

DEC 28 2012

The★Star
THE KANSAS CITY STAR

MU chemistry professor wins national honor

A University of Missouri professor has received the highest honor the United States bestows on a scientist.

President Barack Obama named MU chemistry professor M. Frederick Hawthorne a winner of the National Medal of Science.

Hawthorne, who is director of the International Institute of Nano and Molecular Medicine at MU, and who is also the curators' distinguished professor of chemistry and radiology, was among the 12 scientists named last Friday as award recipients.

Established by Congress in 1959, the medal recognizes individuals who have made outstanding contributions to science and engineering.

Hawthorne was recognized for his work on the chemical element boron. He developed the use of a technique called boron neutron capture therapy, used in experimental treatments for cancer and arthritis. It also has been used to fight heart disease and Alzheimer's disease. Hawthorne started the use of "boron cages," which are chemical structures that can be attached to other compounds and thereby change their physical properties.

"I feel very elated," Hawthorne said when reached Thursday while on vacation in San Diego.

"It is a very nice thing to have had happen. It actually caps my career doing chemistry academically. It is being recognized for its worth and it is unexpected. This is a career award."

Chancellor Brady Deaton praised Hawthorne's work, saying he was sure in 2006 when Hawthorne arrived in Columbia that he would advance the university's national position in nanomedicine and cancer research while providing breakthrough technology and medical solutions to benefit the world.

"This acknowledgement by President Obama of Dr. Hawthorne's work is especially gratifying and well deserved," Deaton said.

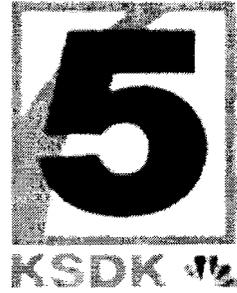
Hawthorne began his career in the 1950s in Huntsville, Ala., as a research chemist for Rohm and Haas, which was studying rocket propellants for the U.S. government. He later taught at the University of California.

He will receive his award at a White House ceremony in early 2013.

A presidential committee selected nominees on the basis of their knowledge in and contributions to chemistry, engineering, computing, mathematics or the biological, behavioral/social and physical sciences. To date, including its latest recipients, 487 U.S. scientists have been honored.

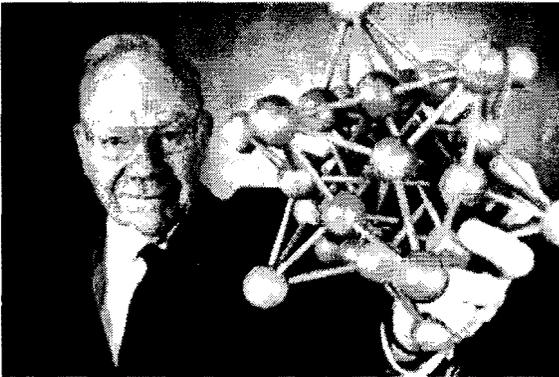
“I am proud to honor these inspiring American innovators,” Obama said in a statement announcing the winners. “They represent the ingenuity and imagination that has long made this nation great — and they remind us of the enormous impact a few good ideas can have when these creative qualities are unleashed in an entrepreneurial environment.”

KBLA 9.3



MU researcher awarded National Medal of Science

By [Ryan Famuliner](#)



Fred Hawthorne

Credit Shane Epping / University of Missouri

A University of Missouri researcher is one of only a dozen recipients of this year's National Medal of Science, announced by President Obama Wednesday.

Frederick Hawthorne is the director of the International Institute of Nano and Molecular Medicine at MU, and will be receiving the nation's highest honor for scientists.

In a press release, the University of Missouri said the institute "was created largely to facilitate Hawthorne's research" with the chemical element Boron. Hawthorne is particularly excited about his most recent research into "Boron Neutron Capture Therapy" for cancer. He explains the process allows scientists to select cancer cells in the human body, label them with boron, and then bombard that Boron with neutrons that would eventually destroy the Boron, and in effect kill the cancer cells.

"We feel confident we have accomplished a proof of principle of this method, and although it's been known for 50 years no one has been able to get it pinned down to a demonstratable process. So anyway, it works and we're gonna scale it up," Hawthorne said.

Hawthorne says MU is the ideal place to do this research, because of its medical program and the nuclear reactor on campus that serves as a source of neutrons for the procedure.

