

# ATS 2009 • San Diego

The American Thoracic Society's 105<sup>th</sup> International Conference, May 15 to 20, 2009



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## News Release

**FOR RELEASE MAY 20, 2009 at 8:15 a.m. PDT**

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ATS Press Room: 619-525-6323, 619-525-6324 or 619-525-6325 (May 15 to 20)

Poster session time: May 20: 8:15 a.m. to 4 p.m.

Poster viewing time: May 20: 10:45 a.m. to 12:30 p.m.

Location: San Diego Convention Center, Area B (Sails Pavilion, Upper Level)

### **Protein from Algae Shows Promise for Stopping SARS**

ATS 2009, SAN DIEGO— A protein from algae may have what it takes to stop Severe Acute Respiratory Syndrome (SARS) infections, according to new research. A recent study has found that mice treated with the protein, Griffithsin (GRFT), had a 100 percent survival rate after exposure to the SARS coronavirus (SARS-CoV), as compared to a 30 percent survival for untreated mice.

The research will be presented at the American Thoracic Society's 105<sup>th</sup> International Conference in San Diego on Wednesday, May 20.

Despite its dramatic entrance into the domain of worldwide public health threats in 2002, little headway has been made therapeutically toward preventing or treating SARS after infection. But GRFT, a lectin protein derived from algae, offers a new possible hope. GRFT is thought to exert its anti-viral effects by altering the shape of the sugar molecules that line the virus' envelope, allowing it to attach to and invade human cells, where it takes over the cells' reproductive machinery to replicate itself. Without that crucial ability, the virus is unable to cause disease.

“While preliminary, these results are very exciting and indicate a possible therapeutic approach to future SARS or other coronaviral outbreaks,” stated Christine Wohlford-Lenane, senior research assistant at the department of pediatrics University of Iowa and the lead author of the study.

Researchers treated experimental mice with GRFT or a sham treatment and then inoculated them with the SARS virus. They analyzed the antiviral activity of GRFT and the extent to which the virus was able to invade and replicate in the mice at two, four and 10 days after infection. They found that mice who had not been treated with GRFT showed 20 times more plaque-forming units of virus than treated mice. They also noted that the lungs of untreated infected mice showed extensive necrotizing bronchitis and prominent edema, while mice treated with GRFT showed evidence of significantly less severe lung damage. Additionally, mice treated with GRFT did not experience the drastic weight loss of untreated mice, which lost 35 percent of their body mass.

“This indicates that not only did the GRFT stop the virus from replicating, but also prevented secondary outcomes, such as weight loss, that are associated with infection,” said Ms. Wohlford-Lenane.

“We are planning future studies to investigate prophylaxis, versus treatment interventions with GRFT, in the SARS mouse model in collaboration with Barry O’Keefe at the National Cancer Institute,” she concluded. “In addition, we want to learn whether mice protected from SARS by GRFT develop protective immunity against future infection.”

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**Session #** D46: “Treatment of Respiratory Infections”

**Abstract #** 4250: “Protective Role of Griffithsin in Severe Acute Respiratory Syndrome Pulmonary Infection”

**Poster Board #** D51

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## ATS 2009 · San Diego International Conference

**Abstract Number:** 4250

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**I confirm that all authors listed on this abstract have knowledge of the abstract submission:**  
Yes

**Title:** Protective Role of Griffithsin in Severe Acute Respiratory Syndrome Pulmonary Infection

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**Rationale:** Severe Acute Respiratory Syndrome (SARS) became a threat to worldwide health in 2002, with over 8000 diagnosed cases reported, causing approximately 800 deaths. While much has been discovered of the coronavirus that causes SARS, little headway has been made toward therapeutic approaches to prevent infection or halt progression. In this study, we evaluated the antiviral effects of the algae protein, Griffithsin (GRFT) as a therapeutic candidate for SARS-CoV infection prevention.

**Methods:** Mice were intranasally inoculated with mouse adapted (MA15) Urbani SARS-CoV (3.0 x 10<sup>5</sup> pfu), treated with GRFT or sham, weighed daily and euthanized on days 2, 4 and 10 post infection. Lungs were excised and used for viral titering, histopathological analysis, and cytokine and chemokine analysis.

**Results:** Untreated mice inoculated with SARS-CoV had a 30% survival rate and those that survived had a 35% reduction in weight. Mice treated with GRFT and inoculated with SARS-CoV had a 100% survival rate with no reduction in weight. Antiviral activity of GRFT was analyzed by

titering SARS-CoV in homogenized lung supernatant. This showed a 20-fold decrease in pfu/ml at in mice treated with GRFT compared to those that received no treatment. Lungs from SARS-CoV only group had early necrotizing bronchiolitis followed by predominant edema. GRFT treated lungs had significant perivascular infiltrates from d2-10 but less severe scores for edema and necrotizing bronchiolitis. We are currently investigating various cytokine and chemokine protein levels in lung homogenates.

Conclusions: These results identify GRFT as a potent inhibitor of SARS-CoV infection and disease progression in mice. GRFT may be beneficial in the prophylaxis or treatment of SARS coronavirus infection.