CURRICULUM VITAE

Michael W. Young
Nobel Laureate in Physiology or Medicine (2017)

Birth: March 28, 1949, Miami, Florida

Married: Laurel A. Eckhardt; two children

Education:

The University of Texas, Austin	B.A. Biology	1971
The University of Texas, Austin	Ph.D. Genetics	1975

Address: Laboratory of Genetics,
The Rockefeller University, 1230, York Avenue,
New York, New York 10021. Tel. (212) 327-8645.

Positions:

Postdoctoral Fellow, Department of Biochemistry, Stanford University School of Medicine, Palo Alto, CA	1975-1977
Assistant Professor, Meyer Foundation Fellow, The Rockefeller University, New York, NY	1978-1984
Associate Professor, The Rockefeller University	1984-1988
Investigator, Howard Hughes Medical Institute	1987-1996
Professor, Rockefeller University	1988-
Head, Rockefeller Unit, National Science Foundation Science and Technology Center for Biological Timing	1991-2001
Vice President for Academic Affairs, Rockefeller University	2004-
Richard and Jeanne Fisher Professor, The Rockefeller University	2004-

Selected Committees:

Member, Advisory Panel for Genetic Biology, National Science Foundation	1984-1988
Member, Editorial Board, Molecular and Cellular Biology	1986-1991
Member, Research Advisory Committee, National Science Foundation Science and Technology Center for Biological Timing	1991-
Member, Cell Biology Study Section, National Institutes of Health	1993-1997

NYSTAR, Evaluation Committee for Capital Facility and Faculty Development Programs in New York State	2001-2002
Member, Harvey Society Council	1999-2004
Treasurer, Harvey Society	2001-2004
Associate Editor/Advisory Board, Journal of Biological Rhythms	2000-
Associate Editor, Neuron	2000-2016
Co-organizer, Fondation des Treilles Conference, Cellular Mechanisms of Circadian Clocks, Nice, Fr.	2000
Organizer, Keystone Symposium, Molecular Clocks, Tahoe, CA	2001
Chairman, External Review Panel, Life Sciences Task Force Program of Excellence, Texas A&M University	2003
Member, Neurodifferentiation, Plasticity, Regeneration and Rhythmicity Study Section, National Institutes of Health	2012-2016

University Service:

Member, Executive Committee of the Faculty, The Rockefeller University	1990-1993, 2000-2003
Chairman, Faculty Senate, The Rockefeller University	1992-1993 2002-2003
Chairman, Faculty Nominating Committee, The Rockefeller University	1996-2003

Selected Honors and Awards:

Hayaishi Prize, University of Tokyo	2001
Ashoff/Pittendrigh Award for Pioneering Contributions to the Field of Circadian Biology, Society for Research on Biological Rhythms	2006
Member, National Academy of Sciences, USA	2007
Fellow, American Academy of Microbiology	2007
Neuroscience Prize, Peter and Patricia Gruber Foundation	2009
Louisa Gross Horwitz Prize, Columbia University	2011
Canada Gairdner International Award	2012
Massry Prize, USC Keck School of Medicine	2012
Wiley Prize in Biomedical Sciences	2013
Shaw Prize in Life Science and Medicine	2013
Nobel Prize in Physiology or Medicine	2017

Memberships:

National Academy of Sciences, USA
American Academy of Microbiology
Genetics Society of America
Society for Research on Biological Rhythms
New York Academy of Sciences
American Society for Microbiology
Harvey Society

Selected Publications

Judd, B. H. and Young, M. W. (1974). An examination of the one cistron: one chromomere concept. Cold Spring Harbor Symp. Quant. Biol. 38: 573-579.

Finnegan, D. J., Rubin, G. M., Young, M. W., and Hogness, D. S. (1978). Repeated gene families in *Drosophila melanogaster.* Cold Spring Harbor Symp. Quant. Biol. 42: 1053-1063.

Young M. W., Judd B. H. (1978). Nonessential Sequences, Genes, and the Polytene Chromosome Bands of *DROSOPHILA MELANOGASTER*. Genetics 88: 723-742.

Young, M. W. (1979). Middle repetitive DNA: A fluid component of the *Drosophila* genome. Proc. Natl. Acad. Sci. U. S. A. 76: 6274-6278.

Dowsett, A. P. and Young, M. W. (1982). Differing levels of dispersed, repetitive DNA among closely related species of *Drosophila.* Proc. Natl. Acad Sci. U. S. A. 79: 4570-4574.

Kidd, S., Lockett, T. J., and Young, M. W. (1983). The *Notch* locus of *Drosophila melanogaster.* Cell 34: 421-433.

Bargiello, T. A. and Young, M. W. (1984). Molecular genetics of a biological clock in *Drosophila.* Proc. Natl. Acad. Sci. U. S. A. 81: 2142-2146.