“Other Universities have pretty much shut down their nuclear activities but luckily Missouri went ahead and advanced their holdings in that area and are still doing so today, and that puts us in a pretty unique position nationally and internationally,” Hawthorne said.

He says Boron research is useful in a number of other fields, including medicine, catalysis and everyday chemistry. According to a press release, Hawthorne will join the other researchers at a ceremony at the White House early next year to receive the National Medal of Science. Hawthorne first came to MU to conduct his research in 2006.

Frederick Hawthorne wins National Medal of Science

By Robert Swain

December 27, 2012 | 5:14 p.m. CST

COLUMBIA — President Barack Obama granted one MU researcher the highest honor the government can grant to scientists, engineers and inventors last week.

M. Frederick Hawthorne is the first MU researcher ever to receive the National Medal of Science. He and 11 other scientists will receive their awards at a White House ceremony in early 2013.

Hawthorne is the director of MU's International Institute of Nano and Molecular Medicine and Curators' Distinguished Professor of Chemistry and Radiology.

His work with the chemical element boron led to the award. Developing the technique, Boron Neuron Capture Therapy, Hawthorne's work has been used in experimental treatments for cancer, arthritis and other diseases, according to a previous Missouriian article.

His work with boron has also been used to fight heart disease and Alzheimer's.

"I am proud to honor these inspiring American innovators," President Obama said in a news release. "They represent the ingenuity and imagination that has long made this nation great — and they remind us of the enormous impact a few good ideas can have when these creative qualities are unleashed in an entrepreneurial environment."

Hawthorne came to MU to utilize the array of resources the university could provide to conduct his research. In an MU news release, he said that the variety of science disciplines and humanities offered at MU, the research nuclear reactor and the "very strong, collegial biomedicine departments" make MU unique.

"When Dr. Hawthorne came to MU in 2006, I was sure that he would advance MU's national leadership in nanomedicine and cancer research while providing break-through technology and medical solutions for the world," MU Chancellor Brady Deaton said in an MU news release. "This acknowledgement by President Obama of Dr. Hawthorne's work is especially gratifying and well deserved."

MU's International Institute of Nano and Molecular Medicine was created primarily to further Hawthorne's research. In addition to studying boron, the release said, the institute focuses on the

uses of nanotechnology in medicine, engineering microscopic motors, inventing methods to store hydrogen fuel and designing materials to store energy.

Supervising editor is Zach Murdock.

MISSOURIAN

MU researcher's drug structure work might have implications for chemotherapy

BY Hannah Spaar

COLUMBIA — If you were to ask Mark Lee what he's working on these days, he'd tell you he's trying to invent magic bullets.

Lee, an assistant professor and researcher at MU, and his colleagues are attempting to create a microscopic weapon that has one target: cancer cells.

Lee is the lead researcher on a team that unveiled in late August an experimental chemotherapy drug with a new structure that goes beyond organic chemistry and is potentially 10 times stronger.

Ten times might sound impressive on its own, but experimental chemotherapy drugs are far removed from the cancer drugs used today on patients. Lee said his team's drug is somewhere between a thousand and a million times more powerful than current chemotherapy drugs because the drug structure, called "carboranes," bonds more strongly a target within a cancer cell than current medications.

From here, the research goes in many directions. Lee hopes to combine the drugs his team has created with targeted cancer therapies to make them as advanced and effective as possible.

And though Lee's personal target is cancer, he believes the research he has done will help decrease side effects in medications for all maladies.

Because the drugs are too early in their development to be tested on humans, it's unknown if they will be declared safe. But Lee hopes the cumulative effect of his efforts to revolutionize chemotherapy will result in significantly fewer side effects, which would radically alter cancer treatments.

Magic bullets

Finding a cure for cancer through chemotherapy isn't like finding a flower with healing powers. It's more like weapon development.

Paul Ehrlich, the Nobel Prize-winning scientist who developed chemotherapy in the late 1890s, first used the phrase "magic bullets." It refers to the fact that toxins will kill cancer cells but only if they don't kill the patient in the process.

Carl Freter, the director of the Division of Hematology and Medical Oncology at the MU School of Medicine, described the difference between untargeted and targeted therapies as the difference between a baseball bat and a silver bullet.

"Right now, we can kill all cancer cells, but that's not the question," Lee said. "The question is, can we keep the patient alive while we're doing it?"

Chemotherapy drugs currently use large amounts of medication to kill the cancer cells. Lee says the large quantity of the current drugs needed prevents them from being aimed properly, instead overflowing and attacking healthy tissues as well.

