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DNA Mediated Bacterial Transformation

A Bibliography, 1955-61

Syntex Institute for Molecular Biology
3221 Porter Drive
Stanford Industrial Park
Palo Alto, California

DNA Mediated Bacterial Transformation

A bibliography compiled by
Martha W. West
Syntex Institute for Molecular Biology
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An attempt has been made at comprehensive coverage of the literature on bacterial transformation during the period January, 1955 - June, 1961. The main criterion for inclusion was that the material dealt with the transforming activity of DNA and/or bacteria in the process of transformation. Wherever possible, abstracts of material not available for examination (marked *) are cited.

1) Abe, M. An intermediate stage of pneumococcus transformation as revealed by the effect of 8-azaguanine. Japan J. Med. Sci. & Biol. 12:441-52, 1959.

2) Abe, M. and Mizuno, D. A contribution to the knowledge of pneumococcus transformation during the period between the incorporation of deoxyribonucleic acid and the appearance of streptomycin resistance. Biochim. et Biophys. Acta 32:464-9, 1959.

3) Alexander, H. E. and Leidy, G. Origin of species in micro-organisms: use of transformation as a tool. Am. J. Diseases Children 90:860-1, 1955.

4) Anagnostopoulos, C. and Crawford, I. P. Linkage studies by transformation in Bacillus subtilis. Bacteriol. Proc. 61:89, 1961.

5) Anagnostopoulos, C. and Crawford, I. P. Transformation studies on the linkage of markers in the tryptophan pathway in Bacillus subtilis. Proc. Nat. Acad. Sci. U.S. 47:378-90, 1961.

6) Anagnostopoulos, C. and Spizizen, J. Requirements for transformation in Bacillus subtilis. J. Bacteriol. 81:741-6, 1961.

7) Austrian, R. and Bernheimer, H. P. Some biological properties of doubly capsulated pneumococci. J. Clin. Invest. 34:920-1, 1955.

8) Austrian, R., Bernheimer, H. P., Smith, E. E. B. and Mills, G. T. Genetic biochemistry of double encapsulation in pneumococcus. Intern. Congr. Microbiol., 7th Congr., Stockholm, 1958. Abstr. p. 48.

9) Austrian, R., Bernheimer, H. P., Smith, E. E. B. and Mills, G. T. Acquisition of new capsular type by pneumococcus, a multifactor transformation. Cold Spring Harbor Symposia Quant. Biol. 23:99-100, 1958.

10) Austrian, R. and Bernheimer, H. P. Simultaneous production of two capsular polysaccharides by pneumococcus. I. Properties of a pneumococcus manifesting binary capsulation. J. Exp. Med. 110:571-83, 1959.

11) Austrian, R., Bernheimer, H. P., Smith, E. E. B. and Mills, G. T. Simultaneous production of two capsular polysaccharides by pneumococcus. II. The genetic and biochemical basis of binary capsulation. J. Exp. Med. 110:585-602, 1959.

12) Balassa, R. Durch desoxyribonucleinsäuren induzierte Veranderungen an Rhizobien. Naturwiss. 42:133, 1955.

13) Balassa, R. In vivo induzierte Transformationen bei Rhizobien. Naturwiss. 43:422-3, 1956.

14) *Balassa, R. Induced changes by deoxyribonucleic acids in Rhizobium. Acta Microbiol. Acad. Sci. Hung. 4:77-84, 1957. CA 51:12206b, 1957.

15) *Balassa, R. Some limitations in the formation of deoxyribonucleic acid-induced low streptomycin resistance by Rhizobium. Acta Microbiol. Acad. Sci. Hung. 4:85-95, 1957. CA 51:12206d, 1957.

16) Balassa, R. Transformationserscheinungen bei Rhizobien. Intern. Congr. Microbiol., 7th Congr., Stockholm, 1958. Abstr., p. 49.

17) Balassa, R. Transformation of a strain of Rhizobium lupine. Nature 188:246-7, 1960.

18) Balows, A., Weaver, R. H. and Humphries, J. C. Attempts to demonstrate type formation with Klebsiella pneumoniae. J. Bacteriol. 69:139-41, 1955.

19) Beiser, S. M. and Ellison, S. A. The effect of ultraviolet irradiation on pneumococcus transforming factor. Intern. Congr. Microbiol., 7th Congr., Stockholm, 1958. Abstr., p. 51.

20) Beiser, S. M., Pahl, H. B., Rosenkranz, H. S. and Bendich, A. Studies on the fractionation of transforming deoxyribonucleic acid of pneumococcus. I. Recovery and dose-response relations. Biochem. et. Biophys. Acta 34:497-502, 1959.

21) Bellin, J. S. and Oster, G. Photodynamic inactivation of transforming principle. Biochim. et Biophys. Acta 42:533-5, 42:533-5, 1960.

22) Bendich, A., Fresco, J. R., Rosenkranz, H. S. and Beiser, S. M. Fractionation of deoxyribonucleic acid (DNA) by ion exchange. J. Am. Chem. Soc. 77:3671-72, 1955.

23) Bendich, A., Pahl, H. B. and Beiser, S. M. Chromatographic fractionation of deoxyribonucleic acid with special emphasis on the transforming factor of pneumococcus. Cold Spring Harbor Symposia Quant. Biol. 21:31-48, 1956.

24) Bendich, A., Pahl, H. B. and Brown, G. B. Chromatographic fractionation of E. coli DNA containing 5-Bromouracil-2-C^{14}. Discussion, in Symposium on the Chemical Basis of Heredity, ed. by W. D. McElroy and Bentley Glass. Baltimore: John Hopkins Press, 1957. Pp. 378-96.

25) Bendich, A, Pahl, H. B., Rosenkranz, H. S. and Rosoff, M. Studies of deoxyribonucleic acids with the acid of anion exchangers. Symposia Soc. Exp. Biol. 12:31-48, 1958.

