

BIOGRAPHICAL SKETCH

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NAME David M. Gilbert	POSITION TITLE Professor		
eRA COMMONS USER NAME gilbertdm			
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
U.C. San Diego, La Jolla, CA.	B.S.	1982	Biochemistry/Cell Biology
Stanford University, Stanford, CA	Ph.D.	1989	Genetics Dept. (DNA Rep.)
Faculté de Médecine, Strasbourg, FRANCE	Post-Doc	1/90-11/91	Chromatin and Transcription
Roche Institute of Mol. Biol., Nutley, N.J.	Post-Doc	12/91-8/94	DNA Replication

A. Positions and Honors**Professional Positions**

9/94-6/98 Assistant Professor, SUNY Health Science Center at Syracuse (SUNY HSC)
6/98-4/03 Associate Professor, SUNY Upstate Medical University (formerly SUNY HSC)
4/03-8/06 Full Professor, SUNY Upstate Medical University
8/06-present J. Herbert Taylor Distinguished Professor, Florida State University

Awards and Other Professional Activities

1982 Honors with Distinction, U.C. San Diego
1989-1991 Eur. Mol. Biol. Org. (EMBO) Post-Doctoral Fellowship
1990 NATO Post-Doctoral Fellowship (declined)
1991-1994 Roche Post-Doctoral Fellowship
1995-1998 Peer Review for the US Army Reserve Medical Corps Breast Cancer Program
1997-present Peer Review for NIH
1996-2004 Peer Review for the American Cancer Society
2002 SUNY Upstate President's Award for Excellence in Research for a Young Investigator
2004 Nominated as a Howard Hughes Medical Institute Investigator
2004-2005 NIH Career Enhancement (K18) Award for Stem Cell Research
2005 Selected to compete in Phase II of the NIH Director's Pioneer Award (NDPA)

B. Publications

- Gilbert, D.M.** (1986) Temporal order of replication of *Xenopus laevis* 5S ribosomal RNA genes in somatic cells. **PNAS USA** 83, 2924-2928.
- Gilbert, D.M.** and Cohen, S.N. (1987) Bovine papilloma virus plasmids replicate randomly in mouse fibroblasts throughout S-phase of the cell cycle. **CELL** 50:59-68.
- Hertel-Wulff, B., Lindsten, T., Schwadron, R., **Gilbert, D.M.**, Davis, M. and Strober, S. (1987) Rearrangement and expression of T-cell receptor genes in cloned murine natural suppressor cell lines. **J. EXP. MED.** 166:1168-1173.
- Gilbert, D.M.** and Cohen, S. N. (1988) Autonomous replication in mouse cells. **CELL** 56:143-144.
- Gilbert, D.M.** and Cohen, S.N. (1990) Position effects on the timing of replication of chromosomally integrated simian virus 40 molecules in chinese hamster cells. **MOL. CELL. BIOL.** 10:4345-4355.
- Ten-Hagen, K., **Gilbert, D.M.**, Willard, H., and Cohen, S.N. (1990) Replication timing of DNA sequences associated with human centromeres and telomeres. **MOL.CELL. BIOL.** 10:6348-6355.
- Gilbert, D.M.**, Hernandez, R. and Cohen, S.N. (1992) Mouse genomic DNA sequences homologous to sea urchin TU elements are genetically stable polydispersed repeats useful for analysis of multiple RFLP's. **GENOMICS** 12:357-362.
- Gilbert, D.M.**, Losson, R. and Chambon, P.C. (1992) Ligand dependence of estrogen receptor induced changes in chromatin structure. **NUCL. ACIDS RES.** 20:4525 - 4531.

