

# SUPPORTING MATERIAL





## Academic CV & Bibliography

(2022)

**Name:** Stephen Brian Henry KENT  
**Address (home):** 273 Hartford Street  
San Francisco, CA 94114, USA  
**Phone (mobile):** +1 415 849 6906  
**Email:** skent@uchicago.edu

### EDUCATION:

1975 Ph.D., University of California, Berkeley  
(Organic Chemistry)  
1970 M.Sc., Massey University, New Zealand  
(Chemistry/Biochemistry)  
1968 B.Sc., Victoria University of Wellington, New Zealand  
(Chemistry and Biochemistry, double major)

### PROFESSIONAL APPOINTMENTS:

06/01/2021- Professor Emeritus of Chemistry  
Professor Emeritus of Biochemistry & Molecular Biology  
The University of Chicago  
2003 -2009 Director, Institute for Biophysical Dynamics  
The University of Chicago  
2002-05/31/2021 Professor of Chemistry  
2001-05/31/2021 Professor, Biochemistry & Molecular Biology  
Institute for Biophysical Dynamics  
The College  
The University of Chicago  
1997-2000 Founder, President, & Chief Scientist  
Gryphon Sciences, South San Francisco, California  
1991-1996 Member, Cell Biology  
Professor, Macromolecular and Cellular Structure and Chemistry  
The Scripps Research Institute  
1989-1990 Professor and Associate Dean  
Graduate School of Science and Technology  
Bond University, Queensland, Australia  
Co-Director, Burroughs Wellcome-Bond University Research  
Program (Protease Inhibitor AIDS Drug Development)  
1983-1989 Senior Research Associate (now: Research Professor)  
California Institute of Technology  
Pasadena, California  
1982 Director of Protein Chemistry

## Stephen Kent - CV & Bibliography

1977-1981 Molecular Genetics Inc., Minnesota  
Assistant Professor  
The Rockefeller University, New York

1974-1977 Research Associate  
Laboratory of R.B. Merrifield  
The Rockefeller University, New York

### HONORS:

2022 Johannes Meienhofer Award  
Boulder Peptide Society

2018 *(Inaugural) Ernesto Scoffone Award*  
Italian Peptide Society

2017 *Prelog Medal*  
ETH Zurich

2013 *Leach Medal*  
Lorne Conference on Protein Structure and Function

2011 *Bader National Award in Bioorganic Chemistry*  
American Chemical Society

2010 *Akabori Memorial Award*  
Japanese Peptide Society

2010 *Josef Rudinger Memorial Lecture Award*  
European Peptide Society

2009 *R. Bruce Merrifield Award*  
American Peptide Society

2008 *Fellow*  
Royal Society of Chemistry

2006 *Honorary Fellow*  
Royal Society of New Zealand

2004 *Vincent du Vigneaud Award*  
American Peptide Society

2002 *(Inaugural) E T Kaiser Award*  
The Protein Society

2000 *Fellow*  
American Association for the Advancement of Science

1994 *Hirschmann National Award in Peptide Chemistry*  
American Chemical Society

## Stephen Kent - CV & Bibliography

### ACADEMIC ADVISORY BOARDS (selected)

- 2017-2022 Council Member, American Peptide Society
- 2016-2019 Chair, Awards Committee, American Peptide Society
- 2013-2019 European Research Council, Panel PE5 - Chemistry and Materials
- 2001-2004 Scientific Advisory Board, Institute for Molecular Bioscience, University of Queensland, Australia
- 1991-1996 Scientific Advisory Board, The New York Blood Center, New York
- 1990-1992 Scientific Advisory Board, National Biomolecular Mass Spectrometry Resource, The Rockefeller University, New York

### BIBLIOGRAPHY

#### Dissertations

- M.Sc. Peptide Sequences by Mass Spectrometry.  
*Massey University, New Zealand, 1970*
- Ph.D. Specific Chemical Modification and  $^{13}\text{C}$ -NMR Properties of the Lysine at the Active Site of Liver Alcohol Dehydrogenase (LADH).  
*University of California, Berkeley, 1975.*

Primary Publications in Refereed Journals

1. The mass spectra of permethylated acetylpeptides. Hodges R., Kent S.B.H., Richardson B.C. *Biochim Biophys Acta* **257**, 54 (1972).
2. Formation of non-amidine products in the reaction of primary amines with imido esters. Browne D.T., Kent S.B.H. *Biochem Biophys Res Comm* **67**, 126 (1975).
3. Formation of non-amidine products in the chemical modification of horse liver alcohol dehydrogenase with imido esters. Browne D.T., Kent S.B.H. *Biochem Biophys Res Comm* **67**, 133 (1975).
4. Preparation of aminomethyl-polystyrene resin by direct amidomethylation. Mitchell A.R., Kent S.B.H., Erickson B.W., Merrifield R.B. *Tetrahedron Lett*, **17**, 3795-98 (1976).
5. Test for racemization in model peptide synthesis by direct chromatographic separation of the diastereoisomers of the tetrapeptide leucylalanylglycylvaline. Kent S.B.H., Mitchell A.R., Barany G., Merrifield R.B. *Anal Chem* **50**, 155-159 (1978).
6. Quantitative determination of D- and L-amino acids: Reaction with tert-butylloxycarbonyl-L-leucine N-hydroxysuccinimide ester and chromatographic separation as L,D and L,L dipeptides. Mitchell A.R., Kent S.B.H., Chu I.R., Merrifield R.B. *Anal Chem* **50**, 637 (1978).
7. A new synthetic route to tert-butylloxycarbonylaminoacyl-4-(oxymethyl)phenylacetamidomethyl-resin, an improved support for solid phase peptide synthesis. Mitchell A.R., Kent S.B.H., Engelhard M., Merrifield R.B. *J. Organic Chem* **43**, 2845-2852 (1978).
8. Mechanisms and prevention of trifluoroacetylation in solid phase peptide synthesis. Kent S.B.H., Mitchell A.R., Engelhard M., Merrifield R.B. *Proc Natl Acad Sci USA* **76**, 2180-2184 (1979).
9. Preparation and properties of tert-butylloxycarbonylaminoacyl-4-(oxymethyl)phenylacetamidomethyl-(Kel F-g-styrene) resin, an insoluble, noncrosslinked support for solid phase peptide synthesis. Kent S.B.H., Merrifield R.B. *Isr. J Chem* **17**, 243 (1978).
10. Improved synthesis of Boc-aminoacyl-4-oxymethylphenylacetic acids for use in solid phase peptide synthesis. Tam J.P., Kent S.B.H., Wong T.-W., Merrifield R.B. *Synthesis*, 955 (1979).
11. Properties of swollen polymer networks: Solvation and swelling of peptide-containing resins in solid phase peptide synthesis. Sarin V.K., Kent S.B.H., Merrifield R.B. *J Am Chem Soc* **102**, 5463-5470 (1980).

## Stephen Kent - CV & Bibliography

12. Preparation and characterization of a biologically active gastrin derivative modified with an <sup>125</sup>I-labeled imido ester. Praissman M., Praissman L., Kent S.B.H., Berkowitz J.M. *Anal Biochem* **115**, 287 (1981).
13. Quantitative monitoring of solid phase peptide synthesis by the ninhydrin reaction. Sarin V.K., Kent S.B.H., Tam J.P., Merrifield R.B. *Anal Biochem* **117**, 147-157 (1981).
14. Weak acid-catalyzed pyrrolidone carboxylic acid formation from glutamine during solid phase peptide synthesis. Minimization by rapid coupling. Dimarchi R.D., Tam J.P., Kent S.B.H., Merrifield R.B. *Int. J Pept Protein Res.* **19**, 88-93 (1982).
15. Specificity of antibodies elicited by a synthetic peptide having a sequence in common with a fragment of a virus protein - the hepatitis B surface antigen. Neurath A.R., Kent S.B.H., Strick N. *Proc Natl Acad Sci USA* **79**, 7871 (1982).
16. A chemical mechanism to account for the artifactual formation of shortened peptides with free alpha-amino groups in solid phase peptide synthesis. Kent S.B.H., Merrifield R.B., *Int. J Pept Protein Res.* **22**, 57-65 (1983).
17. Protein microsequencing by post-column fluorescent phenylisothiocyanates. L'Italien J.J. and Kent S.B.H. *J Chromatog*, **283**, 149-156 (1984).
18. A microchemical facility for the analysis and synthesis of genes and proteins. Hunkapiller M., Kent S.B.H., Caruthers M., Dreyer W., Firca J., Giffin C., Horvath S.J., Hunkapiller T., Tempst P. and Hood L. *Nature*, **310**, 105-111 (1984).
19. Antibodies to hepatitis B surface antigen (HBsAg) elicited by immunization with a synthetic peptide not linked to protein carriers. Neurath A.R., Kent S.B.H. and Strick N. *J Gen Virology*, **65**, 1009 (1984).
20. Antibody response to two synthetic peptides corresponding to residues 45-68 and 69-79 of the major protein of hepatitis B surface antigen. Neurath A.R., Kent S.B.H. and Strick N. *Virus Research* **1**, 321 (1984).
21. Monoclonal antibodies to hepatitis B surface antigen with anti-a specificity recognize a synthetic peptide analogue (S135-155) with unmodified lysine 141. Neurath A.R., Kent S.B.H. and Strick N. *J Virol Methods*, **9**, 341-346 (1984).
22. Location and chemical synthesis of an immunodominant epitope coded for by the Pre-S region of hepatitis B virus DNA. Neurath A.R., Kent S.B.H. and Strick N., *Science*, **224**, 392-395 (1984).
23. Purification to apparent homogeneity of a factor stimulating the growth of multiple lineages of hemopoietic cells, Clark-Lewis I., Kent S.B.H. and Schrader J.W. *J Biol Chem*, **259**, 7488-7494 (1984).
24. Purification and structural studies of a major scrapie prion protein. Prusiner S., Groth D.F., Bolton D.C., Kent S.B.H. and Hood L. *Cell*, **38**, 127-134 (1984).