26) Bloch, H., Walter, A. and Yamamura, Y. Failure of deoxyribonucleic acid from mycobacteria to induce bacterial transformation. Am. Rev. Respirat. Diseases 80:911, 1959.

27) Bracco, R. M., Krauss, M. R., Roc, A. S. and MacLeod, C. M. Transformation reactions between pneumococcus and three strains of streptococci. J. Exp. Med. 106:247-59, 1957.

28) Catlin, B. W. Activities of deoxyribonucleates and of a deoxyribonuclease from meningococcus. Bacteriol. Proc. 59: 28-29, 1959.

29) Catlin, B. W. Transformation reactions within and between species of Neisseria. Bacteriol. Proc. 60:74, 1960.

30) Catlin, B. W. Transformation of Neisseria meningitidis by deoxyribonucleates from cells and from culture slime. J. Bacteriol. 79:579-90, 1960.

31) Catlin, B. W. Interspecific transformation of Neisseria by culture slime containing deoxyribonucleate. Science 131: 608-10, 1960.

32) Catlin, B. W. Affinities among Neisseria as revealed by studies of DNAs and DNases. Bacteriol. Proc. 61:90, 1961.

33) Cavalieri, L. F. Paucidisperse deoxyribonucleic acid and its use in the study of genetic determinants. J. Am. Chem. Soc. 79:5319-20, 1957.

34) Cavalieri, L. F. and Rosenberg, B. The interpretation of bacterial transformation data. Proc. Nat. Acad. Sci. U.S. 44:853-7, 1958.

35) Chakrabarti, S. G. and Litwack, G. Apparent transfer of lysozyme resistance by DNA preparations. Bacteriol. Proc. 60:75, 1960.

36) CIBA Foundation Symposium. Drug Resistance in Micro-organisms: Mechanisms of Development. Boston: Little, Brown, 1957.

37) Corey, R. R. and Starr, M. P. Genetic transformation of colony type in Xantomonas phaseoli. J. Bacteriol. 74:141-5, 1957.

38) Corey, R. R. and Starr, M. P. Genetic transformation of streptomycin resistance in Xanthomonas phaseoli. J. Bacteriol. 74:146-50, 1957.

39) DeFillipes, F. M. and Guild, W. R. Irradiation of solutions of transforming DNA. Radiation Research 11:38-53, 1959.

40) Demerec, M., et. al. Bacterial genetics. Carnegie Inst. Wash. Yearbook 56:368-76, 1956-57.

41) Demerec, M., et. al. Bacterial genetics. Carnegie Inst. Wash. Yearbook 57:390-406, 1957-58.

42) Doty, P., Marmur, J. and Sueoka, N. The heterogeneity in properties and functioning of deoxyribonucleic acids. Brookhaven Symposia in Biol. 12:1-16, 1959.

43) Doty, P., Marmur, J. Eigner, J. and Schildkraut, C. Strand separation and specific recombination in deoxyribonucleic acids: physical chemical studies. Proc. Nat. Acad. Sci. 46: 461-76, 1960.

44) Dove, W. F. and Yamane, T. The complete retention of transforming activity after reversal of the interaction of DNA with mercuric ion. Biochem. Biophys. Res. Communs. 3:608-12, 1960.

45) Drew, R. M. γ-irradiation of pneumococcus deoxyribonucleic acid. Radiation Research 3:116-20, 1955.

46) Drew, R. M. Induction of resistance to A-methopterin in Diplococcus pneumoniae by deoxyribonucleic acid. Nature 179: 1251-2, 1957.

47) Ellison, O. A. and Beiser, S. A. The ultraviolet inactivation of pneumococcus transforming factor. Radiation Research 12:381-8, 1960.

48) Ephrati-Elizur, E. and Zamenhof, S. Incorporation of 5-bromouracil into transforming principle of Bacillus subtilis and its biological effects. Nature 184:472-3, 1959.

49) Ephrati-Elizur, E., Srinivasan, P. R. and Zamenhof, S. Genetic analysis by means of transformation of histidine linkage groups in Bacillus subtilis. Proc. Nat. Acad. Sci. U.S. 47: 56-63, 1961.

50) Ephrussi-Taylor. Genetic function and molecular structure of DNA. Proc. Intern. Congr. Biochem., 3rd Congr., Brussels, 1955. N.Y.: Academic, 1956. Pp. 333-9.

51) Ephrussi-Taylor, H. and Lafar et, R. Inactivation, par les rayons X, d'un facteur transformant du pneumocoque. Biochim. et Biophys. Acta 16:183-97, 1955.

52) Ephrussi-Taylor, Harriett. X-ray inactivation studies on solutions of transforming DNA of pneumococcus, in Symosium on the Chemical Basis of Heredity, ed. by W. D. McElroy and Bentley Glass. Baltimore: John Hopkins Press, 1957. Pp 299-320.

53) Ephrussi-Taylor, H. State of transforming deoxyribonucleic acid (DNA) during the first phase of bacterial transformation. Compt. rend. soc. biol. 154:1951-5, 1960.

54) Fox, M. S. and Hotchkiss, R. D. Phenotypic expression of a selective genetic character introduced by transformation. Congr. intern. biochim,, Résumés Communs., 3rd Congr. Brussels, 1955. P. 74.

55) Fox, M. S. Deoxyribonucleic acid (DNA) incorporation by transformed bacteria. Biochem. et Biophys. Acta 26:83-5, 1957.

56) Fox, M. S. and Hotchkiss, R. D. Initiation of bacterial transformation. Nature 179:1322-5, 1957.

57) Fox, M. S. and Hotchkiss, R. D. Fate of transforming deoxyribonucleate following fixation by transformable bacteria. I. Nature 187:1002-3, 1960.

58) Fox, M. S. Fate of transforming deoxyribonucleate following fixation by transformable bacteria. II. Nature 187:1004-6, 1960.