9. Ravnán, J. B., **Gilbert, D.M.**, Ten Hagen, K., and Cohen, S.N. (1992) Random-choice replication of extrachromosomal bovine papillomavirus (BPV) molecules in heterogeneous, clonally derived BPV-infected cell lines. **J. VIROLOGY** 66:6946-6952.
10. **Gilbert D.M.**, Heery, D.M., Losson, R., Chambon, P. and Lemoine, Y. (1993) Estradiol-Inducible squelching and cell growth arrest by a chimeric VP16-estrogen receptor expressed in *Saccharomyces cerevisiae*: suppression by an allele of PDR1. **MOL. CELL. BIOL.** 13:462-472.
11. **Gilbert, D.M.**, Miyazawa, H., Nallaseth, F.S., Ortega, J.M., Blow, J.J. and DePamphilis, M.L. Site-specific initiation of DNA replication in metazoan chromosomes and the role of nuclear organization. **COLD SPRING HARBOR SYMP. QUANT. BIOL.** 58:475-485.
12. **Gilbert, D.M.**, Neilson, A., Miyazawa, H., DePamphilis, M.L. and Burhans, W.C. (1995) Mimosine arrests DNA synthesis at replication forks by inhibiting deoxyribonucleotide metabolism, **J. BIOL. CHEM.** 270: 9597-9606.
13. **Gilbert, D.M.**, Miyazawa, H. and DePamphilis, M.L. (1995) Site-specific initiation of DNA Replication in *Xenopus* egg extracts requires nuclear structure. **MOL. CELL. BIOL.** 15, 2942-2954.
14. J.W. Wu and **Gilbert, D. M.** Rapid DNA preparation for 2D gel analysis of replication intermediates. (1995) **NUCL. ACIDS RES.** 23: 3997-3998.
15. Wu, J.W. and **Gilbert, D. M.** (1996) A Distinct G1 Step Required to Specify A Mammalian Replication Origin **SCIENCE** 271: 1270-1272.
16. Lawlis, S.J., Keezer, S.M., Wu, J.-R. and **Gilbert, DM.** (1996) Chromosome Architecture Can Dictate Site-Specific Initiation of DNA Replication in *Xenopus* Egg Extract **J. CELL BIOL.** 135: 1207-1218.
17. Wu, J.-W. and **Gilbert, DM** (1997) The Replication Origin Decision Point is a Mitogen Independent, 2-Aminopurine Sensitive, G1-Phase Event That Precedes Restriction Point Control. **MOL. CELL. BIOL.** 17: 4312-4321.
18. Wu, J.-W., Yu, G. and **Gilbert, D.M.** (1997) Origin-Specific Initiation of Mammalian Nuclear DNA Replication in a *Xenopus* Cell-Free System. **METHODS** 13:313-324
19. **Gilbert, D.M.** (1998) Replication origins in yeast versus metazoa: separation of the haves and the have nots. **CURR. OPIN. GEN. DEV.** 8: 194-199.
20. Wu, J.-W. and **Gilbert, D.M.** (1998) Transformation Abrogates an Early G1-Phase Arrest Point Required for Specification of the Chinese Hamster DHFR Replication Origin **EMBO J.** 17: 1810 - 1818.
21. Dimitrova, D.S and **Gilbert, D.M.** (1998) Regulation of Mammalian Replication Origin Usage in *Xenopus* Egg Extract. **J. CELL SCI.** 111: 2989-2998.
