

CURRICULUM VITAE

1. Name, Position, Academic Department

Albert E. Dahlberg
Professor of Medical Science Emeritus
Department of Molecular and Cell Biology and Biochemistry
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554 Wayland Ave.
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3. Education

Haverford College, Haverford, Pennsylvania, B.S.	1960
University of Chicago School of Medicine, M.D.,	1965
University of Chicago Hospitals, Internship in Pediatrics,	1967
University of Chicago, Department of Biochemistry, Ph.D.,	1968
Thesis advisor: Dr. Eugene Goldwasser	
National Cancer Institute, National Institutes of Health, Postdoctoral Bethesda, Maryland; Laboratory of Dr. Andrew C. Peacock	1967-70
University of Aarhus, Aarhus, Denmark: Postdoctoral Laboratory of Dr. Niels Ole Kjeldgaard	1970-72

4. Professional Appointments

Department of Pediatrics, Intern, University of Chicago Hospitals	1966-67
Research Associate, NCI, NIH, Bethesda, Maryland	1967-70
Postdoctoral Fellow, University of Aarhus, Aarhus, Denmark, Department of Molecular Biology	1970-72
Assistant Professor of Medical Science, Brown University	1972-77
Associate Professor of Medical Science, Brown University	1977-82
Visiting Associate Professor, University of Wisconsin, Madison, WI, Department of Physiological Chemistry	1978-79
Professor of Medical Science, Brown University	1982
Chairman, Biochemistry Section, Brown University	1984-85/1986-87
Visiting Professor, Microbiology Institute, University of Copenhagen, Denmark (summer)	1988
Visiting Professor, Microbiology and Immunology, University of New South Wales, Sydney, Australia (fall)	2006

5. Publications

a) Books

1. The Ribosome: Structure, Function and Evolution, W.E. Hill, A. Dahlberg, R. Garrett, P. Moore, D. Schlessinger, and J. Warner, (eds.), Washington, D.C., American Society for Microbiology (1990)
2. Ribosomal RNA: Structure, Evolution, Processing, and Function in Protein Synthesis, R. Zimmerman and A. Dahlberg (eds.) C.R.C. Press, Boca Raton, FL (1995)

b) Chapters in Books (Since 1990)

1. Tapprich, W.E., H.U. Göringer, E.A. De Stasio, and A.E. Dahlberg (1990) "Site-Directed Mutagenesis of E. coli Ribosomal RNA" In: *Ribosomes and Protein Synthesis: A Practical Approach* (G. Spedding, ed.), Information Retrieval Ltd. Press, London, pp. 253-271.
2. Tapprich, W.E., H.U. Göringer, E.A. De Stasio, C. Prescott, and A.E. Dahlberg (1990) "Studies of Ribosome Function by Mutagenesis of *Escherichia coli* Ribosomal RNA" In: *The*