59) Fuerst, C. R., Jacob, F., and Wollman, E. L. Détermination de liaisons génétiques, chez Escherichia coli K-12, à l'aide de radiophosphore. Compt rend. 243:2162-4, 1956.

60) Fukuda, S. and Tsuzuki, K. Interspecific induction of transformation of bacteria with respect to phage-susceptibility. Nature 190:937-8, 1961.

61) Ginoza, W. and Guild, W. R. On the inactivation of transforming DNA by temperatures below the melting point. Proc. Nat. Acad. Sci. U.S. 47:633-9, 1961.

62) Ginoza, W. and Zimm, B. H. Mechanisms of inactivation of deoxyribonucleic acids by heat. Proc. Nat. Acad. Sci. U.S. 47:639-52, 1961.

63) Goodgal, S. H. and Herriott, R. M. Uptake of transforming DNA and its penetration into Hemophilus influenzae. Federation Proc. 15:590A, 1956.

64) Goodgal, S. H. and Herriott, R. M. Studies on transformation of Hemophilus influenzae, in Symposium on the Chemical Basis of Heredity, ed. by W. D. McElroy and Bentley Glass. Baltimore: John Hopkins Press, 1957. Pp. 336-340.

65) Goodgal, S. H., Rubert, C. S. and Herriott, R. M. Photoreactivation of Hemophilus influenzae transforming factor for streptomycin resistance by an extract of Escherichia coli B. Discussion, in Symposium on the Chemical Basis of Heredity, ed. by W. D. McElroy and Bentley Glass. Baltimore: John Hopkins Press, 1957. Pp. 341-50.

66) Goodgal, S. H. and Herriott, R. M. A study of linked transformations in Hemophilus influenzae. Records Genet. Soc. Am. 26:372-3, 1957.

67) Goodgal, S. H., Rupert, C. S., and Herriott, R. M. Molecular weight and in vitro photorestoration studies of a transforming factor for Hemophilus influenzae. Trans. Faraday Soc. 53:257-8, 1957.

68) Goodgal, S. H. Expression and segregation in Hemophilus influenzae transformations. Proc. Intern. Congr. Genet., 10th Congr., Montreal, 1958. II:100.

69) Goodgal, S. H. and Melechen, N. E. Synthesis of transforming DNA in the presence of chloramphenicol. Biochem. Biophys. Research Communs. 3:114-8, 1960.

70) Green, D. MacDonald. A host-specific variation affecting relative frequency of transformation of two markers in pneumococcus. Exp. Cell Research 18:466-80, 1959.

71) Greer, S., Heldemuth, L. and Zamenhof, S. Transformation to auxotrophy in B. subtilis. Federation Proc. 20:255, 1961.

72) Guild, W. R. and DeFillppes, F. M. Ionizing radiation and ultrasonic evidence for a minimum unit of transforming principle DNA. Biochim. et Biophys. Acta 26:241-51, 1957.

73) Guild, W. R. Physical studies of transforming principle. Proc. Ist Natl. Biophys. Conf. New Haven: Yale University Press, 1959. P. 228.

74) Guild, W. R. Radiation sensitivity of transforming DNA with and without oxygen. Radiation Research 11:444-5, 1959.

75) Hall, R. H. and Gale, G. O. New observations on pneumococcal transformations in vivo. Proc. Soc. Exp. Biol. Med. 101: 487-91, 1959.

75) Hall, R. H. and Gale, G. O. New observations on pneumococcal transformations in vivo. Proc. Soc. Exp. Biol. Med. 101: 487-91, 1959.

76) *Hashimoto, K. The transformation of streptomycin resistance in pneumococcus. I. Transformation of streptomycin indifference and resistance. Nippon Saikingaku Zasshi (Japan. J. Bacteriol.) 10:933-8, 1955.
CA 51:1061b, 1957.

77) *Hashimoto, K. II. Transformation of the streptomycin dependence. Nippon Saikingaku Zasshi (Japan. J. Bacteriol.) 10:1049-53, 1955.
CA 51:10651f, 1957.

78) Hashimoto, K. Further studies on the transformation of streptomycin resistance in pneumococci. Japan J. Microbiol. 1:1-9, 1957.

79) Herriott, R. M. Formation of heterozygotes by annealing a mixture of transforming DNAs. Proc. Nat. Acad. Sci. U.S. 47: 146-53, 1961.

80) Hotchkiss, R. D. The biological role of the deoxypentose nucleic acids, in The Nucleic Acids, ed. by E. Chargaff and J. N. Davidson. New York: Academic, 1955. II:443-453.

81) Hotchkiss, R. D. Bacterial transformation. J. Cellular Comp. Physiol. 45:1-22, 1955.

82) Hotchkiss, R. D. The genetic organization of the deoxyribonucleate units functioning in bacterial transformation, in Enzymes: Units of Biological Structure and Function, ed. by O. H. Gaebler. New York: Academic, 1956. Pp. 119-30.

83) Hotchkiss, R. D. Criteria for quantitative genetic transformation of bacteria, in Symposium on the Chemical Basis of Heredity, ed. by W. D. McElroy and Bentley Glass. Baltimore: John Hopkins Press, 1957. Pp. 321-335.

84) Hotchkiss, R. D. Size limitations governing the incorporation of genetic material in the bacterial transformations and other nonreciprocal recombinations. Symposia Soc. Exp. Biol. 12:49-59, 1958.

85) Hotchkiss, R. D. and Evans, A. H. Analysis of the complex sulfonamide resistance locus of pneumococcus. Cold Spring Harbor Symposia Quant. Biol. 23:85-97, 1958.

86) Hutchinson, F. and Arena, J. Destruction of the activity of deoxyribonucleic acid in irradiated cells. Radiation Research 13:137-47, 1960.