## Stephen Kent - CV & Bibliography

25. Presence of Pre-S gene coded domains in hepatitis B virus (HBV) and their function. Neurath A.R., Kent S.B.H., Strick N., Taylor P. and Stevens C.E. *Nature*, **315**, 154-156 (1985).
26. Synthetic efficiency as a function of peptide chain length in solid phase peptide synthesis. Sarin V.K., Kent S.B.H., Mitchell A.R. and Merrifield R.B. *J Am Chem Soc*, **106**, 7845-7850 (1984).
27. The Mr 28,000 gap junction proteins from rat heart and liver are different but related. Nicholson B.J., Gros D.B., Kent S.B.H., Hood L.E. and Revel J-P. *J Biol Chem*, **260**, 6514-6517 (1985).
28. A cellular gene encodes scrapie PrP 27-30 protein. Oesch B, Westaway D, Walchli M, McKinley M, Barry R.A., Kent, S.B.H., Teplow D, Aebersold R, Tempst P, Hood L, Prusiner S and Weissman C. *Cell*, **40**, 735-746 (1985).
29. Enhanced immunogenicity of the pre-S domain of hepatitis B surface antigen. Milich D.R., Thornton G.B., Neurath A.R., Kent S.B.H., Michel M., Tiollais P. and Chisari F.V. *Science*, **228**, 1195-1199 (1985).
30. Expression in E. coli of a cloned DNA sequence encoding the pre-S2 region of hepatitis B virus. Offensperger W., Wahl S., Neurath A.R., Price P., Strick N., Kent S.B.H. and Christman J.K., Acs G. *Proc Natl Acad Sci USA*, **82**, 7540-7544 (1985).
31. Genetic restriction of immune responsiveness to synthetic peptides corresponding to sequences in the pre-S region of the hepatitis B virus envelope gene. Neurath A.R., Kent S.B.H., Strick N, Stark D and Sproul P. *J Med Virol*, **17**, 119-125 (1985).
32. Design of hepatitis B vaccines. Neurath A.R., Kent S.B.H. and Strick N. *Advances in Immunopharmacology*, **3**, 337-345 (1986).
33. Multiple copy genes: Production and modification of monomeric peptides from large multimeric fusion proteins. Kempe T., Kent S.B.H., Chow F., Peterson S.M., Sundquist W.I., L'Italien J.J., Harbrecht D., Plunkette D. and Delorbe W.J. *Gene*, **39**, 239-245 (1985).
34. Identification of a peptide fragment from the carboxyl terminal extension region (E-domain) of rat proinsulin-like growth factor-II. Hylka V.W., Teplow D.B., Kent S.B.H. and Straus D.S. *J Biol Chem*, **14**, 417-420 (1985).
35. Electroblotting onto activated glass: I. high efficiency preparation of proteins from analytical SDS-PAGE gels for direct sequence analysis. Aebersold R.H., Teplow D.B., Hood L.E. and Kent S.B.H. *J Biol Chem*, **261**, 4229-4238 (1986).
36. Antibodies to a synthetic peptide from the Pre-S (120-145) region of the hepatitis B virus envelope are virus-neutralizing. Neurath A.R., Kent S.B.H., Prince A.M., Strick N., Brotman B. and Sproul P. *Vaccine*, **4**, 35-37 (1985).
37. Detection of a rare foetal hemoglobin chain in adult baboons after treatment with 5-azacytidine. DeSimone J., Schroeder W.A., Shelton J.B., Shelton J.R., Kent S.B.H. and Hood L.E. *Hemoglobin*, **9**, 217-226 (1985).



## Stephen Kent - CV & Bibliography

38. Automated total chemical synthesis of a protein growth factor for hemopoietic cells, interleukin-3. Clark-Lewis I., Aebersold R.A., Ziltener H., Schrader J.W., Hood L.E. and Kent S.B.H. *Science*, **231**, 134-139 (1986).
39. Enzyme-linked immunoassays of pre-S gene coded sequences in hepatitis B vaccines. Neurath A.R., Strick N., Kent S.B.H., Offensberger W., Wahl S. and Christman J.K. *J Virol Methods*, **12**, 185-192 (1986).
40. Detection of antiviral antibodies with predetermined specificity using synthetic peptide-beta-lactamase conjugates: Application to antibodies specific for the pre-S region of the hepatitis B virus envelope proteins. Neurath A.R., Kent S.B.H. and Strick N. *J Gen Virol*, **67**, 453-461 (1986).
41. Microscale structure analysis of a high molecular weight, hydrophobic membrane glycoprotein fraction with PDGF-dependent kinase activity. Tempst P., Woo D., Aebersold R., Teplow D., Hood L.E. and Kent S.B.H. *J Chromatography*, **359**, 403-412 (1986).
42. Fluorescence detection in automated DNA sequence analysis. Smith L.M., Sanders J.Z., Kaiser R.J., Hughes P., Dodd C., Kent S.B.H. and Hood L.E. *Nature*, **321**, 674-679 (1986).
43. Identification and chemical synthesis of a host cell receptor binding site on hepatitis B virus. Neurath A.R., Kent S.B.H., Strick N. and Parker K. *Cell*, **46**, 429-436 (1986).
44. Characterization of monoclonal antibodies specific for the pre-S(2) region of the hepatitis B virus envelope proteins. Neurath A.R., Adamowicz P., Kent S.B.H., Riottot M.M., Strick N., Parker K., Offensperger W., Petit M.A., Wahl S., Budkowska A., Girard M. and Pillot J. *Molec Immunol*, **23**, 991-997 (1986).
45. Antipeptide antibodies of predetermined specificity recognize and neutralize the bioactivity of the pan-specific hemopoietin interleukin 3. Ziltener H.J., Clark-Lewis I., Hood L.E., Kent S.B., Schrader J.W. *J Immunol*, **138**, 1099-1104 (1986).
46. Antipeptide antibodies define the N-terminal structure of the natural pan-specific hemopoietin interleukin 3. Ziltener H.J., Clark-Lewis I., Fazekas de St. Groth B., Hood L.E., Kent S.B.H. and Schrader J.W. *J Immunol*, **138**, 1105-1108 (1986).
47. Scrapie and cellular prion proteins share polypeptide epitopes. Barry R.A., Kent S.B.H., McKinley M.P., Meyer R.K., DeArmond S.J., Hood L.E. and Prusiner S.B. *J Infect Disease*, **153**, 848-854 (1986).
48. Immune response to the pre-S(1) region of the hepatitis B surface antigen (HBsAg): a pre-S(1)-specific T-cell response can bypass nonresponsiveness to the pre-S(2) and S regions of HBsAg. Milich D.R., McLachlan A., Chisari F.V., Neurath A.R., Kent S.B.H. and Thornton G.B. *J Immunol*, **137**, 315-322 (1986).

## Stephen Kent - CV & Bibliography

49. E-domain peptide of rat pro-insulin-like growth factor II: Validation of a radioimmunoassay and measurement in culture media and rat serum. Hylka V.W., Kent S.B.H. and Straus D.S. *Endocrinology*, **120**, 2050-2058 (1987).
50. Immunological cross-reactivity between pre-S(2) sequences of the hepatitis B virus envelope proteins corresponding to serological subtypes adw2 and ayw. Neurath A.R., Kent S.B.H., Adamowicz P., Riottot M.M., Price P., Strick N., Parker K., Petit M.A., Budkowska A., Girard M. and Pillot J. *Molec Immunol*, **24**, 561-568 (1987).
51. Antibodies to synthetic peptides from the pre-S(1) and pre-S(2) regions of one subtype of the hepatitis B virus envelope protein recognize all HBV subtypes. Neurath A.R., Kent S.B.H., Strick N., Parker K., Courouce A-M, Riottot M.M., Petit M.A., Budkowska A., Girard M. and Pillot J. *Molec Immunol*, **24**, 975-980 (1987).
52. Approaches to subpicomole protein sequencing. Kent S.B.H., Hood L.E., Aebersold R., Teplow D., Smith L., Hines W., Farnsworth V., Cartier P., Hughes P. and Dodd C. *Biotechniques*, **5**, 314-321 (1987).
53. Internal amino acid sequence analysis after in situ protease digestion on nitrocellulose of proteins separated by one- or two-dimensional gel electrophoresis. Aebersold R.A., Leavitt J., Saavedra R., Hood L.E. and Kent S.B.H. *Proc Natl Acad Sci USA*, **84**, 6970-6974 (1987).
54. Characterization of prion proteins with nonspecific antisera to synthetic peptides. Barry R.A., Vincent M.T., Kent S.B.H., Hood L.E. and Prusiner S.B. *J Immunol*, **140**, 1188-1193 (1988).
55. Isolation and characterization of a corticotropin releasing factor-like peptide from human placenta. Sasaki A., Liotta A.S., Margioris A.N., Tempst P., Hood L.E., Kent S.B.H. and Krieger D.T. *J Clin Endocrinol and Metab*, **67**, 768-773 (1988).
56. Role of disulfide bridges in determining the biological activity of interleukin-3. Clark-Lewis I., Hood L.E. and Kent S.B.H. *Proc Natl Acad Sci USA*, **85**, 7897-7901 (1988).
57. Monoclonal antipeptide antibodies recognize interleukin-3 and neutralize its bioactivity in vivo. Ziltener H.J., Clark-Lewis I., de St. Groth B.F., Orban P.C., Hood L.E., Kent S.B.H. and Schrader J.W. *J Immunology*, **140**, 1182-1187 (1988).
58. Delineation of contiguous determinants essential for biological functions of the pre-S sequence of the hepatitis B virus envelope protein: antigenicity, immunogenicity, cell-receptor recognition. Neurath A.R., Kent S.B.H., Strick N. and Parker K. *Ann Inst Pasteur/Virol*, **139**, 13-38 (1988).
59. Structure-function studies of human granulocyte-macrophage colony-stimulating factor: identification of amino acids required for activity, and an 84-residue active

## Stephen Kent - CV & Bibliography

- fragment. Clark-Lewis I., Lopez A., Luen B., Vadas M., Schrader J.W., Hood L.E. and Kent S.B.H. *J Immunol*, **141**, 881-889 (1988).
60. Covalent immobilization of proteins for high sensitivity sequence analysis: electroblotting onto chemically-activated glass from SDS-polyacrylamide gels. Aebersold R.A., Pipes G.D., Nika H., Hood L.E. and Kent S.B.H. *Biochemistry*, **27**, 6860-6867 (1988).
  61. Location and chemical synthesis of a binding site for HIV-1 on the CD4 protein. Jameson B.A., Rao P.E., Kong L., Hahn B., Shaw G., Hood L.E. and Kent S.B.H. *Science*, **240**, 1335-1339 (1988).
  62. Molecular characterization of plastin: a human leukocyte protein expressed in transformed human fibroblasts. Lin C-S., Aebersold R.H., Kent S.B.H., Varma M. and Leavitt J. *Molecular and Cellular Biology*, **8**, 4659-4668 (1988).
  63. Enzymatic activity of a synthetic 99 residue protein corresponding to the putative HIV-1 protease. Schneider J., Kent S.B.H. *Cell* **54**, 363-368 (1988).
  64. N-terminal and internal sequence determination of microgram amounts of proteins separated in immobiline isoelectric focusing gels. Aebersold R.H., Pipes G., Hood L.E. and Kent S.B.H. *Electrophoresis*, **9**, 520-530 (1988).
  65. Identification of a novel retroviral gene unique to HIV-2 and simian immunodeficiency virus SIVMAC. Kappes J.C., Morrow C.D., Lee S.-W., Jameson B.A., Kent S.B.H., Hood L.E., Shaw G.M., Hahn B.H. *J. Virol.* **62**, 3501-3505 (1988).
  66. Antibodies recognizing human serum albumin are not elicited by immunization with preS(2) sequences of the hepatitis B virus envelope protein. Neurath A.R., Strick N., Parker K., Kent S.B.H. *J. Med. Virol.* **24**, 137-151 (1988).
  67. Chemical synthesis in protein engineering: total synthesis, purification, and covalent structural characterization of a mitogenic protein, human transforming growth factor- $\alpha$ . Woo D. D.-L., Clark-Lewis I., Chait B.T., Kent S.B.H. *Protein. Eng.*, **3**, 29-37 (1989).
  68. Substitutions engineered by chemical synthesis at three conserved sites in mitochondrial cytochrome c: thermodynamic and functional consequences. Wallace C.J.A., Mascagni P., Chait B.T., Collawn J.F., Paterson Y., Proudfoot A.E.I., Kent S.B.H., *J. Biol. Chem.*, **264**, 15199-15209 (1989).
  69. Crystal structure of synthetic HIV-1 protease: conserved fold in retroviral proteases. Wlodawer A., Miller M., Jaskolski M., Sathyanarayana B.K., Baldwin E., Weber I.T., Selk L.M., Clawson L., Schneider J., and Kent, S.B.H. *Science*, **245**, 616-621 (1989).