22. Yu, G, Wu, J.-W. and **Gilbert, D.M.** (1998) Analysis of mammalian origin specification in ORC depleted *Xenopus* egg extracts. **GENES TO CELLS** 3: 709-721.
23. Dimitrova, D.S., Todorov, I.T., Melendy, T. and **Gilbert, D.M.** (1999) Mcm2, But Not RPA, is a Component of the Mammalian Early G1-Phase pre-Replication Complex. **J. CELL BIOL.** 146: 1-14.
24. Dimitrova, D.S. and **Gilbert, D. M.** (1999) The spatial position and replication timing of Chromosomal domains are both established in early G1-phase. **MOL. CELL** 4: 983-993.
25. Dimitrova, D.S. and **Gilbert, D.M.** (1999) DNA replication and nuclear organization: prospects for a soluble in vitro system. **CRIT. REV. GENE EXP.** 9: 353-361.
26. Izumi, M and **Gilbert, D.M.** (1999) Homogeneous Tetracycline-Regulatable Gene Expression In Mammalian Fibroblasts. **J. CELLULAR BIOCHEM.** 76: 280-289.
27. Dimitrova, D.S. and **Gilbert, D.M.** (2000) Stability and nuclear distribution of mammalian RPA heterotrimeric complex. **EXP. CELL RES.** 254: 321-327.
28. Dimitrova, D.S. and **Gilbert, D.M.** (2000) Temporally Coordinated Assembly/Disassembly of Replication Factories in the Absence of DNA Synthesis. **NATURE CELL BIOLOGY** 2: 686-694.
29. Wu, J.-W., Wang, J.-W. and **Gilbert, D.M.** (2000) Initiation Of DNA Replication In *Saccharomyces Cerevisiae* G1-Phase Nuclei By *Xenopus* Egg Extract, **J. CELLULAR BIOCHEM.** 80: 73-84.
30. Izumi, M, Whitfield, W. G. F., Hutchison, C. J. and **Gilbert, D.M.** (2000) Head and/or CaaX domain deletions of lamin proteins can disrupt pre-formed lamin A/C but not lamin B structure in mammalian cells. **MOL. BIOL. CELL.** 11: 4323-4337.
31. Wu, J.-W. and **Gilbert, D.M.** (2000) Lovastatin Arrests CHO Cells Between the Origin Decision Point and the Restriction Point. **FEBS LETTERS** 484: 108-112.
32. **Gilbert, D. M.** (2001) Nuclear Position Leaves its Mark on Replication Timing. **J. CELL BIOL.** 152:F11-15.
33. Li, F., Chen, J., Izumi, M., Butler, M.C., Keezer, S. M. and **Gilbert, D.M.** (2001) The Replication Timing Program of the Chinese Hamster β -Globin Locus is Established Coincident With its Association With Peripheral Heterochromatin in Early G1-Phase. **J. CELL BIOL.** 154: 283-292.
34. Okuno, Y., McNairn, A.J., den Elzen, N., Pines, J. and **Gilbert, D.M.** (2001) Stability, Chromatin-Association and Functional Activity of Mammalian Pre-Replication Complex Proteins During the Cell-Cycle. **EMBO J.** 20: 4263-4277.
35. Feijoo, C., Hall-Jackson, C., Wu, R., Jenkins, D., Leitch, J., **Gilbert, D.M.** and Smythe, C (2001) Activation of mammalian Chk1 during DNA replication arrest: a role for Chk1 in the intra S-phase checkpoint monitoring replication origin firing. **J. CELL BIOL.** 154: 913-923.

