

CURRICULUM VITAE

Kenneth G. Mann, Ph.D.

DATE AND PLACE OF BIRTH

January 1, 1941 Floral Park, New York

NATIONALITY

United States

CURRENT POSITION

Professor, Emeritus, Departments of Biochemistry and Medicine, University of Vermont, College of Medicine, Burlington, Vermont

Senior Scientist in Residence, Chairman of the Board Haematologic Technologies, Inc., Essex Junction, Vermont.

EDUCATION

Manhattan College, Riverdale, New York; (C.W. Batt) B.S. Chemistry	1963
University of Iowa, Iowa City, Iowa (C.S. Vestling); Ph.D., Biochemistry	1967
University of Iowa, Iowa City, Iowa (C.S. Vestling); Postdoctoral	1967-1968
Duke University, Durham, North Carolina (C. Tanford); Postdoctoral	1968-1970

HONORS

Distinguished Emeritus, ASH	2017
Plenary Lecture, Hemostasis Thrombosis Research Society	2017
State of the Art Lecture ISTH	2015
Distinguished Alumni Award – University of Iowa	2012
Lifetime Achievement Award – Hemostasis & Thrombosis Research Society	2012
Distinguished Scientist – American Heart Association	2011
Henri Chaigneau Prize, Association Française des Hémophiles	2010
Plenary Lecture – Gesellschaft für Thrombose- und Hämostasieforschung (GTH)	2009
Pioneer in Hematology, American Society of Hematology	2008
Special Recognition Award in Thrombosis, American Heart Association	2007
Plenary Lecture, European Hematology Association	2004
Distinguished Alumnus Award, Mayo Foundation	2004
Mossesson Lecture, Blood Research Institute	2004
Eberhardt F. Mammen Lecture, Detroit Antithrombotic Symposium	2004
State of the Art Lecture XIX, International Society on Thrombosis and Hemostasis, Birmingham, England	2003
Carl S. Vestling Lecture, University of Iowa	2003
E. Donnall Thomas Lecture and Prize, American Society of Hematology	2002
George Adrouny Memorial Lecture, Tulane University	2000

Citation for Distinguished Service ASBMB	2000
Walter H. Seegers Memorial Lecture, Wayne State University	2001
1 st Stuart Stone Lecture, FASEB Research Conference	1999
Exemplary Service Award - American Society of Hematology	1999
The Novo Nordisk Haemostasis Award	1999
State of the Art Lecture XVIIth International Society on Thrombosis and Hemostasis, Washington D.C.	1999
Robert P. Grant Medal - International Society on Thrombosis and Hemostasis	1997
Plenary Lecture -XXII International Congress of the World Federation of Hemophilia	1996
Henry Stratton Medal - American Society of Hematology	1992
Sol Sherry Award - American Heart Association	1992
Distinguished Lecturer in Medical Science, Mayo Foundation	1989
Merit Award, National Institutes of Health	1989
University of Vermont Scholar Award	1988
Distinguished Career Award for Contribution to Hemostasis	1987
Presidential Symposium - American Society of Hematology	1987
State of Art Lecture - XIth International Society of Thrombosis and Hemostasis, Brussels, Belgium	1987
Nossel Lecture - Columbia University	1986
Ellwood P. Sharp Lecture - Wayne State University	1985
Byrd Leavell Lecture - University of Virginia	1982
Established Investigator, American Heart Association	1974-1979
Camille and Henry Dreyfus Teacher Scholar Grant	1971-1976
NIH Postdoctoral Fellowship, Duke University	1968-1970
NIH Predoctoral Fellowship, Iowa	1967
NASA Traineeship, Iowa	1965-1966
Alpha Chi Sigma Scholarship Award, Iowa	1964
Chemistry Medal, Manhattan College	1963

MAJOR RESEARCH INTEREST

Protein physical chemistry, characterization of protein subunit structure and subunit structure-function relationships.

