


Editorial

The Most Highly Cited Publications from Seminars in Thrombosis and Hemostasis: A Data Analysis 50 Years in the Making

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Welcome to another editorial relating to our celebration of 50 years of publishing for *Seminars in Thrombosis & Hemostasis* (STH). As noted several times previously, 2024 marks the 50th birthday of STH, which first published in 1974.¹ A half-century of publishing is a landmark worthy of celebration. We started the celebrations in 2022, when we published our first 50th year celebratory issue.² A second celebratory issue was published in 2023,³ and a third compilation was published as the first issue of 2024.⁴ All issues were rich in content of a historical nature related to the fields of thrombosis and hemostasis. We plan to prepare a 4th and final 50th year celebratory compilation later in this year. In the interim, we plan to publish a separate tribute to the rich history of STH in each issue of STH publishing in 2024. For the first issue of 2024, we republished the first paper ever published in STH, on the molecular structure of fibrinogen,⁵ together with an accompanying commentary from Neerman-Arbez and Casini.⁶ In the next few issues of STH, we will republish the most highly cited publications from STH of all time, as also accompanied by commentaries from experts in these specific featured fields.

This editorial is accompanying the second issue of STH for 2024 and provides two tables that outline the most highly cited papers from STH. **Table 1** identifies the 100 manuscripts that have been most highly cited over the entire publication history of STH, starting from the first paper published in 1974.⁵ These papers have a citation count of 119 or more. Naturally, in such a listing, papers published earlier in the STH publication time-

line have considerable advantage in terms of overall citations compared to more recent publications. However, this is still an important analysis for our journal. I would like to make a few comments on this listing. First, three of the papers on the top 100 list were authored by the founding editor in chief of STH, Eberhard F. Mammen. This included two papers on the platelet function analyzer (PFA)-100.^{7,8} It is likely that these papers helped the manufacturer obtain regulatory approvals for clinical use of the PFA-100 in hemostasis laboratories. Another paper on the PFA-100, the first full report to describe the instrument,⁹ is understandably also a highly cited paper, listing third on the table. Another paper on the PFA-100 in **Table 1** is my own contribution,¹⁰ written as a tribute to Eberhard Mammen, following his passing in 2008.^{11,12} STH has published several more recent publications mentioning the PFA-100, including its recent remodeling as the PFA-200.^{13–15}

However, the most highly cited paper from STH is on the topic of blood rheology and hemodynamics, from the authorship team of Baskurt and Meiselman.¹⁶ In the preparation of this editorial, I learnt that Prof Baskurt unfortunately passed away in 2013, and an In Memoriam was fittingly prepared by his colleague Prof Meiselman.¹⁷ Prof Meiselman is still professionally active and has agreed to coauthor a commentary to accompany the republication of his original paper.¹⁶

The second most highly cited paper from STH is on the topic of skin bleeding time, from the authorship team of Rodgers and Levin.¹⁸ In the preparation for this editorial, I

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Issue Theme Editorial
Compilation—Part XIV; Guest Editors: Emmanuel J. Favaloro, PhD, FFSc (RCPA), Leonardo Pasalic, FRCPA, FRACP, PhD, and Giuseppe Lippi, MD

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Table 1 The 100 most highly cited papers from Seminars in Thrombosis and Hemostasis of all time^a