36. **Gilbert, D. M.** (2001) Making Sense of Eukaryotic Origins of Replication, **SCIENCE** 294: 96-100.
37. Dimitrova, D.S., Prokhorova, T.A., Blow, J.J., Todorov, I. and **Gilbert, D.M.** (2002) Mammalian Nuclei Become Licensed for DNA Replication During Telophase. **J. CELL SCI.** 115: 51-59.
38. Keezer, S.M. and **Gilbert, D.M.** (2002) Sensitivity of the Origin Decision Point to Specific Inhibitors of Cellular Signaling and Metabolism. **EXP. CELL RES.** 273: 54-64.
39. Keezer, S.M. and **Gilbert, D.M.** (2002) Evidence for a Pre-Restriction Point Cdk3 Activity, **J. CELLULAR BIOCHEM.** 85:545-552.
40. Cowell, I.G., Aucott, R., Mahadevaiah, S., Burgoyne, P.A., Huskisson, N., Bongiorno, S., Prantera, G., Fanti, L., Pimpinelli, S., Wu, R., **Gilbert, D.M.**, Shi, W., Fundele, R., Morrison, H., Jeppesen, P. and Singh, P.B. (2002) Heterochromatin, HP1 and methylation at lysine 9 of histone H3 in animals. **CHROMOSOMA** 111: 22-36.
41. **Gilbert, D.M.** (2002) Replication timing and transcriptional control: beyond cause and effect. **CURR. OPIN. CELL BIOL.** 14: 377-383.
42. **Gilbert, D.M.** (2002) The Evolution of Replication Timing. **NATURE GENETICS** 32:336-337.
43. Cheutin, T., McNairn, A.J., Jenuwein, T., **Gilbert, D.M.**, Singh, P.B., Misteli, T. (2003) Maintenance of stable heterochromatin domains by dynamic HP1 binding. **SCIENCE** 299: 721-725.
44. Li, F., Chen, J. Solessio, E., and **Gilbert, D.M.** (2003) Spatial distribution and specification of mammalian replication origins during G1-phase. **J. CELL BIOL.** 161:257-266.
45. McNairn, A.J. and **Gilbert, D.M.** (2003) Epigenomic Replication: linking epigenetics to DNA replication. **BIOESSAYS** 25:647-56.
46. Okuno, Y., Hahn, P.J. and **Gilbert, D.M.** (2004) Structure of a Palindromic Amplicon Junction Implicates Microhomology-Mediated End Joining as a Mechanism of Sister Chromatid Fusion During Gene Amplification. **NUCL. ACIDS RES.** 32: 749-756.
47. Bettinger, B., **Gilbert, D.M.** and Amberg, D.C. (2004) Actin Up in the Nucleus. **NATURE REV. MOL. CELL BIOL.** 5: 410-415.
48. **Gilbert, D.M.** (2004) The Future of Human Embryonic Stem Cell Research: Addressing Ethical Conflict with Responsible Scientific Research. **MED. SCI. MON.** 10: 99-103.
49. Kourmouli, N., Jeppesen, P., Mahadevahiah, S., Burgoyne, P., Wu, R., **Gilbert, D.M.**, Bongiorno, S., Prantera, G., Fanti, L., Pimpinelli, S., Shi, W., Fundele, R. and Singh, P.B. (2004) Heterochromatin and *tri*-methylated lysine 20 of histone H4 in animals. **J. CELL SCI.** 117: 2491-2501.
50. Angus, S.P., Mayhew, C.N., Solomon, D.A., Markey, M.P., Okuno, Y., Bartek, J., Cardoso, M.C., **Gilbert, D.M.** and Knudsen E.S. (2004) RB reversibly inhibits DNA replication via two temporally distinct mechanisms. **MOL. CELL. BIOL.** 24: 5404-5420.
51. **Gilbert, D.M.** (2004) In Search of the Holy Replicator. **NATURE REV. MOL. CELL BIOL.** 5:1-8.
52. Hiratani, I., Leskovar, A., **Gilbert D.M.** (2004) Differentiation-Induced Replication Timing Changes are Restricted to AT/long interspersed nuclear element (LINE)-rich Isochores. **PNAS USA** 101:16861-6.
53. Panning, M.M. and **Gilbert, D.M.** (2005) Spatio-temporal organization of DNA replication in murine embryonic stem, primary, and immortalized cells. **J. CELL. BIOCHEM.** 95:74-82.
54. Wu, R., Terry, A.V., Singh, P.B., and **Gilbert, D.M.** (2005) Differential Sub-nuclear Localization and Replication Timing of Histone H3 Lysine 9 Methylation States. **MOL. BIOL. CELL** 16:2872-81.
55. McNairn, A.J., Okuno, Y., Misteli, T., and **Gilbert, D.M.** (2005) Chinese Hamster ORC subunits dynamically associate with chromatin throughout the cell cycle. **EXP. CELL RES.** 308:345-56.
56. McNairn, A.J. and **Gilbert, D.M.** (2005) Over-expression of ORC subunits and increased ORC-chromatin association in transformed mammalian cells. **J CELL BIOCHEM.** 96:879-87.
57. **Gilbert, D.M.** (2005) Origins Go Plastic, **MOL. CELL** 20:657-658
58. Wu, R., Terry, A. and **Gilbert, D.M.** (2006) Observing Nuclear Structure/Chromatin Changes with Fluorescently labeled Antibodies. **METHODS IN MOL. BIOL.** 325:139-148
59. Takayo Sasaki, Sunita Ramanathan, Yukiko Okuno, Chiharu Kumagai, Seemab S. Shaikh and **Gilbert, D.M.** (2006) The Chinese Hamster DHFR Replication Origin Decision Point Follows Activation of Transcription and Confines Initiation to the Intergenic Region, **MOL. CELL. BIOL.** 26:1051-1062.
60. Wu, R., Singh, P.B. and **Gilbert, D.M.** (2006) Uncoupling Global and Fine-Tuning Replication Timing Determinants for Mouse Peri-Centric Heterochromatin. **J. CELL BIOL.**, 174: 185-194.
61. **Gilbert, D.M.** and Gasser, S.M. (2006) Nuclear Structure and DNA Replication. In: **DNA replication and human disease.** CSH Press (ed. M. L. DePamphilis), Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York: 175-196
62. **Gilbert, D.M.** (2007) Replication Origin Plasticity, Taylor-Made: inhibition vs. recruitment of new origins under conditions of replication stress. **CHROMOSOMA**, 116: 341-347.
63. Sasaki, T. and **Gilbert, D.M.** (2007) The Many Faces of the Origin Recognition complex. **CURR. OPIN. CELL BIOL.** 19:337-343.
64. **Gilbert, D.M.** and Zink, D. (2007) Nuclear Structure of Normal and Cancer Cells. **GENOME BIOLOGY** 8:312.

