Study: proteins suppress tumor growth in fruit flies

The concept sounds simple, but understanding the process has been elusive. Cut off the nutrient supply to suppress the growth of tumors.

Now researchers in the College of Veterinary Medicine at Kansas State University are unveiling promising results by studying the behaviors of specific proteins in fruit flies. The proteins have known counterparts in human.

“In our latest study, we identified ‘Headcase’ (Hdc) and ‘Unkempt’ (Unk) as two nutrient-restriction-specific tumor suppressor proteins that form a complex that acts to restrict cell-cycle progression and tissue growth in response to nutrient stress in Drosophila [fruit flies],” said Dr. Jianzhong Yu, assistant professor and cancer biologist in the Department of Anatomy and Physiology.

Dr. Yu is collaborating with Drs. Naren Li and Yulan Xiong and a graduate student, Qinfang Liu. The four of them recently published an article on their latest research, “Headcase and Unkempt Regulate Tissue Growth and Cell Cycle Progression in Response to Nutrient Restriction,” in the journal Cell Reports.

Their study was supported in part by a grant from the Kansas INBRE (P20 GM103418), a start-up fund and SUCCESS-FVI Intramural Grant from the College of Veterinary Medicine. The work is also supported by the Johnson Cancer Research Center at Kansas State University.

“Given the role of the human counterparts of these proteins, our results suggest that Hdc and Unk may function as tumor suppressors in mammals,” Dr. Yu said. “Although the human ortholog of Unk has not been studied in the context of cell proliferation, we showed that both Hdc and Unk are able to inhibit tissue growth in vivo in the Drosophila model. Thus, it is worthwhile in the future to investigate the growth control function of these two proteins, especially in regard to the formation of cancer tumors.”

Figure: “Headcase” functions together with “Unkempt” to regulate tissue growth in fruit flies.

K-State team authors public health chapter

A multidisciplinary team of professors and a former research assistant from K-State have just mastered a chapter on laws and regulations for a new book for the Council on Public Health Education.

The team includes Dr. Ellyn Mulcahy, director of the MPH program/associate professor of DMP, Dr. Justin Kastner, associate professor of DMP; Dr. Jason Ackleson, adjunct faculty in DMP; Dr. Sara Gragg, assistant professor of animal sciences and industry; and Dr. Danny Unruh, former research assistant in animal sciences and industry.

The textbook, “Master of Public Health Competencies: A Case Study Approach,” is edited by Dr. Anthony Santella, associate professor of health professions at Hofstra University. The book features 22 chapters contributed by public health professors and scientists from a variety of major universities, hospitals and health departments.

The chapter by the K-State team is titled, “Developing Primary Laws and Secondary Regulations for Food Safety: The Case of FSMA and Its Attendant Rules.” Dr. Kastner said while MPH students would certainly benefit from the chapter, he thinks lay readers will be interested in the history and trajectory of U.S. food safety policy too.

As educators involved in several of K-State’s graduate programs (public health, veterinary medicine, food science, etc.), we mentor public health-minded students of all kinds — but especially those interested in food safety,” Dr. Kastner said. Read more at Lifelines online.
Researchers predict spread of invasive long-horned ticks in North America

A recently invaded tick species known as the “long-horned tick” could establish itself in wide swaths of North America — if they are transported accidentally. This prediction was published in a new study in Nature’s Scientific Reports by Dr. Ram Raghavan, assistant professor, and his international collaborators.

“The long-horned tick is also known as the East Asian tick, in Australia as the bush tick and in New Zealand as the cattle tick,” explained Dr. Raghavan. “This species of tick is native to Japan, China, Primorsky Krai region of eastern Russia and Korea; and it is well-established as an invasive species in Australia, New Zealand, and on several Pacific Islands.”

In some of these countries, Australia and New Zealand in particular, Dr. Raghavan said this tick is implicated in the transmission of theileriosis to cattle — costing several millions of dollars each year, and in other places they are known to transmit severe fever thrombocytopenia virus to humans.