87) Imshenetskii, A. A., Perova, K. Z., Zaitseva, T. A. and Belozerskil, A. N. Transformation of streptomycin resistance in staphylococci by means of DNA. Microbiology 28:175-8, 1960. (Tr. from Mikrobiologiya 28:187-90, 1959.)

88) Imshenetskii, A. A. and Perova, K. Z. Transformation carried out by cell-free extracts. Microbiology 28:371-374, 1961. (Tr. from Mikrobiologiya 29:505-11, 1960.)

89) Imshenetskii, A. A. and Perova, K. Z. Transformation in microbes induced by filtrates passed through bacterial filters. Microbiology 29:486-9, 1961. (Tr. from Mikrobiologiya 29:673-8, 1960.)

90) *Jabloński, L. and Poplawski, S. Deoxyribonucleic acid in Brucella. Preliminary study of transformation. Acta Microbiol. Polon. 10:147-155, 1961.

91) Jackson, S., Macleod, C. M. and Krauss, M. R. Determination of type in capsulated transformants on penumococcus by the genome of non-capsulated donor and recipient strains. J. Exp. Med. 109:429-38, 1959.

92) *Jarai, M. Transformation in streptomyces. Acta Microbiol. Acad. Sci. Hung. 8:81-7, 1961.

93) Hogness, D. S. and Kaiser, A. D. The transformation of Escherichia coli with deoxyribonucleic acid isolated from bacteriophage λdg. J. Mol. Biol. 2:392-415, 1960.

94) *Kimura, Y. The streptomycin resistance induced by deoxyrinonucleic acid from streptomycin-resistant bacteria. II. The induced streptomycin resistance and the R → S variation. Nippon Saikingaku Zasshi (Japan. J. Bacteriol.) 11:199-204, 1956.
CA 51:18013b, 1957.

95) *Kinoshita, K. The streptomycin resistance induced by the deoxyribonucleic acid from streptomycin-resistant bacteria. Nippon Saikingaku Zasshi 10:463-8, 1955.
CA 51:6764e, 1957.

96) Kohiyama, M. and Saito, H. Stimulation of genetic transformation in Bacillus subtilis by biological inactive DNA and polyphosphate. Biochim. et Biophys. Acta 41:180-1, 1960.

97) Kohiyama, M. Genetic research on Bacillus subtilis. Compt. rend. soc. biol. 154:690-2, 1960.

98) Kohiyama, M., Saito, H. and Ikeda, Y. An hypothesis on genetic transformation in Bacillus subtilis. Compt. rend. soc. biol. 154:1893-4, 1960.

99) *Kohoutová, M. The effect of monovalent cations on the transformation of type specificity in pneumococci. Cesko-slov. Mikrobiologie 3:144-53, 1958.
BA 32:41113, 1958.

100) Kohoutová, M. Effect of univalent cations on type specificity transformation in pneumococci. Nature 182:188-9, 1958.

101) *Kohoutová, M. The sodium and potassium concentration in rabbit anti-R pneumococcal sera and its relationship to type-specific transformation. Folia Mikrobiol. 4:130-2, 1959.
BA 35:13824, 1960.

102) Kohoutová, M. Mechanism of the transformation of polysaccharide capsule in pneumococcus. Nature 190:1171-3, 1961.

103) Lacks, S. and Hotchkiss, R. D. Genetic material determining and enzyme activity in pneumococcus. Biochim. et Biophys. Acta 39:508-18, 1960.

104) Latarjet, R. Effects of radiation and peroxides on viral and bacterial functions linked to DNA specificity, in Ciba Foundation Symposium on Ionizing Radiation and Cell Metabolism. Boston: Little, Brown, 1956. Pp. 275-99.

105) Latarjet, R. Photorestauration, katalase-restauration and "pox"-effect bei bakterien und bakteriophagen. Strahlen-therapie 101:580-98, 1956.

106) *Latarjet, R. and Cherrier, N. Intern. Congr. Photobiol., 2nd Congr., Turin, 1957. P. 131.

107) Latarjet, R., Rebeyrotte, N. and Demerseman, P. Action of organic peroxides on a transforming factor of pneumococcus, in Organic Peroxides in Radiobiology, ed. by M. Haissinsky, New York: Pergamon, 1958. Pp. 61-72.

108) Latarjet, R., Rebeyrotte, N. and Demerseman, P. Action de peroxydes organigues sur un facteur transformant du pneumocogue. Actions chim. et biol. radiations 4:61-72, 1958.

109) Latarjet, R. Radiobiological studies on transforming nucleic acids. Strahlentherapie 110:443-50, 1959.

110) Latarjet, R., Ephrussi-Taylor, H. and Rebeyrotte, N. On the target size of a transforming factor based on x-ray inactivation. Radiation Research Suppl. 1:417-30, 1959.

111) Leidy, G., Hahn, E. and Alexander, H. E. On the specificity of the desoxyribonucleic acid which induces streptomycin resistance in Hemophilus. J. Exp. Med. 104:305-20, 1956.

112) Leidy, G., Hahn, E. and Alexander, H. E. Interspecific transformation in Hemophilus; a possible index of relationship between H. influenzae and H. aegyptius. Proc. Soc. Exp. Biol. Med. 102:86-8, 1959.

113) *Lejeune, J. The structure of hereditary substance. Rev. Méd. Liège 13:533-41, 1958.

114) Lerman, L. S. Chromatographic fractionation of the transforming principle of the pneumococcus. Biochim. et Biophys. Acta 18:132-4, 1955.

115) Lerman, L. S. and Tolmach, L. J. Kinetic studies of genetic transformation in pneumococcus. Proc. 1st. Natl. Biophys. Conf., 1957. New Haven: Yale University Press, 1959. P. 436.

116) Lerman, L. S. and Tolmach, L. J. Genetic transformation. I. Cellular incorporation of deoxyribonucleic acid (DNA) accompanying transformation in pneumococcus. Biochim. et Biophys. Acta 26:68-82, 1957.