SPECIFIC INTEREST

Proteins of the blood coagulation process; Proteins in Bone

RESEARCH AND/OR PROFESSIONAL EXPERIENCE

Senior Scientist in Residence, Haematologic Technologies, Inc.	2015-present
Professor Emeritus of Biochemistry and Medicine, University of Vermont	2013-present
Professor of Biochemistry and Medicine, University of Vermont	2005 - 2013
Professor and Chair of Biochemistry, University of Vermont	1984 - 2005
Professor of Biochemistry, University of Minnesota	1980 - 1984
Professor of Biochemistry, Mayo Medical School	1978 - 1984
Vice-Chairman, Department of Internal Medicine, Mayo Clinic	1977 - 1984
Consultant in Hematology Research, Mayo Clinic and Mayo Foundation	1972 - 1984

Associate Professor, Department of Biochemistry, University of Minnesota, St. Paul	1975 - 1978
Associate Professor of Biochemistry, Mayo Medical School	1974 - 1978
Assistant Professor of Biochemistry, Mayo Medical School	1972 - 1974
Assistant Professor, Department of Biochemistry, University of Minnesota, St. Paul	1970 - 1975

PROFESSIONAL SOCIETIES/RESPONSIBILITIES

<u>Thrombosis and Hemostasis Society of North America</u> Board of Directors	2018
<u>Foundation for Women and Girls with Blood Disorders</u> Board of Directors	2013
<u>American Heart Association</u> Member, Nominating Committee	1993 - 1994
Member, Research Committee	1993 - 1998
Chairman, Thrombosis Research Study Group	1993 - 1998
Member, Scientific Advisory Committee	1991 - 1995
Chairman, Council on Thrombosis	1989 - 1991
Delegate,	1988 - 1990
Vice-Chair, Thrombosis	1987 - 1989
Program Chairman, Council on Thrombosis	1982 - 1985
Chairman, Program Planning Committee, 5th National Conference on Thrombosis and Hemostasis	1982
Member, Physiological Chemistry B Research Study Committee	1973 - 1976
<u>American Society of Hematology</u> Member, Communications Committee	2003 - 2006
Member, Research Study Committee	2003
Clinical Investigator Supporter	2003
Chairman, Committee on Publications	1996 - 2000
Member, Committee on Training Programs	1994 - 1998
Member, Education Committee	1994 - 1998
Member, Scientific Subcommittee on Hemostasis	1994 -
Abstract Coordinator	1994
Scientific Affairs Committee	1989
Chairman, Scientific Subcommittee on Hemostasis	1987, 1992
Member, Program Committee	1985
Member, Awards Committee	2013-
<u>International Society on Thrombosis and Hemostasis</u> Senior Advisory Committee	1997 -
Council Chairman	1990 - 1992
Council Secretary	1988 - 1990
Elected Member, Council	1984 - 1992
Elected Member, Committee on Standards	1982 - 1986

Federation of American Societies for Experimental Biology

Treasurer	2006 - 2008
Executive Committee, Board of Directors	2006 - 2008
Finance Committee	2003 - 2005
Investment Committee	2008-

National Hemophilia Foundation

Chairman, Research Working Group	2003 - 2004
Board of Directors	2004 - 2010

American Society of Biochemistry and Molecular Biology

Finance Committee	2001 - 2004
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Association of Medical and Graduate Departments of Biochemistry

President	2001
President-Elect	2000
Treasurer	1993 - 1996

Foundation for Women and Girls with Bleeding Disorders

Board of Directors	2013-
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Journals

Member, Editorial Board, JOURNAL OF BIOLOGICAL CHEMISTRY	1981 - 1986
Associate Editor, BLOOD	1996 - 2000
Member, Editorial Board, BLOOD	1989 - 1994
Member, Editorial Board, CALCIFIED TISSUE	1984 - 1989
Member, Editorial Board, THROMBOSIS RESEARCH	1986 - 1988
Member, Editorial Board, JOURNAL OF MOLECULAR RECOGNITION	1981 - 1986
Member, Editorial Board, JOURNAL OF PROTEIN CHEMISTRY	1987 - 1997
Co-Editor, METHODS IN ENZYMOLOGY	1996 - 2001
Member, Editorial Board, JOURNAL OF THROMBOSIS AND THROMBOLYSIS	1982 - 1987
Consulting Editor, ARTERIOSCLEROSIS, THROMBOSIS AND VASCULAR BIOLOGY	1991 - 1994
Associate Editor, JOURNAL OF THROMBOSIS AND HAEMOSTASIS	2002 - 2007
	2002 - 2006

