

BRUCE PATTERSON
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Education

University of Ohio, Athens	B.S.	1982	Botany
University of California, S.F.	Ph.D.	1989	Biochemistry/Biophysics

Professional Experience

7/82 - 6/89	Graduate Student , University of California, San Francisco
7/89 - 8/94	Postdoctoral Assistant , Stanford University, California
8/94 - 12/99	Assistant Professor , University of Arizona, Tucson, Arizona
1/00 - 7/04	Assistant Research Professor , University of Arizona, Tucson
8/04 - 7/05	Lecturer , University of Arizona, Tucson
7/05 - 5/14	Director, Introductory Biology Labs , University of Arizona, Tucson
6/14 - 5/15	Senior Lecturer , U. of AZ, Tucson
7/15 - 1/17	Lecturer , Princeton University
7/17-present	Tutor , Wyzant Tutoring (400+ hours; AP Biology; college biology & genetics)

Honors and Awards

9/82	National Science Foundation Fellowship
9/85	UCSF Chancellor's Fellowship
7/89-6/92	Damon Runyon/Walter Winchell Cancer Fund Fellow
7/92-6/95	NIH Fellow
1/95 - 12/95	Small Grants, Univ. of Arizona,
1/95 - 12/95	ACS Inst. Res. Grant, 110S,
7/95 - 12/96	Am. Heart/AZ Affiliate, AZBG-19-95,
2/96 - 01/98	March of Dimes, Basil O'Connor, 5-FY95-1124,
8/96 - 07/00	NIH, R01 GM55977
8/1/01-8/31/02	University of Arizona New Learning Environment grant

Courses Taught

University of Arizona 1995-2015

MCB396B Lab Preceptor training

MCB492 Independent Undergraduate Research

MCB497A Undergraduate Lab Instructor preparation

MCB184 The Secrets of Life (introductory biology; 150-200 students, taught 4 times)

MCB181L, ECOL182L Introductory Biology Labs (Director, lab design, manual author, hiring, instructor preparation; directed 181L 10 years; 182L 5 years)

MCB184, Introductory Biology (combined lab + lecture; 100% responsibility)

MCB325, Genetics (20 students; taught 1 time)

MCB545, Genetics (Graduate) (15-35 students, 3 times @ 33% responsibility, coordinated 1 time)

MCB422, Problem Solving with Genetic Tools (10-20 students, ~10 times @ 100%)

MCB411, Molecular Biology (100-150 students ~7 times @ 50 or 100%)

ECOL320, Genetics (2 times @33%)

I have also participated briefly in MCB410 (Cell Biology) and taught a summer course in Genetics for High School Biology Teachers.

Princeton University 2015-2016

MOL350, Core Lab (upper division 'authentic' research experience) 2 semesters

MOL214 Introductory Biology (responsible for precepts; teach 6 of the weekly 1-hour sections)

Courses Created

University of Arizona 1995-2015

MCB184, The Secrets of Life: Combined lab/lecture introductory biology course

MCB181L and **ECOL182L**: the two Introductory Biology lab semesters; extensively modified

MCB325: Small upper division general genetics course with emphasis on problem-based learning

MCB422, Problem Solving with Genetic Tools: Computer-simulated laboratory. Solving problems via genetic experiments in phage, yeast, and Mendelian genetic systems. Individual and team projects require deduction and discovery of genotype, pathway, and genetic phenomena through crosses and phenotypic observation (also offered at University of Georgia by an ex-student)

Princeton University 2015-2016

MOL350, Core Lab: Completely re-designed content, assignments, rubrics (2 times)

MOL214 Introductory Biology: Creating all precept materials used this semester

Software and Websites

Simulations and **explorations** can be viewed and tested from <https://thinkbio.guru>; I programmed all software and most database interaction features. I'm currently converting several exercises to iPad-compatible format.

