CURRICULUM VITAE

Edward D. Lipson, Professor Emeritus

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8035 Shadowrock Road
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EDUCATION

Ph.D. Physics (nuclear), California Institute of Technology, Pasadena, CA (1971)
(adviser: Felix Boehm)
B.Sc.(Hons.) Physics and Mathematics, University of Manitoba, Winnipeg, Canada (1966)

ACADEMIC EMPLOYMENT

2016-	Professor of Physics, Emeritus, Syracuse University
2007-2016	Kauffman Professor of Entrepreneurship and Innovation, Syracuse University
2003-2007	Chair, Department of Physics, Syracuse University
2002-2012	Adjunct Professor, Department of Electrical Engineering and Computer Science, Syracuse University
1999-	Adjunct Professor, Department of Radiology, Upstate Medical University, State University of New York, Syracuse
1996-1997	Interim Chair, Department of Physics, Syracuse University
1995-1996	Acting Chair, Department of Physics, Syracuse University
1994-2000	Faculty Associate, Northeast Parallel Architectures Center, Syracuse University
1990	Compton Visiting Professor, Department of Biology, Technion (Haifa, Israel; January-May)
1989-1995	Associate Chair, Department of Physics, Syracuse University
1985-2016	**Professor of Physics, Syracuse University**
1983-89	Director, Graduate Biophysics Program, Syracuse University
1980-85	Associate Professor of Physics, Syracuse University
1976-80	Assistant Professor of Physics, Syracuse University
1974-76	Senior Research Fellow in Biology, California Institute of Technology
1971-74	Research Fellow in Biology, California Institute of Technology (with Max Delbrück; 1971-76)
Summers 1978 & 1981	Visiting Associate in Biology, California Institute of Technology
Summer 1976	Instructor in course “Phycomyces: Behavior, Genetics, Biochemistry” at Cold Spring Harbor Laboratory

HONORS

1979-83	Alfred P. Sloan Foundation Fellow
1972-74	NIH Postdoctoral Research Fellow
1966-69	NSF Predoctoral Fellow
1966-67	Woodrow Wilson Fellow (Honorary)
1966	University Gold Medal, Allen Medal in Physics
1962-66	nine scholarships
1964	Governor General’s Gold Medal

RESEARCH INTERESTS

Biophysics:	Cellular and molecular bases of the light responses of the microorganisms, including *Phycomyces* and *Chlamydomonas*, model systems for sensory-transduction processes in single cells. Research approaches have included physiology (including nonlinear system identification), genetics, biochemistry, and spectroscopy.
Medical Physics:	Human-computer interfaces, particularly for people with severe physical disabilities (custom software, sensors and transducers, and interface electronics). Telemedicine. Nuclear medicine and medical imaging (SPECT, PET, MRI, CT, and micro-CT).
Building Automation:	Smart-building and green technologies for environmental and energy systems in commercial, residential, and community settings.

ENTREPRENEURSHIP

Founding partner of MindTel LLC (1997) and SenSyr LLC (2003)

GRANTS RECEIVED

"Syracuse Entrepreneurial Ecosystem Development (SEED)" Chancellor's Leadership Project grant, $200,000 (funding from Chancellor Cantor, Kauffman Grant, SyracuseCoE; shared with three SU faculty co-PI's) 7/1/09 to 6/30/13

"Electronic Interfacing for Environmental and Energy Systems and for Assistive Technology" 1/1/08 to 6/30/11, $120,000 (combined funding from Kauffman Foundation grant to SU ('Syracuse Campus-Community Entrepreneurship Initiative' [SCCEI]), and cost sharing from Syracuse Center of Excellence in Environmental and Energy Systems (SyracuseCoE)

"MR Diffusion-Weighted and Parametric Breast Imaging Combined with MR Spectroscopy and Parametric PET/CT for Enhanced Breast Cancer Detection." 7/1/2009 to 6/30/2010, $11,642 (SU subaward under grant to Upstate Medical University [Andrzej Krol, PI] from Carol M. Baldwin Breast Cancer Research Fund, Inc.).