Rank	Citation	Publication year
1	Baskurt OK, Meiselman HJ. Blood rheology and hemodynamics. <i>Semin Thromb Hemost.</i> 2003 Oct;29(5):435–450.	2003
2	Rodgers RP, Levin J. A critical reappraisal of the bleeding time. <i>Semin Thromb Hemost.</i> 1990 Jan;16(1):1–20.	1990
3	Kundu SK, Heilmann EJ, Sio R, Garcia C, Davidson RM, Ostgaard RA. Description of an in vitro platelet function analyzer–PFA-100. <i>Semin Thromb Hemost.</i> 1995;21 Suppl 2:106–112.	1995
4 ^b	Mammen EF, Comp PC, Gosselin R, Greenberg C, Hoots WK, Kessler CM, Larkin EC, Liles D, Nugent DJ. PFA-100 system: a new method for assessment of platelet dysfunction. <i>Semin Thromb Hemost.</i> 1998;24(2):195–202.	1998
5	Linhardt RJ, Gunay NS. Production and chemical processing of low molecular weight heparins. <i>Semin Thromb Hemost.</i> 1999;25 Suppl 3:5–16.	1999
6	Jurk K, Kehrel BE. Platelets: physiology and biochemistry. <i>Semin Thromb Hemost.</i> 2005;31(4):381–392.	2005
7	Boccardo P, Remuzzi G, Galbusera M. Platelet dysfunction in renal failure. <i>Semin Thromb Hemost.</i> 2004 Oct;30(5):579–589.	2004
8	Hellgren M. Hemostasis during normal pregnancy and puerperium. <i>Semin Thromb Hemost.</i> 2003 Apr;29(2):125–130.	2003
9	Caprini JA, Arcelus JJ, Hasty JH, Tamhane AC, Fabrega F. Clinical assessment of venous thromboembolic risk in surgical patients. <i>Semin Thromb Hemost.</i> 1991;17 Suppl 3:304–312.	1991
10	Nagy JA, Chang SH, Shih SC, Dvorak AM, Dvorak HF. Heterogeneity of the Tumor Vasculature. <i>Semin Thromb Hemost.</i> 2010 Apr;36(3):321–331.	2010
11	Finkelstein JD. Pathways and regulation of homocysteine metabolism in mammals. <i>Semin Thromb Hemost.</i> 2000;26(3):219–225.	2000
12	Savi P, Herbert JM. Clopidogrel and ticlopidine: P2Y ₁₂ adenosine diphosphate-receptor antagonists for the prevention of atherothrombosis. <i>Semin Thromb Hemost.</i> 2005 Apr;31(2):174–183.	2005
13 ^b	Mammen EF, Koets MH, Washington BC, Wolk LW, Brown JM, Burdick M, Selik NR, Wilson RF. Hemostasis changes during cardiopulmonary bypass surgery. <i>Semin Thromb Hemost.</i> 1985 Jul;11(3):281–292.	1985
14	Schrör K. Aspirin and platelets: the antiplatelet action of aspirin and its role in thrombosis treatment and prophylaxis. <i>Semin Thromb Hemost.</i> 1997;23(4):349–356.	1997
15	Tschoepe D, Roesen P, Esser J, Schwippert B, Nieuwenhuis HK, Kehrel B, Gries FA. Large platelets circulate in an activated state in diabetes mellitus. <i>Semin Thromb Hemost.</i> 1991 Oct;17(4):433–438.	1991
16	Sierko E, Wojtukiewicz MZ. Platelets and angiogenesis in malignancy. <i>Semin Thromb Hemost.</i> 2004 Feb;30(1):95–108.	2004
17	Jänicke F, Schmitt M, Graeff H. Clinical relevance of the urokinase-type and tissue-type plasminogen activators and of their type 1 inhibitor in breast cancer. <i>Semin Thromb Hemost.</i> 1991 Jul;17(3):303–312.	1991
18	Tracy PB. Regulation of thrombin generation at cell surfaces. <i>Semin Thromb Hemost.</i> 1988 Jul;14(3):227–233.	1988
19 ^c	Favaloro EJ. Clinical utility of the PFA-100. <i>Semin Thromb Hemost.</i> 2008 Nov;34(8):709–733.	2008
20	van Giezen JJ, Humphries RG. Preclinical and clinical studies with selective reversible direct P2Y ₁₂ antagonists. <i>Semin Thromb Hemost.</i> 2005 Apr;31(2):195–204.	2005
21	Niitsu Y, Jakubowski JA, Sugidachi A, Asai F. Pharmacology of CS-747 (prasugrel, LY640315), a novel, potent antiplatelet agent with in vivo P2Y ₁₂ receptor antagonist activity. <i>Semin Thromb Hemost.</i> 2005 Apr;31(2):184–194.	2005
22	Østerud B, Bjørklid E. Sources of tissue factor. <i>Semin Thromb Hemost.</i> 2006 Feb;32(1):11–23.	2006
23	Rak J. Microparticles in cancer. <i>Semin Thromb Hemost.</i> 2010 Nov;36(8):888–906.	2010
24	Savcic M, Hauert J, Bachmann F, Wyld PJ, Geudelin B, Cariou R. Clopidogrel loading dose regimens: kinetic profile of pharmacodynamic response in healthy subjects. <i>Semin Thromb Hemost.</i> 1999;25 Suppl 2:15–19.	1999

