BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Marchand, Christophe	NCI Staff Scientist
eRA COMMONS USER NAME marchanc	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	YEAR(s)	FIELD OF STUDY
University of Reims, France	B.S.	1989-1992	Cellular Biology
University of Cambridge, UK		1991-1996	Molecular Pharmacology
University of Paris, France (Pierre et Marie Curie)	Ph.D.	1994-1997	Molecular Pharmacology

A. Positions and Honors

Positions and Employment

1991-1996 Intern, Laboratory of Molecular Pharmacology, Department of Pharmacology, University of Cambridge (UK)
1994-1997 Ph.D. Student, Laboratory of Biophysics, INSERM U.201, CNRS U.A.481, Muséum National d'Histoire Naturelle, Paris (France)
1998-2003 Visiting Fellow, Laboratory of Molecular Pharmacology, Center for Cancer Research, NCI
2003-2005 Research Fellow, Laboratory of Molecular Pharmacology, Center for Cancer Research, NCI
2005-2006 Research Associate, Laboratory of Molecular Pharmacology, Center for Cancer Research, NCI
2006-Pres. Staff Scientist, Laboratory of Molecular Pharmacology, Center for Cancer Research, NCI

Other Experience and Professional Memberships

2007-Pres. Steering Committee, NCI Center for Excellence in HIV and Cancer Virology

Honors

1998 National Institutes of Health Visiting Program Fellowship Award
2002-2008 NCI Federal Technology Transfer Awards
2007 NCI Director's Intramural Innovation Award

B. Selected peer-reviewed publications and patents

Publications (42 out of 56)

1. **Marchand C,** Bailly C, McLean MJ, Moroney SE and Waring MJ (1992) The 2-amino group of guanine is absolutely required for specific binding of the anti-cancer antibiotic echinomycin to DNA. *Nucleic Acids Research, 20*, 5601-5606
2. Bailly C, **Marchand C** and Waring MJ (1993) New binding sites for antitumor antibiotics created by relocating the purine 2-amino group in DNA. *Journal of the American Chemical Society, 115*, 3784-3785
3. Zhou BW, **Marchand C,** Asseline U, Thuong NT, Sun JS, Garestier T and Hélène C (1995) Recognition of alternating oligopurine/oligopyrimidine tracts of DNA by oligonucleotides with base-to-base linkages. *Bioconjugate Chemistry, 6*, 516-523

