

Jennifer Franzen Kugel, Ph.D.

Department of Biochemistry
University of Colorado, Boulder
596 UCB
Boulder, CO 80309

jennifer.kugel@colorado.edu
Office Phone: (303) 492-3596

Educational Background and Academic Positions

Aug. 1992 – May 1996	Bachelor of Arts, Summa Cum Laude St. Olaf College, Northfield, MN Major: Chemistry Concentration: Molecular Biology
Aug. 1996 – Jan. 2001	Ph.D. Chemistry Department of Chemistry and Biochemistry University of Colorado, Boulder, CO
June – Aug. 1998	Summer Intern Sangamo BioSciences, Boulder, CO Part of the Graduate Interdisciplinary Biotechnology Program
Feb. 2001 – Dec. 2003	Research Associate Department of Chemistry and Biochemistry University of Colorado, Boulder, CO
Jan. 2004 – April 2006	Senior Research Associate Department of Chemistry and Biochemistry University of Colorado, Boulder, CO
May 2006 – June 2012	Assistant Research Professor Department of Chemistry and Biochemistry University of Colorado, Boulder, CO
July 2012 – present	Associate Research Professor Department of Biochemistry University of Colorado, Boulder, CO
June 2020 – present	Research Professor Department of Biochemistry University of Colorado, Boulder, CO

Publications (chronological order, the underlined DOI will link to the article)

1. Nemecek Marshall, M., MacDonald, M., **Franzen, J.J.**, Wojciechowski, C.L., and Fall, R. (1995) Methanol emission from leaves. *Plant Phys.* 108:1359-1368.
2. Chakravarti, D., Mailander, P., **Franzen, J.**, Higginbotham, S., Cavalieri, E.L., and Rogan, E.G. (1998) Detection of dibenzo[*a,l*]pyrene-induced H-ras codon 61 mutant genes in preneoplasitic SENCAR mouse skin using a new PCR-RFLP method. *Oncogene* 16:3203-3210.
3. **Kugel, J.F.** and Goodrich, J.A. (1998) Promoter escape limits the rate of transcription from the adenovirus major late promoter on negatively supercoiled templates. *Proc. Natl. Acad. Sci. USA*. 95:9232-9237. [pnas.95.16.9232](#)