Table 1 (Continued)

Rank	Citation	Publication year
25	Esmon CT. Inflammation and the activated protein C anticoagulant pathway. <i>Semin Thromb Hemost.</i> 2006 Apr;32 Suppl 1:49–60.	2006
26	Vervloet MG, Thijs LG, Hack CE. Derangements of coagulation and fibrinolysis in critically ill patients with sepsis and septic shock. <i>Semin Thromb Hemost.</i> 1998;24(1):33–44.	1998
27	Bachmann F, Kruihof IE. Tissue plasminogen activator: chemical and physiological aspects. <i>Semin Thromb Hemost.</i> 1984 Jan;10(1):6–17.	1984
28	Davie EW, Kulman JD. An overview of the structure and function of thrombin. <i>Semin Thromb Hemost.</i> 2006 Apr;32 Suppl 1:3–15.	2006
29	Falanga A, Rickles FR. Pathophysiology of the thrombophilic state in the cancer patient. <i>Semin Thromb Hemost.</i> 1999;25(2):173–182.	1999
30	Bick RL. Coagulation abnormalities in malignancy: a review. <i>Semin Thromb Hemost.</i> 1992;18(4):353–372.	1992
31	Gremmel T, Frelinger AL 3rd, Michelson AD. Platelet Physiology. <i>Semin Thromb Hemost.</i> 2016 Apr;42(3):191–204.	2016
32	Walker FJ. Protein S and the regulation of activated protein C. <i>Semin Thromb Hemost.</i> 1984 Apr;10(2):131–138.	1984
33	de Moerloose P, Casini A, Neerman-Arbez M. Congenital fibrinogen disorders: an update. <i>Semin Thromb Hemost.</i> 2013 Sep;39(6):585–595.	2013
34	Zacharski LR, Wojtukiewicz MZ, Costantini V, Ornstein DL, Memoli VA. Pathways of coagulation/fibrinolysis activation in malignancy. <i>Semin Thromb Hemost.</i> 1992 Jan;18(1):104–116.	1992
35	Wiman B, Hamsten A. The fibrinolytic enzyme system and its role in the etiology of thromboembolic disease. <i>Semin Thromb Hemost.</i> 1990 Jul;16(3):207–216.	1990
36	Lacroix R, Robert S, Poncelet P, Dignat-George F. Overcoming limitations of microparticle measurement by flow cytometry. <i>Semin Thromb Hemost.</i> 2010 Nov;36(8):807–818.	2010
37	Pierangeli SS, Chen PP, Raschi E, Scurati S, Grossi C, Borghi MO, Palomo I, Harris EN, Meroni PL. Antiphospholipid antibodies and the antiphospholipid syndrome: pathogenic mechanisms. <i>Semin Thromb Hemost.</i> 2008 Apr;34(3):236–250.	2008
38	Kelton JG, Gibbons S. Autoimmune platelet destruction: idiopathic thrombocytopenic purpura. <i>Semin Thromb Hemost.</i> 1982 Apr;8(2):83–104.	1982
39	Tefferi A, Elliott M. Thrombosis in myeloproliferative disorders: prevalence, prognostic factors, and the role of leukocytes and JAK2V617F. <i>Semin Thromb Hemost.</i> 2007 Jun;33(4):313–320.	2007
40	Bick RL. Alterations of hemostasis associated with malignancy: etiology, pathophysiology, diagnosis and management. <i>Semin Thromb Hemost.</i> 1978 Summer;5(1):1–26.	1978
41	Bick RL. Disseminated intravascular coagulation and related syndromes: a clinical review. <i>Semin Thromb Hemost.</i> 1988 Oct;14(4):299–338.	1988
42	Dentali F, Sironi AP, Ageno W, Turato S, Bonfanti C, Frattini F, Crestani S, Franchini M. Non-O Blood Type Is the Commonest Genetic Risk Factor for VTE: Results from a Meta-Analysis of the Literature. <i>Semin Thromb Hemost.</i> 2012 Jul;38(5):535–548.	2012
43	Caplain H, Donat F, Gaud C, Necciari J. Pharmacokinetics of clopidogrel. <i>Semin Thromb Hemost.</i> 1999;25 Suppl 2:25–28.	1999
44	De Stefano V, Chiusolo P, Paciaroni K, Leone G. Epidemiology of factor V Leiden: clinical implications. <i>Semin Thromb Hemost.</i> 1998;24(4):367–379.	1998
45	Goldfarb RH, Liotta LA. Proteolytic enzymes in cancer invasion and metastasis. <i>Semin Thromb Hemost.</i> 1986 Oct;12(4):294–307.	1986
46	Karimi M, Bereczky Z, Cohan N, Muszbek L. Factor XIII Deficiency. <i>Semin Thromb Hemost.</i> 2009 Jun;35(4):426–438.	2009
47	Demers M, Wagner DD. NETosis: a new factor in tumor progression and cancer-associated thrombosis. <i>Semin Thromb Hemost.</i> 2014 Apr;40(3):277–283.	2014
48	Robson SC, Wu Y, Sun X, Knosalla C, Dwyer K, Enjyoji K. Ectonucleotidases of CD39 family modulate vascular inflammation and thrombosis in transplantation. <i>Semin Thromb Hemost.</i> 2005 Apr;31(2):217–233.	2005