65. Lu J, Gilbert DM. (2007) Proliferation-Dependent and Cell-Cycle Regulated Transcription of Mouse Pericentric Heterochromatin. **J. CELL BIOL.** 179: 411-421.
66. Yokochi, T. and **Gilbert, D.M.** (2007) Methods for Visualizing Replication Origins in Mammalian Cells. **CURRENT PROTOCOLS.** In press.

C. Research Projects Ongoing or Completed During the Last 3 Years:

Ongoing

"Genome Plasticity During ES Cell Differentiation to Neural Lineages"

Principle Investigator: David M. Gilbert, PhD

Agency: NIH

Type: RO1 (1R01GM083337-01A1)

Period: 9/30/07 - 8/31/11

The major goals of this project are to investigate epigenetic change during mouse ES neural differentiation. In particular, to examine chromatin changes at the Ptn/Chrm2 domain during the commitment to neural lineages and the role of the G9a histone methyltransferase in forming sub-nuclear compartments.

Completed

"DNA Replication During ES Cell Differentiation"

Principle Investigator: David M. Gilbert, Ph.D.

Agency: NIH

Type: K18 (1K18 H1077183-01)

Period: 07/01/04 – 06/30/05

The aim of this Career Enhancement Award for Stem Cell Research was for Dr. Gilbert to obtain training in the differentiation of ES cells during his sabbatical.

"Specification of Mammalian Replication Origins"

Principle Investigator: David M. Gilbert, PhD

Agency: NIH

Type: RO1 (2 R01GM57233-05)

Period: 9/01/02 - 8/31/07

The major goal of this grant was to test the hypothesis that the Origin Decision Point (ODP) is a point of global origin specification in mammalian cells, during which specific pre-replication complexes are selected for initiation of replication.

"Administrative Supplement for Human Embryonic Stem Cell Research"

Principle Investigator: David M. Gilbert, PhD

Agency: NIH

Type: Supplement to R01GM57233

Period: 9/01/03-8/31/07

The goal of this supplement was to map the positions of replication origins during the differentiation of human embryonic stem cells.

"Nuclear Organization and Stem Cell Commitment"

Principle Investigator: David M. Gilbert, PhD

Agency: American Cell Therapy Research Foundation/Stem Cell Research Foundation (SCRF)

Type: Research Grant

Period: 04/01/05-03/31/07

This pilot grant (\$50K/yr) was to investigate the molecular basis of changes in replication-timing and sub-nuclear organization that occur during loss of pluripotency of ES cells and during commitment to the neural lineages.