## Stephen Kent - CV & Bibliography

70. Structure of a complex of synthetic HIV-1 protease with a substrate-based inhibitor at 2.3Å resolution. Miller M., Schneider J., Sathyanarayana B.K., Toth M.V., Marshall G.R, Clawson L., Selk L., Kent S.B.H.\*, Wlodawer A\*. *Science*, **246**, 1149-1152 (1989).
71. Hydroxyethylamine analogues of the p17/p24 substrate cleavage site are tight-binding inhibitors of HIV Protease. Rich D.H., Green J., Toth M.V., Marshall G.R., Kent S.B.H. *J. Med. Chem.* **3**, 1285-1288 (1990).
72. X-ray crystallographic structure of a complex between synthetic HIV-1 protease and a substrate-based hydroxyethylamine inhibitor. A.L. Swain, M. Miller, J. Green, D.H. Rich, J. Schneider, S.B.H. Kent, A. Wlodawer, *Proc. Natl. Acad. Sci. USA* **87**, 8805-8809 (1990).
73. Structure at 2.5Å resolution of chemically synthesized HIV-1 protease complexed with a hydroxyethylene-based inhibitor. M. Jaskolski, A.G. Tomasselli, T.K. Sawyer, D.G. Staples, R.L. Heinrikson, J. Schneider, S.B.H. Kent, A. Wlodawer, *Biochemistry* **30**, 1600-1609 (1991).
74. Inhibition of intercellular adhesion molecule 1-dependent biological activities by a synthetic peptide analog. J.V. Fecondo, S.B.H. Kent, A.W. Boyd, *Proc. Natl. Acad. Sci. USA* **88**, 2879-82 (1991).
75. Solid phase synthesis of hydroxyethylamine isosteres: synthesis of the potent HIV-1 protease inhibitor JG365. P.F. Alewood, R.J. Dancer, R.I. Brinkworth, S.B.H. Kent, *Tetrahedron. Lett.*, **33**, 977-980 (1992).
76. Constructing proteins by dovetailing unprotected synthetic peptides: backbone engineered HIV protease. M. Schnölzer, S.B.H. Kent *Science*, **256**, 221-225 (1992).
77. Ionspray mass spectrometry in peptide synthesis: structural characterization of minor by-products in the synthesis of ACP(65-74). M. Schnölzer, A. Jones, P.F. Alewood, S.B.H. Kent, *Anal. Biochem.* **204**, 335-343 (1992)
78. Direct observation by electrospray mass spectrometry of a ternary complex between the dimeric enzyme HIV protease and a substrate-based inhibitor. M. Baca, S.B.H. Kent, *J.Am.Chem.Soc.* **114**, 3992-3993 (1992)
79. Total chemical synthesis of a D-enzyme: the enantiomers of HIV-1 protease demonstrate reciprocal chiral substrate specificity, R.C deLisle Milton, S.C.F. Milton, and S.B.H. Kent, *Science*, **256**, 1445-1448 (1992). **Cover** Erratum: (Title & Fig. 3 labels)
80. "In situ" neutralization protocols in Boc-chemistry solid phase peptide synthesis: rapid, high yield assembly of difficult sequences. Schnölzer M., Alewood P., Alewood D., Kent S.B.H., *Int.J.Pept.Prot.Res.*, **40**, 180-193 (1992).

## Stephen Kent - CV & Bibliography

*\*Republished, with commentary & posthumous dedication to R. Bruce Merrifield: "In situ" neutralization protocols in Boc-chemistry solid phase peptide synthesis: rapid, high yield assembly of difficult sequences. Schnölzer M., Alewood P., Alewood D., Kent S.B.H., International Journal of Peptide Research and Therapeutics, 13, 31–44 (2007).*

81. Weighing naked proteins: practical, high-accuracy mass measurement of peptides and proteins, B.T. Chait, S.B.H. Kent, *Science*, **257**, 1885-1894 (1992).
82. Efficient method for the preparation of peptoids [oligo N-substituted glycines] by sub-monomer solid phase synthesis. R. N. Zuckermann, J.M. Kerr, S.B.H. Kent, W.H. Moos, *J. Am. Chem. Soc.* **114**, 10646-10647 (1992).
83. Identification of proteolytic processing sites within the Gag and Pol polyproteins of feline immunodeficiency virus. J. Elder, M. Schnölzer, C.S. Hasselkus-Light, M. Henson, D.A. Lerner, T.R. Philips, P.C. Wagaman, S.B.H. Kent, *J. Virology*, **67**, 1869-1876 (1993).
84. Structural engineering of HIV-1 protease with a  $\beta$ -turn mimic of fixed geometry. Baca M., Alewood P., Kent S.B.H., *Protein Science*, **2**, 1085-1091 (1993).
85. Convenient total synthesis of a 4-Helix TASP molecule by chemoselective ligation. Philip E. Dawson, Stephen B.H. Kent, *J.Am.Chem.Soc.*, **115**, 7263-7266 (1993).
86. Protein ladder sequencing. B.T. Chait, R.Wang, R. Beavis, S.B.H. Kent, *Science*, **262**, 89-92 (1993).
87. Catalytic contribution of flap-substrate hydrogen bonds in HIV-1 protease explored by chemical synthesis. Manuel Baca and Stephen B.H. Kent, *Proc. Natl. Acad. Sci. U.S.*, **90**, 11638-42 (1993).
88.  $^1\text{H}$  NMR determination of the three dimensional structures of mirror image forms of a Leu<sup>5</sup> variant of the trypsin inhibitor *Ecballium elaterium* (EETI-II), Katherine J. Nielsen, Dianne Alewood, John Andrews, Stephen B.H. kent, David J. Craik, *Protein Science*, **3**, 291-302 (1994).
89. Design and chemical synthesis of an artificial neoprotein designed to mimic the cytoplasmic domains of the multichain integrin receptor 2b3a. T. W. Muir, M. J. Williams, M. H. Ginsberg, S.B.H. Kent, *Biochemistry*, **33**, 7701-7708 (1994).
90. The primary structure of halocyanin, an archaeal blue copper protein, predicts a lipid anchor for membrane fixation. S. Mattar, B. Schaff, S. Kent, K. Rodewald, D. Oesterhelt, M. Engelhard, *J. Biol. Chem.*, **269**, 14939-945 (1994).

## Stephen Kent - CV & Bibliography

91. Total chemical synthesis of a folded  $\beta$ -sandwich protein domain: a fibronectin type 3 module. M. Williams, T. Muir, M. Ginsberg, S.B.H. Kent, *J.Am.Chem.Soc.*, **116**, 10797-798 (1994).
92. Detection of synthetic protein isomers & conformers by electrospray mass spectrometry. T. Muir, M. Williams, S.B.H. Kent, *Analytical Biochemistry*, **224**, 100-109 (1995).
93. Synthesis of proteins by native chemical ligation. Philip E. Dawson, Tom W. Muir, Ian Clark-Lewis, Stephen B.H. Kent, *Science*, **266**, 776-779 (1994).
94. Chemical ligation of cysteine-containing peptides: synthesis of a 22kDa tethered dimer of HIV-1 protease. Manuel Baca, Tom W. Muir, Martina Schnölzer, Stephen B.H. Kent, *J.Am.Chem.Soc.*, **117**, 1881- 87 (1995).
95. Total chemical synthesis of a unique transcription factor-related protein: *cMyc-Max*. L.E. Canne, A.R. Ferré-D'Amaré, S.K. Burley, S.B.H. Kent, *J.Am.Chem.Soc.*, **117**, 2998-3007 (1995).
96. A convenient general synthesis of Boc-aminoacyl-thioester resins for use in peptide synthesis. L.E. Canne, S. Walker, S.B.H. Kent, *Tetrahed. Letters*, **36**, 1217-20 (1995)
97. Kinetic properties of HIV-1 protease produced by total chemical synthesis with cysteine residues replaced by isosteric L- $\alpha$ -amino-*n*-butyric acid. Doug A. Bergman, Dianne Alewood, Paul F. Alewood, John L. Andrews, Ross Brinkworth, Darren Englebretsen, Stephen B.H. Kent, *Letters in Peptide Science*, **2**, 99 (1995).
98. Analysis of the structure of chemically synthesized HIV-1 protease complexed with a hexapeptide inhibitor. Part I: crystallographic refinement of 2Å data. M. Miller, M. Geller, M. Gribskov, S.B.H. Kent, *Proteins (Structure, Function, Genetics)*, **27** 184-94 (1997).
99. Total chemical synthesis and catalytic properties of the enzyme enantiomers D- & L-4-oxalocrotonate tautomerase. M. C. Fitzgerald, I. Chernushevich, K.G. Standing, S.B.H. Kent, C.P. Whitman, *J.Am.Chem.Soc.*, **117**, 11075-80 (1995).
100. Mapping protein-protein interactions by affinity-directed mass spectrometry. Y.-M. Zhao, T.W. Muir, S.B.H. Kent, E. Tischer, J. M. Scardina, B.T. Chait, *Proc.Natl.Acad.Sci.U.S.*, **93**, 4020-4024 (1996).
101. Template-directed chemical ligation of peptides to oligonucleotides. Richard K. Bruick, Philip E. Dawson, Stephen B.H. Kent, Nassim Usman, Gerald F. Joyce, *Chemistry & Biology*, **3** 49-56 (1996).

