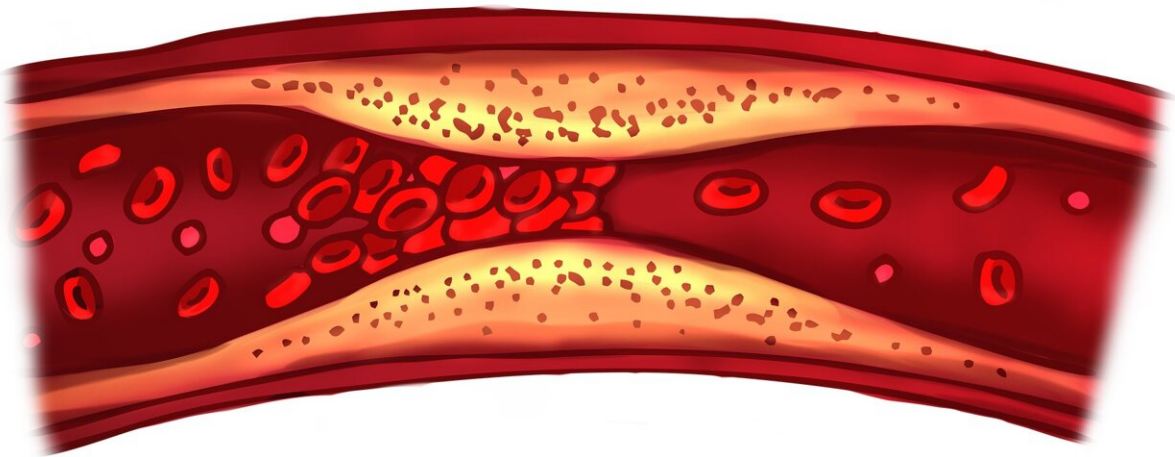


# New anticoagulants may help treat sepsis and COVID-19

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Scientists from Trinity College Dublin have just discovered that the drug dimethylfumarate can block blood clotting during infection, offering hope that it could be used to treat a number of conditions, such a life-threatening disseminated intravascular coagulopathy (DIC), which can occur in serious infections with bacteria that lead to sepsis or in response to viral infections such as COVID-19.

Reporting in *Nature Communications*, Dr. Tristram Ryan and Professor Luke O'Neill from the Trinity Biomedical Sciences Institute (TBSI),

with collaborators in Trinity, Royal College of Surgeons in Ireland, Poland, Germany and Australia, describe how dimethylfumarate and a related experimental drug called 4-OI can stop coagulation by decreasing production of a clotting factor called Tissue Factor.

They have shown that the mechanism involves a block in proteins called interferons, which promote tissue factor releases. Dr. Ryan said, "DIC is one of the leading causes of death worldwide so we hope our findings might lead to new therapies that save lives."

The team demonstrated that life-threatening clotting could be prevented in mice infected with the bacteria *E. coli* and *Staph aureus* and also in response to SARS-CoV2, the virus that causes COVID-19. They also showed the process being blocked was dysfunctional in [blood samples](#) taken from patients in St James's hospital with severe COVID-19.

"We hope our work will lead to better therapies to halt the dangerous [blood](#) clotting that can occur in people with severe infections, including COVID-19," said Prof O'Neill.

Dr. Ryan added, "Dimethylfumarate is already in use for diseases such as psoriasis and multiple sclerosis and could be repurposed for sepsis and COVID-19, while 4-OI might be used to develop a brand new therapy."

**More information:** Tristram A. J. Ryan et al, Dimethyl fumarate and 4-octyl itaconate are anticoagulants that suppress Tissue Factor in macrophages via inhibition of Type I Interferon, *Nature Communications* (2023). [DOI: 10.1038/s41467-023-39174-1](https://doi.org/10.1038/s41467-023-39174-1)

Provided by Trinity College Dublin

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