Developing new asthma therapies

BY SEAN MOORE
Research Promotion

There’s something wrong with the drugs.
Over the last 20 years, asthma rates in Canada and other Western countries have approached near-epidemic proportions. And the amount of drugs prescribed to asthmatics has risen in relative stride.

“Clearly these drugs are not preventing or reversing this disease,” said Andrew Halayko, Canada Research Chair in Airway Cell and Molecular Biology working in the departments of physiology and internal medicine.

Halayko’s research focuses on new therapies that can prevent or reverse asthma. He will discuss his work at the next Get to Know Research at Your University speaker series (details below).

Asthma currently affects 12 per cent of children and 6 per cent of adults in Canada; percentages that have roughly doubled in the past 20 years despite dramatic increase in the prescription of anti-asthma drugs.

Halayko’s studies airway smooth muscle, which is different from skeletal or cardiac muscle in that, besides contracting, it plays an immunomodulator and pro-fibrotic role: it can produce many growth factors, cytokines and other pro-inflammatory molecules that drive smooth muscle to contract, relax, proliferate and release pro-inflammatory molecules.

GPCRs have long been known to do a lot of things. But they look to be in cahoots with receptor tyrosine kinases (RTKs), cell surface receptors for many growth factors, cytokines and hormones.

Both of these receptors are found in caveolae, spiroton shaped structures that are abundant in smooth muscle - they are where the intracellular machinery that tells the cell what to do when receptors bind biomolecules are localized. Simply speaking, think of caveolae as a meeting room.

Two people standing on opposite sides of a long hallway can converse. But they will better interact and express themselves when they are nearer the other, like in a small room. So it is with GPCRs and RTKs, when they are present in the caveolae at the same time, they amplify each others signals resulting in, say, more collagen production.

Halayko is studying ways to take away or disrupt this meeting room, thereby reducing the deleterious things the plasma environment induces them to do.

If you want to learn more on this and how a popular anti-cholesterol drug may be key to developing new asthma therapies, attend “Breathing Easier: Finding Better Ways to Treat Asthma” at the next Get to Know Research at Your University speaker series on Feb. 28. It starts at 7 p.m. in the Smartpark boardroom, located at 135 Innovation Drive. Admission is free and all are welcome. For more information please call 474-9020.