotics: use of base-modified DNA molecules to investigate determinants of sequence-specific binding of triostin A and TANDEM. *Biochem. J*. **330**, 81-87 (1998).

262. M-J. Guo, S. Hildbrand, C.J. Leumann, L.W. McLaughlin & M.J. Waring: Inhibition of DNA polymerase reactions by pyrimidine nucleotide analogues lacking the 2-keto group. *Nucleic Acids Res*. **26**, 1863-1869 (1998).

263. C. Carrasco, M.J. Waring & C. Bailly: Substitution of 5-methylcytosines for cytosines enhances the stability of topoisomerase I-DNA complexes and modulates the sequence-selectivity of camptothecin-induced DNA cleavage. *FEBS Letters* **425**, 337-340 (1998).

264. M. Buttinelli, A. Minnock, G. Panetta, M.J. Waring & A. Travers: The exocyclic groups of DNA modulate the affinity and positioning of the histone octamer. *Proc. Nat. Acad. Sci. U.S.A.* **95**, 8544-8549 (1998).

265. C. Bailly & M.J. Waring: The use of diaminopurine to investigate structural properties of nucleic acids and molecular recognition between ligands and DNA. *Nucleic Acids Res*. **26**, 4309-4314 (1998).

266. C. Marchand, J.S. Sun, C. Bailly, M.J. Waring, T. Garestier & C. Helene: Optimization of alternate-strand triple helix formation at the 5'CpG3' and 5'GpC3' junction steps. *Biochemistry* **37**, 13322-13329 (1998).

267. M. Tomasz, A.Das, K.S. Tang, M.G.J. Ford, A. Minnock, S.M. Musser & M.J. Waring: The purine 2-amino group as the critical recognition element for sequence-specific alkylation and cross-linking of DNA by mitomycin C. *J. Amer. Chem. Soc*. **120**, 11581-11593 (1998).

268. M.J. Waring: Genetic medicine comes out of the cold in Sweden. *Biochim. Biophys. Acta Reviews on Cancer* **1378**, R63-R65 (1998).

269. L. Kittler, B.C. Baguley, G. Löber & M.J. Waring: Sequence-specific interactions of minor groove binders with restriction fragments of cDNAs for h tau 40 protein and MAP kinase 2. A qualitative and quantitative footprinting study. *J. Mol. Recognition* **12**, 121-130 (1999).

270. M.J. Waring: Drug regulation of gene expression. *Investigational Drugs Weekly Highlights* **40**, 57-59. Current Drugs Ltd, London, October 6th (1999)

271. C. Bailly, S. Crow, A. Minnock & M.J. Waring: Demethylation of thymine residues affects DNA cleavage by endonucleases but not sequence recognition by drugs. *J. Mol. Biol*. **291**, 561-573 (1999).

272. S.R. Stetor, J.W. Rausch, M-J. Guo, L.R. Boone, M.J. Waring & S.F.J. Le Grice: Characterization of plus strand initiation and termination sequences located at the center of the equine infectious anemia virus genome. *Biochemistry* **38**, 3656-3667(1999).

273. C. Bailly, S. Echepare, F. Gago & M.J.Waring: Recognition elements that determine affinity and sequence-specific binding to DNA of 2QN, a biosynthetic bis-quinoline analogue of echinomycin *Anti-Cancer Drug Design* **14,** 291-303 (1999).

274. M-H. David-Cordonnier, D. Payet, J-C. D'Halluin, M.J. Waring. A.A. Travers & C. Bailly: The DNA-binding domain of human c-Abl tyrosine kinase promotes the interaction of a HMG chromosomal protein with DNA. *Nucleic Acids Res*. **27**, 2265-2270 (1999).

275. A. Das, K.S. Tang, S. Gopalakrishnan, M.J. Waring & M. Tomasz: Reactivity of guanine at m^5CpG steps in DNA: Evidence for electronic effects transmitted through the base pairs. *Chem Biol*. **6**, 461-471 (1999).