117) Lerman, L. S. Estimation of the critical DNA segment required for genetic transformation. Proc. Intern. Congr. Genet. 10th Congr., Montreal, 1958 2:164.

118) Lerman, L. S. and Tolmach, L. S. Genetic transformation. II. The significance of damage to the DNA molecule. Biochim. et Biophys. Acta 33:371-87, 1959.

119) *Lindegren, C. C. The biological function of deoxyribonucleic acid. J. Theoretical Biol. 1:107-19, 1961.
BA 36:54675, 1961.

120) Litman, R. M. and Ephrussi-Taylor, H. Inactivation and mutation of the genetic factors of the desoyribonucleic acid of pneumococcus by ultraviolet light and by nitrous acid. Compt. rend. 249:838-40, 1959.

121) Litt, M., Marmur, J., Ephrussi-Taylor, H. and Doty, P. The dependence of pneumococcal transformation on the molecular weight of deoxyribose nucleic acid. Proc. Nat. Acad. Sci. 44:144-52, 1958.

122) Loginova, L. G. Changes in characteristics of microorganisms by tranformation substances. Microbiology 26:483-95, 1958. (Tr. from Microbiologiya 26:485-99, 1957.)

123) Lorkiewicz, Z., Opara-Kubinska, Z. and Szybalski, W. Molecular fate of transforming DNA. Federation Proc. 20:360, 1961.

124) MacLeod, C. M. and Krauss, M. R. Transformation reactions with two non-allelic R mutants of the same strain of pneumococcus type VIII. J. Exp. Med. 103:623-32, 1956.

125) Marmur, J. and Fluke, D. J. Uniformity of ionizing radiation action on several transforming factors of pneumococcus. Arch. Biochem. Biophys. 57:506-14, 1955.

126) Marmur, J. and Hotchkiss, R. D. Mannitol metabolism, a transferable property of pneumococcus. J. Biol. Chem. 214: 383-96, 1955.

127) Marmur, J. and Lane, D. The biological activity of thermally denatured transforming DNA. Federation Proc. 19:307, 1960.

128) Marmur, J. and Lane, D. Strand separation and specific recombination in deoxyribonucleic acids: biological studies. Proc. Nat. Acad. Sci. 46:453-61, 1960.

129) Marmur, J. A procedure for the isolation of deoxyribonucleic acid from microörganisms. J. Mol. Biol. 3:208-18, 1961.

130) Masamune, Y., Abe, M. and Mizuno, D. A stabilizing effect of hemoglobin on the pneumococcus transformation. Japan J. Med. Sci. & Biol. 13:23-31, 1960.

131) Mills, G. T. Genetic and biochemical lesions of polysaccharide synthesis in the pneumococcus. Federation Proc. 19:991-5, 1960.

132) Nester, E. W. Linkage relationships between indole, tyrosine, and histidine in Bacillus subtilis. Bacteriol. Proc. 61:90, 1961.

133) Nester, E. W. and Lederberg, J. Linkage of genetic units of Bacillus subtilis in deoxyribonucleic acid (DNA) transformation. Proc. Nat. Acad. Sci. U.S. 47:52-5, 1961.

134) *Odaka, T. Nippon Saikingaku Zasshi (Japan. J. Bacteriol.) 14: 254, 1959.

135) *Odaka, T. Acquisition of streptomycin resistance in pneumococci by means of transformation reaction. II. Relationship between S-R variation and the transformability. Nippon Saikingaku Zasshi (Japan. J. Bacteriol.) 14:266-70, 1959.
BA 35:4835, 1960.

136) *Odaka, T. Acquisition of streptomycin resistance in pneumococci by means of transformation reaction. III. Transformation of dialyzed media and effect of fatty acids. Nippon Saikingaku Zasshi (Japan. J. Bacteriol.) 14:796-800, 1959.
BA 35:35204, 1960.

137) *Odaka, T. Acquisition of streptomycin resistance in pneumococci by means of transformation reaction. IV. Transformation in partially defined media containing no serum factor. Nippon Saikingaku Zasshi (Japan. J. Bacteriol.) 14:965-8, 1959.
BA 35:35204, 1960.

138) Odaka, T. and Watanabe, T. Transformation reaction of pneumococci in the absence of serum and the effect of fatty acids. Japan J. Exp. Med. 29:407-16, 1959.

139) Odaka, T. and Watanabe, T. Transformation reaction of pneumococci in the absence of serum factor. Nature 184: 471-2, 1959.

140) *Opara, Z. Selected problems from genetics of bacteria. Med. Doswiadczalna i. Mikrobiol. 11:235-52, 1957.
BA 33:46061, 1959.

141) *Opara, Z. Effect of chloromycin on the transformation of streptomycin resistance in pneumococci. Bull. acad. polon. sci., Ser. sci. biol. 6:471, 1958.
CA 53:19025f, 1959.

142) *Opara, Z. Transformation co-factors of pneumococcus R36A. Polska Acad. Nauk, Zeszyty Problemowe Nauki Polskiej 14:41-9, 1958.
CA 53:5386d, 1959.

143) *Opara-Kubinska, Z. Investigations on bacterial transformations. I. Influence of centrifugation on the transformation ability. ("Competence") of diplococcus pneumoniae cells. Bull. acad. polon. sci., Ser sci. biol. 7:433-7, 1959.
BA 36:1904, 1961.

144) *Opara-Kubinska, Z. Investigations on bacterial transformations. II. Influence of Tween 80 on the transformation of streptomycin-resistance of pneumococci. Bull. acad. polon. sci., Ser. sci. biol. 7:439-43, 1959.
BA 36:1905, 1961.

145) Opara-Kubinska, Z., Lorkiewicz, Z. and Szybalski, W. Genetic transformation studies. II. Radiation sensitivity of halogen labeled DNA. Biochem. Biophys. Research Communs. 4:288-91, 1961.