Bargiello, T.A., Jackson, F.R., and Young, M.W. (1984). Restoration of circadian behavioural rhythms by gene transfer in *Drosophila.* Nature 312: 752-754.

Shin, H. -S., Bargiello, T. A., Clark, B. T., Jackson, F. R., and Young, M. W. (1985). An unusual coding sequence from a *Drosophila* clock gene is conserved in vertebrates. Nature 317: 445-448.

Young, M. W., Jackson, F. R., Shin, H. -S., and Bargiello, T. A. (1985). A biological clock in *Drosophila.* Cold Spring Harbor Symp. Quant Biol. 50: 865-875.

Jackson, F. R., Bargiello, T. A., Yun, S. -H., and Young, M. W. (1986). Product of the *per* locus of *Drosophila* shares homology with proteoglycans. Nature 320: 185-188.

Kidd, S. J., Kelley, M. R., and Young, M. W. (1986). Sequence of the *Notch* locus of *Drosophila melanogaster;* relationship of the encoded protein to mammalian clotting and growth factors. Mol. Cell. Biol. 6: 3094-3108.

Kidd, S. J., and Young, M. W. (1986). Transposon dependent mutant phenotypes at the *Notch* locus of *Drosophila.* Nature 323: 89-91.

Baylies, M. K., Bargiello, T. A., Jackson, F. R., and Young, M. W. (1987). Changes in the abundance or structure of the *per* gene product can affect the periodicity of the *Drosophila* clock. Nature 326: 390-392.

Kelley, M. R., Kidd, S. J., Deutsch, W. A., and Young, M. W. (1987). Mutations altering the structure of Epidermal Growth Factor-like coding sequences at the *Drosophila Notch* locus. Cell 51: 539-548.

Kidd, S. J., Baylies, M. K., Gasic, G. P., and Young, M. W. (1989). Structure and distribution of the *Notch* protein in developing *Drosophila*. Genes and Development 3:1113-1129.

Corbin, V., Michelson, A. M., Abmayr, S. M., Neel, V., Alcamo, E., Maniatis, T., and Young, M. W. (1991). A role for the *Drosophila* neurogenic genes in mesoderm differentiation. Cell, 67: 311-323.

Sehgal, A., Price, J., and Young, M. W. (1992). Ontogeny of a biological clock in *Drosophila melanogaster*. Proc. Natl. Acad. Sci., USA, 89: 1423-1427.

Baylies, M.K., Sehgal, A., and Young, M.W. (1992). New short period mutations of the *Drosophila* clock gene *per*. Neuron, 9: 575-581.

Lieber, T., Wesley, C. S., Alcamo, E., Hassel, B., Krane, J.F., Campos-Ortega, J.A., and Young, M.W. (1992). Single amino acid substitutions in EGF-like elements of *Notch* and *Delta* modify *Drosophila* development and affect cell adhesion *in vitro*. Neuron, 9: 847-859.

Molecular Genetics of Biological Rhythms. (1992). Young, M. W., ed. Marcel Dekker, New York, 319 pp.

Lieber, T., Kidd, S., Alcamo, E., Corbin, V., and Young, M.W. (1993). Anti-neurogenic phenotypes induced by truncated Notch proteins indicate a role in signal transduction, and may point to a novel function for Notch in nuclei. Genes & Dev., 7: 1949-1965.

Lyman, D. and Young, M.W. (1993). Further evidence for function of the *Drosophila* Notch protein as a transmembrane receptor. Proc. Natl. Acad. Sci. U.S.A., 90: 10395-10399.

Sehgal, A., Price, J.L., Man, B., and Young, M.W. (1994). Loss of circadian behavioral rhythms and *per* RNA oscillations in the *Drosophila* mutant *timeless*. Science, 263: 1603-1606.

Vosshall, L.B., Price, J.L., Sehgal, A., Saez, L., and Young, M.W. (1994). Block in nuclear localization of *period* protein by a second clock mutation, *timeless*. Science, 263: 1606-1609.

Neel, V. A. and Young, M.W. (1994). *igloo*, a GAP-43-related gene expressed in the developing nervous system of *Drosophila*. Development, 120: 2235-2243.

Vosshall, L.B. and Young, M.W. (1995). Circadian Rhythms in *Drosophila* can be driven by *period* expression in a restricted group of central brain cells. Neuron, 15: 345-360.

Price, J.L., Dembinska, M.E., Young, M.W. and Rosbash, M. (1995). Suppression of PERIOD protein abundance and circadian cycling by the *Drosophila* clock mutation *timeless*. EMBO J., 14: 4044-4049.

