CHEMICAL HERITAGE FOUNDATION

JAMES A. GOODRICH

The Pew Scholars Program in the Biomedical Sciences

Transcript of an Interview
Conducted by

Robin Mejia

at

University of Colorado, Boulder
Boulder, Colorado

on

15, 16, and 17 August 2006

From the Original Collection of the University of California, Los Angeles

James A. Goodrich

ACKNOWLEDGEMENT

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JAMES A. GOODRICH

Born in Montrose, Pennsylvania

Education

1985	B.S., Biochemistry, University of Scranton
1991	Ph.D., Biological Sciences, Carnegie Mellon University

Professional Experience

University of California, Berkeley

1992-1996	Postdoctoral Fellow, Department of Molecular and Cell Biology, with Dr. Robert Tjian

University of Colorado, Boulder

1996-2002	Assistant Professor, Department of Chemistry and Biochemistry
2002- 2006	Associate Professor, Department of Chemistry and Biochemistry
2006-present	Professor, Department of Chemistry and Biochemistry

Cold Spring Harbor Laboratory

1998-2001	Instructor, Eukaryotic Gene Expression Course (Summer)

Honors

1992-1994	Damon Runyon Walter Winchell Postdoctoral Fellow
1995-1998	Leukemia Society of America Special Fellow
1998	University of Colorado Junior Faculty Development Award
1998	Outstanding Professor of 1998 - Mortar Board National Honor Society
1999-2003	Pew Scholar in Biomedical Sciences
2000	Runner up for the 2000 SOAR Teacher Recognition Award
2004	Sabbatical
2007	New Inventor of the Year, University of Colorado

Select Publications

Goodrich, J.A., Schwartz, M.L., and McClure, W.R. (1990). Searching for and predicting the activity of sites for DNA binding proteins: compilation and analysis of the binding sites for Escherichia coli integration host factor (IHF). *Nucleic Acids Res.* 18: 4993-5000.

Goodrich, J.A. and McClure, W.R. (1992). Regulation of open complex formation at the Escherichia coli galactose operon promoters. *J. Mol. Biol.* 224: 15-29.
Goodrich, J.A., Hoey, T., Thut, C.J., Admon, A., and Tjian, R. (1993). Drosophila TAFII40 interacts with both a VP 16 activation domain and the basal transcription factor TFIIB. *Cell* 75: 5 19-530.
Goodrich, J.A. and Tjian, R. (1994). Transcription factors IIE and IIH and ATP hydrolysis direct promoter clearance by RNA polymerase II. *Cell* 77: 145-156.
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.* 95: 9232-9237.
Galasinski, S.K., Lively, T.N., Grebe de Barron, A., and Goodrich, J.A. (2000). Acetyl coenzyme A stimulates RNA polymerase II transcription and promoter binding by transcription factor IID in the absence of histones. *Mol. Cell. Biol.* 20: 1923-1930.
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.
Kim, L.J., Seto, A.G., Nguyen, T.N., and Goodrich, J.A. (2001). Human TAFII130 is a coactivator for NFATp. *Mol. Cell. Biol.* 21: 3503-35 13.
Lively, T.N., Ferguson, H.A., Galasinski, S.K., Seto, A.G., and Goodrich, J.A. (2001). c-Jun binds the N-terminus of human TAFII250 to derepress RNA polymerase II transcription in vitro. *J. Biol. Chem.* 276: 25582-25588.
Ferguson, H.A. and Goodrich, J.A. (2001). Expression and purification of recombinant human c-Fos/c-Jun that is highly active in DNA binding and transcriptional activation in vitro. *Nucleic Acids Res.* 29: E98 (6 pages).
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.
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.
Kugel, J.F. and Goodrich, J.A. (2003). In vitro studies of the early steps of RNA synthesis by human RNA polymerase II. *Methods Enzymol.* 370: 687-701.
Lively, T.N., Nguyen, T.N., Galasinski, S.K., and Goodrich, J.A. (2004). The basic leucine zipper domain of cJun functions in transcriptional activation through interaction with the N-terminus of hsTAF1 (human TAFII250). *J. Biol. Chem.* 279: 26257-26265.
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.
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.
Weaver, J.R., Kugel, J.F., and 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.
Nguyen, T.N. and Goodrich, J.A. (2006). Immobilized Protein-Protein Interaction Assays: Eliminating False Positive Interactions Caused by Contaminating Nucleic Acid. *Nature Methods.* 3: 135-139.