Freter also explained that chemotherapy treatments developed in the past 30 years target cells that divide more quickly than others, which includes not only cancer cells but also cells such as hair and bone marrow. He said targeted therapies developed in the past 10 years target cancer cells directly, rather than other rapidly dividing cells.

Lee said drugs with a carborane structure are so effective that fewer chemotherapy molecules are needed and can be targeted more directly.

Lee has set his crosshairs on one precise part of the cancer cell.

His recent research has indicated that the enzyme Nampt plays a large part in creating energy for the cancer cells and their ability to heal themselves when damaged. Lee hopes the combination of the carborane structure, the recent developments in targeted therapies and the specific attention to the Nampt enzyme will be the magic bullet he has been seeking.

"I basically now consider myself an inventor, but my tools are molecules," Lee said. His interest in chemistry stemmed from his childhood wish to invent as an occupation. Now, he said, his work is similar to that of an engineer but with much smaller teams. On the carboranes, he worked with Yulia Sevryugina, Aslam Khan and Shui Ye.

"I wouldn't be doing any other research if I were given the choice," Lee says of his work. "This is what my passion is."

That passion and his interest in chemotherapy research came partly from his personal experience watching families deal with cancer. He said watching his mother deal with the death of his grandmother showed him the effects cancer has on the survivors and made him want to make a contribution in the fight against cancer.

Carborane drug structures

What Lee discovered is that changing the structure of a chemotherapy drug by including a carborane will make it bond tighter to its target in a cancer cell.

Freter, described Lee's research as "extremely exciting." Because it re-examines the fundamental aspects of chemotherapy drugs, many are excited about its implications, he said.

"Right now the medicinal chemist's toolbox is limited to organic chemistry for the most part," Lee said. Carborane structures are inorganic compounds, and "at least in this particular case, carboranes were better than any of the purely organic groups we compared them with."

A carborane molecule is a three-dimensional cluster of boron, carbon and hydrogen. When it bonds, a carborane molecule creates a unique, powerful hydrogen bond with a cell. Lee said this is the most powerful type of bond a drug can make with a molecule.

Although carborane molecules are not currently used in any medications, Lee's research team isn't the first to use them in a drug structure. In 2004, Yasuyuki Endo, a researcher in Japan, discovered that the female hormone estradiol will still act as estradiol, even if the structure of the molecule is changed to include a carborane.

Lee said Endo's work played a large part in his decision to use carboranes to fight cancer.

"I'll make a prediction," Lee said. "Within 10 years we will see all drugs made this way."

The road ahead

Lee's work is gaining attention in the scientific community, far beyond MU.

The week the team's paper about carboranes was published, the American Chemical Society profiled Lee's research as one of the eight most significant papers during that week in its magazine, *C&E News*. The research was also highlighted in *SciBX* magazine. Lee says a few Web-based publications have also covered his work, and there are still more publications expressing interest.

Despite the interest, there is still a lot to be done before the chemotherapy drugs Lee has been developing will reach patients.

"I don't want to give false hope; I don't want to build hopes for current patients," Lee said. "It's going to be a long time before this drug will come out."

Freter said that the FDA will most likely want to see more data on carborane-based drugs to be sure some of the problems currently seen with targeted therapies are resolved before they can be tested on humans.

Freter said that even with targeted therapies, areas of the body sometimes become unintended targets. Some side effects are not resolved by the targeted nature of the drug and can also be a problem.

Another potential problem is the way the drug concentrates in the urine while being expelled from the body.

He described these issues as falling under the category "technical difficulties you always see in the small print."

"There are always technical difficulties when delivering targeted therapy to the body," he said.

Lee said it will take testing to know for sure if there are drawbacks in the carborane structure specifically. For now, he said he does not expect any.

"Yeah, I really believe this is going to happen," he said. "I don't believe necessarily that we're going to cure all cancer this way, but I think we'll see some revolutionary improvements over the next 10 years in targeted therapies."

Lee estimates the drugs he has been developing could be available in about 10 years, if approved by the FDA. He's always quick to add an "if."

ST. LOUIS POST-DISPATCH

The five most inspiring youth sports stories of 2012

8 hours ago • by [Douglas E. Abrams](#)

Douglas E. Abrams is a law professor at the University of Missouri at Columbia.