4. **Kugel, J.F.** and Goodrich, J.A. (2000) A kinetic model for the early steps of RNA synthesis by human RNA polymerase II. *J. Biol. Chem.* 275:40483-40491. [10.1074/jbc.M006401200](https://doi.org/10.1074/jbc.M006401200) (Highlighted in: Valda, V. (2000) First Step to Commitment. *Science*. 289:2243.)
5. Ferguson, H.A., **Kugel, J.F.**, and Goodrich, J.A. (2001) Kinetic and mechanistic analysis of the RNA polymerase II transcription reaction at the human interleukin-2 promoter. *J. Mol. Biol.* 314:993-1006. [10.1006/jmbi.2000.5215](https://doi.org/10.1006/jmbi.2000.5215)
6. **Kugel, J.F.** and Goodrich, J.A. (2002) Translocation after synthesis of a four nucleotide RNA commits RNA polymerase II to promoter escape. *Mol. Cell. Biol.* 22:762-773. [10.1128/MCB.22.3.762-773.2002](https://doi.org/10.1128/MCB.22.3.762-773.2002)
7. **Kugel, J.F.** and Goodrich, J.A. (2003) In vitro studies of the early steps of RNA synthesis by human RNA polymerase II. *Meth. Enzymol.* 370:687-701. [10.1016/S0076-6879](https://doi.org/10.1016/S0076-6879)
8. Allen, T.A., Von Kaenel, S., Goodrich, J.A., and **Kugel, J.F.** (2004) The SINE encoded mouse B2 RNA represses mRNA transcription in response to heat shock. *Nat. Struct. Mol. Biol.* 11: 816-821. [10.1038/nsmb813](https://doi.org/10.1038/nsmb813)
9. Espinoza, C.A., Allen, T.A., Hieb, A. R., **Kugel, J.F.**, and Goodrich, J.A. (2004) B2 RNA binds directly to RNA polymerase II to repress transcript synthesis. *Nat. Struct. Mol. Biol.* 11: 822-829. [10.1038/nsmb812](https://doi.org/10.1038/nsmb812)
(References 8 and 9, which were published back-to-back were: Cover articles; Highlighted in News and Views: Wassarman, KM (2004) RNA regulators of transcription. *Nat. Struct. Mol. Biol.* 11:803-804.; and Highlighted in: Heinrichs, A. (2004) A non-starter. *Nat. Rev. Mol. Cell Biol.* 5:682.)
10. Weaver, J.R., **Kugel, J.F.**, Goodrich, J.A. (2005) The sequence at specific positions in the early transcribed region sets the rate of transcript synthesis by RNA polymerase II in vitro. *J. Biol. Chem.* 280: 39860-39869. [10.1074/jbc.M509376200](https://doi.org/10.1074/jbc.M509376200)
11. Hieb, A.R., Baran, S., Goodrich, J.A., and **Kugel, J.F.** (2006) An 8 nt RNA triggers a rate-limiting shift of RNA polymerase II complexes into elongation. *EMBO J.* 25: 3100-3109. [10.1038/sj.emboj.7601197](https://doi.org/10.1038/sj.emboj.7601197)
12. **Kugel, J.F.** and Goodrich, J.A. (2006) Beating the heat: A translation factor and an RNA mobilize the heat shock transcription factor HSF1. *Mol. Cell* 22:153-154. [10.1016/j.molcel.2006.04.003](https://doi.org/10.1016/j.molcel.2006.04.003)
13. Goodrich, J.A. and **Kugel, J.F.** (2006) Non-coding RNA regulators of RNA polymerase II transcription. *Nat. Rev. Mol. Cell Biol.* 87: 612-616. [10.1038/nrm1946](https://doi.org/10.1038/nrm1946)
14. Goodrich, J.A. and **Kugel, J.F.** (2007) Binding and Kinetics for Molecular Biologists. Cold Spring Harbor Laboratory Press. Cold Spring Harbor, NY. 182 pages.
15. **Kugel, J.F.** and Goodrich, J.A. (2007) An RNA transcriptional regulator templates its own regulatory RNA. *Nat. Chem. Biol.* 3: 89-90. [10.1038/nchembio0207-89](https://doi.org/10.1038/nchembio0207-89)
16. Espinoza, C.A., Goodrich, J.A., and **Kugel, J.F.** (2007) Characterization of the structure, function and mechanism of B2 RNA, an ncRNA repressor of RNA polymerase II transcription. *RNA* 13: 783-596. [10.1261/rna.310307](https://doi.org/10.1261/rna.310307)
17. Weaver, J.R., Good, K., Walters, R.D., **Kugel, J.F.**, and Goodrich, J.A. (2007) Characterization of the sequence and architectural constraints of the regulatory and core regions of the human interleukin-2 promoter. *Mol. Immunol.* 44: 2813-2819. [10.1016/j.molimm.2007.01.027](https://doi.org/10.1016/j.molimm.2007.01.027)