(Continued)

Table 1 (Continued)

Rank	Citation	Publication year
49	Bick RL. Hemostasis defects associated with cardiac surgery, prosthetic devices, and other extracorporeal circuits. <i>Semin Thromb Hemost.</i> 1985 Jul;11(3):249–280.	1985
50	Di Minno A, Ambrosino P, Calcaterra I, Di Minno MND. COVID-19 and venous thromboembolism: a meta-analysis of literature studies. <i>Semin Thromb Hemost.</i> 2020 Oct;46(7):763–771.	2020
51	Marlar RA, Neumann A. Neonatal purpura fulminans due to homozygous protein C or protein S deficiencies. <i>Semin Thromb Hemost.</i> 1990 Oct;16(4):299–309.	1990
52	Wilkerson WR, Sane DC. Aging and thrombosis. <i>Semin Thromb Hemost.</i> 2002 Dec;28(6):555–568.	2002
53	Clarke R, Armitage J. Vitamin supplements and cardiovascular risk: review of the randomized trials of homocysteine-lowering vitamin supplements. <i>Semin Thromb Hemost.</i> 2000;26(3):341–348.	2000
54	Althaus K, Greinacher A. MYH9-related platelet disorders. <i>Semin Thromb Hemost.</i> 2009 Mar;35(2):189–203.	2009
55	Kluft C, Dooijewaard G, Emeis JJ. Role of the contact system in fibrinolysis. <i>Semin Thromb Hemost.</i> 1987 Jan;13(1):50–68.	1987
56	Aoki N, Harpel PC. Inhibitors of the fibrinolytic enzyme system. <i>Semin Thromb Hemost.</i> 1984 Jan;10(1):24–41.	1984
57	Bevilacqua MP, Gimbrone MA Jr. Inducible endothelial functions in inflammation and coagulation. <i>Semin Thromb Hemost.</i> 1987 Oct;13(4):425–433.	1987
58 ^b	Mammen EF, Alshameeri RS, Comp PC. Preliminary data from a field trial of the PFA-100 system. <i>Semin Thromb Hemost.</i> 1995;21 Suppl 2:113–121.	1995
59	Laridan E, Martinod K, De Meyer SF. Neutrophil extracellular traps in arterial and venous thrombosis. <i>Semin Thromb Hemost.</i> 2019 Feb;45(1):86–93.	2019
60	Lippi G, Franchini M, Favaloro EJ, Targher G. Moderate red wine consumption and cardiovascular disease risk: beyond the “French paradox”. <i>Semin Thromb Hemost.</i> 2010 Feb;36(1):59–70.	2010
61	Ruf W, Mueller BM. Thrombin generation and the pathogenesis of cancer. <i>Semin Thromb Hemost.</i> 2006 Apr;32 Suppl 1:61–68.	2006
62	Jalal DI, Chonchol M, Targher G. Disorders of hemostasis associated with chronic kidney disease. <i>Semin Thromb Hemost.</i> 2010 Feb;36(1):34–40.	2010
63	Lee AY, Levine MN. The thrombophilic state induced by therapeutic agents in the cancer patient. <i>Semin Thromb Hemost.</i> 1999;25(2):137–145.	1999
64	Thomas J, Kostousov V, Teruya J. Bleeding and thrombotic complications in the use of extracorporeal membrane oxygenation. <i>Semin Thromb Hemost.</i> 2018 Feb;44(1):20–29.	2018
65	Bick RL. Clinical relevance of antithrombin III. <i>Semin Thromb Hemost.</i> 1982 Oct;8(4):276–287.	1982
66	Honn KV, Tang DG, Chen YQ. Platelets and cancer metastasis: more than an epiphenomenon. <i>Semin Thromb Hemost.</i> 1992;18(4):392–415.	1992
67	Lippi G, Salvagno GL, Montagnana M, Lima-Oliveira G, Guidi GC, Favaloro EJ. Quality standards for sample collection in coagulation testing. <i>Semin Thromb Hemost.</i> 2012 Sep;38(6):565–575.	2012
68	Michiels JJ, Juvonen E. Proposal for revised diagnostic criteria of essential thrombocythemia and polycythemia vera by the Thrombocythemia Vera Study Group. <i>Semin Thromb Hemost.</i> 1997;23(4):339–347.	1997
69	Cattaneo M. Light transmission aggregometry and ATP release for the diagnostic assessment of platelet function. <i>Semin Thromb Hemost.</i> 2009 Mar;35(2):158–167.	2009
70	Mariani G, Bernardi F. Factor VII Deficiency. <i>Semin Thromb Hemost.</i> 2009 Jun;35(4):400–406.	2009
71	Mehta J, Singhal S. Hyperviscosity syndrome in plasma cell dyscrasias. <i>Semin Thromb Hemost.</i> 2003 Oct;29(5):467–471.	2003
72	Clauss M. Molecular biology of the VEGF and the VEGF receptor family. <i>Semin Thromb Hemost.</i> 2000;26(5):561–569.	2000
73	Levi M, Schultz M, van der Poll T. Sepsis and thrombosis. <i>Semin Thromb Hemost.</i> 2013 Jul;39(5):559–566.	2013