Youth sports parents get a bad name these days, and some parents deserve it. Every week seems to bring new headlines about out-of-control fathers and mothers who verbally (and sometimes physically) assault officials, coaches, other parents, and even other youngsters.

The violence is real, but headlines about a few unhinged parents at games played each year by more than 30 million boys and girls can make the sports scene appear much worse than it really is. In the 42 years that I coached youth hockey, troublesome parents were the exception and not the rule.

Each December, I present the year's "top 5" news stories about young athletes who did something special. The stories change each year, but the parents' role remains the same. Once again, the young stars in this year's top 5 could not have inspired us without first learning right from wrong at home. Most parents do it right.

5. Middle Creek High School (Apex, N.C.) football star Rashawn King missed his junior season while battling leukemia. After winning all-conference honors as a senior, he wanted to thank everyone at school for their unwavering support during months of intensive care — the "Pray for Ray" football games, the fundraisers for medical bills, and the friends who flooded the hospital with messages and camped out in the lobby.

Rashawn's struggle caught the attention of the Make-A-Wish Foundation, which fulfills the dreams of children who face life-threatening illness. Rashawn's wish? To treat all his classmates, teachers and staff members to lunch in the school cafeteria because "they cared for me."

"We've never had anyone who wanted to share his wish with this many people," reported the foundation's local president before serving all 1,900 guests.

4. Eleven-year-old Matt Woodrum finished a distant last in the 400-meter race in the Colonial Hills Elementary School field day in Worthington, Ohio. As Matt struggled to complete the course, he won classmates' cheers, encouragement, and high-fives.

Matt has spastic muscular dystrophy, which creates stiffness that limits movement and mobility. Bullies often target vulnerable classmates who appear "different," but Colonial Hills students

know right from wrong. Matt's mother says that his classmates "treat him like every other kid . . . and they're like a second family to him."

3. Soon after 12-year-old hockey player Mark Mannarn (North York, Ontario) lost his grandmother to pancreatic cancer, his mother was diagnosed with breast cancer. Mark and his father created "Feel Like a Pro Day," which enlists former National Hockey League stars to coach and scrimmage kids who secure sponsorships for the Canadian Cancer Society. Mark's ambitious goal was to raise \$100,000 for research in the first year, but corporate donations doubled that figure, the largest amount ever raised by a single event in the society's history.

2. After winning the state title in the 1,600-meters, West Liberty-Salem High School junior Meghan Vogel was in last place in the 3,200-meters final at the Ohio state track and field championships in Columbus. Just 20 feet from the finish line, she had a chance to pass a competitor who had collapsed on the track.

Meghan instead helped up the competitor and supported her across the finish line. Meghan also assured herself a last-place finish by making sure that the competitor remained a split-second ahead of her.

"She was in front of me the whole race," said Meghan, "so she deserved to finish in front of me no matter what it took."

1. Halfway through the race, Cooper Yeshiva High School (East Memphis, Tenn.) cross country runner Seth Goldstein was in the middle of the pack, with a good chance to win or place high. With runners passing him, the senior stopped to save a rival's life. The other runner had collapsed, with his lips turning blue and his eyes rolled back in his head.

Because the runner was bleeding profusely from the mouth after biting his tongue, Seth turned him on his side so that he would not choke or asphyxiate. Seth then summoned a parent to call 911 and reassured the other runner until emergency medical technicians arrived.

Then Seth returned to the course and finished the race that everyone else had finished minutes earlier.

After watching Meghan Vogel's noble gesture, a local track coach put youth sports in perspective: "We hear about the bad stories all the time, but good sportsmanship is still the norm." And good sportsmanship begins at home.



No simple formula to identify dangerous people

Casting 'too big a net' for potential killers creates own problems

7 hours ago • [Jim Doyle St. Louis Post-dispatch](#)

MU MENTION P. 2

ST. LOUIS - One of the two armed seniors at Columbine High School in Colorado who murdered 12 students and a teacher had shown signs that he was a fledgling psychopath with antisocial traits - someone capable of becoming a coldblooded killer.

The gunman who murdered 32 people in the 2007 Virginia Tech massacre had been diagnosed with a severe anxiety disorder.

Adam Lanza, the 20-year-old shooter at Sandy Hook Elementary School in Newtown, Conn., was known to be socially awkward and had difficulty coping with daily life.

In recent decades, mental-health experts and law enforcement officials have attempted to use "threat assessment" principles to help identify people who may be a danger to the community.