276. A. Minnock, S. Crow, C. Bailly & M.J. Waring: The influence of the exocyclic pyrimidine 5-methyl group on DNase I cleavage and sequence recognition by drugs. *Biochim. Biophys. Acta* **1489**, 233-248 (1999).

277. M.J. Waring: Comprehensive Natural Products Chemistry Vol. 7; DNA and Aspects of Molecular Biology [book review] *J. Natural Products* **63**, 291-292 (2000).

278. C. Bailly, S. Crow, A. Minnock & M.J. Waring: DNA recognition by quinoline antibiotics: Use of base-modified DNA molecules to investigate determinants of sequence-specific binding of luzopeptin. *Nucleosides, Nucleotides & Nucleic Acids* **19**, 1337-1353 (2000).

279. N.E. Møllegaard, C. Bailly, M.J. Waring & P.E. Nielsen: Quinoxaline antibiotics enhance peptide nucleic acid binding to double-stranded DNA. *Biochemistry* **39**, 9502-9507 (2000).

280. M.J. Waring: Facilitating structural transitions in DNA. *Proc. Nat Acad. Sci. U.S.A.* **97**, 11685-11687 (2000).

281. C. Bailly & M.J. Waring: Inhibition of topoisomerases: a potential strategy for the treatment of viral infections. *International Antiviral News* **8**, 182-185 (2000).

282. Y.-H. Ji, D. Bur, W. Häsler, V.R. Schmitt, C. Bailly, M.J. Waring, R. Hochstrasser & W. Leupin: Tris-benzimidazole derivatives: Design, synthesis and DNA sequence recognition. *Bioorganic Med. Chem*. **9**, 2905-2919 (2001).

283. A. Minnock, L-S. Lin, J. Morgan, S.D.G. Crow, M.J. Waring & L. Sheh: Sequence-specific DNA cleavage by dipeptides disubstituted with chlorambucil and 2,6-dimethoxy hydroquinone-3-mercaptoacetic acid. *Bioconjugate Chem.* **12**, 870-882 (2001).

284. K.R. Fox & M.J. Waring: High-resolution footprinting studies of drug-DNA complexes using chemical and enzymic probes. *Meth. Enzymol*. **340**, 412-430 (2001).

285. C. Bailly & M.J. Waring: Use of DNA molecules substituted with unnatural nucleotides to probe specific drug-DNA interactions. *Meth. Enzymol*. **340**, 485-502 (2001).

286. B. Cathers & M.J. Waring: DNA interactions. In *Biomolecular Sensors* (eds. E Gizeli & C.R. Lowe), 33-47 (2002). Taylor & Francis, London.

287. M.J. Waring, T. Ben-Hadda, A.T. Kotchevar, A. Ramdani, R. Touzani, S. Elkadiri, A. Hakkou, M. Bouakka & T. Ellis: 2,3-Bifunctionalized quinoxalines: Synthesis, DNA interactions and evaluation of anticancer, anti-tuberculosis and antifungal activity. *Molecules* **7**, 641-656 (2002).

288. S.D.G. Crow, C. Bailly, C. Garbay-Jaureguiberry, B. Roques, B. Ramsay Shaw & M.J. Waring: DNA sequence recognition by the antitumor drug ditercalinium. *Biochemistry* **41**, 8672-8682 (2002).

289. T. Berge, N.S. Jenkins, R.B. Hopkirk, M.J. Waring, J.M. Edwardson & R.M. Henderson: Structural perturbations in DNA caused by *bis*-intercalation of ditercalinium visualised by atomic force microscopy. *Nucleic Acids Res.* **30**, 2980-2986 (2002).

290. M.J. Waring: Fundamental properties of DNA: Some lessons from studies on the molecular basis of drug binding. In *Frontiers of Multifunctional Nanosystems*, (eds. E. Buzaneva & P. Scharff), 225-228 (2002). Kluwer Academic Publishers, Dordrecht.

