



VCU

VIRGINIA COMMONWEALTH UNIVERSITY

“Novel Low Molecular Weight Lignins for use as an Anticoagulant” VCU #12-053

Applications

- Cardiovascular disease
- Thromboembolic disease therapy
- Anticoagulant
- Possible cancer therapeutic
- Possible anti-herpes agent

Advantages

- Structurally unique molecules
- Potent coagulation inhibitor
- Existing FDA approved drug may function as an antidote to accidental overdose

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Market Need

Although highly successful in managing various clinical conditions, heparins suffer from a number of issues including an enhanced bleeding risk, complications arising from immunologic reactions, and food–drug and/or drug–drug interactions. Administering safe anticoagulation therapy can be further complicated by problems such as patient response variability, narrow window of efficacy, poor oral bioavailability of heparins, the necessity to monitor with high frequency, possibility of contamination and high cost to benefit ratio. Newer anticoagulants have been introduced in the clinic, but these continue to suffer from enhanced bleeding risk. There is a clinical need for a potent anticoagulant which doesn't demonstrate the wide range of side-effects seen with existing compounds

Technology Summary

Researchers at VCU have developed a novel low-molecular weight (LMW) lignin that exhibits high selectivity and potency as an anticoagulant. These lignins, which are naturally occurring biopolymers, act as functional macromolecular mimetics of low-molecular weight heparins. However, these do not inhibit the many heparin binding serine proteases. Instead they are highly selective inhibitors of plasmin. This selectivity can significantly reduce medical risks and side-effects associated with the use of heparin. These compounds can be readily synthesized, in few high-yield inexpensive steps and do not need to be isolated from animal sources, making them less prone to prion borne diseases. In case of accidental overdose, an existing FDA approved drug may be used to mediate or function as an antidote to the anticoagulation effects of the lignin. In vitro testing has demonstrated high selectivity and potency of this novel compound

Technology Status

Patent pending: U.S. rights are available.

In vitro testing has been conducted demonstrating high selectivity and potency.

Henry, B. *et al.*, *Biochem. Biophysics Res Commun.* 413(1):382-6 (2012)

Henry, B. *et al.*, *Thromb Haemostasis.* 103(3):507-15 (2010).

This technology is available for licensing to industry for further development and commercialization.