- Ribosome: Structure, Function and Evolution* (W.E. Hill, A. Dahlberg, R. Garrett, P. Moore, D. Schlessinger, and J. Warner, eds.), ASM Press, Washington, D.C., pp. 236-242.
3. Murgola, E.J., A.E. Dahlberg, K.A. Hijazi, and A.A. Tiedeman (1990) "Ribosomal RNA and Codon Recognition: The rRNA-mRNA Base-Pairing Model of Peptide Chain Termination" In: *The Ribosome: Structure, Function and Evolution* (W.E. Hill, A. Dahlberg, R. Garrett, P. Moore, D. Schlessinger, and J. Warner, eds.), ASM Press, Washington, D.C., pp. 402-407.
 4. Firpo, M.A., and A.E. Dahlberg (1990) "The Role of Ribosomal RNA in the Control of Gene Expression" In: *Post Transcriptional Control of Gene Expression* (J.E.G. McCarthy and M. Tuite, eds.), Springer-Verlag, Berlin, pp. 185-195.
 5. Dahlberg A.E., and R.A. Zimmerman (1992) "Ribosomes" In: *Encyclopedia of Microbiology* (J. Lederberg, ed.) *Academic Press*, San Diego, 573-583.
 6. Lieberman, K.R. and A.E. Dahlberg (1995) "Ribosome Catalyzed Peptide Bond Formation" In: *Progress in Nucleic Acids Research and Molecular Biology*; *Academic Press*, New York; **269**,163-169.
 7. Santer, M. and A.E. Dahlberg (1995) "Ribosomal RNA: An Historical Perspective" in *Ribosomal RNA: Structure, Evolution, Processing, and Function in Protein Synthesis*. R. Zimmermann and A. Dahlberg (Eds.) C.R.C. Press, Boca Raton, FL., 3-20.
 8. O'Connor, M., C. Brunelli, M. Firpo, S. Gregory, K. Lieberman, J.S. Lodmell, H. Moine, D. Van Ryk and A. Dahlberg (1995) "Genetic Probes of Ribosomal RNA Function" in *Frontiers in Translation, Matheson, A., (Ed) Biochem. Cell Biol.* **73**, 859-868.
 9. Gregory, S., C. Brunelli, J.S. Lodmell, M. O'Connor and A. Dahlberg (1998). "Genetic Selection of Ribosomal RNA Mutations" in *Methods in Molecular Biology Series. Protein Synthesis: Methods and Protocols*, R. Martin (ed.) *Humana Press Inc.* Totowa, NJ 271-281.
 10. Gregory, S.T., M. O'Connor and A.E. Dahlberg (1999). "Structural Elements of Ribosomal RNA" in *Comprehensive Natural Products Chemistry: Prebiotic Chemistry, Molecular Fossils, Nucleosides and RNA*, D. Söll, S. Nishimura and P.B. Moore, eds. *Elsevier*, New York 189-204.
 11. O'Connor, M., Bayfield, M., Gregory, S.T., Lee, W-C., Lodmell, J.S., Mankad, A., Thompson, J.R., Vila, A., Squires, C.L. and A.E. Dahlberg (1999). "Probing Ribosomal Structure and Function: Analyses with rRNA and Protein Mutants" in *The Ribosome: Structure, Function, Antibiotics and Cellular Interactions*. R. Garrett and S. Douthwaite, A. Liljas, A. Matheson, P. Moore and H. Noller (Eds.). *ASM Press*, Washington, D.C. 217-227.
 12. Gregory, S., Bayfield, M., O'Connor, M., Thompson, J. & A. Dahlberg (2002) "Probing ribosome structure and function by mutagenesis" in *Cold Spring Harbor Symposium on Quantitative Biology*, **LXVI**, The Ribosome, Cold Spring Harbor Laboratory Press, 101-108.
 13. Gregory, S. and A. Dahlberg (2008). "Structure and evolution of the *Thermus thermophilus* ribosome" in *Thermophiles; Biology and Technology at High Temperatures*. Eds. F. Robb, A. Antranikian, D. Grogan and G. Driessen, *CRC Press, Taylor & Francis Books*, 291-308.
 14. Steven T. Gregory, S., Hasan Demirc, H., Carr, J., Belardinelli, R., Thompson, J., Cameron, D., Rodriguez-Correa, D., Murphy, F., Jogl, G. & A. Dahlberg (2010). "Genetic and crystallographic approaches to investigating ribosome structure and function", *Ribosomes; Structure, Function and Dynamics*, M. Rodnina, W. Wintermeyer & R. Green, Eds., *Springer, Wien*, 57-64.

c) Refereed Journal Articles

1. Loewy, A.G., A.E. Dahlberg, K. Dunathan, P. Kriel, and H. Wolfinger (1961) "Fibrinase II: Some Physical Properties" *J. Biol. Chem.* **236**, 26-34.
2. Dahlberg, A.E., C.W. Dingman, and A.C. Peacock (1969) "Electrophoretic Characterization of Bacterial Polyribosomes in Agarose Acrylamide Composite Gels" *J. Mol. Biol.* **41**, 139-147.
3. Dahlberg, A.E., and A.C. Peacock (1971) "Studies of 16S and 23S Ribosomal RNA and *E. coli* Using Composite Gel Electrophoresis" *J. Mol. Biol.* **55**, 61-74.
4. Lazzarini, R.A., and A.E. Dahlberg (1971) "The Control of RNA Synthesis During Amino Acid Deprivation in *E. coli*" *J. Biol. Chem.* **246**, 420-429.
5. Dahlberg, A.E., E. Lund, and N.O. Kjeldgaard (1973) "Some Effects of Antibiotics on Bacterial Polyribosomes as Studied by Gel Electrophoresis" *J. Mol. Biol.* **78**, 627-636.