146) Ottolenghi, E. and Hotchkiss, R. D. Appearance of genetic transforming activity in pneumococcal cultures. Science 132: 1257-8, 1960.

147) *Pakula, R. and Tye, M. Zastosowanie czynnika litycznego ze szczepów z rodzaju Streptomyces (aktynomycetyny) do ekstrakcji kwasu dezoksyrybonukleinowego z bakterii. Med. Doswiadczalna i. Mikrobiol. 8:523-8, 1956.

148) Pakula, R. Albumin as sensitizing factor in transformation of pneumococci to streptomycin resistance. Intern. Congr. Microbiol., 7th Congr., Stockholm, 1958. Abstr. p. 60.

149) *Pakula, R., Fluder, Z., Hulanicka, E. and Walczak, W. Studies on transformation of streptococci. Bull. acad. polon. sci., Ser. sci. biol. 6:319-23, 1958.
BA 33:30196, 1959.

150) *Pakula, R., Hulanicka, E. and Walczak, W. Transformation reactions between streptococci, pneumococci, and staphylococci. Bull. acad. polon. sci., Ser. sci. biol. 6:325-8, 1958.
BA 33:30197, 1959.

151) Pakula, R., Fluder, Z., Walczak, W. and Zakrzewski, K. Albumin as a sensitizing factor in transformation of pneumococci to streptomycin resistance. Schweiz. Z. allgem. Pathol. u. Bakteriol. 21:1119-26, 1958.

152) *Pakula, R., Hulanicka, E. and Walczak, W. Sensitivity to ultraviolet irradiation of the streptomycin-resistance activity in transforming DNA of different bacteria. Bull. acad. polon. sci., Ser. sci. biol. 7:217-22, 1959.
BA 35:70897, 1960.

153) *Pakula, R., Kowalska, J. and Hulanicka, E. Effect of ultraviolet irradiation on the streptomycin-resistance marker in the endocellular and isolated transforming principle. Bull. acad. polon. sci., Ser. sci. biol. 7:345-51, 1959.
CA 54:3586e, 1960.

154) *Pakula, R., Hulanicka, E. and Walczak, W. Ultraviolet sensitivity of the streptomycin-resistant property of deoxyribonucleic acid. Med. Doswiadczalna i. Mikrobiol. 11:267-72, 1959.
CA 54:25043i, 1960.

155) Pakula, R., Hulanicka, E. and Walczak, W. Transformation reactions between different species of streptococci and between streptococci, pneumococci and staphylococci. Schweiz. Z. allgem. Pathol. u. Bakteriol. 22:202-14, 1959.

156) *Pakula, R., Hulanicka, E. and Walczak, W. Inhibition of transformation in streptococcus s.b.e. (S. sanguis) by deoxyribonucleic acids of different origin. Bull. acad. polon. sci., Ser. sci. biol. 8:49-55, 1960.
CA 54:19824i, 1960.

157) *Pakula, R., Hulanicka-Bankowska, E. and Walczak, W. Photoreactivation of ultraviolet-damaged streptomycin resistance marker in transforming deoxyribonucleic acid (DNA) of streptococci and pneumococci. Bull. acad. polon. sci., Ser. sci. biol. 8:269-74, 1960.
CA 55:2785d, 1961.

158) Perry, D. and Slade, H. D. Studies on transformation of streptococci. Bacteriol. Proc. 61:90, 1961.

159) Rappaport, H. P. and Guild, W. R. Defined medium for growth of two transformable strains of Diplococcus pneumoniae. J. Bacteriol. 78:203-5, 1959.

160) Ravin, A. W. The properties of bacterial transforming systems. Brookhaven Symposia in Biol. 8:33-49, 1955.

161) Ravin, A. W. Factors affecting the non-independent recovery of capsular and streptomycin-resistant transformants in pneumococcus. Records. Genet. Soc. Am. 24:591, 1955.

162) Ravin, A. W. The significance of bacterial transformations to studies of the neoplastic process. Ann. N.Y. Acad. Sci. 68:335-48, 1957.

163) Ravin, A. W. Reciprocal capsular transformations of pneumococci. J. Bacteriol. 77:296-309, 1959.

164) Ravin, A. W. Genetic evidence of a multi-site mutation causing imparted synthesis of type III capsular polysaccharide in pneumococcus. Bacteriol. Proc. 60:74, 1960.

165) Ravin, A. W. Linked mutations borne by deoxyribonucleic acid (DNA) controlling the synthesis of capsular polysaccharide in pneumococcus. Genetics 45:1386-404, 1960.

166) Rebeyrotte, N. and Latarjet, R. Effect of non-ionizing rays on a transforming nucleic acid of pneumococcus. Strahlentherapie 111:85-98, 1960.

167) Roger, M. and Hotchkiss, R. D. Selective heat inactivation of pneumococcal transforming deoxyribonucleate. Proc. Nat. Acad. Sci. 47:653-9, 1961.

168) Rosenberg, B. H., Sirotnak, F. M. and Cavalieri, L. F. Size of genetic determinants in pneumococcus and the nature of the variables involved in transformation. Proc. Nat. Acad. Sci. 45:144-56, 1959.

169) Rupert, C. S., Goodgal, S. H. and Herriott, R. M. The photo-restoration in vitro of Haemophilus influenzae transforming deoxyribonucleic acid (DNA). Proc. 1st Natl. Biophy. Conf. 1957. New Haven: Yale University Press, 1959. Pp. 219-28.

170) Rupert, C. S. and Herriott, R. M. Photorestoration of ultraviolet damaged transforming facotr and other DNA's. Intern. Congr. Microbiol., 7th Congr., Stockholm, 1958. Abstr., P. 62.