18. Hieb, A.R., Halsey, W.A., Betterton, M., Perkins, T., **Kugel, J.F.**, and Goodrich, J.A. (2007) TFIIA changes the conformation of the DNA in TBP/TATA complexes and increases their kinetic stability. *J. Mol. Biol.* 372: 619-632. [10.1016/j.jmb.2007.06.061](https://doi.org/10.1016/j.jmb.2007.06.061)
19. Wager, S.D., **Kugel, J.F.**, and Goodrich, J.A. (2008) The role of non-coding RNAs in controlling mammalian RNA polymerase II transcription. Chapter 9 in RNA and the Regulation of Gene Expression, Editor K. Morris, Horizon Scientific Press, Norwich, UK.
20. Mariner, P.D., Walters, R.D., Espinoza, C.A., Drullinger, L.F., Wagner, S.D., **Kugel, J.F.**, and Goodrich, J.A. (2008) Human Alu RNA is a modular transacting repressor of mRNA transcription during heat shock. *Mol. Cell* 29: 499-509. [10.1016/j.molcel.2007.12.013](https://doi.org/10.1016/j.molcel.2007.12.013)
(Highlighted in: Shamovsky, I and Nudler, E. (2008) Modular RNA heats up. *Mol. Cell* 29:415-417.)
21. **Kugel, J.F.** (2008) Using FRET to measure the angle at which a protein bends DNA. *Biochem. Mol. Biol. Educ.* 36: 341-346. [10.1002/bmb.20202](https://doi.org/10.1002/bmb.20202)
22. Goodrich, J.A. and **Kugel, J.F.** (2009) From bacteria to humans, chromatin to elongation, and activation to repression: the expanding roles of noncoding RNAs in regulating transcription. *Crit. Rev. Biochem. Mol. Biol.* 44: 3-15. [10.1080/10409230802593995](https://doi.org/10.1080/10409230802593995)
23. Gilman, B., Drullinger, L.F., **Kugel, J.F.**, and Goodrich, J.A. (2009) TATA-binding protein and transcription factor IIB induce transcript slipping during early transcription by RNA polymerase II. *J. Biol. Chem.* 284: 9093-9098. [10.1074/jbc.M900019200](https://doi.org/10.1074/jbc.M900019200)
24. Yakovchuk, P., Goodrich, J.A., and **Kugel, J.F.** (2009) B2 RNA and Alu RNA repress transcription by disrupting contacts between RNA polymerase II and promoter DNA within assembled complexes. *Proc. Natl. Acad. Sci. USA.* 106: 5569-5574. [10.1073/pnas.0810738106](https://doi.org/10.1073/pnas.0810738106)
25. **Kugel, J.F.** and Goodrich, J.A. (2009) In new company: U1 snRNA associates with TAF15. *EMBO rep.* 10: 454-456. [10.1038/embor.2009.65](https://doi.org/10.1038/embor.2009.65)
26. Walters, R.D., **Kugel, J.F.**, and Goodrich, J.A. (2009) InvAluable junk: the cellular impact and function of Alu and B2 RNAs. *IUBMB Life.* 61: 831-837. [10.1002/iub.227](https://doi.org/10.1002/iub.227)
27. Wagner, S.D., **Kugel, J.F.**, and Goodrich, J.A. (2010) TFIIIF facilitates dissociation of RNA polymerase II from non-coding RNAs that lack a repression domain. *Mol. Cell. Biol.* 30: 91-97. [10.1128/MCB.01115-09](https://doi.org/10.1128/MCB.01115-09)
28. Yakovchuk, P., Gilman, B., Goodrich, J.A., and **Kugel, J.F.** (2010) RNA polymerase II and TAFs undergo a slow isomerization after the polymerase is recruited to promoter-bound TFIID. *J. Mol. Biol.* 397: 57-68. [10.1016/j.jmb.2010.01.025](https://doi.org/10.1016/j.jmb.2010.01.025)
29. Ponicsan, S.L., **Kugel, J.F.**, and Goodrich, J.A. (2010) Genomic gems: SINE RNAs regulate mRNA production. *Curr. Opin. Gen. Dev.* 20: 149-155. [10.1016/j.gde.2010.01.004](https://doi.org/10.1016/j.gde.2010.01.004)
30. Goodrich, J.A. and **Kugel, J.F.** (2010) Dampening DNA binding: A common mechanism of transcriptional repression for both ncRNAs and protein domains. *RNA Biol.* 7:305-309. [10.4161/rna.7.3.11910](https://doi.org/10.4161/rna.7.3.11910)
31. Goodrich, J.A. and **Kugel, J.F.** (2010) Genome-wide insights into eukaryotic transcriptional control. *Genome Biol.* 11:305. [10.1186/gb-2010-11-6-305](https://doi.org/10.1186/gb-2010-11-6-305)
32. Nguyen, T.N., Kim, L.J., Walters, R.D., Drullinger, L.F., Lively, T.N., **Kugel, J.F.**, and Goodrich, J.A. (2010) The C-terminal region of human NFATc2 binds cJun to

