Barenkamp said. If the naturally produced antibodies in the samples are capable of killing the bacteria, that would mean the proteins could be important components of a protective vaccine.

This research is targeting otitis media, a common type of infection found in children. Barenkamp will prepare a vaccine model using a weakened form of common respiratory virus known as adenovirus that will be tested on the chinchilla model.

“We want to decrease the use of antibiotics and use a vaccine instead to prevent this disease,” he said.

In this project, Fleming’s collaborators have determined that hepcidin levels are low not only in hemochromatosis, but also in beta thalassemias.

“We know that giving extra transferrin to the beta thalassemic mice is able to offset the hepatic abnormality. The question we are asking is what mechanisms bring that about,” Fleming said. They will study three possible mechanisms that allow transferrin to serve as a therapeutic agent in beta thalassemia: by directly signaling to hepatic iron through a specialized transferrin receptor cloned in Fleming’s laboratory; by removing toxic free iron from the circulation; or by limiting iron uptake into erythrocyte progenitor cells.

The delivery of oxygen under pressure, however, can damage fragile air sacs and lead to injury and long-term lung diseases, such as asthma and bronchopulmonary dysplasia.

“The goal of our research is to minimize ventilator-induced injury,” said Hillman, associate professor of pediatrics and a neonatologist. “We’re exploring not only what type of lung injury occurs in preterm babies but the progress of that injury over time.”

Hillman conducts his NIH-funded research in collaboration with colleagues at the University of Western Australia in Perth and the Cincinnati Children’s Hospital Medical Center, where he was on faculty for six years before joining SLU. Using an a-pallium sheep model, they are testing resuscitation equipment and procedures, and examining lung tissue to look for the molecular pathways of injury.

Once the researchers find the safest, most effective way of resuscitating preterm babies Hillman said the findings will be incorporated into resuscitation guidelines used throughout the world.

“For forty percent of born under 28 weeks develop chronic lung disease,” he said. “Any small change we make in how we ventilate these newborns could have a dramatic impact.”

Ear infections caused by Haemophilus influenzae bacteria are common among children throughout the world, and there are no preventative measures. However, a $1.2 million NIH grant awarded to Stephen Barenkamp, M.D., professor of pediatrics, will further efforts to develop a potential vaccine against the infections.

Barenkamp and his team have discovered two bacterial proteins that have surfaced as possible vaccine candidates. In his study, these two proteins will be tested for their ability to protect against ear infections in animals when delivered by either the intramuscular or intranasal route.

“We also have collected serum samples from children and adults, and want to determine how well the antibodies from these samples can kill the bacteria,” Barenkamp said.