"Ultrafast laser-based x-ray in-vivo phase-contrast micro-CT" National Institutes of Health, 9/1/05 to 8/31/09, $126,000 total (subgrant of main grant to SUNY Upstate Medical University. A. Krol, PI)

"Nonlinear Dynamics of Cellular Signal Transduction" National Institutes of Health, 7/1/01 to 6/30/05, approx. $1,254,970 (with K. Foster, PI, et al.)

"Physio-Info-Tronics for Perceptualization Environments: An Anthrotronic Interface System for the Emerging Information-Communication Matrix" SPAWAR Systems Center, San Diego, 7/1/01 to 6/30/05, approx. $3,990,109 (with D. Warner, PI, et al.; note that the dollar amount is a limit rather than an initial commitment; as of July, 2004, the budget has reached $1,530,060)

"Improving PC Accessibilty with NeatTools" Microsoft Corporation, 4/1/99-3/31/02, $50,000 (direct costs, plus software donation valued at $42,911)

"The Pulsar Project: Affordable Human-Computer Interfaces for the Severely Disabled" NEC Foundation, 12/1/98-11/30/01, $40,000 (direct costs)

"BotMasters: An Interactive Wearable Universal Human-Computer-Interface System" Defense Advanced Research Projects Agency, 7/1/98–12/31/00, $1,349,720 (with D. Warner and G. Fox)

"The Grok Box — An Interactive Perceptualization Environment" Defense Advanced Research Projects Agency, 5/29/97–11/30/00, $879,500 (with D. Warner and G. Fox)

"Information Technology in Service of Science Education" National Science Foundation, 3/15/96 to 3/14/00, $200,000 (co-PI; with G. Vidali et al.)

"Integration of Information Age Networking and Parallel Supercomputer Simulations into University General Science and K-12 Curricula," National Science Foundation, 11/1/95 to 4/30/03, $940,435 (plus supplements of $25,000 [REU] and $350,000 [vBNS]; I was PI of this grant)

"Cooperation in Applied Science and Technology (with Newly Independent States of Former Soviet Union)" National Research Council, 1/1/93 to 3/31/94, $11,100

"System Analysis of *Phycomyces* Photoresponses" National Institutes of Health, 6/1/90 to 5/31/95, $506,211

"Blue Light Photoreceptors in *Phycomyces*" National Science Foundation, 7/1/87 to 6/30/94 $214,000

"Acquisition of ultracentrifuge, liquid scintillation counter, autoclave, and water purification system for photosensory research in microorganisms" National Science Foundation, 6/1/89 to 11/30/91, $58,113 (joint grant with Dr. Kenneth Foster, SU Physics Dept.)

"Blue Light Receptors in Fungi: Biophysical, Molecular, and Genetic Approaches" United States-Israel Binational Science Foundation, 9/1/87 to 8/31/90, $75,000 (joint grant with Dr. B. Horwitz of the Technion in Haifa)

"System Analysis of *Phycomyces* Photoresponses" National Institutes of Health, 6/1/86 to 5/31/90, $179,059

"Cellular Photobiology of *Phycomyces*" US-Spain Joint Committee for Scientific and Technological Cooperation, 1/1/85 to 12/31/87, $30,000 (joint grant with Dr. E. Cerdá-Olmedo, University of Seville)

"Genetic Analysis of *Phycomyces* Light Response System" National Science Foundation, 3/1/84 to 8/31/87, $205,000

"System Analysis of *Phycomyces* Photoresponses" National Institutes of Health, 7/1/81 to 6/30/85, $357,326

"Biochemical Analysis of Photosensory Transduction in *Phycomyces*"
Senate Research Committee, Syracuse University, 1984

"Genetic Analysis of *Phycomyces* Light Response System"
National Science Foundation, 9/1/80 to 2/29/84, $162,000

Alfred P. Sloan Research Fellowship
Alfred P. Sloan Foundation, 9/16/79 to 9/15/83, $20,000

"System Analysis of *Phycomyces* Photomutants"
National Institutes of Health, 7/1/77 to 12/31/80, $179,059

PATENTS RECEIVED

"Open web services-based indoor climate control system"
(US Patent 7,904,209; dated March 8, 2011; assignee: Syracuse University)
Inventors: Marek Podgorny, Luke Beca, Roman Markowski, Edward A. Bogucz, Suresh Santanam, Edward Lipson, Paul Roman, Greg Michalak, Gregg Lewandowski, and Paul D. Gelling