- synergistically activate interleukin-2 transcription. *Mol Immunol.* 47: 2314-2322. [10.1016/j.molimm.2010.05.287](https://doi.org/10.1016/j.molimm.2010.05.287)
33. Yakovchuk, P., Goodrich J.A., and **Kugel, J.F.** (2011) B2 RNA represses TFIIH phosphorylation of RNA polymerase II. *Transcription.* 2:45-49. [10.4161/trns.2.1.14306](https://doi.org/10.4161/trns.2.1.14306)
 34. Titov, D.V., Gilman, B., He, Q.-L., Bhat, S., Low, W.-K., Dang, Y., Smeaton, M., Demain, A.J., Miller, P.S., **Kugel, J.F.**, Goodrich, J.A., Liu, J.O. (2011). XPB, a subunit of TFIIH, is a target of the natural product triptolide. *Nat. Chem. Biol.* 7:182-188. [10.1038/nchembio.522](https://doi.org/10.1038/nchembio.522)
 35. Kaneko, H., Dridi, S., Tarallo, V., Fowler, B.J., Gelfand, B.D., Cho, W.G., Kleinman, M.E., Ponicsan, S.L., Hauswirth, W.H., Chiodo, V.A., Karikó, K., Yoo, J.W., Lee, D.-K., Hadziahmetovic, M., Song, Y., Chaudhuri, G., Buaas, F.W., Braun, R.E., Hinton, D.R., Zhang, Q., Grossniklaus, H.E., Provis, J.M., Madigan, M.C., Milam, A.H., Justice, N.L., Albuquerque, R.J.C., Blandford, A.D., Bogdanovich, S., Hirano, Y., Witta, J., Fuchs, E., Littman, D.R., Ambati, B.K., Rudin, C.M., Chong, M.M.W., Provost, P., **Kugel, J.F.**, Goodrich, J.A., Dunajef, J.L., Baffi, J.Z., Ambati, J. (2011). DICER1 dysregulation induces cytotoxic Alu RNA accumulation in age-related macular degeneration. *Nature.* 471:325-330. [10.1038/nature09830](https://doi.org/10.1038/nature09830)
 36. **Kugel, J.F.** and Goodrich, J.A. (2012) Non-coding RNAs: key regulators of mammalian transcription. *Trends in Biochem. Sci.* 37:144-151. [10.1016/j.tibs.2011.12.003](https://doi.org/10.1016/j.tibs.2011.12.003)
 37. Tarallo, V., Hirano, Y., Gelfand, B.D., Dridi, S., Kerur, N., Kim, Y., Cho, W.G., Kaneko, H., Fowler, B.J., Bogdanovich, S., Albuquerque, R.J.C., Hauswirth, W.W., Chiodo, V.A., **Kugel, J.F.**, Goodrich, J.A., Ponicsan, S.L., Chaudhuri, G., Murphy, M.P., Dunajef, J., Ambati, B.K., Ogura, Y., Yoo, J.W., Lee, D.K., Provost, P., Hinton, D.R., Núñez, G., Baffi, J., Kleinman, M.E., and Ambati, J. (2012) DICER1 loss and Alu RNA induce age-related macular degeneration via the NLRP3 inflammasome and MyD88. *Cell* 149:847-859. [10.1016/j.cell.2012.03.036](https://doi.org/10.1016/j.cell.2012.03.036)
 38. Dridi, S., Hirano, Y., Tarallo, V., Kim, Y., Fowler, B.J., Ambati, B.K., Bogdanovich, S., Chiodo, V.A., Hauswirth, W.W., **Kugel, J.F.**, Goodrich, J.A., Ponicsan, S.L., Hinton, D.R., Kleinman, M.E., Baffi, J., Gelfand, B.D., and Ambati, J. (2012) ERK1/2 activation is a therapeutic target in age-related macular degeneration. *Proc. Natl. Acad. Sci. USA.* 109:13781-13786. [10.1073/pnas.1206494109](https://doi.org/10.1073/pnas.1206494109)
 39. Blair, R.H., Goodrich, J.A., and **Kugel, J.F.** (2012) Single-molecule fluorescence resonance energy transfer shows uniformity in TATA binding protein-induced DNA bending and heterogeneity in bending kinetics. *Biochemistry* 51:7444-7455. [10.1021/bi300491j](https://doi.org/10.1021/bi300491j)
 40. Heffler M.A., Walters, R.D., and **Kugel, J.F.** (2012) Using electrophoretic mobility shift assays to measure equilibrium dissociation constants: GAL4-p53 binding DNA as a model system. *Biochem. Mol. Biol. Educ.* 40:383-387. [10.1002/bmb.20649](https://doi.org/10.1002/bmb.20649)
 41. **Kugel, J.F.** and Goodrich J.A. (2013). The regulation of mammalian mRNA transcription by long non-coding RNAs: Recent discoveries and current concepts. *Epigenomics.* 5:95-102. [10.2217/epi.12.69](https://doi.org/10.2217/epi.12.69)
 42. Blair, R.H., Goodrich, J.A., and **Kugel, J.F.** (2013) Using FRET to monitor protein-induced DNA bending: the TBP-TATA complex as a model system. *Meth. Mol. Biol.* 977:203-215. [10.1021/bi300491j](https://doi.org/10.1021/bi300491j)

