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Global research trends on drug interactions with direct oral anticoagulants: A comprehensive bibliometric analysis

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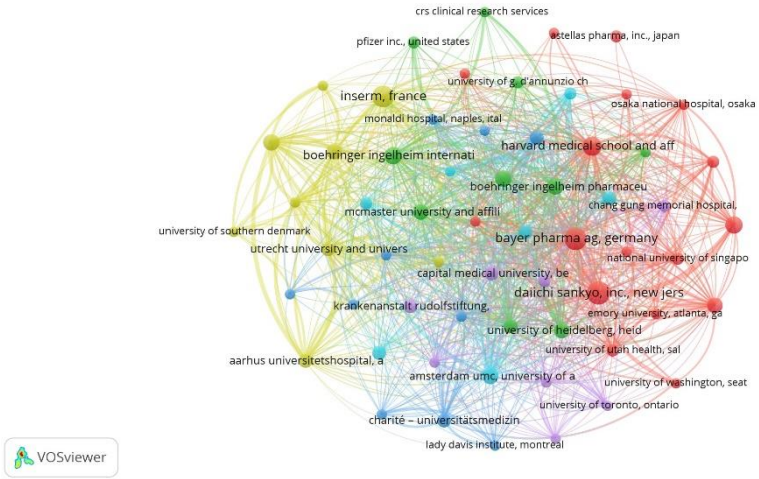
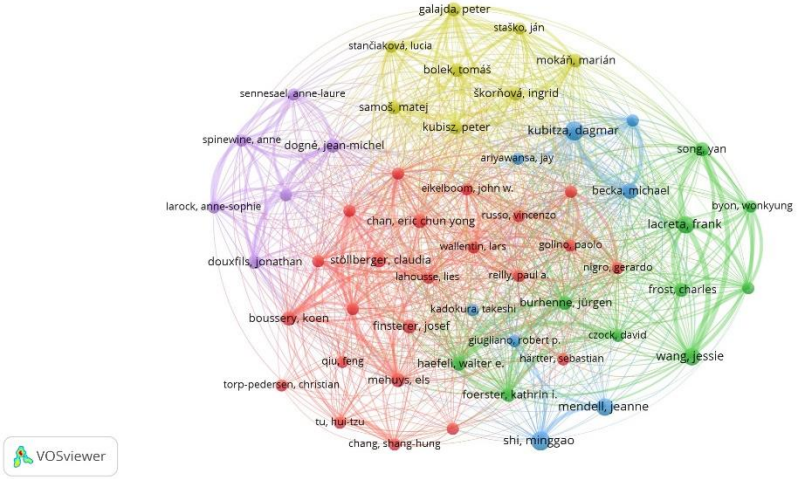
SUPPLEMENTARY MATERIAL

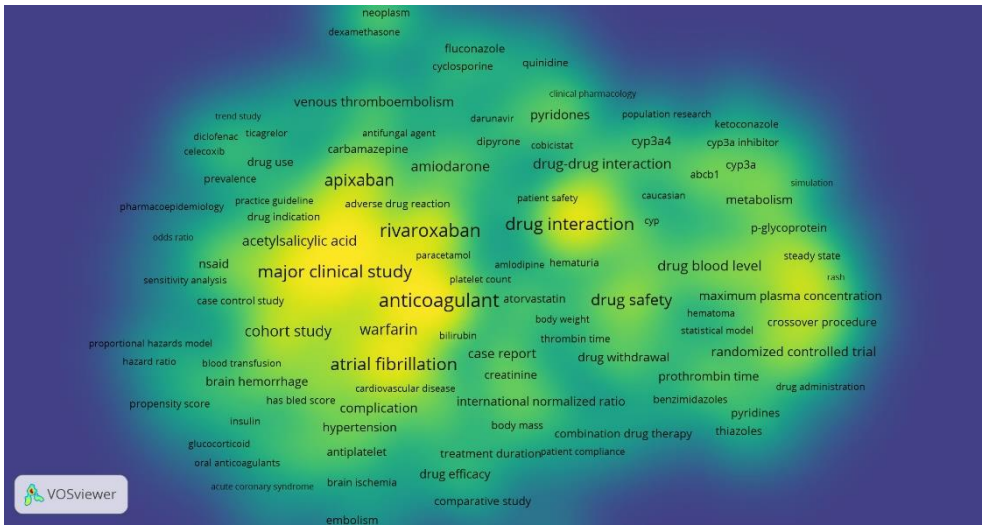
1. Supplementary Figures



SUPPLEMENTARY FIGURE S1 Network visualization map of institutions Bibliographic coupling analysis. The network visualization map, based on the data from Scopus, was created using VOSviewer to visualize the bibliographic coupling between institutions. The analysis settings were as follows: Normalization (Method: Association strength), Layout (Attraction: 4, Repulsion: -3), Clustering (Resolution: 1, Minimum cluster size: 3), and Rotate/flip (Degrees to rotate: 90). Each node represents institutions, with their size reflecting the number of publications. The edges indicate bibliographic coupling, where institutions cite similar references, and the line thickness reflects the strength of this connection.