THESES AND DISSERTATIONS DIRECTED

Jiahan Zhang, "Development and implementation of efficient noise suppression methods for emission computed tomography," Ph.D., May 2016

Levon Vogelsang, "Development of SPECT and CT Tomographic Image Reconstruction," Ph.D., May 2012

Russell Kincaid, "Exploration of *in-vivo* phase-contrast micro-computed tomography with a laser plasma-based x-ray source," Ph.D., December 2010

Alphonso Magri, "Noninvasive Breast Biopsy Method Using Gd-DTPA Contrast Enhanced MRI Series and F-18-FDG PET/CT Dynamic Image Series," Ph.D., May 2010

Taviare Hawkins, "Biophysical Applications of Parallel Cascade Identification," Ph.D., December 2009

Hongwei Ye, "Development and Implementation of Fully 3D Iterative Reconstruction Approaches in SPECT with Parallel-, Fan- and Cone-beam Collimators," Ph.D., May 2008

Paul Schmidt, "Light Interactions with *Phycomyces* Sporangiophores Investigated with Optical and Biochemical Approaches," M.S., May 1991

Chafia Trad, "Blue Light Photoreception in *Phycomyces*: Spectrophotometric and Biochemical Analyses," Ph.D., May 1987

Anuradha Palit, "Nonlinear System Analysis of Light-Growth Response in Behavioral Mutants of *Phycomyces*," Ph.D., May 1987

Promod Pratap, "Nonlinear System Analysis of *Phycomyces* Light-Growth Response with Sum-of-Sinusoids Test Stimuli," Ph.D., May 1986

John Pollock, "Biochemical Analysis of Flavoproteins from *Phycomyces* Sporangiophores as Blue Light Receptors," Ph.D., June 1984

Maharabooshanam Krishnamoorthy, "Computation of Wiener Kernels of a Microbial Stimulus-Response System," M.S., June 1978

COURSES TAUGHT

PHY 212 General Physics II: Electricity, Magnetism, and Light

PHY 105/106	Science for the 21st Century
PHY 200	Science for the 21st Century (pilot course in 92/93)
PHY 277	Physics for the Biological Sciences
PHY 315	Biophysics
PHY 423	Intermediate Mechanics II (through Fall 2000)
PHY425	Electromagnetics II
PHY 515	Biophysics
PHY523	Intermediate Mechanics II (as of Fall 2001)
PHY523	Advanced Mechanics (as of Fall 2009)
PHY 551	Optics (lecture and laboratory course)
PHY 651	Selected Topics in Optics
PHY 715/716/720	Selected Topics in Biophysics

SERVICE (major assignments only)

Department of Physics

Advisor, Physics B.S. Option in Biological and Medical Physics 2007-2016
Chair, Physics Department, 2003-2007
Acting/Interim Chair, Physics Department 1995-1997
Associate Chair, Physics Department 1989-199
Member Planning Committee 1985-1997
Chair, Tenure and Promotions Committee 1984-1989

College of Arts and Sciences

Chair, Faculty Council 2004-2005
Member, Life Sciences Committee 2001-2003
Member, Executive Committee, Doctoral Program in Structural Biology, Biochemistry and Biophysics 2000-2010
Member, Executive Committee, Graduate Biophysics Program, 1989-2000
Director, Graduate Biophysics Program 1983-1989
Member, Search Committee for Dean 1985-1986
Member, Promotions Committee 1981-1982, 1985-1986
Member, Faculty Council 1982-1983
Chair, Faculty Council Subcommittee Reviewing Tenure and Promotions Procedures 1982-1983
Member, Graduate Biophysics Program 1976-2000

University

Member, University Academic Space Advisory Committee 1999-2001
Member, Chancellor's Task Force for Developing Guiding Principles for the Long-Range Budget Plan 1994-1995
Chair, Senate Budget Committee's ad hoc Subcommittee on Finances of Athletics Department and Carrier Dome 1993-1994
Member, Senate Budget Committee 1993-1995
Member, Committee to Review University-Wide Services for Graduate Students 1992-93
Member, Board of Graduate Studies 1991-1994
Member, Computational Neuroscience Program 1991-1995
Member, University Senate 1990-1992, 1993-1997