4. Bailly C, **Marchand C,** Nguyen CH, Bisagni E, Garestier T, Hélène C and Waring MJ (1995) Localized chemical reactivity in double-stranded DNA associated with the intercalative binding of benzo-e-pyridoindole and benzo-g-pyridoindole triple-helix-stabilizing ligands. *European Journal of Biochemistry, 232,* 66-76
5. **Marchand C,** Bailly C, Nguyen CH, Bisagni E, Garestier T, Hélène C and Waring MJ (1996) Stabilization of triple helical DNA by a benzopyridoquinoxaline intercalator. *Biochemistry, 35,* 5022-5032
6. Nguyen CH, **Marchand C,** Delage S, Sun JS, Garestier T, Hélène C and Bisagni E (1998) Synthesis of 13*H*-benzo[6,7]- and 13*H*-benzo[4,5]indolo[3,2-*c*]-quinolines: a new series of potent specific ligands for triplex DNA. *Journal of the American Chemical Society, 120*, 2501-2507
7. **Marchand C,** Sun JS, Bailly C, Waring MJ, Garestier T and Hélène C (1998) Optimization of alternate-strand triple helix formation at the $^{5'}$CpG$^{3'}$ and $^{5'}$GpC$^{3'}$ junction steps. *Biochemistry, 37,* 13322-13329
8. Baudoin O, **Marchand C,** Teulade-Fichou MP, Vigneron JP, Sun JS, Garestier T, Hélène C and Lehn JM (1998) Stabilization of DNA triple helices by crescent-shaped dibenzophenanthrolines. *Chemistry, 4,* 1504-1508
9. Zain R*, **Marchand C*,** Sun JS, Nguyen CH, Bisagni E, Garestier T and Hélène C (1999) Design of a triple-helix-specific cleaving reagent. Chemistry & Biology, *6,* 771-777, ***Equal contribution**
10. **Marchand C,** Nguyen CH. Ward B, Sun JS, Bisagni E, Garestier T and Hélène C (2000) A new family of sequence-specific DNA cleaving agents directed by triple-helical structures: Benzopyridoindole-EDTA conjugates. Chemistry-A European Journal, *6,* 1559-1563
11. Neamati N, **Marchand C** and Pommier Y (2000) HIV-1 Integrase inhibitors: past, present and future. Advances in Pharmacology, *49,* 147-165
12. Jing N, **Marchand C,** Liu J, Mitra R, Hogan ME and Pommier Y (2000) Mechanism of inhibition of HIV-1 integrase by G-tetrad forming oligonucleotides *in vitro*. Journal of Biological Chemistry, *275,* 21460-21467
13. Pilon A, **Marchand C**, Kavlick MF, Owen J, Bajaj K, Mitsuya H and Pommier Y (2000) Mutations in the HIV-1 integrase of patients receiving long-term dideoxynucleoside therapy do not confer resistance to AZT. AIDS Research and Human Retroviruses, *16,* 1417-1422
14. Pommier Y, **Marchand C** and Neamati N (2000) Retroviral integrase inhibitors year 2000: update and perspectives. Antiviral Research, *47,* 139-148
15. **Marchand C**, Neamati N and Pommier Y (2001) In vitro HIV-1 integrase assays. Methods in Enzymology, *340,* 624-633
16. Neamati N, **Marchand C**, Winslow HE and Pommier Y (2001) Human Immunodeficiency Virus type 1 integrase-targeted inhibitor design. Antiretroviral Therapy, *5*, 87-103
17. Jing N, **Marchand C,** Guan Y, Liu J, Pallansch LR, Lackman-Smith C, De Clercq E and Pommier Y (2001) Structure-activity of inhibition of HIV-1 integrase and virus replication by G-quartet oligonucleotides. DNA and Cell Biology, *20,* 499-508
18. **Marchand C,** Pourquier P, Laco G, Jing N and Pommier Y (2002) Interaction of Topoisomerase I with G-quartet-forming and G-rich oligodeoxy- and oligoribonucleotides. Journal of Biological Chemistry, *277,* 8906-8911
19. **Marchand C,** Zhang X, Pais GCG, Cowansage K, Neamati N, Burke TR Jr and Pommier Y (2002) Structural determinants for HIV-1 integrase inhibition by ß-diketo acids. Journal of Biological Chemistry, *277,* 12596-12603
20. Pais GCG, Zhang X, **Marchand C,** Neamati N, Cowansage K, Svarovskaia E, Pathak VK, Tang Y, Nicklaus M, Pommier Y and Burke TR Jr (2002) Structure activity investigation of 3-aryl-1,3-diketo containing compounds as HIV-1 integrase inhibitors. Journal of Medicinal Chemistry, *45,* 3184-3194
21. **Marchand C,** Johnson AA, Karki RG, Pais GCG, Zhang X, Cowansage K, Patel TA, Nicklaus M, Burke TR Jr and Pommier Y (2003) Metal selectivity and resistance of the soluble double-mutant integrase (F185K/C280S) for HIV-1 integrase inhibition by ß-diketo acids. Molecular Pharmacology, *64,* 600-609
22. Krajewski K, Long YQ, **Marchand C**, Pommier Y and Roller PP (2003) Design and synthesis of dimeric HIV-1 integrase inhibitory peptides. Bioorganic & Medicinal Chemistry Letters, *13,* 3203-3205