6. Dahlberg, A.E., E. Lund, N.O. Kjeldgaard, C. Bowman, and M. Nomura (1973) "Colicin E3-Induced Cleavage of 16S Ribosomal RNA: Blocking Effects of Certain Antibiotics" *Biochem.* **12**, 948-950.
7. Dahlberg, A.E. (1974) "Two Forms of the 30S Ribosomal Subunit of *E. coli*" *J. Biol. Chem.* **249**, 7673-7678.
8. Morris, D.R., J.E. Dahlberg, and A.E. Dahlberg (1975) "Detection of Cation-Specific Conformational Changes in rRNA by Gel Electrophoresis" *Nucl. Acids Res.* **2**, 447-456.
9. Dahlberg, A.E., and J.E. Dahlberg (1975) "Binding of Ribosomal Protein S1 of *E. coli* to the 3' End of 16S rRNA" *Proc. Natl. Acad. Sci. USA* **72**, 2940-2944.
10. Dahlberg, A.E., F. Horodyski, and P. Keller (1978) "Interaction of Neomycin with Ribosomes and Ribosomal RNA" *Antimicrob. Agents Chemother.* **13**, 331-339.
11. Dahlberg, A.E., Dahlberg, J.E., Lund, E., Tokimatsu, H., Rabson, A., Calvert, P., Reynolds, F., and M. Zahalak (1978) "Processing the 5' end of *E. coli* 16S ribosomal RNA" *Proc. Natl. Acad. Sci. USA* **75**, 3598-3602.
12. Stellwag, E., and A.E. Dahlberg (1980) "Electrophoretic Transfer of DNA, RNA and Protein onto Diazobenzoyloxymethyl (DBM) Paper" *Nuc. Acids. Res.* **8**, 299-317.
13. Helser, T.L., R.A. Baan, and A.E. Dahlberg (1981) "Characterization of a 40S Ribosomal Subunit Initiation Complex in Polyribosomes of *Saccharomyces cerevisiae* Treated with Cycloheximide" *Mol. Cell. Biol.* **1**, 51-57.
14. Baan, R.A., P.B. Keller, and A.E. Dahlberg (1981) "Isolation of Eukaryotic Initiation Factor 2 from Yeast *Saccharomyces cerevisiae*" *J. Biol. Chem.* **256**, 1063-1066.
15. Tokimatsu, H., W. Strycharz, and A.E. Dahlberg (1981) "Gel Electrophoretic Studies on Ribosomal Proteins L7/L12 and the *E. coli* 50S Subunit" *J. Mol. Biol.* **152**, 397-412.
16. Gourse, R.L., M.J.R. Stark, and A.E. Dahlberg (1982) "Site-Directed Mutagenesis of Ribosomal RNA: Construction and Characterization of Deletion Mutants" *J. Mol. Biol.* **159**, 397-416.
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18. Gourse, R.L., M.J.R. Stark, and A.E. Dahlberg (1983) "Regions of DNA Involved in the Stringent Control of Plasmid-Encoded rRNAs *In Vivo*" *Cell* **32**, 1347-1354.
19. Zwieb, C., and A.E. Dahlberg (1984) "Point Mutations in the Middle of 16S rRNA of *E. coli* Produced by Deletion Loop Mutagenesis" *Nuc. Acids Res.* **12**, 4361-4375.
20. Göringer, H., R. Wagner, W. Jacob, A.E. Dahlberg, and C. Zwieb (1984) "Oligonucleotide-Directed Mutagenesis of *E. coli* 5S rRNA: Construction of Mutant and Structural Analysis" *Nuc. Acids Res.* **12**, 6935-6950.
21. Zwieb, C., and A.E. Dahlberg (1984) "Structural and Functional Analysis of *E. coli* Ribosomes Containing Small Deletions Around Position 1760 in 23S rRNA" *Nuc. Acids Res.* **12**, 7135-7152.
22. Gregory, R., M. Zeller, D. Thurlow, R. Gourse, M. Stark, A.E. Dahlberg, and R. Zimmermann (1984) "Interaction of Ribosomal Proteins S6, S8, S15 and S18 with the Central Domain of 16S rRNA of *E. coli*" *J. Mol. Biol.* **178**, 287-302.
23. Stark, M., R. Gregory, R. Gourse, D. Thurlow, C. Zwieb, R. Zimmermann, and A.E. Dahlberg (1984) "Effects of Site-Directed Mutations in the Central Domain of 16S rRNA Upon Ribosomal Protein Binding, RNA Processing and 30S Subunit Assembly" *J. Mol. Biol.* **178**, 303-322.
24. Stark, M., R. Gourse, D. Jemiolo, and A.E. Dahlberg (1985) "A Mutation in an *E. coli* rRNA Operon that Blocks the Production of Precursor 23S rRNA by RNase III *In Vivo* and *In Vitro*" *J. Mol. Biol.* **182**, 205-216.
25. Skinner, R.H., M. Stark, and A.E. Dahlberg (1985) "Mutations Within the 23S rRNA Coding Sequence of *E. coli* Which Block Ribosome Assembly" *EMBO J.* **4**, 1605-1608.
26. Jemiolo, D.K., C. Zwieb, and A.E. Dahlberg (1985) "Point Mutations in the 3' Minor Domain of 16S rRNA of *E. coli*" *Nuc. Acids Res.* **13**, 8631-8643.
27. Romero, D.P., and A.E. Dahlberg (1986) "The Alpha Subunit of Initiation Factor 2 is Phosphorylated *In Vivo* in the Yeast *Saccharomyces cerevisiae*" *Molec. Cell. Biol.* **6**, 1044-1049.