43. Wagner, S.D., Yakovchuk, P., Gilman, B., Ponicsan, S.L., Drullinger, L.F., **Kugel, J.F.**, and Goodrich, J.A. (2013) Mammalian RNA polymerase II acts as an RNA-dependent RNA polymerase to extend and destabilize a non-coding RNA. *EMBO J.* 32:781-90. [10.1038/emboj.2013.18](https://doi.org/10.1038/emboj.2013.18)
44. Ponicsan, S.L., Houel, S., Old, W.M., Ahn, N.G., Goodrich, J.A., **Kugel, J.F.** (2013) The non-coding B2 RNA binds to the DNA cleft and active site region of RNA polymerase II. *J. Mol. Biol.* 425:3625-3638. [10.1016/j.jmb.2013.01.035](https://doi.org/10.1016/j.jmb.2013.01.035)
45. Walters, R.D., Drullinger, L.F., **Kugel, J.F.**, and Goodrich J.A. (2013) NFATc2 recruits cJun homodimers to an NFAT site to synergistically activate interleukin-2 transcription. *Mol. Immunol.* 46:48-56. [10.1016/j.molimm.2013.03.022](https://doi.org/10.1016/j.molimm.2013.03.022)
46. Horn, A.E., Goodrich, J.A., and **Kugel, J.F.** (2014) Single molecule studies of RNA polymerase II transcription in vitro. *Transcription.* 5:e27608. [10.4161/trns.27608](https://doi.org/10.4161/trns.27608)
47. Walters, R.D., McSwiggen, D.T, Goodrich, J.A., and **Kugel, J.F.** (2014) Selection and characterization of a DNA aptamer that can discriminate between cJun/cJun and cJun/cFos. *PLOS ONE.* 9:e101015. [10.1371/journal.pone.0101015](https://doi.org/10.1371/journal.pone.0101015)
48. Cardiello, J.F., **Kugel, J.F.**, and Goodrich, J.A. (2014) A new twist on cell growth control. *Cell Cycle.* 13:3474-3475. [10.4161/15384101.2014.980702](https://doi.org/10.4161/15384101.2014.980702)
49. Goodrich, J.A., and **Kugel, J.F.** (2015) Studying the affinity, kinetic stability, and specificity of RNA/protein interactions: SINE ncRNA/Pol II complexes as a model system. *Meth. Mol. Biol.* 1206:165-178. [10.1007/978-1-4939-1369-5_15](https://doi.org/10.1007/978-1-4939-1369-5_15)
50. Ponicsan, S.L., **Kugel, J.F.**, and Goodrich, J.A. (2015) Repression of RNA Polymerase II Transcription by B2 RNA Depends on a Specific Pattern of Structural Regions in the RNA. *Non-coding RNA.* 1:4-16. [10.3390/ncrna1010004](https://doi.org/10.3390/ncrna1010004)
51. Pazhani, Y., Horn, A.E., Grado, L., and **Kugel, J.F.** (2016) Evaluating the relationship between FRET changes and distance changes using DNA length and restriction enzyme specificity. *J. Chem. Edu.* 93:383-386. [10.1021/acs.jchemed.5b00440](https://doi.org/10.1021/acs.jchemed.5b00440)
52. Abrisch, R.G., Eidem, T.M., Yakovchuk, P., **Kugel, J.F.**, and Goodrich, J.A. (2016) Infection by Herpes Simplex Virus Type-I causes near-complete loss of RNA polymerase II occupancy on the host cell genome. *J. Virol.* 90:2503-2513. [10.1128/JVI.02665-15](https://doi.org/10.1128/JVI.02665-15)
53. Eidem, T.M., **Kugel, J.F.**, and Goodrich, J.A. (2016) Noncoding RNAs: Regulators of the mammalian transcription machinery. *J. Mol. Biol.* 428:2652-2659. [10.1016/j.jmb.2016.02.019](https://doi.org/10.1016/j.jmb.2016.02.019)
54. Horn, A.E., **Kugel, J.F.**, Goodrich, J.A. (2016) Single molecule microscopy reveals mechanistic insight into RNA polymerase II preinitiation complex assembly and transcriptional activity. *Nucl. Acids Res.* 44:7132-43. [10.1093/nar/gkw321](https://doi.org/10.1093/nar/gkw321)
55. Blair, R.H., Horn, A.E., Pazhani, Y., Grado, L., Goodrich, J.A., and **Kugel, J.F.** (2016) The HMGB1 C-Terminal Tail Regulates DNA Bending. *J. Mol. Biol.* 428:4060-4072. [10.1016/j.jmb.2016.08.018](https://doi.org/10.1016/j.jmb.2016.08.018)
56. **Kugel, J.F.** and Goodrich, J.A. (2017) Finding the start site: redefining the human initiator element. *Genes Dev.* 31:1-2. [10.1101/gad.295980.117](https://doi.org/10.1101/gad.295980.117)
57. Cardiello, J.F., Goodrich, J.A., and **Kugel, J.F.** (2018) Heat shock causes a reversible increase in RNA polymerase II occupancy downstream of mRNA genes, consistent with a global loss in transcriptional termination. *Mol. Cell. Biol.* 38:e00181-18. [10.1128/MCB](https://doi.org/10.1128/MCB)