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Gekakis, N., Saez, L., Delahaye-Brown, A.-M., Myers, M.P., Sehgal, A., Young, M.W., and Weitz, C.J. (1995). Isolation of *timeless* by PER protein interaction: Defective interaction between *timeless* protein and long-period mutant PER^{L}. Science, 270: 811-815.

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Young, M.W., Wager-Smith, K., Vosshall, L.B., Saez, L., and Myers, M.P. (1996). Molecular anatomy of a light-sensitive circadian pacemaker in *Drosophila*. Cold Spring Harbor Symp. Quant. Biol. 61: 279-284.

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Price, J.L., Blau, J., Rothenfluh, A., Abodeely, M., Kloss, B, and Young, M.W. (1998). *double-time* is a novel *Drosophila* clock gene that regulates PERIOD protein accumulation. Cell, 94: 83-95.

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Takumi, T., Taguchi, K., Miyake, S., Sakakida, Y., Takashima, N., Matsubara, C., Maebayashi, Y., Okumura, K., Takekida, S., Yamamoto, S., Yagita, K., Yan, L., Young, M.W., and Okamura H. (1998). A light-independent oscillatory gene mPer3 in mouse SCN and OVLT. EMBO J., 17: 4753-4759.

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Martinek, S. and Young, M.W. (2000). Specific genetic interference with behavioral rhythms in *Drosophila* by expression of inverted-repeats. Genetics, 156: 1717-1725.

Rothenfluh, A., Abodeely, and Young, M.W. (2000). Short-period mutations of *per* affect a *double-time*-dependent step in the *Drosophila* circadian clock. Current Biology, 10: 1399-1402.

Young, M.W. (2000). Life's 24 hour clock: Molecular control of circadian rhythms in animal cells. Trends in Biochem. Sci. 25th Anniversary, 25: 601-606.

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Young, M.W. and Kay, S.A. Time zones: a comparative genetics of circadian clocks. (2001). Nat Rev Genet. 2: 702-715.

Claridge-Chang, A., Wijnen, H., Naef, F., Boothroyd, C., Rajewsky, N., and Young, M.W. (2001).. Circadian regulation of gene expression systems in the *Drosophila* head. Neuron, 32: 657-671.

Lieber, T, Kidd S, Young MW. (2002). *kuzbanian*-mediated cleavage of *Drosophila* Notch. Genes Dev. 16: 209-221.

Wijnen, H, Boothroyd C, Young MW, Claridge-Chang A. (2002). Molecular genetics of timing in intrinsic circadian rhythm sleep disorders. Ann Med. 34:386-393.

Young, M.W. (2002). Big Ben rings in a lesson on biological clocks. Neuron 36:1001-1005.

Cyran, S.A., Buchsbaum, A.M., Reddy, K.L., Lin, M.C., Glossop, N.R., Hardin, P.E., Young, M.W., Storti, R.V., Blau, J. (2003). *vrille*, *Pdp1* and *dClock* form a second feedback loop in the *Drosophila* circadian clock. Cell 112:329-341.

Harms, E,, Young M.W., Saez, L. (2003). CK1 and GSK3 in the *Drosophila* and mammalian circadian clock. Novartis Found Symp. 253:267-277.

Young. MW. (2004). An ultradian clock shapes genome expression in yeast. Proc Natl Acad Sci U S A. 101:1118-1119.

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Cyran SA, Yiannoulos G, Buchsbaum AM, Saez L, Young MW, Blau J. (2005). The double-time protein kinase regulates the subcellular localization of the *Drosophila* clock protein period. J Neurosci. 25:5430-5437.

Meyer P, Saez L, Young MW. (2006). PER-TIM interactions in living *Drosophila* cells: an interval timer for the circadian clock. Science 311:226-229.

Wijnen H, Naef F, Boothroyd C, Claridge-Chang A, Young MW. (2006). Control of Daily Transcript Oscillations in *Drosophila* by Light and the Circadian Clock. PLoS Genet 2(3): e39.

Wijnen H. and Young MW. (2006). Interplay of Circadian Clocks and Metabolic Rhythms. Annu. Rev. Genet. 40:409-448.

Schwartz EC, Saez L, Young MW, Muir TW. (2007). Post-translational enzyme activation in an animal via optimized conditional protein splicing. Nat Chem Biol. 3: 50-54.

Boothroyd, C.E., Wijnen, H., Naef, F., Saez, L., Young, M.W. (2007). Integration of Light and Temperature in the Regulation of Circadian Gene Expression in *Drosophila*. PLoS Genet 3(4):e54, pp. 492-507.

Meyer P, Young MW. (2007). The 2006 Pittendrigh/Aschoff lecture: New roles for old proteins in the *Drosophila* circadian clock. J Biol Rhythms 22:283-290.