291. F. Zunino, A.T. Kotchevar, M. Waring, M. Daoudi, N. Ben Larbi, M. Mimouni, N. Sam, A. Zahidi & T. Ben-Hadda: Novel cytotoxic oxopyridoindolizines: *iso*-propyl-7,8,9-*tri*-chloro-6,7,8,9-*tetra*hydro-5-oxopyrido-[2,3-a]-indolizine-10-carboxylates (OPIC). *Molecules* **7**, 628-640 (2002).

292. C. Carrasco, F. Rosu, V. Gabelica, C. Houssier, E. De Pauw, C. Garbay-Jaureguiberry, B. Roques, W.D. Wilson, J.B. Chaires, M.J. Waring & C. Bailly: Tight binding of the antitumor drug ditercalinium to quadruplex DNA. *ChemBioChem* **3**, 100-106 (2002).

293. M.J. Waring & L.P.G. Wakelin: Forty years on. In *Small Molecule DNA and RNA Binders: From Synthesis to Nucleic Acid Complexes* (eds. M. Demeunynck, C. Bailly & W.D. Wilson), 1-17. Wiley-VCH (2003).

294. T. Berge, E.L. Haken, M.J. Waring & R.M. Henderson: The binding mode of the DNA bisintercalator luzopeptin investigated using atomic force microscopy. *J. Structural Biol.* **142**, 241-246 (2003).

295. C-H. Yang, P-J. Chou, Z.L. Luo, I.C. Chou, J-C. Chang, C-C. Cheng, C.R.H. Martin, M.J. Waring & L. Sheh: Preferential binding to DNA sequences of peptides related to a novel XPRK motif. *Bioorganic & Medicinal Chem.* **11**, 3279-3288 (2003).

296. F. Leng, J.B. Chaires & M.J. Waring: Energetics of echinomycin binding to DNA. *Nucleic Acids Res.* **31**, 6191-6197 (2003).

297. L. May, M.A. Madine & M.J. Waring: Echinomycin inhibits chromosomal DNA replication and embryonic development in vertebrates. *Nucleic Acids Res.* **32**, 65-72 (2004).

298. M.M. Paz, G.S. Kumar, M. Glover, M.J. Waring & M. Tomasz: Mitomycin dimers: polyfunctional cross-linkers of DNA. *J. Med. Chem.* **47**, 3308-3319 (2004).

299. J. Virstedt, T. Berge, R.M. Henderson, M.J. Waring & A.A. Travers: The influence of DNA stiffness upon nucleosome formation. *J. Structural Biol.* **148**, 66-85 (2004).

300. C-H. Yang, W-F. Chen, M-C. Jong, B-J. Jong, J-C. Chang, M. J. Waring, L. Ma & L. Sheh: Semiquinone footprinting. *J. Amer. Chem. Soc.* **126**, 8104-8105 (2004).

301. C. Martin, T. Ellis, C.J. McGurk, T.C. Jenkins, J.A. Hartley, M.J. Waring & D.E. Thurston: Sequence-selective interaction of the minor-groove interstrand cross-linking agent SJG-136 with naked and cellular DNA: Footprinting and enzyme inhibition studies. *Biochemistry* **44**, 4135-4147 (2005).

302. Y.D. Tseng, H. Ge, X. Wang, J.M. Edwardson, M.J. Waring, W.J. Fitzgerald & R.M. Henderson: Atomic force microscopy study of the structural effects induced by echinomycin binding to DNA. *J. Mol. Biol*. **345**, 745-758 (2005).

303. C. Bailly, J. Kluza, C. Martin, T. Ellis & M.J. Waring: DNase I footprinting of small molecule binding sites on DNA. *Methods Mol. Biol*. **288**, 319-342 (2005).

304. A. Urbach & M.J. Waring: Visualising DNA: Footprinting and 1-2D gels. *Molecular BioSystems* **1**, 287-293 (2005).

305. C-H. Yang, K-C.G. Jeng, W-H. Yang, Y-L. Chen, C-C. Hung, J-W. Lin, S-T. Chen, S. Richardson, C.R.H. Martin, M.J. Waring & L. Sheh: Unusually strong positive cooperativity in binding of peptides to latent membrane protein-1 DNA fragments of the Epstein-Barr viral gene. *ChemBioChem*. **7**, 1187-1196 (2006).