Table 1 (Continued)

Rank	Citation	Publication year
74	Aatonen M, Grönholm M, Siljander PR. Platelet-derived microvesicles: multitasking participants in intercellular communication. <i>Semin Thromb Hemost.</i> 2012 Feb;38(1):102–113.	2012
75	Hermans J, McDonagh J. Fibrin: structure and interactions. <i>Semin Thromb Hemost.</i> 1982 Jan;8(1):11–24.	1982
76	Leroy J, Leclerc MH, Delahousse B, Guérois C, Foloppe P, Gruel Y, Toulemonde F. Treatment of heparin-associated thrombocytopenia and thrombosis with low molecular weight heparin (CY 216). <i>Semin Thromb Hemost.</i> 1985 Jul;11(3):326–329.	1985
77	Favaloro EJ, Lippi G, Adcock DM. Preanalytical and postanalytical variables: the leading causes of diagnostic error in hemostasis? <i>Semin Thromb Hemost.</i> 2008 Oct;34(7):612–634.	2008
78	Markwardt F. Development of hirudin as an antithrombotic agent. <i>Semin Thromb Hemost.</i> 1989 Jul;15(3):269–282.	1989
79	Roberts HR, Hoffman M, Monroe DM. A cell-based model of thrombin generation. <i>Semin Thromb Hemost.</i> 2006 Apr;32 Suppl 1:32–38.	2006
80	Østerud B, Bjørklid E. The tissue factor pathway in disseminated intravascular coagulation. <i>Semin Thromb Hemost.</i> 2001 Dec;27(6):605–617.	2001
81	Bukowski RM, Hewlett JS, Reimer RR, Groppe CW, Weick JK, Livingston RB. Therapy of thrombotic thrombocytopenic purpura: an overview. <i>Semin Thromb Hemost.</i> 1981 Winter;7(1):1–8.	1981
82	Griffin JH, Cochrane CG. Recent advances in the understanding of contact activation reactions. <i>Semin Thromb Hemost.</i> 1979 Spring;5(4):254–273.	1979
83	Heit JA. Venous thromboembolism epidemiology: implications for prevention and management. <i>Semin Thromb Hemost.</i> 2002 Jun;28 Suppl 2:3–13.	2002
84	Isbister GK. Snakebite doesn't cause disseminated intravascular coagulation: coagulopathy and thrombotic microangiopathy in snake envenoming. <i>Semin Thromb Hemost.</i> 2010 Jun;36(4):444–451.	2010
85	Markus G. The role of hemostasis and fibrinolysis in the metastatic spread of cancer. <i>Semin Thromb Hemost.</i> 1984 Jan;10(1):61–70.	1984
86	Varki NM, Varki A. Heparin inhibition of selectin-mediated interactions during the hematogenous phase of carcinoma metastasis: rationale for clinical studies in humans. <i>Semin Thromb Hemost.</i> 2002 Feb;28(1):53–66.	2002
87	Francis JL, Biggerstaff J, Amirhosravi A. Hemostasis and malignancy. <i>Semin Thromb Hemost.</i> 1998;24(2):93–109.	1998
