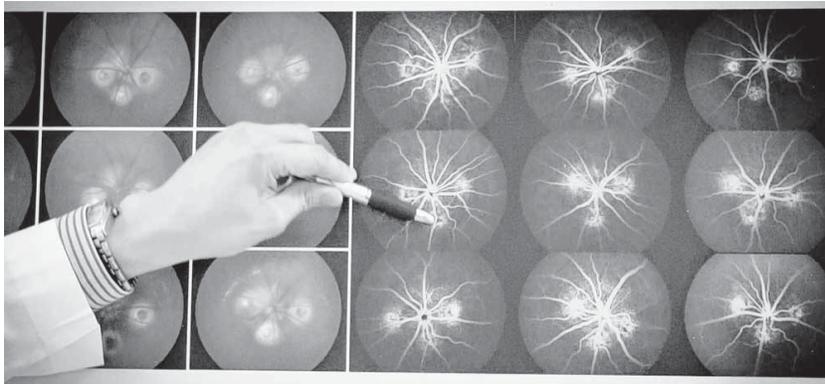




TRICKLE-DOWN THEORY



Symptoms of diabetic retinopathy are illustrated in a display at the Charlesson/EyeCRO facility. (PHOTO BY JIM STAFFORD)

Charlesson advances eyedrop to treat diabetic retinopathy

BY JIM STAFFORD
For The Oklahoman

Let's say that you are slowly going blind, the victim of a progressive eye disease known as diabetic retinopathy. There is treatment that can prevent blindness, and your choice is between an injection directly into the eye or an eyedrop twice a day, which costs a fraction of the injection.

I know which I would choose. However, it's not that simple. There is currently no FDA-approved therapeutic for treating diabetic retinopathy in eyedrop form. The choice today is between an injection or an oral medicine that requires high dosages just to ensure an effective amount reaches the eye.

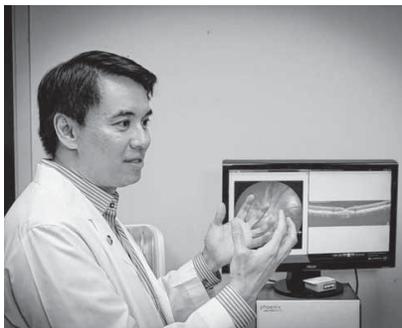
Those limited treatment options soon could expand thanks to an eyedrop-based therapeutic being advanced by Oklahoma City-based Charlesson LLC. Charlesson's formulation builds upon groundbreaking research of its founder and president, Jian-Xing Ma, Ph.D.

Ma has a first

Ma is laureate professor and chairman of the Department of Physiology at the University of Oklahoma College of Medicine and director of research at OU's Harold Hamm Diabetes Center. He was the first scientist to demonstrate that a condition known as angiogenesis — the growth of new blood vessels — is the cause of diabetic retinopathy.

"This has been confirmed by many labs," Ma said during a recent visit to his OU laboratory.

"Now it has become common practice to use anti-



Alain Quiambao is passionate about Charlesson's ultimate goal of curing blindness. (PHOTO BY JIM STAFFORD)

angiogenic agents for treating diabetic retinopathy."

FDA-approved drug

The Charlesson therapeutic was developed around fenofibrate, an FDA-approved drug that has been used safely for decades and proven to reduce diabetic retinopathy.

"The problem is when you orally take this, very little of the drug goes to the eye," Ma said. "You have to take more to get the increased effect, and then you take too much, causing toxicity. That's why we started formulating it into eyedrops for targeted local delivery."

A physician educated in his native China, Ma came to the United States in 1989 to pursue his interest in research. He has been principal investigator for two \$12 million Centers for Biomedical Excellence — COBRE — grants for training young researchers and anticipates a third by the end of this year.

Founded in 2005, Charlesson has received more than \$10 million in funding to support ongoing

research. Charlesson is led by Rafal Farjo, Ph.D., CEO, and Alain Quiambao, director of operations.

Charlesson's team gained expertise in advancing ophthalmic drug development programs and creating formulations for drug delivery as it developed the eyedrop therapeutic.

So a subsidiary company, EyeCRO, was created as a contract research organization to develop and test eyedrop formulations for other companies, and assist in other preclinical studies required before advancing new therapeutics to a clinical stage.

"EyeCRO is a fee-for-service company, and that is how we are actually generating the funds to move along our Charlesson projects," Quiambao said. "We have worked with more than 100 pharmaceutical companies from all over the world. Our clients, largely from North America and Europe, are very happy with the work we provide, and many of them return as repeat clients for more studies."

In fact, EyeCRO has

conducted more than 20 studies for one repeat customer from Canada. It currently has more than 25 contracted research studies underway at its laboratories in the OU University Research Park.

As for Charlesson and its formulation for treating diabetic retinopathy, Quiambao expects the drug will begin clinical trials in 12 to 18 months.

"Fenofibrate has already shown that it has reduced instance of diabetic retinopathy," he said. "The neat part is that we already know this drug works. Why don't we formulate it as an eyedrop, because the target is the eye and what better way to get it into the eye?"

Charlesson/EyeCRO's 20 team members conduct their work at University Research Park independent of the research ongoing in Ma's laboratory nearby on the OU Health Sciences campus.

Sharing same goal

However, the Charlesson team and the company's founder share a common goal.

"I have another 10 to 15 productive years," Ma said. "The most rewarding thing for me before I retire would be that some of my discoveries become a drug and provide treatment for patients. That's my research goal, to benefit patients."

"What we are ultimately going to do is cure blindness, which is exciting and motivates all of us every day," Quiambao said.

Jim Stafford writes about Oklahoma innovation and research and development topics on behalf of the Oklahoma Center for the Advancement of Science & Technology.

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