171) Rupert, C. S. A biological test for ultraviolet damage and photoreversal in non-transforming DNA. Federation Proc. 17:301, 1958.

172) Rupert, C. S., Goodgal, S. H. and Herriott, R. M. Photoreactivation in vitro of ultraviolet-inactivated Haemophilus influenzae-transforming factor. J. Gen. Physiol. 41:451-71, 1958.

173) Rupert, C. S. and Goodgal, S. H. Shape of ultraviolet inactivation curves of transforming deoxyribonucleic acid. Nature 185:556-7, 1960.

174) Schaeffer, P. and Ritz, E. Transfert interspécifigue d'un charactère héréditaire chez des bacteries du genre Hemophilus. Compt. rend. 240:1491-3, 1955.

175) Schaeffer, P. and Ritz, E. Interspecific transformation in Hemophilus. Ann. inst. Pasteur 91:192-211, 1956.

176) Schaeffer, P. Genetic analysis of streptomycin resistance of pneumococci. Ann. inst. Pasteur 91:325-37, 1956.

177) Schaeffer, P. Existence of a competition between molecules of deoxyribonucleic acids for penetration into transformable bacteria. Compt. rend. 245:230-1, 1957.

178) Schaeffer, P. The penetration of nucleic acid into bacteria in the course of interspecific transformations. Compt. rend. 245:375-7, 1957.

179) Schaeffer, P. Inhibition of transformation as means of measuring bacterial competence. Compt. rend. 245:451-3, 1957.

180) Schaeffer, P. Interspecific reactions in bacterial transformation. Symposia Soc. Exp. Biol. 12:60-74, 1958.

181) Schaeffer, P. and Ionesco, H. On the transformation of Bacillus subtilis. Compt. rend. 249:481-2, 1959.

182) Schaeffer, P., Edgar, R. S. and Rolfe, R. Inhibition of bacterial transformation by deoxyribonucleates of various compositions. Compt. rend. soc. biol. 154:1978-93, 1960.

183) *Schaeffer, P. Les réactions hétérospécifiques dans l'étude de la transformation bactérienne. Thèse Doctorat es-Sciences, Paris, 1961.

184) Shamoian, C. A., Canzanelli, A. and Melrose, J. Back-mutation of a Neurospora crassa mutant by a nucleic acid complex from the wild strain. Biochim. et Biophys. Acta 47:208-11, 1961.

185) Shooter, K. V. Recent work on nucleic acids. Nature 178:1320-1, 1956.

186) Shugar, D. Photochemistry of nucleic acids, in The Nucleic Acids, ed. by E. Chargaff and J. N. Davidson. New York: Academic, 1960. III:82-5, 88-90, 97-9.

187) Sinai, J. and Yudkin, J. The origin of bacterial resistance to proflavine. 5. Transformation of proflavine resistance in Escherichia coli. J. Gen. Microbiol. 20:400-13, 1959.

188) Sinsheimer, R. L. First steps toward a genetic chemistry. Science 125:1123-8, 1957.

189) Sirotnak, F. M., Lunt, R. B. and Hutchison, D. J. Genetic studies on amethopterin resistance in Diplococcus pneumoniae. J. Bacteriol. 80:648-53, 1960.

190) Sirotnak, F. M., Lunt, R. B. and Hutchison, D. J. Transformation of resistance to 8-azaguanine in Diplococcus pneumoniae. Nature 187:800-1, 1960.

191) Slade, H. D. and Perry, D. Transformation reactions among streptococci. Circulation 22:813, 1960.

192) Spizizen, J. Transformation of biochemically deficient strains of Bacillus subtilis by deoxyribonucleate. Proc. Nat. Acad. Sci. 44:1072-78, 1958.

193) Spizizen, J. Genetic activity of deoxyribonucleic acid in the reconstitution of biosynthetic pathways. Federation Proc. 18:957-65, 1959.

194) Spizizen, J. and Anagnostopoulos, C. Transformation of indole and sucrose characters in Bacillus subtilis, strain 168. Bacteriol. Proc. 60:185, 1960.

195) Stuy, J. H. Studies on the radiation inactivation of micro-organisms. VI. X-ray-induced breakdown of deoxyribonucleic acid in Haemophilus influenzae and in other bacteria. J. Bacteriol. 79:707-15, 1960.

196) Stuy, J. H. Studies on the radiation inactivation of micro-organisms. VII. Nature of the x-ray induced breakdown of deoxyribonucleic acid in Haemophilus influenzae. Radiation Research 14:56-65, 1961.

197) Szende, K., Sik, T., Ördögh, F. and Györffy, B. Transfer of immunity by nucleic acids of a lysogenic rhizobium strain. Biochim. et Biophys. Acta 47:215-17, 1961.

198) Szybalski, W., Opara-Kubinska, Z. and Ephrati-Elizur, E. Fractionation of analogue-containing transforming principle by centrifugation in the CsCl gradient. Federation Proc. 19: 306, 1960.

199) Szybalski, W., Opara-Kubinska, Z., Lorkiewicz, Z. Ephrati-Elizur, E. and Zamenhof, S. Transforming activity of deoxyribonucleic acid labeled with 5-bromo-uracil. Nature 188:743-5, 1960.

200) Tabor, H. Stabilization of Bacillus subtilis transforming principle by spermine. Biochem. Biophys. Research Communs. 4:228-31, 1961.

201) Tabor, H. The stabilizing effect of spermine on B. subtilis transforming principle. Federation Proc. 20:351, 1961.

202) Talmadge, M. B. and Herriott, R. M. A chemically defined medium for growth, transformation, and isolation of nutritional mutants of Hemophilus influenzae. Biochem. Biophys. Research Communs. 2:203-6, 1960.

203) Terada, M. Microbial genetic studies: transformation, transduction, genetic recombination. Intern. Congr. Microbiol., 7th Congr., Stockholm, 1958. Abstr., p. 66.