## Stephen Kent - CV & Bibliography

102. Probing the oligomeric structure of an enzyme by electrospray ionization time-of-flight mass spectrometry. M. C. Fitzgerald, I. Chernushevich, K.G. Standing, C.P. Whitman, S.B.H. Kent, *Proc.Natl.Acad.Sci.U.S.*, **93**, 6851-6856 (1996).
103. Extending the applicability of native chemical ligation. Lynne E. Canne, Steven J. Bark, Stephen B.H. Kent, *J.Am.Chem.Soc.* **118**, 5891-96 (1996).
104. Ionization states of the catalytic residues in HIV-1 Protease. Ross Smith, Ian M. Brereton, Richard Y. Chai, Stephen B. H. Kent. *Nature Structural Biology*, **3**, 946-950 (1996).
105. Comparative total synthesis of turkey ovomucoid third domain by both stepwise solid phase peptide synthesis and native chemical ligation. W. Lu, M.A. Qasim, S.B.H. Kent, *J.Am.Chem.Soc.*, **118**, 8518-8523 (1996).
106. Comparative enzymatic properties of feline immunodeficiency virus and HIV-1 proteinases prepared by total chemical synthesis. M. Schnölzer, H-R. Rackwitz, G. S. Laco, J. Elder, S.B.H. Kent, *Virology*, **224**, 268-275 (1996).
107. Modulation of reactivity in native chemical ligation through the use of thiol additives. P. E. Dawson, M. Churchill, M. R. Ghadiri, S.B.H. Kent. *J.Am.Chem.Soc.*, **119**, 4325-29 (1997).
108. Probing the chemical basis of binding activity in an SH3 domain by protein signature analysis. Tom W. Muir, Philip E. Dawson, Michael C. Fitzgerald, Stephen B.H. Kent. *Chemistry & Biology*, **3**, 817-825 (1996).
109. Synthesis of a versatile purification handle for use with Boc chemistry solid phase peptide synthesis. L.E. Canne, R.L. Winston, S.B.H. Kent, *Tetrahedron Lett.*, **38**, 3361-3364 (1997).
110. Rapid, sensitive structure analysis of oligosaccharides. Yingming Zhao, Stephen B.H. Kent, Brian T. Chait. *Proc.Natl.Acad.Sci.U.S.*, **94**, 1629-33 (1997).
111. Methods for the chemical synthesis and readout of self-encoded arrays of polypeptide analogues. P.E. Dawson, M.C. Fitzgerald, T. W. Muir, S.B.H. Kent. *J.Am.Chem.Soc.*, **119**, 7917-27 (1997).
112. Probing intermolecular main chain H-bonding in serine proteinase-protein inhibitor complexes: chemical synthesis of a backbone-engineered turkey ovomucoid third domain. W. Lu, M.A. Qasim, M. Laskowski, Jr., S.B.H. Kent, *Biochemistry*, **36**, 673-79 (1997).
113. Total chemical synthesis of enzymatically active human type II secretory phospholipase A2. T.M. Hackeng, C.M. Mounier, C. Bon, P.E. Dawson, J.H. Griffin, S.B.H. Kent, *Proc. Natl. Acad. Sci. USA* **94**, 7845-7850 (1997).

## Stephen Kent - CV & Bibliography

114. Direct monitoring of organic reactions on polymeric supports. M.R. Carrasco, M.C. Fitzgerald, Y. Oda, S.B.H. Kent, *Tetrahedron Lett.*, **38**, 6331-34 (1997).
115. Molecular analysis of the feline immunodeficiency virus protease: generation of a novel form of the protease by autoproteolysis and construction of cleavage-resistant proteases. Laco GS, Fitzgerald MC, Morris GM, Olson AJ, Kent SB, Elder JH, *J Virol.*, **71**, 5505-11 (1997).
116. Probing the structural basis of the catalytic activity of HIV-1 protease through total chemical protein synthesis. M. Miller, M. Baca, J.K.M. Rao, S. Kent, J. *Molec. Structure (THEOCHEM)*, **423**,137-152 (1998).
117. A continuous fluorometric assay for the FIV protease. M.C. Fitzgerald, G.S. Laco, J.H. Elder, S.B.H. Kent, *Anal. Biochem.*, **254**, 226-30 (1997).
118. Chemically synthesis of human 'protein S' thrombin-sensitive module and first epidermal growth factor module. T.M. Hackeng, P.E. Dawson, S.B.H. Kent, J.H. Griffin. *Biopolymers*, **46**, 53-63 (1998).
119. A novel method for the synthesis of cyclic peptides. Yang Shao, Wuyuan Lu, Stephen B.H. Kent, *Tetrahedron Lett.*, **39**, 3911-14 (1998).
120. Total chemical synthesis of bovine pancreatic trypsin inhibitor by native chemical ligation. Wuyuan Lu, Melissa A. Starovasnik, Stephen B.H. Kent, *FEBS Lett*, **429**, 31-35 (1998).
121. Characterization of Agouti-related protein binding to melanocortin receptors. Y-k. Yang, D.A. Thompson, C.J. Dickinson, J. Wilken, G.S. Barsh, S.B.H. Kent, I. Gantz, *Molecular Endocrinology*, **13**, 148-155 (1999).
122. Total chemical synthesis and crystal structure of the potent anti-HIV protein AOP-RANTES. Jill Wilken, David Hoover, Darren A. Thompson, Paul N. Barlow, Helen McSparron, Laurent Picard, Alex Wlodawer, Jacek Lubkowski, Stephen B.H. Kent, *Chemistry & Biology*, **6**, 43-51 (1999).
123. Chemical protein synthesis by solid phase ligation of unprotected peptide segments. Lynne E. Canne, Paolo Botti, Reyna J. Simon, Yijun Chen, Edward A. Dennis, Stephen B.H. Kent, *J.Am.Chem.Soc.*, **121**, 8720-27 (1999).
124. Characterization of the DNA binding properties of the bHLH domain of the transcription factor Deadpan to single and tandem sites. Rachel L. Winston, David P. Millar, Joel M. Gottesfeld, Stephen B.H. Kent, *Biochemistry*, **38**, 5138-46 (1999).
125. NMR structure of a minimized human agouti-related protein prepared by total chemical synthesis. K.A. Bolin, D.J. Anderson, J.A. Trulson, I. Gantz, D.A. Thompson, J. Wilken, S.B.H. Kent, G.L. Milhauser, *FEBS Letters*, **451**, 125-131 (1999).



## Stephen Kent - CV & Bibliography

126. Probing intermolecular backbone H-bonding in serine-proteinase protein-inhibitor complexes. Wuyuan Lu, Michael Randal, Anthony Kossiakoff, Stephen B.H. Kent, *Chemistry & Biology*, **6**, 419-427 (1999)
127. Design, total chemical synthesis, and binding properties of a [(N<sub>1</sub>-Me-7-aza)Trp<sup>91</sup>]Ras-binding domain of c-Raf-1. Jens R. Sydor, Christian Herrmann, Stephen B.H. Kent, Roger S. Goody, Martin Engelhard, *Proc. Natl. Acad. Sci. USA*, **96**, 7865-7870 (1999).
128. Total chemical synthesis of the integral membrane protein influenza A virus M2 proton channel: role of its cytoplasmic domain for pore assembly. Gerd G. Kochendoerfer, David Salom, James D. Lear, Stephen B. H. Kent, William F. DeGrado, *Biochemistry*, **38**, 11905-13 (1999).
129. Engineering an unnatural N<sup>α</sup>-Anchored Disulfide into BPTI by Total Chemical Synthesis: Structural and Functional Consequences, Steven J. Bark, Stephen B. H. Kent, *FEBS Letters*, **460**, 67-76 (1999).
130. Chemical synthesis and spontaneous folding of a multidomain protein: anticoagulant microprotein S. Tilman M. Hackeng, Jose A. Fernandez, Philip E. Dawson, Stephen B.H. Kent, John H. Griffin, *Proc. Natl. Acad. Sci. USA* **97**, 14074-78 (2000).
131. Fmoc-based synthesis of peptide-<sup>α</sup>thioesters: application to the total chemical synthesis of a glycoprotein by native chemical ligation. Y. Shin, K.A. Winans, B.J. Backes, S.B.H. Kent, J.A. Ellman, C.R. Bertozzi, *J. Am. Chem. Soc.*, **121**, 11684-11689 (1999).
132. Deciphering the role of the electrostatic interactions involving Gly70 in Eglin C by total chemical protein synthesis. Wei-Yue Lu, Melissa A. Starovasnik, John J. Dwyer, Anthony A. Kossiakoff, Stephen B.H. Kent, Wuyuan Lu, *Biochemistry*, **39**, 3575-84 (2000).
133. Sexual dimorphism in diverse metazoans is regulated by a novel class of intertwined zinc-finger proteins. L. Zhu, J. Wilken, N. B. Phillips, U. Narendra, G. Chan, S.M. Stratton, S.B. Kent, M.A. Weiss, *Genes & Development*, **14**, 1750-1764 (2000).
134. Protein backbone engineering through total chemical synthesis: new insight into the mechanism of HIV-1 protease catalysis. Manuel Baca and Stephen B.H. Kent *Tetrahedron*, **56**, 9503-9513 (2000).