SUPPLEMENTARY FIGURE S2 Network visualization map of authors Bibliographic coupling analysis. The network visualization map, based on the data from Scopus, was created using VOSviewer to visualize the bibliographic coupling between authors. The analysis settings were as follows: Normalization (Method: Association strength), Layout (Attraction: 4, Repulsion: -2), Clustering (Resolution: 1, Minimum cluster size: 5), and Rotate/flip (Degrees to rotate: 90). Each node represents an author, with the size of the node indicating the author's relevance based on the number of shared references with others. The edges between nodes reflect the strength of bibliographic coupling, with thicker edges indicating stronger connections.



SUPPLEMENTARY FIGURE S3 Keywords analysis for research of drug interactions of DOACs Density visualization. The network visualization map, based on the data from Scopus, was created using VOSviewer to visualize keyword density. The analysis settings were as follows: Normalization (Method: Association strength), Layout (Attraction: 1, Repulsion: 0), Clustering (Resolution: 1, Minimum cluster size: 35), and Rotate/flip (Degrees to rotate: 90). Each node represents keywords, with their size and density indicating the frequency of occurrence in the analyzed literature. Brighter regions highlight areas of higher keyword concentration, revealing core research themes.

2.

3. Supplementary Tables

SUPPLEMENTARY TABLE S1

Top Five highly cited papers on DOAC interactions in the context of COVID-19.

Rank	Document (Author/Year/Journal)	Title	Year	Global citations	Local citations
1	Testa, Sophie, 2020, Journal of Thrombosis and Haemostasis	Direct oral anticoagulant plasma levels' striking increase in severe COVID-19 respiratory syndrome patients treated with antiviral agents: The Cremona experience [65]	2020	129	3
2	Fröhlich, Georg M., 2021, Clinical Research in Cardiology	Impact of oral anticoagulation on clinical outcomes of COVID-19: a nationwide cohort study of hospitalized patients in Germany [66]	2021	43	0
3	Potere, Nicola, 2022, Journal of Thrombosis and Thrombolysis	Direct oral anticoagulant plasma levels in hospitalized COVID-19 patients treated with dexamethasone [67]	2022	9	2
4	Launay, Manon, 2021, Therapeutic Drug Monitoring	Severe Inflammation, Acute Kidney Injury, and Drug-Drug Interaction: Triple Penalty for Prolonged Elimination of Apixaban in Patients with Coronavirus Disease 2019: A Grand Round [68]	2021	3	0
5	Kravchenko, Olga V., 2022, BMJ Open	Drug-drug interaction between dexamethasone and direct-acting oral anticoagulants: A nested case-control study in the National COVID Cohort Collaborative (N3C) [69]	2022	3	0

SUPPLEMENTARY TABLE S2

Top Five Most cited papers on PBPK modeling of DOAC interactions.

Rank	Document (Author/Year/Journal)	Title	Year	Global citations	Local citations
1	Zhao Y, 2014, British Journal of Pharmacology	Physiologically based pharmacokinetic modelling and in vivo [I]/K i accurately predict P-glycoprotein-mediated drug-drug interactions with dabigatran etexilate [70]	2014	34	4
2	Xu R, 2018, European Journal of Clinical Pharmacology	Application of physiologically based pharmacokinetic modeling to the prediction of drug-drug and drug-disease interactions for rivaroxaban [71]	2018	25	3
3	Ismail M, 2018, Journal	Minimal Physiologically	2018	22	5

	of Clinical Pharmacology	Based Pharmacokinetic and Drug-Drug-Disease Interaction Model of Rivaroxaban and Verapamil in Healthy and Renally Impaired Subjects [72]			
4	Kushwah V, 2021, Pharmaceutics	On absorption modeling and food effect prediction of rivaroxaban, a bcs ii drug orally administered as an immediate-release tablet [73]	2021	21	0
5	Willmann S, 2021, Journal of Clinical Pharmacology	Applications of Physiologically Based Pharmacokinetic Modeling of Rivaroxaban—Renal and Hepatic Impairment and Drug-Drug Interaction Potential [74]	2021	19	1

SUPPLEMENTARY TABLE S3

Top Five Most cited papers on Oncology of DOAC interactions.

Rank	Document (Author/Year/Journal)	Title	Year	Global citations	Local citations
1	Mcbane, Robert D., 2020, Journal of Thrombosis and Haemostasis	Apixaban and dalteparin in active malignancy-associated venous thromboembolism: The ADAM VTE trial [56]	2020	390	3
2	Mueck, W., 2013, British Journal of Clinical Pharmacology	Co-administration of rivaroxaban with drugs that share its elimination pathways: Pharmacokinetic effects in healthy subjects [57]	2013	322	43
3	Verso, Melina, 2021, European Journal of Cancer	Effects of concomitant administration of anticancer agents and apixaban or dalteparin on recurrence and bleeding in patients with cancer-associated venous thromboembolism [75]	2021	43	2
4	Gulilat M, 2020, Journal of Thrombosis and Thrombolysis	Drug interactions and pharmacogenetic factors contribute to variation in apixaban concentration in atrial fibrillation patients in routine care [76]	2020	39	4
5	Wang T-F, 2021, Journal of Thrombosis and Haemostasis	Characteristics and outcomes of patients on concurrent direct oral anticoagulants and targeted anticancer therapies—TacDOAC registry: Communication from the ISTH SSC Subcommittee on Hemostasis and Malignancy [77]	2021	24	0