88	Olson ST, Björk I. Regulation of thrombin activity by antithrombin and heparin. <i>Semin Thromb Hemost.</i> 1994;20(4):373–409.	1994
89	Coppola A, Davi G, De Stefano V, Mancini FP, Cerbone AM, Di Minno G. Homocysteine, coagulation, platelet function, and thrombosis. <i>Semin Thromb Hemost.</i> 2000;26(3):243–254.	2000
90	De Stefano V, Teofili L, Leone G, Michiels JJ. Spontaneous erythroid colony formation as the clue to an underlying myeloproliferative disorder in patients with Budd-Chiari syndrome or portal vein thrombosis. <i>Semin Thromb Hemost.</i> 1997;23(5):411–418.	1997
91	Chandler WL. The thromboelastography and the thromboelastograph technique. <i>Semin Thromb Hemost.</i> 1995;21 Suppl 4:1–6.	1995
92	Ferro V, Dredge K, Liu L, Hammond E, Bytheway I, Li C, Johnstone K, Karoli T, Davis K, Copeman E, Gautam A. PI-88 and novel heparan sulfate mimetics inhibit angiogenesis. <i>Semin Thromb Hemost.</i> 2007 Jul;33(5):557–568.	2007
93	van Guldener C, Stehouwer CD. Hyperhomocysteinemia, vascular pathology, and endothelial dysfunction. <i>Semin Thromb Hemost.</i> 2000;26(3):281–289.	2000
94	Müller-Berghaus G. Pathophysiologic and biochemical events in disseminated intravascular coagulation: dysregulation of procoagulant and anticoagulant pathways. <i>Semin Thromb Hemost.</i> 1989 Jan;15(1):58–87.	1989
95	Gando S. Disseminated intravascular coagulation in trauma patients. <i>Semin Thromb Hemost.</i> 2001 Dec;27(6):585–592.	2001

(Continued)

Table 1 (Continued)

Rank	Citation	Publication year
96	Girolami B, Girolami A. Heparin-induced thrombocytopenia: a review. <i>Semin Thromb Hemost.</i> 2006 Nov;32(8):803–809.	2006
97	Falanga A. Thrombophilia in cancer. <i>Semin Thromb Hemost.</i> 2005 Feb;31(1):104–110.	2005
98	Fareed J, Hoppensteadt DA, Bick RL. An update on heparins at the beginning of the new millennium. <i>Semin Thromb Hemost.</i> 2000;26 Suppl 1:5–21.	2000
99	Franceschi LD, Cappellini MD, Olivieri O. Thrombosis and sickle cell disease. <i>Semin Thromb Hemost.</i> 2011 Apr;37(3):226–236.	2011
100	Hursting MJ, Alford KL, Becker JC, Brooks RL, Joffrion JL, Knappenberger GD, Kogan PW, Kogan TP, McKinney AA, Schwarz RP Jr. Novastan (brand of argatroban): a small-molecule, direct thrombin inhibitor. <i>Semin Thromb Hemost.</i> 1997;23(6):503–516.	1997

^aFrom the first publication in 1974,⁵ to the date of data compilation (August 5, 2023). Data from Web of Science. The papers on this list have been cited 119 or more times since publication.

^bAuthored by founding editor in chief of STH.