306. G. Wells, C.R.H. Martin, P.W. Howard, Z.A. Sands, C.A. Laughton, A. Tiberghien, C.K. Woo, L.A. Masterson, M.J. Stephenson, J.A. Hartley, T.C. Jenkins, S.D. Shnyder, P.M. Loadman, M.J. Waring & D.E. Thurston: Design, synthesis and biophysical and biological evaluation of a series of pyrrolobenzodiazepine (PBD)-poly(N-methylpyrrole) conjugates. *J Med. Chem*. (in press)

307. L.D. Van Vliet, T. Ellis, P.J. Foley, L. Liu, F.M. Pfeffer, R.A. Russell, R.N. Warrener, F. Hollfelder & M.J. Waring: Molecular recognition of DNA by rigid [n]-polynorbornane-derived bifunctional intercalators: Synthesis and evaluation of their binding properties. *J. Med. Chem.* (in press)

BOOKS

1 *European Brasses* by A.C. Bouquet & M.J. Waring. Batsford, London (1967). 79pp

2 *Biochemistry of Bacterial Growth* (J. Mandelstam & K. McQuillen, eds.); section on Structure and Synthesis of Nucleic Acids. 1st ed. (1968) pp 243-301. Blackwell, Oxford.

3 *ibid*., 2nd ed. (1973) pp 251-315

4 *ibid*., 3rd ed. (1982) pp 185-238

5 *The Molecular Basis of Antibiotic Action* by E.F. Gale, E. Cundliffe, P.E. Reynolds, M.H. Richmond & M.J. Waring. Wiley, London (1972). 456pp

6 *ibid.,* 2nd ed. (1981). 646pp

7 *Molekulyarnye Osnovy Deystviya Antibiotikov* (Russian edition of *The Molecular Basis of Antibiotic Action)* translated by Yu. V. Dudnik with a foreword by G.F. Gause. Izdatel'stvo "MIR", Moscow (1975). 500pp

8 *Molecular Aspects of Anti-Cancer Drug Action* (S. Neidle & M.J. Waring, eds.). Macmillan, London (1983). 404pp

9 *Biology of Carcinogenesis* (M.J. Waring & B.A.J. Ponder, eds.). MTP Press, Lancaster (1987). 229pp

10 *The Science of Cancer Treatment* (B.A.J. Ponder & M.J. Waring, eds.). Kluwer Academic Publishers, Lancaster (1990). 211 pp

11 *The Search for New Anti-Cancer Drugs* (M.J. Waring & B.A.J. Ponder, eds.). Kluwer Academic Publishers, Lancaster (1991). 284 pp

12 *Molecular Aspects of Anticancer Drug-DNA Interactions* (S. Neidle & M.J. Waring, eds.). Macmillan, London, Vol. **1** (1993). 364 pp

13 *ibid.,* Vol. **2** (1994). 356pp

14 *The Genetics of Cancer* (B.A.J. Ponder & M.J. Waring, eds.). Kluwer Academic Publishers, Lancaster (1995). 221pp

15 *Encyclopedia of Molecular Biology* (T.E. Creighton, ed.); section on Actinomycin D, pp 49-50. Wiley, New York & London (1999).

16 *Oxford Companion to the Body* (C. Blakemore, ed); articles on Antibiotics, Biochemistry, and Cancer. Oxford University Press (2001).

17 *Methods in Enzymology*, Vol **340**, *Drug-Nucleic Acid Interactions* (J.B. Chaires & M.J. Waring, eds.). Academic Press, New York (2001). 705 pp.

18 *Topics in Current Chemistry, Vol* **253**, *DNA Binders and Related Subjects* (M.J. Waring & J.B. Chaires, eds). Springer-Verlag, Berlin-Heidelberg-New York (2005), 209 pp.

19 *Sequence-Specific DNA Binding Agents* (M.J. Waring, ed.), Royal Society of Chemistry, Biomolecular Science series (2006). 258 pp.