58. Ly, E., Goodrich, J.A., and **Kugel, J.F.** (2019) Monitoring transcriptional activity by RNA polymerase II in vitro using single molecule co-localization. *Methods*. S1046-2023(18):30302-5 [10.1016/jymeth.2019.03.006](https://doi.org/10.1016/jymeth.2019.03.006).
59. Greene, E., Flees, J., Dhamad, A., Alrubaye, A., Hennigan, S., Pleimann, J., Smeltzer, M., Murray, S., **Kugel, J.F.**, Goodrich, J., Robertson, A., Wideman, R., Rhoads, D., and Dridi, S. (2019) Double-stranded RNA is a novel molecular target in osteomyelitis pathogenesis. *Am. J. Pathol.* 189:2077-2089. [10.1016/j.ajpath.2019.06.013](https://doi.org/10.1016/j.ajpath.2019.06.013).
60. Ly, E., Powell, A.E., Goodrich, J.A., and **Kugel, J.F.** (2020) Release of human TFIIB from actively transcribing complexes is triggered upon synthesis of 7 nt and 9 nt RNAs. *J. Mol. Biol.* 432: 4049-4060. [10.1016/j.jmb.2020.05.005](https://doi.org/10.1016/j.jmb.2020.05.005)
61. Ly, E., **Kugel, J.F.**, and Goodrich, J.A. (2020) Single molecule studies reveal that p53 tetramers dynamically bind response elements containing one or two half sites. *Sci. Rep.* 10:16176. [10.1038/s41598-020-73234-6](https://doi.org/10.1038/s41598-020-73234-6)
62. Salant, G.M., Tat, K.L., Goodrich, J.A., and **Kugel, J.F.** (2020) miR-206 knockout shows it is critical for myogenesis and directly regulates newly identified target mRNAs. *RNA Biol.* 7: 956-965. [10.1080/15476286.2020.1737443](https://doi.org/10.1080/15476286.2020.1737443)
63. Rivas, T., Goodrich, J.A., and **Kugel, J.F.** (2021) The herpes simplex virus 1 protein ICP4 acts as both an activator and repressor of host genome transcription during infection. *Mol. Cell. Biol.* 24:e0017121. [10.1128/MCB.00171-21](https://doi.org/10.1128/MCB.00171-21)
64. Voong C.K., Goodrich, J.A., and **Kugel, J.F.** (2021) Interactions of HMGB proteins with the genome and the impact on disease. *Biomolecules*. 11:1451. [10.3390/biom11101451](https://doi.org/10.3390/biom11101451)
65. Bosire, R., Fadel, L., Mocsár, G., Nánási, P., Sen, P., Sharma, A.K., Naseem, M.U., Kovács, A., **Kugel, J.**, Kroemer, G., Vámosi, G., and Szabó, G. (2022) Doxorubicin impacts the chromatin binding of HMGB1, Histone H1 and retinoic acid receptor. *Sci Rep.* [10.1038/s41598-022-11994-z](https://doi.org/10.1038/s41598-022-11994-z)
66. Singh, A., Miller, R.C., Archuleta, S.R., and **Kugel, J.F.** (2023) Evaluating two steps in transcription using a fluorescence-based electrophoretic mobility shift assay. *Biochem. Mol. Biol. Educ.* 51:230-235. [10.1002/bmb.21708](https://doi.org/10.1002/bmb.21708)
67. Scott, A.K., Casas, E., Schneider, S.E., Swearingen, A.R., Van Den Elzen, C.L., Seelbinder, B., Barthold, J.E., **Kugel, J.F.**, Stern, J.L., Foster, K.J., Emery, N.C., Brumbaugh, J., Neu, C.P. (2023) Mechanical memory stored through epigenetic remodeling reduces cell therapeutic potential. *Biophys. J.* 122:1428-1444. [10.1016/j.bpj.2023.03.004](https://doi.org/10.1016/j.bpj.2023.03.004)
68. Suwita, J.P., Voong, C.K., Ly, E., Goodrich, J.A., and **Kugel, J.F.** (2023) Single molecule studies characterize the kinetic mechanism of tetrameric p53 binding to different native response elements. *PLoS One*. 18:e0286193. [10.1371/journal.pone.0286193](https://doi.org/10.1371/journal.pone.0286193)
69. Miller, G.M., Brant, T.S., Goodrich, J.A., and **Kugel, J.F.** (2023) Short-term exposure to ethanol induces transcriptional changes in nontumorigenic breast cells. *FEBS Open Bio*. 13:1941-1952. [10.1002/2211-5463.13693](https://doi.org/10.1002/2211-5463.13693)