Heib, A., Baran, S., Goodrich, J.A., and Kugel, J.F. An 8 nt RNA triggers a rate-limiting shift of RNA polymerase II complexes into elongation. Manuscript submitted.
Goodrich, J.A. and Kugel, J.F. Noncoding RNA regulators of RNA polymerase II transcription. *Nat. Rev. Mol. Cell Biol.* Manuscript submitted.
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.
Hofmann, W.A., Vargas, G.M., Ramchandran, R., Ljuba, S., Goodrich, J.A., and de Lanerolle, P. (2006). Nuclear myosin I is necessary for the formation of the first phosphodiester bond by RNA polymerase II. *J. Cell. Biochem.* 99: 1001-1009.
Goodrich, J.A. and Kugel, J.F. (2006). *Binding and Kinetics for Molecular Biologists.* Cold Spring Harbor Laboratory Press. 182 pages. Computer simulations: http://kinetics.cshl.edu/.
Kugel, J.F. and Goodrich, J.A. (2007). An RNA transcriptional regulator templates its own regulatory RNA. *Nature Chem. Biol.* 3: 89-90.
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: 583-596.
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.

ABSTRACT

James A. Goodrich grew up in Honesdale, Pennsylvania, the oldest of five children. His father owned his own business; his mother was a homemaker. Both parents finished high school but did not go to college, so Goodrich felt no expectations for college himself. From about fifth grade, when he had a genuine science teacher, he gravitated toward science. His junior high school was pod-style, and he lost interest as a result until the reversion to regular classroom style. His sophomore chemistry teacher inspired Goodrich's love of chemistry and established his firm desire to be a scientist. Unusually for such a small town, his high school had excellent science and mathematics classes, including his junior-year organic chemistry class

Not realizing what other options science majors had, Goodrich decided to become a doctor. As a result he applied only to the University of Scranton, a Jesuit university nearby that had a very good reputation for placing its graduates in medical schools. He majored in biochemistry. He also had to work throughout.

He did his doctoral work in Carnegie Mellon's biology department. There he worked on transcription in William McClure's lab. Goodrich here discusses his doctoral research in the McClure molecular biology laboratory; the running of the McClure laboratory; bioinformatics on transcription regulation; his marriage; and the birth of his first daughter.

Next Goodrich accepted a postdoc in Robert Tjian's molecular genetics laboratory at University of California, Berkeley; there his research focused on human transcription. Here he compares McClure's mentoring style with Tjian's; he talks about living in and at Berkeley; and he explains the process of writing journal articles in the Tjian lab. Meanwhile, his wife became a lab technician in Tjian's lab.

After about four years as a postdoc Goodrich accepted a position at University of Colorado, Boulder. He discusses setting up his lab and its makeup; the impact of the Pew Scholars Program in the Biomedical Sciences grant on his work; and his teaching responsibilities. He talks about his current research studying the molecular mechanisms of mammalian transcription; about the University of Colorado, Boulder's facilities; about competition and collaboration in science; tenure; and his administrative duties.

During a recent sabbatical, he spent half of his time writing a training grant; the second half he spent in the lab. He describes the fun he had being at the bench again. He goes on to give his opinions on such issues as the small numbers of minorities in science; decreasing percentage of women in science as they progress from students to faculty members; science education in the schools; patents; funding; and publishing. He talks a little more about his current research in molecular biophysics on regulation of transcription and the practical applications of his research, and about his professional goals. He concludes by explaining how he tries to balance his work life with his life at home with his wife and two daughters.

UCLA INTERVIEW HISTORY

INTERVIEWER:

Robin Mejia, Interviewer, UCLA Oral History Program; B.A., Biology, University of California, Santa Cruz, 1997

TIME AND SETTING OF INTERVIEW:

Place: Goodrich's office at the University of Colorado at Boulder

Date: August 15, 16, and 17, 2006.

Total number of recorded hours: 4.5

Persons present during interview: Mejia and Goodrich

CONDUCT OF INTERVIEW:

This interview is one in a series with Pew Scholars in the Biomedical Sciences conducted by the UCLA Oral History Program in conjunction with the Pew Charitable Trusts' Pew Scholars in the Biomedical Sciences Oral History and Archives Project. The project has been designed to document the backgrounds, education, and research of biomedical scientists awarded four-year Pew scholarships since 1988.

To provide an overall framework for project interviews, the director of the UCLA Oral History Program and three UCLA faculty project consultants developed a topic outline. In preparing for this interview, Mejia corresponded with Goodrich by email and talked by phone to obtain background material, including Goodrich's CV, and to schedule the interview. Mejia also obtained and read copies of Goodrich's published articles, reviewed his descriptions of his work on his website, and reviewed background information on the institutions at which he has was trained and has worked.

ORIGINAL EDITING

Carol Squires edited the interview. She edited for punctuation, paragraphing, and spelling, and verified proper names. Words and phrases inserted by the editor have been bracketed.

Goodrich reviewed the transcript. He verified proper names and made a number of corrections and additions.

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