Dr. Raghavan pointed out widespread concerns that the tick — *Haemaphysalis longicornis* — will successfully establish invasive populations in the US and spread broadly from where it has been currently found.

“Our primary focus in this study was to predict where this tick could establish in North America, and to do that as robustly as possible considering all the caveats in spatial distribution modeling,” Dr. Raghavan said.

**Dual-degree duo earns scholarships**

Spring is a time of transformation and renewal. For two veterinary students; Elsie McCoy and MaRyka Smith, it is also a time of new opportunity and plenty of hard work ahead. Both students are new recipients of the concurrent DVM/Ph.D. scholarship in the CVM.

The philosophy of this scholarship program, which started in 2011, is to bring together clinical medicine and research disciplines to create unique opportunities and expand career options in veterinary medicine. Areas of graduate training include, but are not limited to, biomedical research, infectious disease, epidemiology and diagnostic medicine.

“We have awarded as many as three scholarships for any given application cycle,” said Dr. Frank Blecha, associate dean for research. “Currently, there are 11 concurrent DVM/Ph.D. students enrolled. Seven of these students are on DVM/Ph.D. scholarships from the college and two students are on scholarships from the USDA Animal and Plant Health Inspection Service’s NBF/A Scientist Training Program. Five previous DVM/Ph.D. scholarship students have matriculated from both degree programs.”

The scholarship pays for DVM curriculum tuition and fees, regardless of residency status or when they receive the scholarship. Expenses for Ph.D. grad work are supported by major professors. MaRyka is a first-year DVM student in the pathobiology Ph.D. program and is studying Rift Valley Fever Virus under Dr. A. Sally Davis. Elsie is a third-year DVM student and is in the pathobiology Ph.D. program focusing on beef cattle production research, primarily liver abscesses in feedlot cattle under Dr. Dan Thomson.

**Advice on booster vaccinations for pets**

When it comes to booster vaccinations for dogs and cats, Kansas State University veterinarians say most are safe and necessary for the majority of pets but that several factors, including the pet’s health and lifestyle, should be considered.

“Vaccines were developed to help prevent infectious disease, and they do,” said Dr. Susan Nelson, clinical professor at the Veterinary Health Center. “Some vaccines, known as core vaccines, are essential and every dog or cat should receive them because of widespread prevalence and severity of the diseases that they prevent.”

**CVM News Ticker**

Sarah Quick began her yearlong veterinary nurse internship Jan. 14. Sarah comes to us from Dallas, Texas. She’s a 2018 veterinary nurse graduate of Cedar Valley College and has a bachelor’s degree in biomedical sciences and wildlife and fisheries sciences from Texas A&M. She worked as a veterinary assistant while attending school, for the past year and a half. Her interests include exotic medicine, ophthalmology, small animal orthopedic surgery and equine internal medicine and surgery.

The new issue of the One Health Newsletter is now online. The four-person editorial team includes three faculty members from the KSUCVM. The theme in this issue is about One Health Regulation and Policy.

See it online at: www.vet.k-state.edu/OneHealth

Dr. Meena Kumari was invited by the National Institute on Drug Abuse (NIDA) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA) Genetics and Epigenetics Consortium to attend and present her data on exosomes at the January 2019 meeting. Her presentation was entitled: “Do exosomes hold the key to genetic and epigenetic modifications in drug addiction.” Her work was very well received.

When it comes to booster vaccinations for pets, veterinarians recommend that pets receive vaccines even if they are healthy and have no concerns. Dr. Susan Nelson and Susan Moore say a pet’s health and lifestyle should be considered when it’s time for booster vaccinations.

**Dual-degree duo earns scholarships**

Dr. Ram Raghavan collects long-horned ticks near Southeast Queensland in Australia.

**Advice on booster vaccinations for pets**

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