

## UMass Amherst 马萨诸塞大学阿姆赫斯特

### Researcher Partners with Chinese Inventor to Develop New Antibiotics 科学家与中国发明家合作开发新型抗生素

2015年2月25日 By [Janet Lathrop](#) 413/545-0444 [Site Contact](#)

AMHERST, Mass. – Margaret Riley, an evolutionary biologist at the University of Massachusetts Amherst and pioneer in fighting antibiotic-resistant bacteria, announced this week that she is partnering with a Chinese scientist to develop a new drug platform, pheromonicins. The Chinese government is committing \$400 million per year to support the newly created Pheromonicin Institute of Beijing. Riley plans to open a sister institute in the Amherst area. 马萨诸塞州，阿姆赫斯特市。玛格丽特·莱利，一位马萨诸塞大学阿姆赫斯特分校的进化生物学家和抗耐抗生素细菌的先锋，本周披露了她与中国科学家正在合作研发一种新的信息菌素制药平台。中国政府将承诺每年4亿美元来支持信息菌素北京研究院。莱利博士计划在阿姆赫斯特地区开办一个姐妹研究院。

“At this point, I will be doing the work in Beijing,” Riley says. “Later, as we sort out details and opportunities for U.S. funding support, we may be able to bring some of the work to the Pioneer Valley.” “初期，我将在北京工作”，莱利博士提出。“之后，当我们把美国资金支持的机会和细节搞清时，我们可能把一些工作带来先锋谷生命科学院。”

After trying unsuccessfully for years to find funding to study and develop a more effective method of treating catheter-related urinary tract infections (UTI) that are resistant to current antibiotics, she explains, she was contacted by Dr. Xiao-Qing Qiu, the inventor of pheromonicins, who asked if she was interested in collaborating with his government-supported lab. 多年来所求资金来研发一种针对人体植入导管引起的尿路感染（UTI）的更有效方法。不得成功之后，她解释说，信息菌素发明家丘小庆博士联系了她，询问是否有兴趣和他政府资助的实验室合作。

Riley now plans to collaborate with Qiu to develop his powerful new drugs there instead of in the U.S. “I want to solve the problem and if I have to fly to Beijing to do my animal trials, that’s what I’ll have to do,” she says. The short-term goal is to focus on a new treatment for UTI, but, she adds, “Our ultimate goal is to increase the number of effective therapeutic drugs and strategies to combat drug resistance in quickly evolving diseases such as HIV, TB, malaria, cancer and cystic fibrosis.” 莱利现在计划了和丘合作，开发他的特效新药，但不是在美国。她说，“我需要的是实际解决这个（科学）难题，如果必须飞到北京去做我的动物实验，那我也不得不过去做。”短期目标是专注一种新的UTI治疗方法，但是她添说，“我们的最终目标是增加实效医治性药物的数量，战略上战胜耐药的急变疾病，例如艾滋病、结核病、疟疾、癌症和囊性纤维化症等。”

“One of the things that people don’t realize is how significant drug resistance is in the disease process. It’s only in the past 10 or 15 years we have begun to understand the way drug resistance arises at the molecular level. Drug resistance is at the core of many of these diseases and their ability to stay ahead of and stymie our efforts at eradicating them is extremely serious,” the biologist notes. 这位生物学家指出：“一件人们尚不了解的事，是耐药性在疾病过程中是多么重要。仅仅在过去的十到十五年，我们才开始在分子的层次明白耐药性的发展原理。耐药性是许多这些疾病的核心，它是超前存在，到时能阻碍我们消灭它的努力，严重至极。”

Antibiotics are the primary weapons against harmful bacteria like those that cause strep throat, but they have become less effective in recent years because the bacteria can evolve into “superbugs,” new strains resistant to most antibiotics. A recent pledge announced by President Obama to give \$1.2 billion across a half-dozen agencies to classify and monitor antibiotic-resistant bacteria, discover new antibiotics and improve the prescribing methods highlights the importance of such efforts. 抗生素，是对抗有害细菌例如引起链球菌喉炎（strep throats）或金黄色葡萄球菌感染（staph infections）等的主要武器。近年来由于它所抵抗的细菌变形成了所谓“超级细菌”而效果渐弱：新的菌株能已经能耐受大多数的抗生素。一个最近宣布的奥巴马政府承诺，以高达 12 亿美元的重大投资，覆盖数个政府部门、用于分类和检测耐抗生素的细菌、发现新抗生素、改善医生开抗生素处方的方法等。