Societies

American Chemical Society
American Society of Biochemistry & Molecular Biology
American Society for Bone and Mineral Research (RET)
Sigma XI
The Protein Society
American Association for the Advancement of Science
Federation of American Societies for Experimental Biology
American Heart Association
American Society of Hematology
International Society on Thrombosis and Haemostasis

Miscellaneous

NIH and NSF ad hoc Reviewer	1972 -
NIH Reviewers Reserve	1988 - 1992
	1986 - 1991
Director, Thrombosis SCOR-NHLBI	1985 - 1989
Chairman, Platelets/Coagulation Initial Review Group, American Red Cross	1985 - 1989
Member, American Red Cross Blood Services Scientific Council	1976 - 1986
	1985
Member, NHLBI Hematology Study Section	1985
Chairman, Gordon Conference on Hemostasis and Thrombosis	1981 - 1985
	1982 - 1984
Course Director, American College of Physicians	
	1986 -
Member, Board of Directors, Hormel Institute	1989 -
	1997 -
Membership Committee, <u>American Society of Biological Chemists</u>	1999 - 2007
	2001 - 2006
Member, Scientific Advisory Board, The Gladstone Foundation for Cardiovascular Research, UCSF	2002 -
	1997 -
Member, Scientific Advisory Board, New York Blood Center	
Doctors Mayo Society	
Founding Member & Member Scientific Adv. Board LeDucq Foundation	
Member, Scientific Advisory Board, Blood Center of S.E. Wisconsin	
Member, Steering Committee, Advanced Technology Applications for Combat Casualty Care	
Chairman of the Board, Haematologic Technologies	

MOST RECENT SUPPORT**MANN K.G.**

1UM1HL12877-01P1, P2, P3
NIH / NHLBI

10/01/2013-06/30/2018
\$ 4,704,000 (12 months)

The major goal of this multi-year, multi-institution program is to make a comprehensive study of trauma-induced coagulopathies including assessment of the contributions of plasma proteins, blood cells, vascular endothelium, the blood vessel and extravascular tissue through a team approach involving multiple research centers and Department of Defense clinical trial centers.

Doris Duke Innovations in Clinical Research Award
University of North Carolina

09/01/2013-8/31/2016
\$ 228,336

T32 HL07594-24 Mann (PI)
NIH
Hemostasis & Thrombosis Program for Trainees

07/01/13-06/30/16
\$ 420,904

The major goal of this project is the research training of post-graduate fellows (M.D. and Ph.D.) who will be prepared to conduct clinical and basic research in the fields of thrombosis and hemostasis.
Role: PI

DMRDP
Role: co-PI Mann and Brummel-Ziedins
“Systems Biology for Biological Responses to Severe Hemorrhage”

10/01/2010 – 9/30/2016
\$ 3,699,827

We propose to use a multicenter approach to systematically examine and characterize the multiple aspects of the biology of coagulation and coagulopathy after traumatic and burn injury using existing databases, prospective collection and analysis of samples from patients, multiple animal models and in vitro systems. Data from these studies will be used to develop a comprehensive mathematical model of the human coagulation cascade and advanced analysis techniques will be used to interrogate the coagulation model to determine key mechanisms in the coagulation architecture.