Member, Senate Academic Affairs Committee 1990-1992
Member, Neuroscience Program 1984-1997
Member, Senate Research Committee 1979-80

Community

Judge in Annual Scholastic Science Fair 1979-1986
Instructor in "Frontiers of Science" program (NSF-supported lecture and laboratory program to acquaint high school teachers with scientific research) 1985, 1990
President, Syracuse Friends of Chamber Music 1987-1988

Profession

Member of Evaluation Committee for the 1997 Kuwait Prize in Basic Sciences, Kuwait Foundation for the Advancement of Science, Kuwait City, Kuwait, November 15-19, 1997
Program chair of Spring Meeting (topic: *Biological Physics*) of American Physical Society New York State Section, Syracuse University, Syracuse, NY, April 10-11, 1992
Co-organized international scientific meeting on *Phycomyces* research held at Banbury Conference Center, Cold Spring Harbor Laboratory, Long Island, New York, August 2-8, 1982
Co-organized international scientific meeting on *Phycomyces* research held at la Residencia de la Universidad de Sevilla, La Rábida, Huelva, Spain, June 8-13, 1986

OTHER PROFESSIONAL DATA

Memberships in Professional Societies

APS—American Physical Society
AAAS—American Association for the Advancement of Science
IEEE—The Institute of Electrical and Electronics Engineers (until 2016)
EMBS—Engineering in Medicine and Biology Society (under IEEE, until 2016)

Elected Office in Professional Societies

Council Member, American Society for Photobiology 1989-1992

Appointed Offices in Professional Societies

Chair, Public Affairs Committee, American Society for Photobiology, 1991-1993
Chair, Publications Committee, American Society for Photobiology, 1990-1991
Member, Awards Committee, American Society for Photobiology, 1989-1991

PUBLICATIONS

1. Lipson, E. D., Boehm F., and Vanderleeden, J. C. 1971. Measurement of parity admixtures in nuclear forces in ^{180}Hf and ^{159}Tb. Phys. Lett. 35B:307-310.
2. Vanderleeden, J. C., Boehm, F., and Lipson, E. 1971. Experiments on parity non-conservation in nuclear forces II. Gamma transitions in ^{203}Tl and ^{75}As. Phys. Rev. C4:2218-2223.
3. Lipson, E. D., Boehm, F., and Vanderleeden, J. C. 1972. Experiments on parity non-conservation in nuclear forces III. Gamma transitions in ^{180}Hf, ^{159}Tb ^{181}Ta, ^{203}Tl and ^{182}W. Phys. Rev. C5:932-941.
4. Lipson, E. D. and Vanderleeden, J. C. 1972. A Monte Carlo calculation of the analyzing efficiency of gamma ray circular polarimeters. Nucl. Instr. and Meth. 104:525-530.
5. Delbrück, M., Lipson, E., and Lipson, C. 1972. Anfänge der wahrnehmung (The beginnings of perception). Mannheimer Forum. 72:53-82.
6. Foster, K. W. and Lipson, E. D. 1973. The light growth response of *Phycomyces*. J. Gen. Physiol. 62:590-617.
7. Lipson, E. D. 1975. White noise analysis of *Phycomyces* light growth response system. I. Normal intensity range. Biophys. J. 15:989-1011.
8. Lipson, E. D. 1975. White noise analysis of *Phycomyces* light growth response system. II. Extended intensity ranges. Biophys. J. 15:1013-1031.
9. Lipson, E. D. 1975. White noise analysis of *Phycomyces* light growth response system. III. Photomutants. Biophys. J. 15:1033-1045.
10. Lipson, E. D. 1975. Identification of the light growth response system of *Phycomyces* by white noise stimulation. Proceedings of First Symposium on Testing and Identification of Nonlinear Systems, California Institute of Technology. pp. 301-315.
11. Hall, P. F., Lewis, J. L., and Lipson, E. D. 1975. The role of mitochondrial cytochrome P-450 from bovine adrenal cortex in side-chain cleavage of 20S,22R-dihydroxycholesterol. J. Biol. Chem. 250:2283-2286.
12. Lipson, E. D., Foster, K. W., and Walsh, M. P. 1976. A versatile pseudorandom noise generator. IEEE Trans. Instrum. Meas. 25:112-116.
13. Eslava, A. P., Alvarez, M. I., Lipson, E. D., Presti, D., and Kong, K. 1976. Recombination between mutants of *Phycomyces* with abnormal phototropism. Mol. Gen. Genet. 147:235-24l.
14. Lipson, E. D. and Presti, D. 1977. Light-induced absorbance changes in *Phycomyces* photomutants. Photochem. Photobiol. 25:203-208.
15. Galau, G. A., Lipson, E. D., Britten, R. J., and Davidson, E. H. 1977. Synthesis and turnover of polysomal mRNAs in sea urchin embryos. Cell 10:415-432.
16. Harris, W. A., Ready, D. F., Lipson, E. D., Hudspeth, A. J., and Stark, W. S. 1977. Vitamin A deprivation and *Drosophila* photopigments. Nature 266:648-650.