MCB422 (Problem solving with genetic tools) <http://blc.arizona.edu/courses/mcb422/>

MCB184 (Combined lab/lecture Introductory Biology) <http://blc.arizona.edu/courses/mcb184/>

MCB181L (Introductory Biology Lab) <http://blc.arizona.edu/courses/181Lab/>

TeachBio, a blog on teaching Introductory Biology <https://www.thinkbio.guru/tBioWordPress/>

Secrets of Life, an interactive online biology textbook I am writing

(historical) Website “**Mucking about with mutants of the myosin motor**,” a web site describing the ongoing research of the laboratory in a format designed to be accessible to the general public. Currently at <http://research.biology.arizona.edu/myosin>

Publications

- Guthrie, C., Riedel, N., Parker, R., Swerdlow, H., and Patterson, B. (1986). Genetic analysis of snRNAs and RNA processing in yeast. In **Yeast Cell Biology**, J. Hicks, ed. (New York: Alan R. Liss), pp.301-327.
- Patterson, B., and Guthrie, C. (1987). An essential yeast snRNA with a U5-like domain is required for splicing in vivo. **Cell** 49:613-624.
- Parker, R. and Patterson, B. (1987). Architecture of fungal introns: implications for spliceosomal assembly. In **New Perspectives on the Molecular Biology of RNA**, B. Dudock, ed. (New York: Academic Press), pp.133-149.
- Guthrie, C. and Patterson, B. (1988). Function of spliceosomal snRNAs. **Annual Review of Genetics** 22:387-419.
- Patterson, B. and Guthrie, C. (1990). A U-rich tract enhances usage of an alternative 3' splice site in yeast. **Cell** 64:181-187.
- Patterson, B., Ruppel, K.M. and Spudich, J.A. (1991). Molecular genetic approaches to the cytoskeleton in *Dictyostelium*. **Current Opinion in Genetics and Development** 1:378-382.
- Frank, D., Patterson, B. and Guthrie, C. (1992) "Synthetic lethal mutations identify interactions between U5 snRNA and four proteins required for the second step of splicing." **Molecular and Cellular Biology** 12:5197-5205.
- Springer, M.L., Patterson, B. and Spudich, J.A. (1994) "Stage-specific requirement for myosin II during *Dictyostelium* development." **Development** 120:2651-2660.
- Patterson, B. and Spudich, J.A. (1995) "A Novel positive selection for identifying cold-sensitive myosin II mutants in *Dictyostelium*" **Genetics** 140:505-515.
- Patterson, B. and Spudich, J.A. (1996) "Cold-sensitive mutations of *Dictyostelium* myosin heavy chain highlight functional domains of the myosin motor." **Genetics** 143:801-810.
- Uyeda, T. Q.-P. and Patterson, B. (1997) "Swinging lever arm model of force production by myosin: Testing by site-directed mutant approach and analyses of the mechanism by structural genetics." **Seibutubuturi** ('Biophysics' in Japanese) 209:331-335.
- Patterson, B., Ruppel, K. M., Wu, Y. and Spudich, J. A. (1997) "Cold-sensitive mutants G680V and G691C of *Dictyostelium* myosin II confer dramatically different biochemical defects." **Journal of Biological Chemistry** 272:27612-27617.
- Patterson, B. (1998) "Intragenic suppressors of *Dictyostelium* myosin G680 mutants demarcate discrete structural elements: Implications for conformational states of the motor." **Genetics** 149: 1799-1807.

- Wu, Y., Nejad, M. and Patterson, B. (1999) “*Dictyostelium* myosin II G680V suppressors exhibit overlapping spectra of biochemical phenotypes including facilitated phosphate release.” **Genetics** 153: 107-116.
- Patterson, B. and Uyeda, T. (1999) "Structural Genetics: illuminating structures and movements using intragenic suppressors." **Cell Technology** 18: 1631-1640. (Published in Japanese).
- Patterson, B. (2000). "Genetic techniques for enhancing biochemical and structural characterization of *Dictyostelium* myosin II." **Methods**. 22: 299-306.
- Uyeda, T. Q.-P., Tokuraku, K., Kaseda, K., Webb, M.R. and Patterson, B. (2002) “Evidence for a novel, strongly bound acto-S1 complex carrying ADP and phosphate stabilized in the G680V mutant of *Dictyostelium* myosin II.” **Biochemistry** 41(30): 9525-9534.
- Uyeda, T. Q.-P., Patterson, B., Mendoza, L., and Hiratsuka, Y. (2003) “Amino acids 519-524 of *Dictyostelium* myosin II form a surface loop that aids actin binding by facilitating a conformational change.” **Journal of Muscle Research and Cell Motility** 23:685-95.