But there is no simple formula to determine who might be the next shooter, experts say, and such attempts at profiling run the risk of misidentifying individuals who may only be suffering from depression or a behavioral disorder.

People who constantly spew threats of violence may never follow through on their words, and someone who seems sociable and mild-mannered can turn out to be the next mass murderer.

"We don't know everything that goes on in the brain and what sets these things off," said Dr. Annemarie Loth, a pediatric psychiatrist and professor at St. Louis University. "Behavior is still a choice. Our environment plays a role. Their biology plays a role."

However, she and other mental-health experts stressed that psychiatric care and medication can go a long way toward treating a person's illness.

In 2002, the U.S. Secret Service found in its investigation of 37 school shootings that while most all of these massacres are planned, there is no accurate or useful profile of students who engage in targeted school violence. Not much has changed to alter that conclusion, except that the list of horrific massacres has grown.

The Secret Service found that most of the shooters - whose ages ranged from 11 to 21 - came from two-parent families, socialized with mainstream students, had no history of violent or criminal behavior, and had never or rarely been in trouble at school.

Only a third of the attackers had received a mental-health evaluation, but most had exhibited a history of suicide attempts or thoughts. Many of the attackers had felt bullied, or persecuted.

"It's very hard to predict, and if you cast too big a net, then what do you do?" said John Eiler, president of the St. Louis Regional Psychiatric Stabilization Center, which has short-term beds for people in crisis. "What would we have done in Aurora (the site of a mass shooting in July inside a Colorado movie theater) or Connecticut? Would we have had enough information beforehand to say: This person needs to be institutionalized? Probably not."

After the Columbine massacre in 1999, the FBI created a "school shooter" assessment that it said would help teachers spot potential killers among students.

The study listed various traits, from comments and writings that show an obsession with violence to attitudes of intolerance and superiority as well as the development of negative role models such as Adolf Hitler or Satan.

But the FBI conceded that "there is no magic number of traits or constellation of traits which will determine what students may present a problem."

Since the Virginia Tech massacre, college administrators across the country have focused on identifying potentially dangerous students.

Many colleges have created "threat assessment teams" of administrators, counselors and campus police officers to track disruptive students and those with mental-health issues. The teams monitor and interview students of concern, attempt to gauge the credibility of specific threats and to intervene.

At the University of Missouri in Columbia, the "at-risk behaviors team" meets bimonthly in part to discuss individual students who are deemed to be a potential danger. Mizzou conducts screenings for depression and stress - and helps connect students with counselors.

"It's hard to measure what you prevent, but we feel like we have done pretty well," said Cathy Scroggs, vice chancellor for student affairs.

High schools and middle schools, too, are attempting to recognize the warning signs and to manage overly aggressive students.

Dr. Eric Rossen, director of professional development and standards at the National Association of School Psychologists in Bethesda, Md., said that threat assessment has "helped at least to some degree to identify students who are at heightened risk" and provides appropriate interventions.

Settling down with a Christmas tippie may be good for your health - but only if you're slim

- Researchers have found moderate alcohol consumption may only be good for your heart if you are thin
- Australian scientists found it increases the risk of heart disease in those with a BMI of more than 27.5
- Original studies on the health benefits of alcohol may be outdated, they say

By [Daily Mail Reporter](#)

MU MENTION P. 3

PUBLISHED: 06:26 EST, 28 December 2012 | **UPDATED:** 06:26 EST, 28 December 2012

The common assumption that a couple of glasses of wine are good for you may be wrong for most Britons, new research reveals.

Scientists at Australia's Curtin University have discovered that if you are overweight, far from boosting your heart's health, moderate alcohol consumption may actually put it at risk.

Writing in this month's issue of the Australia and New Zealand Journal of Public Health, Dr Tim Lobstein and Professor Mike Daube acknowledged that previous studies show that a little alcohol may lower your risk of heart disease, while a lot will raise the risk.

However, the researchers in Perth were concerned that the data used in these studies had come from surveys undertaken more than 40 years ago when people were much slimmer than they are today.

Therefore, they believed that the findings may no longer stand.

Dr Lobstein, who is director of policy at the International Association for the Study of Obesity in London and who co-authored the research, said: 'We were concerned that the findings from a previous generation may not apply to our modern, fatter population.'

'So we revisited the data in the classic Framingham Heart Study (a landmark study which identifies risk factors for heart disease), and examined the differences between slimmer and fatter men to see how the J-shaped curve held up.'