17. Lipson, E. D. 1980. Sensory transduction in *Phycomyces* photoresponses. In: The Blue Light Syndrome. (H. Senger, editor) Springer-Verlag, Berlin-Heidelberg-New York, pp. 110-118.

18. Lipson, E. D., Terasaka, D. T., and Silverstein, P. S. 1980. Double mutants of *Phycomyces* with abnormal phototropism. Mol. Gen. Genet. 179:155-162.

19. Lipson, E. D. and Presti, D. 1980. Graphical estimation of cross sections from fluence-response data. Photochem. Photobiol. 32:383-391.

20. Lipson, E. D. and Terasaka, D. T. 1981. Photogeotropism in *Phycomyces* double mutants. Exp. Mycol. 5:101-111.

21. Lipson, E. D. 1983. Sensory information processing at the cellular level: The light response systems of *Phycomyces*. In: Radiation and Cellular Response (G. P. Scott and H. W. Wahner, eds.) The Iowa State University Press, Ames, Iowa, pp. 133-152.

22. Lipson, E. D., López-Díaz, I., and Pollock, J. A. 1983. Mutants of *Phycomyces* with enhanced tropisms. Exp. Mycol. 7:241-252.

23. López-Díaz, I. and Lipson, E. D. 1983. Genetic analysis of hypertropic mutants of *Phycomyces*. Mol. Gen. Genet. 190:318-325.

24. López-Díaz, I. and Lipson, E. D. 1983. Meiotic dysgenesis associated with behavioral mutants of *Phycomyces*. Curr. Genet. 7:313-322.

25. Lipson, E. D. and Block, S. M. 1983. Light and dark adaptation in *Phycomyces* light-growth response. J. Gen. Physiol. 81:845-859.

26. Lipson, E. D., Galland, P., and Pollock, J. A. 1984. Blue light receptors in *Phycomyces* investigated by action spectroscopy, fluorescence lifetime spectroscopy, and two-dimensional gel electrophoresis. *In* Blue Light Effects in Biological Systems (H. Senger, ed.) Springer-Verlag, Berlin-Heidelberg-New York. pp. 228-236.

27. Lipson, E. D. and Häder, D.-P. 1984. Video data acquisition for movement responses in individual organisms. Photochem. Photobiol. 39:437-441.

28. Galland, P., Pandya, A. and Lipson, E. D. 1984. Wavelength dependence of dark-adaptation in *Phycomyces* phototropism. J. Gen. Physiol. 84:739-751.

29. Galland, P. and Lipson, E. D. 1984. Photophysiology of *Phycomyces blakesleeanus*. Photochem. Photobiol. 40:795-800 (invited review article).

30. Pollock, J. A., Lipson, E. D., and Sullivan, D. T. 1985. Analysis of microsomal flavoproteins in *Phycomyces* sporangiophores: Candidates for the blue-light photoreceptor. Planta 163:506-516.

31. Galland, P. and Lipson, E. D. 1985. Modified action spectra of photogeotropic equilibrium in *Phycomyces blakesleeanus* mutants with defects in genes *madA*, *madB*, *madC*, and *madH*. Photochem. Photobiol. 41:331-335.

32. Galland, P. and Lipson, E. D. 1985. Action spectra for phototropic balance in *Phycomyces blakesleeanus*: dependence on reference wavelength and intensity range. Photochem. Photobiol. 41:323-329.