204) Thomas, R. The kinetics of bacterial transformations. Congr. intern. biochim., Résumés communs, 3rd Congr., Brussels, 1955. P. 77.

205) *Thomas, R. Genetic role of desoxyribonucleic acids in bacteria. Ann. Soc. sci. med. natur. Bruxelles 8:5-14, 1955.

206) Thomas, R. Kinetics of bacterial transformations. Biochim. et Biophys. Acta 18:467-81, 1955.

207) Thomas, R. Interference of ribonuclease with the transformations of bacteria. Arch. intern. physiol. et biochem. 64:528-9, 1956.

208) *Thomas, R. Transferts génétigues à l'eschelle macro-moléculaire, in Mécanismes d'auto-reproduction, ed. by J. A. Thomas. Paris: Masson et Cie, 1957.

209) Thomas, R. Note on the effects of the proteins of the medium in pneumococcal transformations. Biochem. J. 66:38P-39P, 1957.

210) Thomas, R. Observations on the role of proteins contained in the medium in bacterial transformations. Biochem. et Biophys. Acta 40:50-61, 1960.

211) Tolmach, L. J. and Lerman, L. S. Selective effects of ultraviolet radiation and other agents on genetic transformation. Radiation Research 7:454-5, 1957.

212) Tsukamura, M., Hasimoto, M. and Noda, Yo. Transformation of isoniazid and streptomycin resistance in Mycobacterium avium by the deoxyribonucleic acid derived from isoniazid and streptomycin double-reistant cultures. Am. Rev. Respirat. Diseases 81:403-6, 1960.

213) Voll, M. J. and Goodgal, S. H. Recombination during transformation in Hemophilus influenzae. Proc. Nat. Acad. Sci. U.S. 47:505-12, 1961.

214) *Wacker, A. Bakterien-Transformation. Collog. Ges. Physiol. Chem. 9:85-98, 1959.
BA 35:16466, 1960.

215) Young, F. E. and Spizizen, J. Factors influencing deoxyribonucleic acid uptake and transformation in Bacillus subtilis strain 168. Federation Proc. 20:254, 1961.

216) Young, F. E. and Spizzen, J. Physiological and genetic factors affecting transformation of Bacillus subtilis. J. Bacteriol. 81:823-9, 1961.

217) Zamenhof, S. Biology and biophysical properties of transforming principles. Progress in Biophysics 6:85-119, 1956.

218) Zamenhof, S., Leidy, G., Hahn, E. and Alexander, H. E. Inactivation and unstabilization of the transforming principle by mutagenic agents. J. Bacteriol. 72:1-11, 1956.

219) Zamenhof, S. Properties of the transforming principle, in Symposium on the Chemical Basis of Heredity, ed. by W. D. McElroy and Bentley Glass. Baltimore: John Hopkins Press, 1957. Pp. 351-77.

220) Z a menhof, S., Leidy, G., Greer, S. and Hahn, E. Differential stabilities of individual heredity determinants in transforming principle. J. Bacteriol. 74:194-9, 1957.

Reviews

221) Austrian, R. Some contributions of pneumococcal genetics to the elucidation of biological phenomenon. Bull. N.Y. Acad. Med. 36:355-63, 1960.

222) Cavalli-Sforza, L. L. Bacterial genetics. Ann. Rev. Microbiol. 11:391-418, 1957.

223) Demerec, M. Genetic basis of acquired drug resistance. Public Health Reports 70:817-21, 1955.

224) Ephrussi-Taylor, H. Current status of bacterial transformations. Advances in Virus Research 3:275-307, 1955.

225) Ephrussi-Taylor, H. The mechanism of desoxyribonucleic acid-induced transformation. Intern. Congr. Microbiol., 7th Congr., Stockholm, 1955. Recent Progress in Microbiol. Pp 51-77.

226) Ephrussi-Taylor, H. Biological functions of deoxyribonucleic acids, in Microbiol. Genetics. London: Cambridge University Press, 1960. Pp. 132-54.

227) Fincham, J. R. S. The biochemistry of genetic factors. Ann. Rev. Biochem. 28:343-5, 1958.

228) Harm, W. Recent advances in bacterial genetics. Deut. med. Wochschr. 83:851-4, 1958.

229) Hartman, P. E. and Goodgal, S. H. Bacterial genetics (with particular reference to genetic transfer). Ann. Rev. Microbiol. 13:465-504, 1959.

230) Jagger, J. Photoreactivation. Bacteriol. Rev. 22:99-142, 1958.

231) *Khesin, R. B. The role of deoxyribonucleic acids in the processes of transformation of bacteria. Uspekhi Sovremennoi Biol. 46:113-29, 1958.
CA 53:8303a, 1959.

232) Lanni, Frank. Genetic significance of microbial DNA composition. Perspectives in Biology and Medicine 3:418-32, 1960.

233) Lederberg, Joshua. Bacterial reproduction, in The Harvey Lectures, 1957-58. New York: Academic, 1959. Pp. 69-82.

234) Levinthal, C. and Davison, P. F. Biochemistry of genetic factors. Ann. Rev. Biochem. 30:658-9, 1961.

235) Morse, M. L. Transduction and transformation. Ann. N.Y. Acad. Sci. 68:324-34, 1957.

236) Ravin, A. W. Infection by viruses and genes. Am. Scientist 43: 468-78, 1955.

237) Ravin, A. W. Bacterial genetics. Ann. Rev. Microbiol. 12:309-64, 1958.

238) Sinsheimer, R. L. The biochemistry of genetic factors. Ann. Rev. Biochem. 29:504, 1960.

239) Strauss, B. S. An Outline of Chemical Genetics. Philadelphia: Saunders, 1960. Pp. 36-39, 51-52.

240) Zamenhof, Stephen. The Chemistry of Heredity. Springfield, Ill.: Thomas, 1959. Pp. 10-14, 43-44.