Office of Naval Research
Role: co-PI Mann and Brummel-Ziedins
“Complex Systems Approaches to Characterizing Trauma Induced Coagulopathy”

05/28/2015 – 05/27/2018
\$ 2,613,270

In our studies we propose to use a systems biology approach to integrate empirical (e.g. biomarkers) and clinical data from trauma patients with the results from hypothesis driven biochemical studies to develop a picture of trauma progression. Understanding the biology of interacting clotting processes with a high degree of detail will permit the identification of network-based diagnostics and therapeutics through the discovery of clinically relevant and targetable candidate molecules within those networks. The ultimate objective of such findings will lead to reducing mortality and morbidity following trauma in both the military and civilian sectors

BIBLIOGRAPHY

1. **Mann KG**, Vestling CS: Nature of the Isozymes of Rat Liver Mitochondrial Malate Dehydrogenase. *Biochem. Biophys. Acta.* 159:567-569, 1968.
2. **Mann KG**, Vestling CS: Subunits of Rat Liver Mitochondrial Malate Dehydrogenase. *Biochemistry* 8:1105-1109, 1969.
3. Fish WW, **Mann KG**, Tanford C: The Estimation of Polypeptide Chain Molecular Weights by Gel Filtration in 6 M Guanidine Hydrochloride. *J. Biol. Chem.* 244:4989-4994, 1969.
4. **Mann KG**, Batt CW: The Molecular Weights of Bovine Thrombin and its Primary Autolysis Products. *J. Biol. Chem.* 244:6555-6557, 1969.
5. **Mann KG**, Fish WW, Cox AC, Tanford C: Single-chain Nature of Human Serum Transferrin. *Biochemistry* 9:1348-1354, 1970.
6. Aisen P, Koenig SH, Schillinger WE, Scheinberg IH, **Mann KG**, Fish W: On the Existence of Dimers and the Mechanism of Iron-binding in Solutions of Human Serum Transferrin. (Report) IBM Thomas J. Watson Research Center, Yorktown Heights, New York, 1969.
7. Paulsrud JR, **Mann KG**, Dryer RL: A Comparison of Rat and Bat Malic Dehydrogenase Isoenzymes. In: Brown Adipose Tissue (Lindberg, O., ed.), ch. 8, p. 197-207, American Elsevier, New York, 1970.
8. **Mann KG**, Vestling CS: Isozymes of Rat Liver Mitochondrial Malate Dehydrogenase: Evidence for the Existence of Nonidentical Subunits. *Biochemistry* 9:3020-3025, 1970.
9. Castellino FJ, Fish WW, **Mann KG**: Structural Studies on Bovine Lactoferrin. *J. Biol. Chem.* 245:4269-4275, 1970.
10. **Mann KG**, Castellino FJ, Hargrave PA: Molecular Weight and Subunit Structure of Yeast Enolase. *Biochemistry* 9:4002-4007, 1970.
11. Batt CW, Mikulka TW, **Mann KG**, Guarracino CL, Altieri RJ, Graham RC, Quigley JP, Wolf JW, Zafonte CW: The Purification and Properties of Bovine Thrombin. *J. Biol. Chem.* 245:4857-4862, 1970.
12. **Mann KG**, Heldebrant CM, Fass DN: Multiple Active Forms of Thrombin. I. Partial Resolution, Differential Activities, and Sequential Formation. *J. Biol. Chem.* 246:5994-6001, 1971.
13. **Mann KG**, Heldebrant CM, Fass DN: Multiple Active Forms of Thrombin. II. Mechanism of Production From Prothrombin. *J. Biol. Chem.* 246:6106-6114, 1971.
14. Huston JS, Fish WW, **Mann KG**, Tanford C: Studies on the Subunit Molecular Weight of Beef Heart Lactate Dehydrogenase. *Biochemistry* 11:1609-1612, 1972.
15. **Mann KG**, Fish WW: Protein Polypeptide Chain Molecular Weights by Gel Chromatography in Guanidinium Chloride. In: Methods in Enzymology, vol. XXVI, Enzyme Structure, Part C, (Hirs CHW, Timasheff SN, eds.), p. 28-42, Academic Press, New York, 1972.
16. **Mann KG**, Yip R, Heldebrant CM, Fass DN: Multiple Active Forms of Thrombin. III. Polypeptide

Chain Location of Active Site Serine and Carbohydrate. J. Biol. Chem. 248:1868-1875, 1973.