33. Pollock, J. A., Lipson, E. D., and Sullivan, D. T. 1985. Electrophoretic analysis of proteins from night-blind mutants of *Phycomyces*. Biochem. Genet. 23:379-390.

34. Pollock, J. A. and Lipson, E. D. 1985. A flavoprotein in *Phycomyces blakesleeanus* with short fluorescence lifetime. Photochem. Photobiol. 41:351-354.

35. Galland, P., Palit, A., and Lipson, E. D. 1985. *Phycomyces*: Phototropism and light-growth response to pulse stimuli. Planta 165:538-547.

36. Reddy, V., Galland, P., and Lipson, E. D. 1985. A new allele with abnormal cyclic-AMP phosphodiesterase activity in *Phycomyces*. Mol. Gen. Genet. 201:124-125.

37. Garcés, R., Pollock, J. A., and Lipson, E. D. 1985. Examination of *Phycomyces blakesleeanus* for nitrate reductase as a possible blue light photoreceptor. Plant Science: 40:173-177.

38. Garcés, R., Chmielewicz, C., and Lipson, E. D. 1986. *Phycomyces*: A new gene for a flavoprotein with a covalently linked cofactor. Mol. Gen. Genet. 203:341-345.

39. Horwitz, B., Trad, C. H., and Lipson, E. D. 1986. Modified light-induced absorbance changes in *dimY* photoresponse mutants of *Trichoderma*. Plant Physiol. 81:726-730.

40. Horwitz, B., Trad, C. H., and Lipson, E. D. 1986. Differential spectrophotometry of *Phycomyces* mutants with abnormal photoresponses. Photochem. Photobiol. 44:207-214.

41. Pratap, P., Palit, A., and Lipson, E. D. 1986. System analysis of *Phycomyces* light-growth response with sum-of-sinusoids test stimuli. Biophys. J. 50:645-651.

42. Pratap, P., Palit, A., and Lipson, E. D. 1986. System analysis of *Phycomyces* light-growth response: Wavelength and temperature dependence. Biophys. J. 50:653-660.

43. Palit, A., Pratap, P., and Lipson, E. D. 1986. System analysis of *Phycomyces* light-growth response: Photoreceptor and hypertropic mutants. Biophys. J. 50:661-668.

44. Poe, R. C. and Lipson, E. D. 1986. System analysis of *Phycomyces* light-growth response with Gaussian white noise test stimuli. Biol. Cybern. 55:91-98.

45. Poe, R. C., Pratap, P., and Lipson, E. D. 1986. System analysis of *Phycomyces* light-growth response: Single mutants. Biol. Cybern. 55:99-104.

46. Poe, R. C., Pratap, P., and Lipson, E. D. 1986. System analysis of *Phycomyces* light-growth response: Double mutants. Biol. Cybern. 55:105-113.

47. Häder, D. P., and Lipson, E. D. 1986. Fourier analysis of angular distributions for motile microorganisms. Photochem. Photobiol. 44:657-664.

48. Galland, P. and Lipson, E. D. 1987. Blue-light reception in *Phycomyces* phototropism: evidence for two photosystems operating in low- and high-intensity ranges. Proc. Natl. Acad. Sci. U.S.A. 84:104-108.

49. Horwitz, B., Lipson, E. D. and Schechtman, M. G. 1987. *In vivo* absorption spectra of *Neurospora crassa* white collar photomutants. Exp. Mycol. 11:74-76.

50. Lipson, E. D. 1987. Blue light responses of *Phycomyces* sporangiophores. In: From Photophysics to Photobiology (A. Favre, R. Tyrrell, and J. Cadet, eds.), Elsevier, Amsterdam, pp. 191-201.

51. Cerdá-Olmedo, E. and Lipson, E. D., eds. 1987. *Phycomyces*. Cold Spring Harbor Laboratory, New York (430 pages).

52. Galland, P. and Lipson, E. D. 1987. Light physiology of *Phycomyces* sporangiophores. In: *Phycomyces* (E. Cerdá-Olmedo and E. D. Lipson, editors) Cold Spring Harbor Laboratory, New York, pp. 49-92.

53. Cerdá-Olmedo, E. and Lipson, E. D. 1987. A biography of *Phycomyces*. In: *Phycomyces* (E. Cerdá-Olmedo and E. D. Lipson, editors) Cold Spring Harbor Laboratory, New York, pp. 7-26.