## Stephen Kent - CV & Bibliography

135. A sensitive fluorescence monitor for the detection of activated Ras: Total chemical synthesis of site specifically-labelled Ras-binding domain of c-Raf1 immobilised on a surface. Christian F.W. Becker, Christie L. Hunter, Ralf P. Seidel, Stephen B.H. Kent, Roger S. Goody, and Martin Engelhard, *Chemistry & Biology*, **8**, 243-252 (2001).
136. Native chemical ligation using removable N<sup>a</sup>-(1-phenyl-2-mercaptoethyl) auxiliaries. Paolo Botti, Michael R. Carrasco & Stephen B. H. Kent, *Tetrahedron Letters*, **42**,1831–1833 (2001)
137. Chemical synthesis of lymphotactin: a glycosylated chemokine with a C-terminal mucin-like domain. Lisa A. Marcaurelle, Laura S. Mizoue, Jill Wilken, Lisa Oldham, Stephen B.H. Kent, Tracy M. Handel, Carolyn R. Bertozzi, *Chem. Eur. J.*, **7**, 1129-1132 (2001)
138. Total synthesis of cytochrome b562 by native chemical ligation using a removable auxiliary. D.W. Low, M.G. Hill, M.R. Carrasco, P. Botti, S.B. Kent, *Proc. Nat. Acad. Sci. USA*, **98**, 6554-9 (2001)
139. Total chemical synthesis of a functional protein pair: the proto-oncogene hRas and the Ras-binding domain of its effector c-Raf1. Christian F.W. Becker, Christie L. Hunter, Ralf Seidel, Stephen B.H. Kent, Roger S. Goody, Martin Engelhard, *Proc. Nat. Acad. Sci. USA*, **100**, 5075-80 (2003).
140. Design and chemical synthesis of a homogeneous polymer-modified erythropoiesis protein. Gerd G. Kochendoerfer, Shiah-Yun Chen, Feng Mao, Sonya Cressman, Stacey Traviglia, Haiyan Shao, Christie Hunter, Don Low, Neil Cagle, Maia Carnevali, Vincent Gueriguian, Peter Keogh, Heather Porter, Stephen M. Stratton, M. Con Wiedeke, Jill Wilken, Jie Tang, Jay J. Levy, Les P. Miranda, Milan Crnogorac, Suresh Kalbag, Paolo Botti, Janice Schindler-Horvath, Laura Savatski, John W. Adamson, Ada Kung, Stephen B. H. Kent, James A. Bradburne, *Science*, **299**, 884-887 (2003).
141. Total chemical synthesis of Crambin. D. Bang, N. Chopra, S.B.H. Kent, *J. Am. Chem. Soc.*, **126**, 1377-83 (2004).
142. A one-pot chemical synthesis of Crambin. D. Bang, S.B.H. Kent, *Angew. Chem. Int. Ed. Eng.*, **43**, 2534-8 (2004).
143. Medicinal chemistry applied to a synthetic protein: development of highly potent HIV entry inhibitors. O. Hartley, H. Gaertner, J. Wilken, D. Thompson, R. Fish, A. Ramos, C. Pastore, A. Melotti, F. Cerini, N. Heveker, L. Picard, M. Alizon, D. Mosier, S.B.H. Kent, R. Offord, *Proc. Nat. Acad. Sci. USA*, **101**, 16460-16465 (2004).
144. His<sub>6</sub> tag-assisted chemical protein synthesis. D. Bang, S.B.H. Kent, *Proc. Nat. Acad. Sci. USA*, **102**, 5014-5019 (2005).

## Stephen Kent - CV & Bibliography

145. Synthetic erythropoietic proteins: tuning biological performance by site-specific polymer attachment. Shiah-Yun Chen, Sonya Cressman, Feng Mao, Haiyan Shao, Donald W. Low, Hal S. Beilan, E. Neil Cagle, Maia Carnevali, Vincent Gueriguian, Peter J. Keogh, Heather Porter, Stephen M. Stratton, 8, M. Con Wiedeke, Laura Savatski, John W. Adamson, Carlos E. Bozzini, Ada Kung, Stephen B.H. Kent, James A. Bradburne, Gerd G. Kochendoerfer, *Chemistry & Biology*, **12**, 371-383 (2005).
146. Total chemical synthesis and X-ray crystal structure of a protein diastereomer: [D-Gln35]Ubiquitin. Duhee Bang, George I. Makhatadze, Valentina Tereshko, Anthony A. Kossiakoff, Stephen B. Kent, *Angew. Chem. Int. Ed. Eng.*, **44**, 3852-3856 (2005).
147. Optimizing thiophosphorylation in the presence of competing phosphorylation with MALDI-TOF-MS detection. Laurie L. Parker, Alexander B. Schilling, Stephen J. Kron, Stephen B.H. Kent, *J. Proteome Research*, **4**, 1863-6 (2005)
148. Dissecting the energetics of protein  $\alpha$ -helix C-cap termination through chemical protein synthesis. Duhee Bang, Alexey V. Gribenko, Valentina Tereshko, Anthony A. Kossiakoff, Stephen B. Kent\*, George I. Makhatadze\*, *Nature Chemical Biology*, **2**, 139-43 (2006). **Cover**
149. Direct on-resin synthesis of peptide- $\alpha$ thiophenylesters for use in native chemical ligation. Duhee Bang, Brad L. Pentelute, Zachary P. Gates, and Stephen B. Kent, *Organic Letters*, **8**, 1049-52 (2006).
150. Insights into the mechanism and catalysis of the native chemical ligation reaction. Erik C.B. Johnson, Stephen B.H. Kent, *J. Am. Chem. Soc.*, **128**, 6640-6 (2006).
151. Studies on the insolubility of a transmembrane peptide from Signal Peptide Peptidase. Erik C.B. Johnson, Stephen B.H. Kent, *J. Am. Chem. Soc.*, **128**, 7140-1 (2006).
152. Synthesis, stability and optimized photolytic cleavage of 4-methoxy-2-nitrobenzyl backbone-protected peptides. Erik C.B. Johnson and Stephen B.H. Kent, *Chemical Communications*, 1557-9 (2006).
153. Kinetically-controlled ligation for the convergent chemical synthesis of proteins. Duhee Bang, Brad Pentelute, Stephen B.H. Kent, *Angew Chem Int Ed*, **45**, 3985-3988 (2006). **Cover**
154. Total chemical synthesis, folding, and assay of a small protein on a water-compatible solid support. Erik C.B. Johnson, Thomas Durek, Stephen B.H. Kent, *Angew Chem Int Ed Eng*, **45**, 3283-7 (2006).
155. Control of the yeast cell cycle with a photocleavable  $\alpha$ -factor analog. Laurie L. Parker, Stephen B. H. Kent, Stephen J. Kron, *Angew Chem Int Ed Eng*, **45**, 6322-5 (2006).

## Stephen Kent - CV & Bibliography

156. Towards the total chemical synthesis of integral membrane proteins: a general method for the synthesis of hydrophobic peptide- $\alpha$ thioester building blocks. Erik C.B. Johnson, Stephen B.H. Kent, *Tetrahedron Letters*, **48**, 1795-99 (2007).
157. An exploratory synthesis of peptide- $\alpha$ thioester segments spanning the polypeptide sequence of the  $\delta$ -opioid receptor, a G protein-coupled receptor. Erik C.B. Johnson, Stephen B.H. Kent, *Biopolymers: Peptide Science*, **88**, 340-9. (2007).
158. Convergent chemical synthesis and crystal structure of a 203 amino acid 'covalent dimer' HIV-1 protease enzyme molecule. Vladimir Yu. Torbeev, Stephen B. H. Kent, *Angew Chem Int Ed Eng*, **46**, 1667-70 (2007).
159. Selective desulfurization of cysteine in the presence of Cys(Acm) in polypeptides obtained by native chemical ligation. Bradley L. Pentelute, Stephen B.H. Kent, *Organic Letters*, **9**, 687-90 (2007).
160. Total Synthesis by modern chemical ligation methods & high resolution (1.1Å) X-ray structure of ribonuclease A. David J. Boerema, Valentina A. Tereshko, Stephen B. H. Kent, *Biopolymers – Peptide Science*, **90**, 278-286 (2008).
161. Convergent chemical synthesis and high resolution X-ray structure of human lysozyme. Thomas Durek, Vladimir Yu. Torbeev, Stephen B. H. Kent, *Proc. Natl. Acad. Sci. USA*, **104**, 4846-4851 (2007).
162. Synthesis of a C-terminal thioester derivative of the lipopeptide Pam2CSKKKK using Fmoc SPPS. Paul W.G.R. Harris, Margaret A. Brimble, Rod Dunbar, Stephen B.H. Kent, *SYNLETT*, 713–16 (2007).
163. Total chemical synthesis and biophysical characterization of the minimal isoform of the KChIP2 potassium channel regulatory subunit. Sudarshan Rajagopal, Stephen B.H. Kent, *Protein Sci*, **16**, 2056-64 (2007).
164. Biomimetic total chemical synthesis of an HIV-1 protease. Erik C.B. Johnson, Enrico Malito, Yuequan Shen, Dan Rich, Wei-Jen Tang, Stephen B.H. Kent, *J Am Chem Soc*, **129**, 11480-90 (2007).
165. Insights from atomic-resolution X-ray structures of chemically synthesized HIV-1 protease in complex with inhibitors. Erik C.B. Johnson, Enrico Malito, Yuequan Shen, Brad Pentelute, Dan Rich, Jan Florián, Wei-Jen Tang, Stephen B.H. Kent. *J Molecular Biol*, **373**, 573-86 (2007).
166. Synthesis of photo-active analogs of a cystine knot trypsin inhibitor protein. Thomas Durek, Junliang Zhang, Chuan He, Stephen B.H. Kent, *Organic Letters*, **9**, 5497-500 (2007).
167. Comparative properties of insulin-like growth factor 1 (IGF-1) and [Gly7D-Ala]IGF-1 prepared by total chemical synthesis. Youhei Sohma, Brad L.

## Stephen Kent - CV & Bibliography

- Pentelute, Jonathan Whittaker, Qin-xin Hua, Linda J. Whittaker, Michael A. Weiss, and Stephen B. H. Kent, *Angewandte Chemie Int Ed Engl*, **47**, 1102-1106 (2008).
168. Mirror image forms of snow flea antifreeze protein prepared by total chemical synthesis have identical antifreeze activities. Brad L. Pentelute, Zachary P. Gates, Jennifer Dashnau, Jane M. Vanderkooi, Stephen B. H. Kent, *J Am Chem Soc*, **130**, 9702-9707 (2008).
169. X-ray structure of snow flea antifreeze protein determined by racemic crystallization of synthetic protein enantiomers. Brad L. Pentelute, Zachary P. Gates, Valentina Tereshko, Jennifer Dashnau, Jane M. Vanderkooi, Anthony A. Kossiakoff, Stephen B. H. Kent, *J Am Chem Soc*, **130**, 9695-9701 (2008).
170. Crystal structure of chemically synthesized HIV-1 protease and a ketomethylene isostere inhibitor based on the p2/NC cleavage site. V. Yu. Torbeev, K. Mandal, V. A. Terechko, S. B. H. Kent, *Bioorganic & Medicinal Chemistry Letters*, **18**, 4554-7 (2008).
171. Dynamics of 'flap' structures in three HIV-1 protease/inhibitor complexes probed by total chemical synthesis and pulse-EPR spectroscopy. Vladimir Yu. Torbeev, H. Raghuraman, Kalyaneswar Mandal, Sanjib Senapati, Eduardo Perozo, Stephen B. H. Kent, *J Am Chem Soc*, **131**, 884-5 (2009).
172. X-ray structure of native scorpion toxin BmBKTx1 by racemic protein crystallography using direct methods. Kalyaneswar Mandal, Brad L. Pentelute, Valentina Tereshko, Anthony A. Kossiakoff, Stephen B. H. Kent, *J Am Chem Soc*, **131**, 1362-3 (2009).
173. Racemic crystallography of synthetic protein enantiomers used to determine the X-ray structure of plectasin by direct methods. Kalyaneswar Mandal, Brad L. Pentelute, Valentina Tereshko, Anthony A. Kossiakoff, Stephen B. H. Kent, *Protein Science*, **18**, 1146-1154 (2009). **Cover**
174. Role of a salt bridge in the model protein crambin explored by chemical protein synthesis: X-ray structure of a unique protein analogue, [V15A]crambin-alpha-carboxamide. Duhee Bang, Valentina Tereshko, Anthony A. Kossiakoff, Stephen B. H. Kent, *Molecular BioSystems*, **5**, 750 - 756 (2009).
175. Biomimetic synthesis of lispro insulin via a chemically synthesized 'mini-proinsulin' prepared by oxime-forming ligation. Youhei Sohma, Stephen B. H. Kent, *J Am Chem Soc*, **131**, 16313-8 (2009).
176. A one-pot approach to neoglycopeptides using orthogonal native chemical ligation and click chemistry. Dong Jun Lee, Kalyaneswar Mandal, Paul W. R. Harris, Margaret A. Brimble, and Stephen B. H. Kent, *Organic Letters*, **11**, 5270-3 (2009).