^cAuthored by current editor in chief of STH as a tribute to founding editor in chief of STH, after his passing in 2008.

discovered that Prof Levin is still professionally active and has agreed to coauthor a commentary to accompany the republication of his original paper.¹⁸ It is also interesting to me that the skin bleeding time, an invasive procedure requiring the patient to be subjected to a skin cut, was in part replaced by the PFA-100, which in several papers has been described as an *in vitro* bleeding time. Thus, three of the four papers heading the list in **Table 1** can be considered as “somewhat related.”^{7,9,18}

It is also interesting to me that these papers are still being cited in the current literature. **Fig. 1** provides a summary of citations for the four leading papers in **Table 1**. Impressively, the leading paper¹⁶ is being cited more currently than it was in the past, suggesting continued high relevance in 2024! One could say it was way ahead of its time.

The most “prolific” author on the list in **Table 1** is Roger L. Bick, with five papers listed. According to PubMed, Prof Bick published 163 papers during his career, with 34 of these

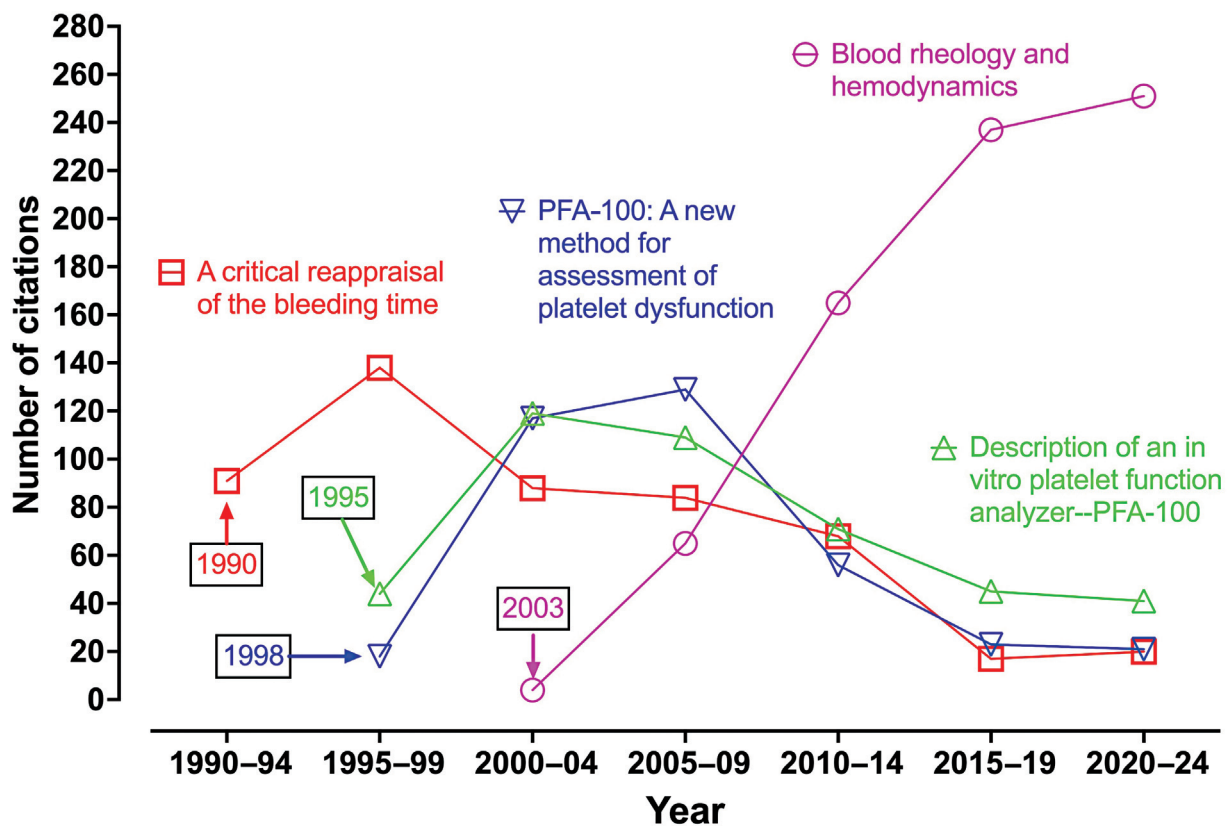


Fig. 1 Citations over time for the four most highly cited papers from **Table 1**. Data shown in 5-year groupings, with the year of publication for each paper also noted at the start of each data curve. Data from Web of Science. Data compiled up to the date of data collection (August 5th, 2023); thus, the period 2020 to 2024 comprises less than 4 years of data.