23. Zhang X, **Marchand C,** Pommier Y and Burke TR Jr (2004) Design and synthesis of photoactivatable aryl diketo acid-containing HIV-1 integrase inhibitors as potential affinity probes. *Bioorganic & Medicinal Chemistry Letters, 14,* 1205-1207
24. Johnson AA, **Marchand C** and Pommier Y (2004) HIV-1 integrase inhibitors: a decade of research and two drugs in clinical trial. *Current Topics in Medicinal Chemistry*, *4,* 671-686
25. Krajewski K, **Marchand C**, Long YQ, Pommier Y and Roller PP (2004) Synthesis and HIV-1 integrase inhibitory activity of dimeric and tetrameric analogs of indolicidin. *Bioorganic & Medicinal Chemistry Letters, 14,* 5595-5598
26. Pommier Y and **Marchand C** (2005) Interfacial inhibitors of the protein-nucleic acid interactions. *Current Medicinal Chemistry – Anti Cancer Agents, 5,* 421-429
27. Pommier Y, Johnson AA and **Marchand C** (2005) Integrase inhibitors to treat HIV/AIDS. *Nature Reviews Drug Discovery, 4,* 236-248
28. Johnson AA, Santos W, Pais GC, **Marchand C**, Amin R, Burke TR, Verdine G and Pommier Y (2006) Integration requires the donor DNA end (5'-C) interaction with glutamine 148 of the HIV-1 integrase flexible loop. *Journal of Biological Chemistry, 261*, 461-467
29. **Marchand C**, Antony S, Kohn KW, Cushman M, Ioanoviciu A, Staker BL, Burgin AB, Stewart L and Pommier Y (2006) A novel norindenoisoquinoline structure reveals a common interfacial inhibitor pardigm for ternary trapping of the topoisomerase I-DNA covalent complex. *Molecular Cancer Therapeutics, 5,* 1-9
30. Di Santo R, Costi R, Roux A, Artico M, Lavecchia A, Marinelli L, Novellino E, Palmisano L, Andreotti M, Amici R, Galluzzo CM, Nencioni L, Palarma AT, Pommier Y and **Marchand C** (2006) Novel bifunctional quinolonyl diketo acid derivatives as HIV-1 integrase inhibitors: design, synthesis, biological activities and mechanism of action. *Journal of Medicinal Chemistry, 49,* 1939-1945
31. Semenova E, Johnson AA, **Marchand C**, Davis DA, Yarchoan R and Pommier Y (2006) Preferential inhibition of the magnesium-dependent strand transfer reaction of HIV-1 integrase by α-hydroxytropolones. *Molecular Pharmacology*, *69*, 1454-1460
32. **Marchand C**, Johnson AA, Semenova E and Pommier Y (2006) Mechanisms and inhibition of HIV integration. *Drug Discovery Today: Disease Mechanisms, 3,* 253-260
33. Semenova E, Johnson AA, **Marchand C** and Pommier Y (2006) Integrase inhibitors. *Current Opinions in HIV and AIDS, 1,* 380-387
34. **Marchand C**, Krajewski K, Lee HF, Antony S, Johnson AA, Amin R, Roller P, Kvaratskhelia M and Pommier Y (2006) Covalent binding of the natural antimicrobial peptide indolicidin to DNA abasic sites. *Nucleic Acids Research, 34,* 5157-5165
35. Johnson AA*, **Marchand C*,** Patil S, Costi R, Di Santo R, Burke TR and Pommier Y (2007) Probing HIV-1 integrase inhibitor binding sites with position-specific integrase-DNA crosslinking assays. *Molecular Pharmacology, 71,* 893-901, ***Equal contribution***
36. **Marchand C** and Pommier Y (2007) A novel norindenoisoquinoline structure reveals a common interfacial inhibitor paradigm for ternary trapping of the topoisomerase I-DNA covalent complex. *CCR Newsletter, Frontiers in Science, 6,* 1-5
37. Antony S*, **Marchand C***, Stephen AG, Thibaut L, Agama KK, Fisher RJ and Pommier Y (2007) Novel high-throughput electrochemiluminescent assay for identification of human tyrosyl-DNA phosphodiesterase (Tdp1) inhibitors and characterization of furamidine (NSC 305831) as an inhibitor of Tdp1. *Nucleic Acids Research, 35*, 4474-4484, ***Equal contribution***
38. Liao C, Karki RG, **Marchand C**, Pommier Y and Nicklaus M (2007) Virtual screening application of a model of full-length HIV-1 integrase complexed with viral DNA. *Bioorganic & Medicinal Chemistry Letters, 17,* 5361-5365
39. **Marchand C**, Beutler JA, Warimu A, budihas S, Möllman U, Heinisch L, Mellors JW, Le Grice SF and Pommier Y (2008) madurahydroylactones derivatives as dual inhibitors of human immunodeficiency virus type 1 integrase and RNase H. *Antimicrobial Agents and Chemotherapy, 52*, 361-364