28. Steen, R., A.E. Dahlberg, B.N. Lade, F.W. Studier, and J.J. Dunn (1986) "T7 RNA Polymerase Expression of the *Escherichia coli* *rrnB* Operon" *EMBO J.* **5**, 1099-1103.
29. Zwieb, C., D.K. Jemiolo, W.F. Jacob, R. Wagner, and A.E. Dahlberg (1986) "Characterization of a Collection of Deletion Mutants at the 3' End of 16S Ribosomal RNA of *Escherichia coli*" *Mol. Gen. Genet.* **203**, 256-264.
30. Jacob, W.F., M. Santer, and A.E. Dahlberg (1987) "A Single Base Change in the Shine-Dalgarno Region of 16S rRNA of *E. coli* Affects Translation of Many Proteins" *Proc. Natl. Acad. Sci. USA* **84**, 4757-4761.
31. Makosky, P.C., and A.E. Dahlberg (1987) "Spectinomycin Resistance at Site 1192 in 16S rRNA of *E. coli*: An Analysis of Three Mutants" *Biochimie* **69**, 885-889.
32. De Stasio, E., H.U. Göringer, W.E. Tapprich, and A.E. Dahlberg (1988) "Probing Ribosome Function Through Mutagenesis of Ribosomal RNA" NATO: ASI Series: *Genetics of Translation* (M.F. Tuite, M. Bolotin-Fukuhara, and M. Picard, eds.), Springer-Verlag, Berlin, pp. 17-42.
33. Weiss, R.B., D.M. Dunn, A.E. Dahlberg, J.F. Atkins, and R.F. Gesteland (1988) "Reading Frame Switch Caused by Base Pair Formation Between the 3' End of 16S rRNA and the mRNA During Elongation of Protein Synthesis in *Escherichia coli*" *EMBO J.* **7**, 1503-1507.
34. Murgola, E.J., K.A. Hijazi, H.U. Göringer, and A.E. Dahlberg (1988) "Mutant 16S Ribosomal RNA: A Novel Codon-Specific Translational Suppressor" *Proc. Natl. Acad. Sci. USA* **85**, 4162-4165.
35. Thompson, J., E. Cundliffe, and A.E. Dahlberg (1988) "Site-Directed Mutagenesis of *E. coli* 23S rRNA at Position 1067 Within the GTP Hydrolysis Center" *J. Mol. Biol.* **203**, 457-465.
36. De Stasio, E.A., D. Moazed, H.F. Noller, and A.E. Dahlberg (1989) "Mutations in 16S Ribosomal RNA Disrupt Antibiotic-RNA Interactions" *EMBO J.* **8**, 1213-1216.
37. Tapprich, W.E., D.J. Goss, and A.E. Dahlberg (1989) "A Mutation at Position 791 in *E. coli* 16S Ribosomal RNA Affects Processes Involved in the Initiation of Protein Synthesis" *Proc. Natl. Acad. Sci. USA* **86**, 4927-4931.
38. Dahlberg, A.E., and P.J. Grabowski (1990) "Gel Electrophoresis of Ribonucleoproteins, Ribosomes and Spliceosomes" In: *Gel Electrophoresis of Nucleic Acids - A Practice Approach* (D. Rickwood and R. Hames, eds.), Information Retrieval Ltd. Press, London, 275-289.
39. De Stasio, E.A., and A.E. Dahlberg (1990) "The Effects of Mutagenesis of a Conserved Base-Paired Site Near the Decoding Region of *E. coli* 16S ribosomal RNA" *J. Mol. Biol.* **212**, 127-133.
40. Prescott, C.D., and A.E. Dahlberg (1990) "A Single Base Change at 726 in 16S rRNA Radically Alters the Pattern of Protein Synthesized *In Vivo*" *EMBO J.* **9**, 289-294.
41. Bilgin, N., A. Richter, M. Ehrenberg, A.E. Dahlberg, and C.G. Kurland (1990) "Ribosomal RNA and Protein Mutants Resistant to Spectinomycin" *EMBO J.* **9**, 735-739.
42. Tapprich, W.E., and A.E. Dahlberg (1990) "A Single Base Mutation at Position 2661 in *E. coli* 23S Ribosomal RNA Affects the Binding of Ternary Complex to the Ribosome" *EMBO J.* **9**, 2649-2655.
43. Frattali, A.L., M.K. Flynn, E.A. De Stasio, and A.E. Dahlberg (1990) "Effects of Mutagenesis of C912 in the Streptomycin Binding Region of *E. coli* 16S Ribosomal RNA" *Biochem. Biophys. Acta* **1050**, 27-33.
44. Göringer, H.U., K.A. Hijazi, E.J. Murgola, and A.E. Dahlberg (1991) "Mutations in 16S rRNA that Affect UGA (Stop Codon) Directed Translation Termination" *Proc. Natl. Acad. Sci. USA* **88**, 6603-6607.
45. O'Connor, M., E.A. DeStasio, and A.E. Dahlberg (1991) "Interaction Between 16S Ribosomal RNA and Ribosomal Protein S12: Differential Effects of Paromomycin and Streptomycin" *Biochimie* **73**, 1493-1500.
46. O'Connor, M., H.U. Göringer, and A.E. Dahlberg (1992) "A Ribosomal Ambiguity Mutation in the 530 Loop of *E. Coli* 16S rRNA" *Nuc. Acids Res.* **20**, 4221-4227.
47. Thompson, J., W. Musters, E. Cundliffe, and A.E. Dahlberg (1993) "Replacement of the L11 Binding Region Within *E. Coli* 23S Ribosomal RNA with its Homologue from Yeast: *In Vivo* and *In Vitro* Analysis of Hybrid Ribosomes Altered in the GTPase Centre" *EMBO J.* **12**, 1499-1504.