appearing in STH, the first of which appeared in STH in 1976, only 2 years after STH began. So, Prof Bick was a strong supporter of this journal during his professional life. In comparison, also according to PubMed, Eberhard Mammen is attributed with 119 publications, with 15 of these appearing in STH, the first of which published in 1975. Like Eberhard Mammen, Roger Bick also passed away too young in 2008.^{19,20}

In the top 10 most highly cited papers (► **Table 1**) is a paper from Jurk and Kehrel, on the physiology and biochemistry of platelets.²¹ This is a perennial favorite of STH readers and is always on the top list of most downloaded papers in every

year of analysis, as well as being an almost permanent fixture in the “most read” list in the online journal list of top 10.²² And, yes, it was on this list at time of writing this editorial. The continued popularity of this paper actually led me to commission an update, which was written by Gremmel et al²³ and which also appears on the top 100 list (► **Table 1**), as well as on the online journal list of top 10.²²

Of course, not all the papers appearing on the top 100 cited papers of all time are from the historical vault of STH, with several published in the last two decades. To highlight these recent most highly cited papers, I have provided a separate table (► **Table 2**) that lists the most highly cited

Table 2 The 100 most highly cited papers from Seminars in Thrombosis and Hemostasis in terms of yearly citations^a

Rank	Citation	Publication year
1	Di Minno A, Ambrosino P, Calcaterra I, Di Minno MND. COVID-19 and venous thromboembolism: a meta-analysis of literature studies. <i>Semin Thromb Hemost.</i> 2020 Oct;46(7):763–771.	2020
2	Baskurt OK, Meiselman HJ. Blood rheology and hemodynamics. <i>Semin Thromb Hemost.</i> 2003 Oct;29(5):435–450.	2003
3	Laridan E, Martinod K, De Meyer SF. Neutrophil extracellular traps in arterial and venous thrombosis. <i>Semin Thromb Hemost.</i> 2019 Feb;45(1):86–93.	2019
4	Thomas J, Kostousov V, Teruya J. Bleeding and thrombotic complications in the use of extracorporeal membrane oxygenation. <i>Semin Thromb Hemost.</i> 2018 Feb;44(1):20–29.	2018
5	Gremmel T, Frelinger AL 3rd, Michelson AD. Platelet physiology. <i>Semin Thromb Hemost.</i> 2016 Apr;42(3):191–204.	2016
6	Kumar KR, Cowley MJ, Davis RL. Next-generation sequencing and emerging technologies. <i>Semin Thromb Hemost.</i> 2019 Oct;45(7):661–673.	2019
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Rank	Citation	Publication year
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Rank	Citation	Publication year
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^aData from Web of Science (compiled up to the date of data collection; August 5, 2023). The papers on this list have been cited an average of 8 or more times per year since publication.

papers from STH according to the yearly citation rate. The papers on this list have been cited eight or more times per year on average since publication. Most papers are from the past two decades, indicating the continued relevance of STH in the current thrombosis and hemostasis literature. Quite a few of these papers relate to coronavirus disease 2019 (COVID-19), including the paper with the highest yearly citation rate by Di Minno et al.²⁴ This paper has been cited 141 times since publishing, for an annual citation rate of nearly 38 citations/year for 2020 to 2023 inclusive. COVID-19 is a terrible disease but somehow unified humanity to aim to understand, treat, and combat the disease. STH published four issues devoted to COVID-19 over the years 2020 to 2023,^{25–28} and the content in these issues proved very popular with the readership,^{29–31} as well as being highly cited (► **Table 2**).

Also on this list in ► **Table 2** are several of the papers from ► **Table 1**, highlighting that these appear in ► **Table 1**,

not because their citations reflect an accumulation of historical papers from the distant past, but because they have proven consistently relevant over time. In any case, we look forward to continuing to publish material of interest to our readership for the next 50 years!

Conflict of Interest

None declared.

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