Current Research Support

Awarding agency: NSF

Grant number: MCB 2242824

Principal Investigator: Jennifer F. Kugel

Co-PI: James A. Goodrich

Title: Investigating mechanisms of RNA polymerase II transcription and regulation using single molecule fluorescence

Awarding agency: NIH

Grant number: R01 GM148613

Principal Investigator: Jennifer F. Kugel

Co-I: James A. Goodrich

Title: Unraveling the biological roles of specific miRNAs, from experimental target identification through functional characterization

Classroom Teaching

Ongoing

Advanced Topics in Signal Transduction and Cell Cycle Regulation
BCHM 5801, University of Colorado at Boulder
Guest Lecturer

Ongoing

Biochemistry Laboratory
BCHM 4761, University of Colorado at Boulder
Design and teach novel experimental modules

Mentoring/Non-classroom teaching

Ongoing

Advisor for Ph.D. students (19); undergraduate researchers (36); post-doctoral researchers (8); professional research assistants (14)

Select Professional Service

Ongoing

Reviewer for NSF and NIH grant applications

Ongoing

Reviewer for research manuscripts submitted to >25 different journals

Select Outreach

Ongoing

Member of FabFems. An online resource for connecting girls with female mentors that work in STEM fields.

Ongoing

Participate in a career days and one-on-one mentoring for middle school and high school students interested in biomedical research and careers.