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41. Di Santo R, Costi R, Roux A, Miele G, Crucitti GC, Iacovo A, Rosi F, Lavecchia A, Marinelli L, Di Giovanni C, Novellino E, Palmisano L, Andreotti M, Amici R, Galluzzo CM, Nencioni L, Palamara AT, Pommier Y, **Marchand C**. (2008) Novel quinolinonyl diketo acid derivatives as HIV-1 integrase inhibitors: design, synthesis, and biological activities. *Journal of Medicinal Chemistry,* 51: 4744-50

42. Marchand C, Lea W, Jadhav A, Dexheimer TS, Austin CP, Inglese J, Pommier Y and Simeonov A. (2009) Identification of phosphotyrosine mimetic inhibitors of human tyrosyl-DNA phosphodiesterase I by a novel AlphaScreen high-throughput assay. *Molecular Cancer Therapeutics,* 8: 242-250

Patents

1. International Patent Application # WO 03/049695 A2 (2003) [DHHS# E-317-2001] "Compounds to treat HIV infection and AIDS". Terrence Burke, Xuechun Zhang, Godwin Pais, Evguenia Svarovskaia, Vinay Pathak, **Christophe Marchand** and Yves Pommier. *The Government of the United States of America.*
2. International Patent Application # WO 05/087759 (2004) [DHHS# E-187-2003] "Quinolin-4-ones as Inhibitors of Retroviral Integrase for the Treatment of HIV, AIDS and AIDS Related Complex (ARC)". Yves Pommier, **Christophe Marchand**, Roberto Di Santo, Marino Artico and Roberta Costi. *The Government of the United States of America*
3. US Provisional Patent Application # 60/534,378 (2004) [DHHS# E-039-2004] "Peptide inhibitors of HIV-1 integrase useful for the treatment of retroviral and HIV infections". Peter Roller, **Christophe Marchand**, Krysztof Krajewski, Vinay Pathak, Yijun Zhang and Yves Pommier. *The Government of the United States of America*
4. US Provisional Patent Application #60/741,769 (2005) [DHHS# E-308-2005] "Discovery of tropolone Inhibitors of HIV-1 Integrase that can be Used for the Treatment of Retroviral Infection, Including AIDS" Yves Pommier, **Christophe Marchand**, Elena Semenova and Allison Johnson. *The Government of the United States of America*
5. US Provisional Patent Application # 60/786,746 (2006) [DHHS# E-097-2006] "Tetracycline Inhibitors of Human Tyrosyl-DNA Phosphodiesterase (Tdp1) for the Treatment of Cancers" Yves Pommier, **Christophe Marchand** and Laurent Thibaut. *The Government of the United States of America*
6. US Provisional Patent Application # 60/786,604 (2006) [DHHS# E-165-2006] "Diamidines Inhibitors of Human Tyrosyl-DNA Phosphodiesterase (Tdp1) for the Treatment of Cancers" Yves Pommier, **Christophe Marchand** and Laurent Thibaut. *The Government of the United States of America*
7. US Provisional Patent Application # 60/849,718 (2006) [DHHS# E-264-2006] "Discovery of stilbenedisulfonic acid derivatives as inhibitors of HIV-1 integrase that can be used for the treatment of retroviral infection including AIDS" Yves Pommier, **Christophe Marchand**, Elena Semenova. *The Government of the United States of America*
8. US Provisional Patent Application [DHHS # E-130-2007-0-US-01] (2007) "Steroid compounds, compositions and methods of treatment" Yves Pommier, **Christophe Marchand**, Smitha Antony, Thomas Dexheimer. *The Government of the United States of America*
9. US Provisional Patent Application # 61/042,706 (2008) [DHHS# E-121-2008] "Protein tyrosine phosphatase inhibitors of human tyrosyl-DNA phosphodiesterase (Tdp1) and methods of treating disorders" Yves Pommier, **Christophe Marchand**, Anton Simeonov, Thomas Dexheimer, Wendy Lea, James Inglese, Chris Austin and Ajit Jadhav. *The Government of the United States of America.*

C. Research Support

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