17. Fass DN, **Mann KG:** Activation of Fluorescein-labeled Prothrombin. J. Biol. Chem. 248:3280-3287, 1973.
18. Olson JD, Fass DN, Bowie EJW, **Mann KG:** Ristocetin-induced Aggregation of Gel Filtered Platelets: A Study of von Willebrand's Disease and the Effect of Aspirin. Thromb. Res. 3:501-514, 1973.
19. Heldebrant CM, **Mann KG:** The Activation of Prothrombin. I. Isolation and Preliminary Characterization of Intermediates. J. Biol. Chem. 248:3642-3652, 1973.
20. Lundblad RL, Harrison JH, **Mann KG:** On the Reaction of Purified Bovine Thrombin with N-acetylimidazole. Biochemistry 12:409-413, 1973.
21. Heldebrant CM, Noyes C, Kingdon HS, **Mann KG:** The Activation of Prothrombin. III. The Partial Amino Acid Sequence at the Amino Terminal of Prothrombin and the Intermediates of Activation. Biochem. Biophys. Res. Commun. 54:155-160, 1973.
22. Heldebrant CM, Butkowski RJ, Bajaj SP, **Mann KG:** The Activation of Prothrombin. II. Partial Reactions, Physical and Chemical Characterization of the Intermediates of Activation. J. Biol. Chem. 248:7149-7163, 1973.
23. **Mann KG,** Cox BG: Physical Description and Mechanics of the Analytical Ultracentrifuge. (Video Tape) Mayo Clinic, Rochester, Minnesota, 1973.
24. Bajaj SP, **Mann KG:** Simultaneous Purification of Bovine Prothrombin and Factor X. Activation of Prothrombin by Trypsin-activated Factor X. J. Biol. Chem. 248:7729-7741, 1973.
25. **Mann KG,** Fass DN and Fish WW: Polypeptide Chain Molecular Weight Determination by Gel Permeation Studies on Agarose Columns in 6 M Guanidinium Chloride. In: Polymer Molecular Weight Methods, Advances in Chemistry Series, 125, (Gould, R.F., ed.), vol. 25, p. 310-26, American Chemical Society, Washington, 1973.
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29. **Mann KG,** Heldebrant CM, Fass DN, Bajaj SP, Butkowski RJ: The Molecular Mechanism of Prothrombin Activation. Thromb. Diath. Haemorrh. Suppl. 57:179-196, 1974.
30. Butkowski RJ, Bajaj SP, **Mann KG:** The Preparation and Activation of [sialyl-³H] Prothrombin. J. Biol. Chem. 249:6562-6569, 1974.
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32. **Mann KG**, Fass DN: Calcium and Prothrombin Activation. Mayo Clinic Proc. 49:929-932, 1974.
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35. Hudson BG, Heldebrant CM, **Mann KG**: Distribution of Prothrombin Carbohydrate Units Upon Thrombin Activation. Thromb. Res. 6:215-221, 1975.
36. Taswell C, McDuffie FC, **Mann KG**: Immunochemical Relationships of the Intermediates of Prothrombin Activation. Communication to the Editors, Immunochemistry 12:339-343, 1975.
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38. Lundblad RL, Uhteg LC, Vogel CN, Kingdon HS, **Mann KG**: Preparation and Partial of Characterization Two Forms of Bovine Thrombin. Biochem. Biophys. Res. Commun. 66:482-489, 1975.
39. Rohrbach M, Bodley J, **Mann KG**: Chemical and Physical Studies on the Structure of Escherichia coli Elongation Factor G. J. Biol. Chem. 250:6831-6836, 1975.
40. Downing MR, Butkowski RJ, Clark MM, **Mann KG**: Human Prothrombin Activation. J. Biol. Chem. 250:8897-8906, 1975.
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44. Gleich GJ, Loegering DA, **Mann KG**, Maldonado JE: Comparative Properties of the Charcot-Leyden Crystal Protein and the Major Basic Protein From Human Eosinophils. J. Clin. Invest. 57:633-640, 1976.
45. Downing MR, **Mann KG**: High-pressure Liquid Chromatographic Analysis of Amino Acid Phenylthiohydantoins: Comparison with Other Techniques. Anal. Biochem. 74:298-319, 1976.
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51. Olson JD, Brockway WJ, Fass DN, Bowie EJW, **Mann KG**: Purification of Porcine and Human Ristocetin-Willebrand Factor. *J. Lab. and Clin. Med* 89:1278-1294, 1977.
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55. Elion J, Downing MR, Butkowski RJ, **Mann KG**: Structure of Human Thrombin: Comparison with Other Serine Proteases. In: The Chemistry and Biology of Thrombin (Lundblad RL, Fenton JW, **Mann KG**, eds.), p. 97-112, Ann Arbor Press, Ann Arbor, MI, 1977.
56. Prendergast FG, Nesheim ME, Downing MR, **Mann KG**: Approaches to Fluorescence Studies with Thrombin. In: The Chemistry and Biology of Thrombin (Lundblad RL, Fenton JW, **Mann KG**, eds.), p. 233-244, Ann Arbor Press, Ann Arbor, MI, 1977.
57. Downing MR, Bloom JW, **Mann KG**: Antitrypsin Inhibition of Thrombin. In: The Chemistry and Biology of Thrombin (Lundblad RL, Fenton JW, **Mann KG**, eds.), pp. 441-50, Ann Arbor Press, Ann Arbor, MI, 1977.
58. Booyse FM, Quarfoot AJ, Bell S, Fass DN, Lewis JC, **Mann KG**, Bowie EJW.: Cultured Aortic Endothelial Cells From Pigs with von Willebrand Disease: In Vitro Model for Studying the Molecular Defect(s) of the Disease. *Proc. Natl. Acad. Sci. USA* 74:5702-6, 1977.
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64. Downing MR, Elion J, Butkowski RJ, **Mann KG**: Thrombin: Structural Features Related to Specificity. *Bibl. Haematol.* 44:39-53, 1978.
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67. Nesheim ME, Prendergast FG, **Mann KG**: Interactions of a Fluorescent Active-site-directed Inhibitor of Thrombin: Dansylarginine N-(3-ethyl-1,5-pentanediyl)amide. *Biochemistry* 18:996-1003, 1979.
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77. McDuffie FC, Giffin C, Niedringhaus R, **Mann KG**, Owen CA Jr, Bowie EJW, Peterson J, Clark G, Hunder GG: Prothrombin, Thrombin and Prothrombin Fragments in Plasma of Normal Individuals and of Patients with Laboratory Evidence of Disseminated Intravascular Coagulation. *Thromb. Res.* 16:759-73, 1979.