48. O'Connor, M., and A.E. Dahlberg (1993) "Mutations at U2555, a tRNA-Protected Base in 23S rRNA, Affect Translational Fidelity" *Proc. Natl. Acad. Sci. USA*, **90**, 9214-9218.
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50. Lieberman, K.R. and A.E. Dahlberg (1994) "The Importance of Conserved Nucleotides of 23S Ribosomal RNA and Transfer RNA in Ribosome Catalyzed Peptide Bond Formation." *J. Biol. Chem.* **269**, 16163-16169.
51. Moine, H. and A.E. Dahlberg (1994) "Mutations in Helix 34 of Escherichia coli 16S Ribosomal RNA Have Multiple Effects on Ribosome Function and Synthesis" *J. Mol. Biol.* **243**, 402-412.
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d) Non-Refereed Journal Articles

1. Dahlberg AE (1989) "The Functional Role of Ribosomal RNA in Protein Synthesis" *Cell* **57**, 525-529.
2. Blasi U, O'Connor M, Squires C and A Dahlberg (1999) "Misled by sequence complementarity: Does the DB-anti_DN interaction withstand scientific scrutiny?" *Molec. Micro.* **33**, 439-441.
3. Dahlberg AE (2001) "The Ribosome in Action". *Science* **292**, 868-869.

4. Gregory S and A Dahlberg (2004) "Peptide bond formation is all about proximity" News and Views, *Nature Structural and Molecular Biology* **11**, 586-587.

6. Research Grant

NIH GM19756: Polysomes and Subunits: Structure-Function Relationships
(9/1/1972 – 3/31/2015)

7. Service

i) University Committees (current)

1. Brown University Faculty Club, Executive Committee of Board of Directors
2. Faculty Representative; The Brown Sports Foundation
3. Faculty Liaison for the Varsity Football Team

ii) Professional (current)

1. Founder, Milkhaus Laboratory Inc., Providence, RI.
2. Medical Director, Beech Tree Laboratory, Providence, RI.
3. Member of the Board of Directors, The Monroe Institute, Faber, VA

8. Honors and Awards

- i. USPHS Predoctoral Fellow in combined M.D.-Ph.D. program 1965-1967
University of Chicago, Chicago, Illinois
- ii. American Cancer Society Postdoctoral Fellow 1970-1971
Aarhus University, Aarhus, Denmark
- iii. European Molecular Biology Organization 1971-1972
Postdoctoral Fellow, Aarhus University, Aarhus, Denmark
- iv. NIH Research Career Development Award 1975-1980
- v. Teaching Award from Brown University Medical School 1980
- vi. Nominated for the Van Arkel Honorary Chair of Chemistry 1985
Gorlaeus Laboratories, Department of Chemistry
State University of Leiden, The Netherlands
- vii. Who's Who in America, 44th edition 1986
- viii. Visiting Professor, Institute of Microbiology 1988
University of Copenhagen, Denmark (June-August)
- ix. Fellow, American Association for the Advancement of Science 1992
- x. Fellow, American Academy of Microbiology 2000