On May 22, 2011, a devastating tornado ripped through Joplin, Mo. The twister – the deadliest single tornado since modern recordkeeping began in 1950 – killed 157 people and destroyed an estimated 8,000 buildings.

Something had to be done. The State Emergency Management Agency’s Structural Assessment and Visual Evaluation (SAVE) program sent a team of architects and engineers to Joplin immediately after the disaster. “After seeing the extent of the damage to the city, it was hard to not get involved in helping them rebuild,” says Architectural Studies teaching assistant professor Michael Goldschmidt, who serves as the State Housing and Environmental Design Specialist with MU Extension. “I was part of a team that did damage assessment for over 6,000 damaged or destroyed houses and commercial buildings.” Goldschmidt and company swiftly determined whether these structures could be used for housing, emergency shelters or supply storage. Of the inspected buildings, 38 percent were found to be unsafe, six percent had restricted use, and 56 percent did not pose problems. “The SAVE Coalition’s quick response absolutely saved the city of Joplin,” says Steven Cope, Joplin’s building and neighborhood improvement supervisor. “We were overwhelmed by the sheer magnitude of evaluating thousands of damaged structures, and we had no idea how much information we would have to quickly provide. We couldn’t have done it without them.”

Back in Columbia, the disaster was applied to coursework. In the studio and building technology classes, lessons about the damage seen in Joplin helped students understand how they play a vital role in determining how well their designs will stand up to this type of weather.
Those designs were put to the test almost immediately – students saw an online advertisement for Extreme Makeover: Home Edition, based in Joplin. “We then contacted the show to see if we could be involved,” says Goldschmidt. “Because our students had specific design expertise, we were all accepted to participate.”

“I really thought that this could be an opportunity to get a large number of students together because of how many MU students have been personally touched by the tragedy in Joplin and how well known this TV show is,” says Ashton Oltmanns, a senior in Architectural Studies and vice president of the Student Environmental Design Association. “We were well aware that no amount of physical donations and hours of volunteering could ever fully repair the loss of so many from the tornado, but we wanted to try to help rebuild a sense of home for these families.”

While in Joplin, the students, who built seven houses in seven days, also provided practical information and expertise to homeowners who are rebuilding after the disaster. “The students definitely learned how important their volunteer efforts are in this type of catastrophe, and hopefully they are more likely to volunteer again in the future,” Goldschmidt says.

Oltmanns agrees. “When I visited the zone of town that was damaged by the tornado, it was truly overwhelming and humbling,” he says. “The experience of volunteering for the show really makes me thankful for all of the blessings that I have been given and has taught me that material things do not make a house a home – but rather the community and family that bond together. The community of Joplin has been amazing and my heart goes out to all of them as they rebuild.”

**NUTRITION AND EXERCISE PHYSIOLOGY**

**Rats on the Run**

NIH grant helps fund Nutrition and Exercise Physiology research

**NEARLY THREE YEARS AFTER** submitting his first National Institutes of Health (NIH) grant, Nutrition and Exercise Physiology associate professor John Thyfault received notification that he’d been awarded $1,462,508 to study the relationship between aerobic fitness and chronic diseases – specifically non-alcoholic fatty liver disease (NAFLD) and type-2 diabetes. “In fall 2009, I submitted my first NIH R01 grant. The grant received positive comments and was scored in the 36th percentile on its first submission,” Thyfault explains. “The comments were addressable, so I resubmitted in July 2010. A year later, the grant was funded for a five-year project.”

“I was extremely happy and relieved – and also felt like I had arrived as a scientist,” says Thyfault, who has received additional funding from the Diabetes Action Research and Education Foundation, the American Heart Association and the Veterans Health Administration, among others. “Now the next step is to deliver on the promise of the grant by having impactful science and to have the grant refunded in 5 years so we can keep this important area of research moving forward.”

Thyfault has a number of collaborators on the project, among them Dr. Jamal Ibdaah from the Department of Internal Medicine. Thyfault says the overall goal of their research is to “provide evidence to the general population and medical community that aerobic fitness and daily physical activity is obligatory for the maintenance of health and the prevention of chronic diseases like NAFLD and type-2 diabetes that are currently threatening our country.”

Thyfault became interested in NAFLD because there was little research linking the condition to lifestyle choices such as diet and activity. He uses a rat model to study why low fitness (reduced ability to exercise or to perform well on an exercise test that occurs due to inactivity) increases risk for fatty liver disease. Similarly, he also examines how high fitness reduces risk for such chronic conditions.

Rats were run to exhaustion during a graded exercise test. The rats that ran the shortest distance during the test were then bred over several generations, producing offspring with intrinsically low fitness. The strongest runners from the original group were bred over time to produce very fit rats. Thyfault then looked at fatty liver disease in each group of rodents. “A key aspect is that the rats do not run, rather they are kept sedentary in their cages, but they possess the low or high fitness phenotypes intrinsically due to the breeding,” he explains. “It allows us to study the effect of fitness independent from the effects of exercise.”

Why is this important? Because 34 percent of the general population and 75 to 100 percent of obese individuals are estimated to have fatty liver disease, a condition that can lead to liver failure. A recent clinical study also showed that people with low fitness are more likely to have fatty liver disease. Thyfault’s research helps provide therapeutic targets for the treatment or prevention of fatty liver disease and insulin resistance. His work also helps us understand the molecular and biochemical role of whole body aerobic fitness in the liver. “Ultimately, we would like to integrate our studies with other researchers at MU into an NIH program project grant that would investigate links between insulin resistance, NAFLD and vascular function in rodent models and obese, sedentary human subjects,” Thyfault says.