Systemic inflammatory response syndrome (SIRS) is a serious healthcare issue that can be thought of as an immune system “over response” that leads to diffuse tissue injury, dysfunction of multiple organs, and often death. SIRS typically occurs in association with overwhelming infection (sepsis) or following a range of insults, including trauma, burns, pancreatitis, or hemorrhage. SIRS is a major cause of deaths in the ICU and results in significant healthcare expenditures. Although supportive care measures have improved SIRS-related mortality, 20-40% of affected by severe SIRS still die, as no available therapy specifically targets the SIRS process itself.

We have investigated a biological approach to sepsis treatment using the adipokine leptin, which is best known for its role in satiety signaling and metabolic control. Following our initial observations that very high blood leptin levels (hyperleptinemia), substantially reduces both the release of inflammatory cytokines in and the mortality from clinical SIRS with severe lung injury (ARDS), we successfully recapitulated these findings in obese mouse models of SIRS/ARDS in order to dissect the biology of this effect. Subsequent work in our lab has shown that body mass per se is not associated with reduction in inflammation and tissue injury in multivariate analysis, yet systemic leptin levels are in both mouse models and patients. We have recently demonstrated that this protection is conferrable through the therapeutic induction of hyperleptinemia using mouse models of SIRS in which lean mice injected with recombinant pegylated leptin demonstrated significantly attenuated inflammatory response to injury. Studies in our lab examining the effects of high dose leptin on leukocyte signaling suggest that hyperleptinemia inhibits activation of these cells following stimuli, possibly reflecting ‘reprogramming’ of the immune cells. Clinical trials of leptin therapy for obesity and other conditions demonstrated only nominal side effects of elevated pulse and mild hypertension. Thus, the ameliorative effects of hyperleptinemia on SIRS accompanied by insignificant toxicity make leptin an attractive, novel therapy for this disease.

Overview
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Invention
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Advantages
- Cost-effective
- Low toxicity
- Reduces morbidity and mortality rates
- Can be administered preventatively
- Inexpensive and disposable

Applications
- Hospitals, Critical Care Units, Emergency Rooms
- As a preventative treatment administered upon injury
- As a treatment for active SIRS cases.

Patent Status
Patent Application Filed
Worldwide Rights Available

Learn more about Dr. Suratt’s research at: http://bit.ly/1f1EDFY

For more information and licensing opportunities contact us at: Ph: 802-656-8780 or email: innovate@uvm.edu

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