Sekine T, Yamaguchi T, Hamano K, Young MW, Shimoda M, Saez L. (2008). Casein kinase I epsilon does not rescue double-time function in *Drosophila* despite evolutionarily conserved roles in the circadian clock. J Biol Rhythms. 23:3-15.

Saez L, Meyer P, Young MW. (2008). A PER/TIM/DBT interval timer for *Drosophila*'s circadian clock. Cold Spring Harb Symp Quant Biol.72:69-74.

Kivimäe S, Saez L, Young MW. (2008). Activating PER repressor through a DBT-directed phosphorylation switch. PLoS Biol. 6(7):e183, pp 1570-1583.

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Saez L, Derasmo M, Meyer P, Stieglitz J, Young MW. (2011). A key temporal delay in the circadian cycle of *Drosophila* is mediated by a nuclear localization signal in the Timeless protein. Genetics 188:591-600.

Syed S, Saez L, Young MW. (2011). Kinetics of Doubletime Kinase-dependent degradation of the *Drosophila* Period protein. J Biol Chem. 286:27654-27662.

Zoltowski BD, Vaidya AT, Top D, Widom J, Young MW, Crane BR. (2011). Structure of full-length Drosophila cryptochrome. Nature 480:396-399.

Stavropoulos N, Young MW. (2011). *insomniac* and Cullin-3 regulate sleep and wakefulness in *Drosophila*. Neuron 72:964-976.

Rogulja D, Young MW. (2012). Control of Sleep by Cyclin A and its regulator. Science 335: 1617-1621.

Levy C, Zoltowski BD, Jones AR, Vaidya AT, Top D, Widom J, Young MW, Scrutton NS, Crane BR, Leys D. (2013). Updated structure of *Drosophila* cryptochrome. Nature 495: E3-4.

Bamne MN, Ponder CA, Wood JA, Mansour H, Frank E, Kupfer DJ, Young MW, Nimgaonkar VL. (2013). Application of an ex vivo cellular model of circadian variation for bipolar disorder research: a proof of concept study. Bipolar Disord. 15: 694-700.

Vaidya AT, Top D, Manahan CC, Tokuda JM, Zhang S, Pollack L, Young MW, Crane BR. (2013). Flavin reduction activates *Drosophila* cryptochrome. Proc. Natl. Acad. Sci. U. S. A., 110:20455-20460.

Crane BR, Young MW. (2014). Interactive features of proteins composing eukaryotic circadian clocks. Annu. Rev. Biochem., 83:191-219.

Axelrod S, Saez L, Young MW. (2015). Studying circadian rhythm and sleep using genetic screens in *Drosophila*. Methods Enzymol. 551:3-27.

Jang AR, Moravcevic K, Saez L, Young MW, Sehgal A. (2015). Drosophila TIM binds Importin α1, and acts as an adapter to transport PER to the nucleus. PLoS Genet., 11(2): e1004974. doi:10.1371/journal.pgen.1004974.

Kidd PB, Young MW, Siggia ED. (2015) Temperature compensation and temperature sensation in the circadian clock. Proc. Natl. Acad. Sci. U. S. A., 112: E6284-E6292.

Garaulet DL, Sun K, Li W, Wen J, Panzarino AM, O'Neil JL, Hiesinger PR, Young MW, Lai EC. (2016). miR-124 Regulates Diverse Aspects of Rhythmic Behavior in *Drosophila*. J Neurosci. 36:3414-3421.

Patke A, Murphy PJ, Onat OE, Krieger AC, Ozcelik T, Campbell SS, Young MW. (2017). Mutation of the Human Circadian Clock Gene CRY1 in Familial Delayed Sleep Phase Disorder. Cell 169:203-215.

Biosketch:

Vice President for Academic Affairs, Richard and Jeanne Fisher Professor, Head of the Laboratory of Genetics, The Rockefeller University. B.A. in Biology (1971), Ph.D. in Genetics (1975), University of Texas, Austin. Doctoral work with Burke Judd -cytogenetic studies of *Drosophila* chromosomes. Postdoctoral work, Biochemistry, Stanford University Medical School with David Hogness -identification and cloning of *Drosophila* transposable elements. Joined the faculty of The Rockefeller University in 1978 (Fellow of the Andre and Bella Meyer Foundation). Work at Rockefeller has focused on two areas of research: Neuromuscular development, stemming from the laboratory's isolation and studies of the *Notch* locus of *Drosophila*, and the genetics of behavior, primarily circadian rhythms including initial cloning of the *period* gene of *Drosophila*, discovery and functional characterizations of the circadian clock genes *timeless*, *double-time*, *shaggy*, *vrille,* and *pdp1*, and modeling of principal molecular features of the *Drosophila* circadian system.