## Stephen Kent - CV & Bibliography

177. Contribution of residue B5 to the folding and function of insulin and IGF-I: constraints and fine tuning in the evolution of a protein family. Youhei Sohma, Qing-xin Hua, Ming Liu, Nelson B. Phillips, Shi-Quan Hu, Jonathan Whittaker, Linda J. Whittaker, Aubree Ng, Charles T. Roberts, Jr., Peter Arvan, Stephen B. H. Kent\*, & Michael A. Weiss\*, *J Biol Chem*, **285**, 5040-55 (2010).
178. A semisynthesis platform for investigating structure-function relationships in the N-terminal domain of the anthrax lethal factor. Brad L. Pentelute, Adam P. Barker, Blythe E. Janowiak, Stephen B. H. Kent, R. John Collier, *ACS Chemical Biology*, **5**, 359-64 (2010).
179. Design and total synthesis of [GluA4(O $\beta$ ThrB30)]insulin ('ester insulin'): a minimal proinsulin surrogate that can be chemically converted into human insulin. Youhei Sohma, Qing-Xin Hua, Jonathan Whittaker, Michael A. Weiss, Stephen B. H. Kent, *Angewandte Chemie Int Ed Engl*, **49**, 5489 - 5493 (2010). **Cover**
180. Synthesis and comparative properties of two amide-generating resin linkers for use in solid phase peptide synthesis. Fang-Kun Deng, Kalyaneswar Mandal, Sam Luisier, Stephen B.H. Kent, *J. Peptide Science*, **16**, 545-550 (2010).
181. Determination of the X-ray structure of the snake venom protein Omwaprin by total chemical synthesis and racemic protein crystallography. James R. Banigan, Kalyaneswar Mandal, Michael R. Sawaya, Vilasak Thammavongsa, Antoni P. Hendrickx, Olaf Schneewind, Todd O. Yeates, Stephen B. Kent, *Protein Science*, **19**, 1840-1849 (2010).
182. Total chemical synthesis and X-ray structure of kaliotoxin by racemic protein crystallography. Brad L. Pentelute, Kalyaneswar Mandal, Zachary P. Gates, Michael R. Saway, Todd O. Yeates, Stephen B. H. Kent, *Chem. Commun.*, **46**, 8174 - 8176 (2010).
183. Total chemical synthesis of human proinsulin. Samuel Luisier, Michal Avital-Shmilovici, Michael A. Weiss, Stephen B.H. Kent, *Chem. Commun.*, **46**, 8177 – 8179 (2010).
184. An investigation into the origin of the dramatically reduced reactivity of peptide-prolyl-thioesters in native chemical ligation. Samuel B. Pollock, Stephen B.H. Kent, *Chem. Commun.*, **47**, 2342 – 2344 (2011).
185. Total chemical synthesis of biologically active vascular endothelial growth factor. Kalyaneswar Mandal, Stephen B.H. Kent, *Angewandte Chem Int Ed*, **50**, 8029–8033, (2011).
186. On the role of protein conformational dynamics in the chemical mechanism of HIV-1 protease catalysis. Vladimir Yu. Torbeev, H. Raghuraman, Donald Hamelberg, Marco Tonelli, William M. Westler, Eduardo Perozo & Stephen B. H. Kent, *Proc Natl Acad Sci USA*, **108**, 20982-20987 (2011).

## Stephen Kent - CV & Bibliography

187. Single-molecule studies of HIV-1 Protease catalysis enabled by chemical protein synthesis. Vladimir Yu. Torbeev, Sua Myong, Taekjip Ha, Stephen B.H. Kent, *Israel J. Chem.*, **51**, 960-967 (2011). **Cover**
188. Synthesis of tripeptide mimetics based on dihydroquinolinone and benzoxazinone scaffolds. Aline D. de Araujo, Caspar Christensen, Jens Buchardt, Stephen B. H. Kent, Paul F. Alewood, *Chem - Eur Journal*, **17**, 13983-13986 (2011).
189. Convergent chemical synthesis of [Lys<sup>24,38,83</sup>]human erythropoietin. Suhuai Liu, Brad L. Pentelute, Stephen B. H. Kent, *Angewandte Chem*, **51**, 993-999 (2012).
190. Single wavelength phasing strategy for quasi-racemic protein crystal diffraction data. Michael Sawaya, Bradley Pentelute, Stephen Kent, Todd Yeates, *Acta Crystallographica Section D*, **68**(Pt 1), 62-8 (2012).
191. Design, total chemical synthesis, and X-ray structure of a protein having a novel linear-loop polypeptide chain topology. Kalyaneswar Mandal, Brad L. Pentelute, Duhee Bang, Zachary P. Gates, Vladimir Yu. Torbeev, Stephen B. H. Kent, *Angewandte Chem Int Ed*, **51**, 1481-1486 (2012).
192. Ionization state of the catalytic dyad Asp25/25' in the HIV-1 protease: NMR studies of site-specifically <sup>13</sup>C labeled HIV-1 protease prepared by total chemical synthesis. Vladimir Yu. Torbeev, Stephen B. H. Kent, *Organic & Biomolecular Chemistry*, **10**, 5887–5891 (2012).
193. Chemical synthesis and X-ray structure of a heterochiral {D-protein antagonist plus VEGF-A} protein complex by racemic crystallography. Kalyaneswar Mandal, Maruti Uppalapati, Dana Ault-Riché, John Kenney, Joshua Lowitz, Sachdev Sidhu, Stephen B.H. Kent, *Proc Natl Acad Sci USA*, **109**, 14779-14784 (2012).
194. Rapid formal hydrolysis of peptide- $\alpha$ thioesters. Zachary P. Gates, Jules Stephan, Dong Jun Lee, Stephen B.H. Kent, *Chem. Commun.*, **49**, 786-788 (2013).
195. Convergent chemical synthesis of ester insulin: determination of the high resolution X-ray structure by racemic protein crystallography. Michal Avital-Shmilovici, Kalyaneswar Mandal, Zachary P. Gates, Nelson Phillips, Michael A. Weiss, Stephen B.H. Kent, *J. Am. Chem. Soc.*, **135**, 3173–3185 (2013).
196. Total chemical synthesis of fully functional photoactive yellow protein. Wendy R. Gordon, Duhee Bang, Wouter D. Hoff, Stephen B.H. Kent, *Bioorganic & Medicinal Chemistry*, **21**, 3436-42 (2013).
197. Native chemical ligation at Asx-Cys, Glx-Cys: chemical synthesis and high resolution X-ray structure of ShK toxin by racemic crystallography. Bobo Dang, Tomoya Kubota, Kalyaneswar Mandal, Francisco Bezanilla, Stephen B.H. Kent, *J. Am. Chem. Soc.*, **135**, 11911-9 (2013).

## Stephen Kent - CV & Bibliography

198. Total chemical synthesis of the enzyme Sortase A<sub>ΔN59</sub> with full catalytic activity. Fang-Kun Deng, Liang Zhang, Ya-Ting Wang, Olaf Schneewind, Stephen B. H. Kent, *Angewandte Chem Int Ed*, **53**, 4662-6 (2014).
199. Total chemical syntheses and biological activities of glycosylated and non-glycosylated forms of the chemokines CCL1 and Ser-CCL1. Ryo Okamoto, Kalyaneswar Mandal, Morris Ling, Andrew Luster, Yasuhiro Kajihara, Stephen B. H. Kent, *Angewandte Chem Int Ed*, **53**, 5188-93 (2014).
200. (Quasi-)racemic X-ray structures of glycosylated and non-glycosylated forms of the chemokine Ser-CCL1 prepared by total chemical synthesis. Ryo Okamoto, Kalyaneswar Mandal, Michael R. Sawaya, Yasuhiro Kajihara, Todd O. Yeates Stephen B. H. Kent, *Angewandte Chem Int Ed*, **53**, 5194-8 (2014).
201. Deciphering a molecular mechanism of neonatal diabetes mellitus by the chemical synthesis of a protein diastereomer, [D-Ala<sup>B8</sup>]human proinsulin. Michal Avital-Shmilovici, Jonathan Whittaker, Michael A. Weiss, Stephen B. H. Kent, *J. Biol. Chem.*, **289**, 23683-92 (2014).
202. Total chemical synthesis of biologically active fluorescent dye-labeled Ts1 toxin. Bobo Dang, Tomoya Kubota, Ana M. Correa, Francisco Bezanilla, Stephen B. H. Kent, *Angewandte Chem Int Ed*, **53**, 8970-4 (2014).
203. A functional role of Rv1738 in *Mycobacterium tuberculosis* persistence suggested by racemic protein crystallography. Richard D. Bunker, Kalyaneswar Mandal, Ghader Bashiri, Jessica J. Chaston, Brad Pentelute, J. Shaun Lott, Stephen B. H. Kent\*, Edward N. Baker\*, *Proc Natl Acad Sci USA*, **112**, 4310-5 (2015).
204. Enhanced solvation of peptides attached to a 'solid-phase' resin: straightforward synthesis of the elastin sequence Pro-Gly-Val-Gly-Val-Pro-Gly-Val-Gly-Val. B. Dang, B. Dhayalan, S.B.H. Kent, *Organic Letters*, **17**, 3521-3 (2015).
205. Efficient total chemical synthesis of <sup>13</sup>C=<sup>18</sup>O isotopomers of human insulin for isotope-edited FTIR. B. Dhayalan, A. Fitzpatrick, K. Mandal, J. Whittaker, M. A. Weiss, A. Tokmakoff,\* S. B. H. Kent\*, *ChemBioChem*, **17**, 415-420 (2016).
206. Spontaneous resolution of crystalline insulins from quasi-racemic solutions: Xray structure determination of isotope-labeled ester-insulin and human insulin. K. Mandal, B. Dhayalan, M. Avital-Shmilovici, A. Tokmakoff, S.B.H. Kent, *ChemBioChem*, **17**, 421-425 (2016).
207. A potent D-protein antagonist of VEGF-A is non-immunogenic, metabolically stable and longer-circulating *in vivo*. Maruti Uppalapati, Dong Jun Lee, Kalyaneswar Mandal, Hongyan Li, Les P. Miranda, Joshua Lowitz, John Kenney, Jarrett J. Adams, Dana Ault-Riché, Stephen B. H. Kent, Sachdev S. Sidhu, *ACS Chemical Biology*, **11**, 1058-65 (2016).