54. Lipson, E. D. and Galland, P. 1987. Measurement of *Phycomyces* light responses. In: *Phycomyces* (E. Cerdá-Olmedo and E. D. Lipson, editors) Cold Spring Harbor Laboratory, New York, pp. 367-373.

55. Galland, P. and Lipson, E. D. 1987. Light calibrations and radiometric units. In: *Phycomyces* (E. Cerdá-Olmedo and E. D. Lipson, editors) Cold Spring Harbor Laboratory, New York, pp. 375-380.

56. Trad, C. H. and Lipson, E. D. 1987. Biphasic fluence-response curves and derived action spectra for light-induced absorbance changes in *Phycomyces* mycelium. J. Photochem. Photobiol., B:Biology 1:169-180.

57. Lipson, E. D. 1987. Blue light responses of *Phycomyces*. In: Phytochrome and Photoregulation in Plants (M. Furuya, ed.), Academic Press, pp. 305-314.

58. Senger, H. and Lipson, E. D. 1987. Problems and prospects of blue and ultraviolet light effects. In: Phytochrome and Photoregulation in Plants (M. Furuya, ed.), Academic Press, pp. 315-331.

59. Trad, C. H., Horwitz, B., and Lipson, E. D. 1988. Light-induced absorbance changes in extracts of *Phycomyces* sporangiophores: Modifications in night-blind mutants. J. Photochem. Photobiol., B:Biology 1:305-313.

60. Lipson, E. D. and Pratap, P. 1988. System analysis of *Phycomyces* light-growth response with Gaussian white-noise and sum-of-sinusoids test stimuli. Ann. Biomed. Eng. 16:95-109.

61. Corrochano, L. M., Galland, P., Lipson, E. D., and Cerdá-Olmedo, E. 1988. Photomorphogenesis in *Phycomyces*: fluence-response curves and action spectra. Planta 174:315-320.

62. Palit, A., Pratap, P., and Lipson, E. D. 1989. System analysis of *Phycomyces* light-growth response: *madC*, *madG*, and *madH* mutants. Biophys. J. 55:519-526.

63. Alvarez, M. I., Eslava, A. P., and Lipson, E. D. 1989. Phototropism mutants of *Phycomyces blakesleeanus* isolated at low light intensity. Exp. Mycol. 13:38-48.

64. Galland, P., Corrochano, L. M., and Lipson, E. D. 1989. Subliminal light control of dark adaptation kinetics in *Phycomyces* phototropism. Photochem. Photobiol. 49:485-491.

65. Galland, P., Orejas, M., and Lipson, E. D. 1989. Light-controlled adaptation kinetics in *Phycomyces*: evidence for a novel yellow-light absorbing pigment. Photochem. Photobiol. 49:493-499.

66. Palit, A., Galland, P., and Lipson, E. D. 1989. High- and low-intensity photosystems in *Phycomyces* phototropism: effects of mutations in genes *madA*, *madB*, and *madC*. Planta 177:547-553.

67. Palit, A. and Lipson, E. D. 1989. System analysis of *Phycomyces* light-growth response in single and double night-blind mutants. Biol. Cybern. 60:385-393.

68. Trad, C. H. and Lipson, E. D. 1989. Electrophoretic analysis of proteins from *Phycomyces* mutants with abnormal tropisms. Biochem. Genet. 5/6:355-365.

69. Ensminger, P. A., Chen, X., and Lipson, E. D. 1990. Action spectra for photogravitropism of *Phycomyces* wild type and three behavioral mutants (L150, L152, and L154). Photochem. Photobiol. 51:681-687.

70. Bejarano, E. R., Avalos, J., Lipson, E. D., and Cerdá-Olmedo, E. 1990. Photoinduced accumulation of carotene in *Phycomyces*. Planta 183:1-9.

71. Ensminger, P. A., Schaefer, H. R., and Lipson, E. D. 1991. Action spectra of *Phycomyces* light-growth response. Planta 184:498-505.

72. Ensminger, P. A. and Lipson, E. D. 1991. Action spectra of the light-growth response in three behavioral mutants of *Phycomyces*. Planta 184:506-509.

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