78. Tuhy PM, Bloom JW, **Mann KG**: Decarboxylation of Bovine Prothrombin Fragment 1 and Prothrombin. *Biochemistry* 18:5842-48, 1979.
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80. Prendergast FG, Bloom J, Downing MR, **Mann KG**: Correlation of Metal Ion-induced Fluorescence Transitions with Conformational Changes in Prothrombin Fragment 1. In: Vitamin K Metabolism and Vitamin K-Dependent Proteins (Suttie JW, ed.), pp. 39-48, University Park Press, Baltimore, MD, 1980.
81. **Mann KG**, Elion JE: Prothrombin. In: CRC Handbook Series in Clinical Laboratory Science, Section 1; Hematology (Schmidt RM, ed.), vol. 3, pp. 15-31, CRC Press, Inc., Boca Raton, FL, 1980.
82. Hibbard LS, **Mann KG**: The Calcium Binding Properties of Bovine Factor V. *J. Biol. Chem.* 255:638-45, 1980.
83. **Mann KG**, Prendergast FG, Bloom JW: The Metal Ion and Phospholipid Interactions of the Vitamin K-dependent Factors. In: The Regulation of Coagulation (**Mann KG**, Taylor FB, eds.), pp. 3-9, Elsevier North-Holland, Inc., New York, 1980.
84. Tracy PB, Peterson JM, Nesheim ME, McDuffie FC, **Mann KG**: Platelet Interaction with Bovine Coagulation Factor V and Factor Va. In: The Regulation of Coagulation (**Mann KG**, Taylor FB, eds.), pp. 237-43, Elsevier North-Holland, Inc., New York, 1980.
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