## Stephen Kent - CV & Bibliography

208.  $\beta$ 1 Subunit-Induced Structural Rearrangements of the Ca<sup>2+</sup>- and Voltage-Activated (BK) Channel. Juan P Castillo, Jorge E Sánchez-Rodríguez, H Clark Hyde, Cristian A Zaelzer, Daniel Aguayo, Romina V Sepúlveda, Louis Y.P. Luk, Stephen B.H. Kent, Fernando D Gonzalez-Nilo, Francisco Bezanilla, Ramon Latorre, *Proc.Nat.Acad.Sci.*, **113**, E3231-9 (2016).
209. Elucidation of the covalent and tertiary structures of biologically active Ts3 toxin. Bobo Dang, Tomoya Kubota, Kalyaneswar Mandal, Ana M. Correa, Francisco Bezanilla, Stephen B. H. Kent, *Angewandte Chemie Int. Ed.*, **55**, 8639-42 (2016).
210. Chemical synthesis and enzymatic properties of RNase A analogues designed to enhance second-step catalytic activity. David J. Boerema, Valentina A. Tereshko, JunLiang Zhang, Stephen B. H. Kent, *Org. Biomol. Chem*, **14**, 8804 – 8814 (2016).
211. Perplexing cooperative folding and stability of a low sequence complexity, poly-proline 2 protein lacking a hydrophobic core. Zachary Gates, Michael C Baxa, Wookyung Yu, Joshua A Riback, Hui Li, Benoit Roux, Stephen Kent, Tobin R Sosnick, *Proc.Nat.Acad.Sci.* 2017;**114**:2241-2246. doi: 10.1073/pnas.1609579114
212. Obviation of hydrogen fluoride in Boc chemistry solid phase peptide synthesis of peptide-<sup>α</sup>thioesters. Zachary P. Gates, Balamurugan Dhayalan, Stephen B.H. Kent, *Chem. Comm.*, **52**,13979-13982 (2016).
213. Scope & limitations of Fmoc chemistry SPPS-based approaches to the total synthesis of Insulin Lispro via ester insulin. Balamurugan Dhayalan, Kalyaneswar Mandal, Nischay Rege, Michael A. Weiss, Simon H. Eitel, Thomas Meier, Ralph O. Schoenleber, Stephen B.H. Kent, *Chem. Eur. J.*, **23**, 1709-1716 (2017).
214. Inversion of Thr and Ile side chain stereochemistry in a protein molecule: impact on the folding, stability, and structure of the ShK toxin protein molecule. Bobo Dang, Tomoya Kubota, Rong Shen, Kalyaneswar Mandal, Francisco Bezanilla, Benoit Roux, Stephen B. H. Kent, *Angewandte Chemie Int. Ed.* 2017;**56**:3324-3328. doi: 10.1002/anie.201612398
215. Mapping of voltage sensor positions in resting and inactivated mammalian sodium channels by LRET. Tomoya Kubota, Thomas Durek, Bobo Dang, Rocio K. Finol-Urdaneta, David J Craik, Stephen B.H. Kent, Robert J French, Francisco Bezanilla, Ana M Correa, *Proc Natl Acad Sci U S A.* 2017;**114**:E1857-E1865 2017. doi: 10.1073/pnas.1700453114
216. Reinvestigation of the biological activity of D-allo-ShK protein. Dang B, Chhabra S, Pennington MW, Norton RS, Kent SBH. *J Biol Chem.* 2017; **292**:12599-12605. doi: 10.1074/jbc.M117.793943

## Stephen Kent - CV & Bibliography

217. Chemical synthesis of an enzyme containing an artificial catalytic apparatus. Vladimir Torbeev, Stephen B.H. Kent. *Aust. J. Chem.* 2020, **73**, 321–326. doi.org/10.1071/CH19460
218. Total synthesis of Bovine Pancreatic Trypsin Inhibitor (BPTI) and the protein diastereomer [Gly37D-Ala]BPTI using Boc chemistry solid phase peptide synthesis . Alexander J. Donovan, Joanna Dowle, Yanwu Yang, Michael A. Weiss, Stephen B.H. Kent. *Peptide Science*, Special Issue dedicated to Louis Carpino. 2020;112:e24166. Doi: doi.org/10.1002/pep2.24166
219. Peptide bond cleavage at –Asn-Ser(O-Peptidyl)– ; a chemical counterpart to Nature's intein-mediated protein splicing. Balamurugan Dhayalan, Ingrid Fetter-Pruneda, Daniel J. C. Kronauer, Stephen B. H. Kent. To be re-submitted.
220. A non-immunogenic bivalent D-protein potently inhibits retinal vascularization and tumor growth. Paul S. Marinec, Kyle E. Landgraf, Maruti Uppalapati, Gang Chen, Daniel Xie, Qiyang Jiang, Yanlong Zhao, Annalise Petriello, Kurt Deshayes, Stephen B. H. Kent, Dana Ault-Riche, Sachdev S. Sidhu, *ACS Chemical Biology*, 2021, **16**, 548–556. dx.doi.org/10.1021/acscchembio.1c00017

### On-Line Web Seminars

1. Chemical protein synthesis: total synthesis of proteins for biological research. S.B.H. Kent in Austin, D. (ed.), *Chemical Biology: The role of Chemistry in our fundamental understanding of Biology*, The Biomedical & Life Sciences Collection, Henry Stewart Talks Ltd, London 2008.
2. Solid phase peptide synthesis. S.B.H. Kent in Austin, D. (ed.), *Chemical Biology: The role of Chemistry in our fundamental understanding of Biology*, The Biomedical & Life Sciences Collection, Henry Stewart Talks Ltd, London.

### Perspectives

1. Chemical synthesis of peptides and proteins. Kent S.B.H. *Ann. Rev. Biochem.* **57**, 957-984 (1988).
2. Chemical synthesis of proteins. Tom Muir, Stephen B.H. Kent, in *Current Opinion in Biotechnology*, **4**, 420-427 (1993).
3. Protein splicing: occurrence, mechanisms and related phenomena. Yang Shao, Stephen BH Kent, *Chemistry & Biology* **4** : 187-194 (1997).
4. Chemical protein synthesis. Wilken J, Kent SBH: *Current Opinion in Biotechnology* **9**, 412-426 (1998).
5. Chemical protein synthesis. Gerd Kochendoerfer, Stephen Kent, *Current Opinion in Chemical Biology*, **3**: 665-671 (1999).
6. Synthesis of native proteins by chemical ligation. Dawson, P.E., Kent S.B.H. *Ann. Rev. Biochem.* **69**, 925-962 (2000).
7. Total chemical synthesis of enzymes. Stephen Kent, *J. Peptide Sci.*, **9**, 574-593 (2003). **Cover**
8. Novel forms of chemical protein diversity in nature and in the laboratory. Stephen B.H. Kent, *Curr. Opinion Biotech.*, **15**, 607–614 (2004).
9. Total chemical synthesis of proteins. Stephen B.H. Kent, *Chemical Society Reviews*, **38**, 338-51 (2009).
10. Origin of the chemical ligation concept for the total synthesis of enzymes (proteins). Stephen Kent, *Biopolymers – Peptide Science*, **94**(4), pp. iv-ix (2010).
11. Through the looking glass – a new world of proteins enabled by chemical synthesis. Stephen Kent, Youhei Sohma, Suhuai Liu, Duhee Bang, Brad Pentelute, Kalyaneswar Mandal, *J. Peptide Sci.*, **18**, 428-36 (2012).

## Stephen Kent - CV & Bibliography

12. Racemic protein crystallography. Todd O. Yeates, Stephen B.H. Kent, *Ann. Review Biophysics*, **41**, 41–61 (2012).
13. Bringing the science of proteins into the realm of organic chemistry: total chemical synthesis of SEP (synthetic erythropoiesis protein). Stephen B.H. Kent, *Angew. Chem. Int. Ed.*, **52**, 11988–11996 (2013).
14. Chemical protein synthesis: inventing synthetic methods to decipher how proteins work. Kent SBH. *Bio Org Med Chem.*, **25**, 4926-4937 (2017). doi: 10.1016/j.bmc.2017.06.020
15. Racemic & quasi-racemic protein crystallography enabled by chemical protein synthesis. Kent SBH. *Current Opinion in Chemical Biology* **2018**; 46,1–9.
16. Novel protein science enabled by total chemical synthesis. Kent SBH. *Protein Science* 2019; **28**:313–328. [Cover]

### Chapters in Books

1. New aspects of solid phase peptide synthesis. Kent S.B.H. in *Biomedical Polymers*, E. P. Goldberg, Akio Nakajima, eds., Acad. Press, 1980, pp. 213-242.
2. Fundamental aspects of the Chemical applications of cross-linked polymers. Live D.H., Kent S.B.H., in *Elastomers and Rubber Elasticity*, J.E. Mark, ed., American Chemical Society Symposia Series, American Chemical Society, Washington, D.C., 1982, pp. 501-515.
3. Kent, S.B.H., Riemen, M., LeDoux, M., and Merrifield, R.B., in "Methods in Protein Sequence Analysis", M. Elzinga, ed., Humana Press, New Jersey, 1982, pp.205-213
4. Antigenic structures of human hepatitis viruses. Neurath A.R., Kent S.B.H. in *Immunochemistry of Viruses*, M.V.H. Van Regenmortel, A.R. Neurath, eds., Elsevier, Amsterdam, 1985, pp. 325-366.
5. Synthetic peptides in immunoprophylaxis and diagnosis of hepatitis B. Neurath A.R., Kent S.B.H., Strick N. in *Synthetic Peptides in Biology and Medicine*, K. Alitalo, P. Partanen, A. Vaheri, eds., Elsevier, Amsterdam, 1985, pp. 113-131.
6. Modern methods for the chemical synthesis of biologically active peptides. Kent S.B.H., Clark-Lewis I. in *Synthetic Peptides in Biology and Medicine*, K. Alitalo, P. Partanen, A. Vaheri, eds., Elsevier, Amsterdam, 1985, pp. 29-57.
7. Practical high performance liquid chromatography of proteins and peptides. Tempst P., Hood L.E., Kent S.B.H. for: *Modern Methods of Plant Analysis: HPLC in Plant Sciences*, H.F. Linskens, J.F. Jackson, eds., Springer-Verlag, Heidelberg 5, 1987, 170-208.
8. Vaccination with synthetic hepatitis B virus peptides. Neurath A.R., Kent S.B.H., Strick N. in *Applied Virology Research*, E. Kurstak, R.G. Marusyk, F.A. Murphy,