The researchers discovered that the health benefits still hold for slim men but not for those with a Body Mass Index above 27.5.

Healthcare professionals recommend that a healthy BMI is between 18.5 and 25.

The study comes at a time when the latest NHS figures show that 42 per cent of men and 32 per cent of women are overweight - they have a BMI of more than 25.

Furthermore, 26 per cent of adults in the UK are classed as obese because their BMI is more than 30.

Research published in The Lancet last year showed that the average BMI for adults in the UK is currently 27.

Dr Lobstein said: 'In effect, the standard advice about a small amount of alcohol being good for the heart doesn't stack up for overweight men.'

'We will need to check other surveys and see if they show the same pattern, and we will need to check the data for women.'

'We know that apart from heart disease, other causes of disease are made worse by even small amounts of alcohol, including cancer, diabetes and stroke - the major chronic disease killers,' he added.

'For now, the advice has to be that there is no such thing as a beneficial level of consumption, especially if you are overweight.'

Other recent research has shown that wine could have additional health-giving properties.

Studies have indicated alcohol may raise levels of good cholesterol and be beneficial to blood vessels, while antioxidants in wine are thought to protect arteries.

Cardiologist Geoffrey Tofler, of the University of Sydney, has found that moderate wine drinkers have higher levels of HDL, the so-called 'good cholesterol'.

His study of 3,000 people found that the platelets of people who drank three to six standard measures a week are much less likely to clump together in a way that could cause clotting.

Meanwhile, researchers at Leicester University also found that drinking a large glass of red wine each day could help prevent bowel cancer.

Their research showed that resveratrol, a substance found in the skin of red grapes, has cancer-fighting properties.

Just small quantities of the substance were shown to halve the growth of tumours.

Similarly, researchers at the University of Missouri discovered that resveratrol can make prostate tumour cells more susceptible to radiation treatment.



Program teaches financial lessons to foster care youth

By Dalton Barker

Foster care can be difficult for many reasons: stress on the family, forced assimilation into a new environment for the child and a lack of resources can create problems for those in the system. But what you don't always hear about is what happens to the kids who age out of the system at 18.

These teenagers are often thrown into an adult world with adult problems, including how to make ends meet. But, one St. Louis foundation is helping teach the former foster children the financial lessons to succeed after foster care.

Eddy Vanderkwaak is your typical college student. She is constantly busy juggling her social life with her schoolwork at the Des Moines Area Community College. But while many college students complain about a lack of disposable income for bar tabs or clothes, Vanderkwaak is worried about weighty issues like not having a safety valve in her car for when it breaks down.

Vanderkwaak used to be in foster care. Back then, she says she didn't know the first thing about money, and had to find clever ways to store her paychecks.

"So I was working a part-time job and you know, making a little bit of money, but I didn't have an account I was putting it in to," she says. "I actually gave it to my foster mother and she kept it in a shoe box in her drawer and she gave me an allowance each week."

Before she aged out of foster care, her foster mother put her into contact with the Jim Casey Youth Opportunities Foundation. The foundation had a program called Passport Opportunities which was directly aimed at helping foster youth learn financial skills. Clark Peters, social work professor at the University of Missouri, studied the program for 11 months.

"When young people put money into that account and purchase some kind of asset, like an automobile, the foundation matches it dollar-for-dollar," he says. "So you put in a hundred bucks and you two hundred bucks out to make that purchase and that's a huge incentive."

Not only does the program match dollar-for-dollar, but it also puts individuals through a financial literacy course that teaches the foster youth about bank accounts, savings and the difference between good and bad credit. Vanderkwaak credits the course for teaching her how to properly handle her money.

“Some of the biggest things that I’ve learned and I have been able to do effectively is...how to budget and how to stay kind of on track with my budget,” she says.

Peters says that the financial literacy course is a great tool for teaching a mostly uneducated audience. He says that learning about money is not always at the top of the agenda for the young person or the guardian.

“When you sort of bounce around between group homes and foster homes, imparting financial literacy skills may not be the top priority in those places,” he says.

Though the foundation is based in St. Louis, the passport opportunities program is currently not operating in Missouri, but it has started to gain traction in Iowa and Michigan and there are plans to kick-start it in Missouri in the future.

This story originally aired as part of Business Beat, a weekly program about business and economics in mid-Missouri.