“I think the president’s initiative is phenomenal and long overdue,” Riley says. The biggest chunk of money allotted to the effort as part of the 2016 budget proposal, nearly \$1 billion, will go to the Department of Health and Human Services, which will effectively double the agency’s funding over 2015 levels, she notes. 莱利博士说“我想总统的这个倡议真是来得非凡，但姗姗来迟”。在 2016 年这个预算中的一大部分，将近 10 亿美元，将交给卫生与公共服务部支配。这笔资金是其 2015 年预算体量的两倍。

Many observers in recent years thought that new antibiotics would be discovered in time so doctors wouldn’t need to worry about resistance, Riley acknowledges. But the Centers for Disease Control and Prevention estimate that antibiotic-resistant bacteria now cause 2 million illnesses and 23,000 deaths a year in the U.S. Riley feels that’s a conservative estimate and the real number of deaths is likely double or triple that. 莱利博士承认，近年来的许多观察者认为有了新的抗生素，医生将不再为耐药性而担忧了。但是美国疾病控制和预防中心的数字披露：耐抗生素细菌在美国造成着每年 2 百万例的疾病和 23 万例的死亡。莱利博士说，这是个非常保守的统计，真实情况的死亡率可能是这个数字的二至三倍。

The economic price is high, as well, she adds, as much as \$20 billion a year in health care costs and \$35 billion in lost worker productivity. 她添说道：经济损失也很大，大约每年它耗资 200 亿美元的卫生保健费用，加上 350 亿美元是由于疾病造成的生产力损失。

Further, the antibiotics doctors employ now use a “shotgun approach,” she explains, that targets healthy as well as harmful bacteria. With this method, when people take antibiotics, the drugs also kill beneficial bacteria in our bodies that we need for good health. This can do more harm than good, especially for children who take antibiotics while young and may carry long-term damage to their microbiome. 进一步，抗生素医生运用所谓“鸟枪法”施加抗生素，她解释说，这种方式同时杀死益生菌和病菌。用这种方法，当病人使用了抗生素时，同时杀死了保持健康所特别需要的益生菌。尤其是对于儿童，他们从年轻就使用抗生素，就会终生损坏他们的微生物系统平衡。

Riley and others have evidence that a much more targeted approach is possible and believe it shows great promise for the future, in part because they have seen in experiments that bacteria have the ability to produce their own “chemical weapons,” proteins called bacteriocins that attack enemy bacteria without harming beneficial ones. 莱利博士和她的同行有充足的证据证明，极具靶向的（杀菌）途径在未来是可能的。这个证明部分来源于他们已有的实验观察：细菌能产生它们自己的“化学武器”，叫做“细菌素”的蛋白，追杀敌对的细菌但不伤害有益的细菌。

“We’re at the tip of the iceberg now in understanding how many antibiotic-resistant genes there are, what they are and what they do,” she says. “If bacteria know how to make compounds that quite precisely target their enemies, we can learn from that and do a better job of developing the next generation of antibiotics that work without threatening everything in their path.” “到底有多少耐抗生素的基因、它们都是些什么，我们真正的了解还只相当于冰山的一角，”莱利博士说。

“如果细菌知道如何制造能够精确靶向它们敌人的化合物，我们就可以从中学到并更好地开发下一代的抗生药物。理想的药物功能不会威胁它路径上的所有不相关的细菌。

Overall, Riley says she and other researchers are delighted to see that the president's budget proposal includes what they consider a comprehensive and science-based approach to antibiotic resistance, even if it's a bit overdue. “It's already translated into new opportunities,” she says. “There's been new attention on novel approaches to antibiotics.” 总之，对于奥巴马的预算建议书，莱利博士和其他科学家所兴奋的在于，总统的预算建议这次包含了它们认为是全面、有科学根据的针对耐抗生素途径，虽然已经有些晚了。莱利博士说，“它已经产生出新的机会，已经对创新抗生药物发明带来了新的关注。”