

Research aims to eliminate allergies

Local work examines diagnostic techniques and how reactions occur

What does the future hold for people with severe allergies to things such as peanuts and milk? Perhaps a treatment that will see the body accept something it now views as a threat, so the allergic reaction never happens?

It's years away, but there is groundbreaking work happening here in Hamilton to try to create such treatments and perhaps even a cure.

Some of that research is being done by McMaster University's Dr. Susan Waserman, an assistant professor in clinical immunology, and Dr. Manel Jordana, a professor of pathology and molecular medicine and head of the respiratory diseases and allergy division.

Some of their research is funded by the AllerGen Network, a centre of excellence hosted by McMaster University (allergen-nce.ca/research/default.htm.)

Dr. Judah Denburg is an immunologist and scientific director and CEO of the AllerGen Network.

It was launched last year, making it the newest of about 20 such federally funded centres and one of only eight biomedical centres. The AllerGen Network draws together researchers with diverse backgrounds, giving it a strong platform from which to launch projects.

Denburg said its aim is to "not just do research, but make it useful and make a difference." Jordana and Waserman want to make a difference for those with severe allergies.

"We've had a couple of recent deaths nationally, which really brought the issue of research in this area to the forefront," said Waserman, referring to the deaths of two teenage girls last fall due to anaphylaxis.

"This is a problem on the rise. This is a problem that is not going away."

Jordana points out that, in the cases of diseases such as asthma, which is also on the increase, there are several therapies. But for food allergies, peanut allergy in particular, there is nothing other than epinephrine, and that is used after only a reaction occurs.

Anaphylaxis occurs when the body makes an antibody, called immunoglobulin E (IgE), to a substance in the environment that is usually considered harmless. If the IgE encounters that substance, the cells attached to the IgE can release substances that have powerful effects on blood vessels and air passages. It can lead to a drop in blood pressure and restrict air passages.

To counter those effects, patients should use epinephrine (adrenalin) in the form of emergency needles (such as EpiPen or Twinject auto-injectors) as the first line of therapy. Who becomes allergic is determined by genetics and



Pathologist Dr. Manel Jordana, in the foreground, works with PhD students Katherine Arias, centre, and Kevin Sun. Jordana is supervising the groundbreaking work by his graduate students into peanut-induced anaphylaxis. CATHIE COWARD, THE HAMILTON SPECTATOR

Can you help?

Doctors Manel Jordana and Susan Waserman always need diagnosed allergy patients for their research. If you are interested in participating in the study, please call Mary Conway at 905-521-2100, ext. 75642.

environmental exposures.

Researchers hope to manipulate the immune system early in life to prevent this allergic response to food from occurring or to lessen the reaction in a person who is already sensitized. One such area involves developing a peanut vaccine using an altered peanut protein, which can effectively reduce the severity of an allergic reaction.

Denburg said there are some promising studies in these areas.

"There are other treatments coming along the way that lead to tolerance or the body accepting the allergen, not seeing it as a reaction," he said. "That would be the ideal because what has happened in an allergic response is you are reacting to a common substance but in the wrong way."

Jordana's team is overseeing the study of how food allergies work, in order to develop those kinds of treatments.

It's a difficult area of science, but

Jordana's team has a significant tool to use — an animal model, the only experimental model of its kind in Canada. The team works with mice that are allergic to peanuts.

"It's very difficult, and that's what makes it so exciting — the challenge of whether or not we can reprogram an established allergic response," he said, noting that finding a means of controlling an anaphylactic response is still years away.

Waserman, who is also a clinician, has spent the past three years refining diagnostic tools. It's hoped these studies will better identify those with an allergy and will influence new treatment.

This is a critical area of research because food allergies can have such a significant impact on lifestyle. Sometimes trace exposure to the food is all it takes to trigger a reaction. Also, the problem may not always be recognized, since symptoms can manifest differently in each patient.

Denburg said AllerGen has also begun studying a birth cohort, a group of unborn children, their parents and their prenatal history.

"Going back to the origins of allergy is really how we're going to solve it."

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Other notable research developments

Dr. Hugh Sampson, chief of pediatric allergy and immunology at the Mount Sinai School of Medicine in New York, announced last fall his research team had a key breakthrough in the development of a peanut vaccine. Sampson engineered bacteria to produce the three peanut proteins most associated with the allergy. The proteins had been slightly altered so they would not attract the huge reaction by antibodies that is associated with an allergic attack.

The vaccine was given to mice with peanut allergy, and after three doses, the mice did not react when fed peanuts, Dr. Sampson's team reported.

"This particular vaccine, which could be adapted for human use, provides some hope that we may be able to treat peanut allergy in human patients and that we will no longer see symptoms," Dr. Sampson said.

Last fall, Toronto doctors discovered a substance readily available at most pharmacies could prove to be a life-

saver for people suffering from peanut allergies. Activated charcoal has been used for years to treat the effects of poison, but Dr. Peter Vadas of St. Michael's Hospital in Toronto said it can "put the brakes" on an allergic peanut reaction. If taken early enough, the activated charcoal acts on the peanut protein in the stomach and prevents the allergen from entering the bloodstream and causing the severe reaction.

A U.S. team tested 80 children with peanut allergies and found that over time more than half outgrew their allergic reaction.

"Although we once thought peanut allergy was a lifelong problem, we now believe certain children, namely those with low levels of allergy antibodies, may outgrow it," said Dr. Robert Wood, a pediatric allergist and immunologist at Johns Hopkins Children's Center in Baltimore, who carried out the study.

— From *Hamilton Spectator* wire services and the Internet