## Stephen Kent - CV & Bibliography

- M.H.V. Van Regenmortel, eds., Plenum Press, New York, 1987, pp. 107-128.
9. Biological role of Pre-S sequences of the hepatitis B virus envelope protein. Neurath A.R., Kent S.B.H., Strick N., Parker K. in *Hepadna Viruses*, William Robinson, ed., Alan R. Liss, Inc., New York, 1987, pp. 189-203.
  10. Purification of synthetic proteins (total chemical synthesis of human transforming growth factor-alpha). Woo D. D.-L., Kent S.B.H. in *Protein Purification: Micro to Macro*, R. Burgess, ed. (UCLA Symposia on Molecular and Cellular Biology, 68), Alan R. Liss, New York, 1987, pp. 49-73.
  11. (Review) The Pre-S region of hepadnavirus envelope proteins. Neurath A.R., Kent S.B.H. in *Advances in Virus Research*, K. Maramorosh, F.A. Murphy, A.J. Shatkin, eds., Academic Press, New York, 1988, 34, 65-142.
  12. Protein chemistry and the development of diagnostics and therapeutics. Kent S.B.H., in *Proceedings of the Pharmaceutical Manufacturers Association Symposium on Biotechnology and Human Health Care*, Washington, D.C., 1988, pp. 43-59.
  13. The chemical synthesis of therapeutic peptides and proteins. Kent S.B.H., Parker K.F., in *Therapeutic Peptides and Proteins: Assessing the New Technologies*, D.R. Marshak, D.T. Liu, eds., Cold Spring Harbor Press, New York, 1988, pp. 3-16.
  14. Synthesis, purification and characterization of biologically active peptides. Clark-Lewis I., Kent S.B.H. in *Receptor Biochemistry and Methodology Vol. 14* (J.C. Venter, L.C. Harrison, series eds.) - *The use of HPLC in Protein Purification and Characterization*, A.R. Kerlavage, vol. ed., Alan R. Liss, Inc., New York, 1989, pp 43-79.
  15. Chemical synthesis approach to the molecular biology of retroviral proteases: Structure-function studies of the HIV-1 and HIV-2 enzymes and their substrates. Kent S.B.H., Schneider J., Clawson L., Selk L., Delahunty C., Chen Q. in *Viral Proteinases as Therapeutic Targets*, E. Wimmer, H.G. Krauslich, eds., Cold Spring Harbor Press, New York, 1989, pp. 223-230.
  16. X-ray analysis of the HIV-1 protease and its complexes with inhibitors. M. Miller, A.L. Swain, M. Jaskolski, B.K. Sathyanarayana, G.R. Marshall, D.H. Rich, S.B.H. Kent, A. Wlodawer, In: *Retroviral Proteases: Control of Maturation and Morphogenesis*, L.H. Pearl, ed., MacMillan Press, 1990, pp.93-106.
  17. Total chemical synthesis of proteins: evolution of solid phase synthetic methods illustrated by total chemical syntheses of the HIV-1 protease. Stephen B.H. Kent, D. Alewood, P. Alewood, M. Baca, A. Jones, M. Schnölzer, in "Innovation & Perspectives in Innovations and Perspectives in Solid Phase Synthesis 1992", R. Epton, ed., Intercept, Andover, U.K., 1992, pp.1-22.
  18. Synthesis of proteins by chemical ligation of unprotected peptide segments: mirror-image enzyme molecules, D- & L-HIV protease analogues. R. deL. Milton, Saskia Milton, Martina Schnölzer, Stephen B.H. Kent, in "Techniques in Protein Chemistry IV", R. Angeletti, ed., Academic Press, New York, 1993, pp. 257-267.

## Stephen Kent - CV & Bibliography

19. Breaking the Shackles of the Genetic Code: Engineering Retroviral Proteases through Total Chemical Synthesis. Stephen B.H. Kent, Manuel Baca, John Elder, Maria Miller, Raymond Milton, Saskia Milton, Mohan Rao, Martina Schnölzer, in "Aspartyl Proteinsases 1993", K. Takahashi, ed., Plenum, New York, 1994, pp. -
20. Total chemical synthesis of proteins. Michael C. Fitzgerald, & Stephen B.H. Kent, in "Bioorganic Chemistry: Peptides and Proteins", Sidney M. Hecht, ed., Oxford University Press, New York, 1998, pp.65-99.
21. Protein signature analysis: a practical new approach for studying structure-activity relationships in peptides and proteins. T.W. Muir, P.E. Dawson, M.C. Fitzgerald, S.B.H. Kent, in "Methods in Enzymology: Solid Phase Peptide Synthesis", Vol. 289, G.B. Fields, ed., Academic Press, 1997, pp.545-564.
22. Protein synthesis by chemical ligation of unprotected peptide segments in aqueous solution. T.W. Muir, P.E. Dawson, S.B.H. Kent, in "Methods in Enzymology: Solid Phase Peptide Synthesis", Vol. 289, G.B. Fields, ed., Academic Press, 1997, pp.266-298.
23. Building proteins through chemistry: total synthesis of protein molecules by chemical ligation of unprotected peptide segments. Stephen B.H. Kent, in "Biological Molecules in Nanotechnology", Stephen C. Lee, ed., IBC Library Series, 1998, pp.75-92.
24. Chemical protein synthesis: inventing new chemistries to reveal how proteins work (Merrifield Award address). Stephen B.H. Kent, in "Proceedings of the 21<sup>st</sup> American Peptide Symposium", M. Lebl, ed., Prompt Scientific Publishing, San Diego, CA, 2009, pp.3-8.
25. Medicinal chemistry applied to the protein molecule - total protein synthesis by native chemical ligation of synthetic peptides. Youhei Sohma, Stephen B.H. Kent, in "Modern Peptide Synthesis Technology and its application to Medicinal Chemistry", Y. Kiso, ed., 2012.
26. Total chemical protein synthesis for the determination of novel X-ray structures by racemic protein crystallography. Kalyaneswar Mandal & Stephen B.H. Kent, in Advancing Methods for Biomolecular Crystallography (Proceedings of the NATO Conference on Advanced Methods in X-Ray Crystallography), Randy Reid, Alexandre G. Urzhumtsev, Vladimir Y. Lunin, eds., Springer, 2013, pp.11-22.
27. Characterization of protein molecules prepared by total chemical synthesis. Stephen B.H. Kent, in: Ashraf Brik, Philip E. Dawson, Lei Liu (Eds.), Total Chemical Synthesis of Proteins. ISBN: 978-3-527-34660-8, Wiley-VCH; 1st edition (March 22, 2021).

**Selected Book Reviews, Commentaries, etc.**

1. (Letter) Determining the 3D structure of HIV-1 protease. S. Kent, GR Marshall, A Wlodawer, *Science*, **288**,1590 (2000).
2. [Obituary] Bruce Merrifield (1921–2006). Inventor of solid phase peptide synthesis. *Nature*, **441**, 824 (2006).

US Patents

[45 issued]

9,285,372	Methods and compositions for identifying D-peptidic compounds that specifically bind target proteins
8,618,049	Ester insulin
8,034,900	Water-soluble thioester and selenoester compounds and method
7,674,881	Convergent synthesis of proteins by kinetically controlled ligation
7,588,906	Hydrogels for biomolecule analysis and corresponding method to analyze biomolecules
7,482,425	Compositions for lipid matrix-assisted chemical ligation
7,408,026	Synthesis of proteins by native chemical ligation
7,341,874	Method for detecting post-translation modifications of peptides
7,135,279	D-receptor compositions and methods of their use
7,118,856	D-enzyme compositions and methods of their use
7,118,737	Polymer-modified synthetic proteins
7,094,871	Solid phase native chemical ligation of unprotected or N-terminal cysteine protected peptides in aqueous solution
7,030,218	Pseudo native chemical ligation
7,030,217	Solid phase native chemical ligation of unprotected or N-terminal cysteine protected peptides in aqueous solution
6,977,292	Nucleophile-stable thioester generating compounds, methods of production and use
6,844,161	Modular protein libraries and methods of preparation
6,750,061	Sequence determination of peptides using a mass spectrometer
6,642,357	Process for preparing modified proteins
6,548,279	D-enzyme compositions and methods of their use
6,495,314	Process for characterizing proteins.
6,476,190	Process for preparing modified proteins.
6,451,543	Lipid matrix-assisted chemical ligation and synthesis of membrane polypeptides
6,326,468	Solid phase native chemical ligation of unprotected or n-terminal cysteine protected peptides in aqueous solution
6,307,018	General chemical ligation



## Stephen Kent - CV & Bibliography

6,271,037	Method and product for the sequence determination of peptides using a mass spectrometer
6,228,654	Methods for structure analysis of oligosaccharides
6,184,344	Synthesis of proteins by native chemical ligation
6,040,133	D-enzyme compositions and methods of their use
5,977,301	Synthesis of N-substituted oligomers
5,910,437	D-enzyme compositions and methods of their use
5,891,993	Template assembled synthetic protein
5,854,389	Process for preparing modified proteins
5,831,005	Synthesis of N-substituted oligomers
5,792,664	Methods for producing and analyzing biopolymer ladders
5,620,844	Assays for detecting hepatitis B virus envelope antigens or antibodies thereto and diagnostic test kits for use in performing the assays
5,565,548	Pre-S gene coded peptide hepatitis B immunogens and synthetic lipid vesicle carriers
5,273,715	Automated system for providing a sequence of chemicals to a reaction process
5,204,096	Pre-S gene coded peptide hepatitis B immunogens, vaccines, diagnostics, and synthetic lipid vesicle carriers
5,186,898	Automated polypeptide synthesis apparatus
5,158,769	Pre-S gene coded peptide hepatitis B immunogens, vaccines, diagnostics, and synthetic lipid vesicle carriers
4,861,588	Pre-S gene coded peptide hepatitis B immunogens, vaccines, diagnostics, and synthetic lipid vesicle carriers
4,847,080	Pre-S gene coded peptide hepatitis B immunogens, vaccines, diagnostics, and synthetic lipide vesicle carriers
4,816,513	Automated polypeptide synthesis process
4,668,476	Automated polypeptide synthesis apparatus
4,548,904	Protein sequencing method

