December 2008

January

Alzheimer's Disease: TWRI Triggers Stimulating Findings: Deep brain stimulation—implanting battery-powered electrodes into the brain to deliver electrical signals to the brain—has been primarily used in Parkinson's patients and other movement disorders. Drs. Andres Lozano, Mary Pat McAndrews, Colin Shapiro and Richard Wennberg found increasing electrode stimulator intensity caused memories to become more vivid and detailed. This may lead to the development of new treatments for Alzheimer's disease and other memory problems. [Pubmed abstract].

March

Stroke: Taking Time to Understand Delayed Responses: A TWRI team led by Dr. Lyanne Schlichter has developed a new 'stroke-in-a-dish' model, allowing scientists to study the events occurring in the penumbra. Their model focuses on microglia, key immune cells that can propagate ongoing toxic reactions in the penumbra, and led to identification of new specific targets, including receptors and secreted factors, which may prove vulnerable to new therapeutics. [Pubmed abstract].

April

Heart Failure: Controlling Cell Growth: An international study led by TGRI researcher Dr. Rudiger von Harsdorf has uncovered promising parallels between the pathways controlling cell enlargement and cell proliferation—a hallmark of cancer. Cardiac hypertrophy—heart cell enlargement—is common in heart failure patients and manipulation of the cancer-related molecule p27 could provide a potential treatment for these patients. [Pubmed abstract].

May

Arthritis: New Treatment May Require Caution: A potential replacement for COX-2 inhibitors—used to treat patients with pain, fever and inflammatory diseases like arthritis—may carry a previously unrecognized cardiovascular risk. Dr. Barry Rubin found patients at risk of infarction prescribed mPEGS-1 should be monitored closely as these drugs may affect their ability to recover from a heart attack. [Pubmed abstract].

Diabetes: A Three-Pronged Treatment Approach: A new three-organ sensory network relaying vital information responsible for the regulation of glucose levels has been discovered by Dr. Tony Lam. The axis of communication exists between the gut, brain, and liver whereby accumulation of fats in the upper intestine triggers information to pass to the brain and then off to the liver. This signals the liver to decrease glucose production and maintain appropriate levels of blood glucose. [Pubmed abstract].

Regenerative Medicine: Growing Heart Cells for

A selection of honours conferred this year.

UHN Wins Leading Drug Development Award

PMH was awarded a $3M U.S. National Cancer Institute Phase I grant headed by Senior Scientist Dr. Lillian Siu, co-Director of the Robert and Maggie Bras and Family New Drug Development Program.

One of only two new applications to be funded, the award will ensure PMH patients have access to the most promising treatments for cancer.

Royal College Recognizes OCI Scientist

Dr. Shereen Ezzat was awarded the 2008 Royal College CSCI Distinguished Scientist Award in recognition of his significant research contributions.

Director Lauded with MERIT

The only researcher in Canada to hold this honor, and one of only 4 outside the US, OCI Director and Senior Scientist Dr. Benjamin Neel was awarded a renewal of his MERIT award from the National Institutes of Health.

He was presented with the award for having demonstrated a long-term commitment to and success in research.

Royal College Recognizes OCI Scientist

Repair: Dr. Gordon Keller successfully grew human heart progenitor cells—immature heart cells—from embryonic stem cells, a major step towards creating functioning heart tissue. The group treated cultures of embryonic stem cells with a combination of growth-promoting proteins and was able to direct the stem cells to grow into three types of heart cells, representing a new means of efficiently and effectively producing these cell types. [Pubmed abstract].

June

Immune System: Taking Apart the 'Engine': A new level of control has been revealed for interferon-gamma (IFNgamma)—an important 'engine' of the immune system involved in a variety of human diseases including cancer, multiple sclerosis, heart disease and arthritis. Dr. Rod Bremner and his team demonstrated that the BRG1 protein works with at least five other remote switches to activate the CIITA gene, in turn responsible for revving up the immune response. [Pubmed abstract].

Diabetes and Cardiology: Tracking Fat in Disease: TGRI's Dr. Gary Lewis found that elevated levels of free fatty acids stimulate production of 'bad' cholesterol not only in the liver, but also in the intestine. This suggests chronic high levels of free fatty acids are likely to play an important role in the overproduction of intestinal fats seen in insulin resistance or type 2 diabetes, leading to dyslipidemia (unhealthy blood fat profiles), increasing the risk of cardiovascular disease. [Pubmed abstract].

July

Hepatitis B: Examining New Therapeutic Approaches: A new therapy option that lowers the levels of hepatitis B virus (HBV) DNA in patients with chronic hepatitis B no longer responsive to lamivudine was unveiled. Dr. Morris Sherman and colleagues showed that, after one year of treatment, 81% of patients treated with entecavir in combination with other antivirals showed clinically significant decreased levels of HBV DNA (up from 65% at the start of the study) and remained consistent throughout the second year of the study. [Pubmed abstract].

Malaria: Enzyme Deficiency Confers Protection in Humans: With colleagues from McGill University, Dr. Kevin Kain has shown individuals deficient for the enzyme pyruvate kinase (PK)—required for energy production in the body—have a two-tiered system of disease protection. These PK-deficient individuals show reduced invasion of red blood cells by malaria parasites and an increased occurrence of phagocytosis of ring-stage-infected red blood cells. This may confer a protective advantage against malaria leading to novel therapies to treat and prevent this disease. [Pubmed abstract].

Colorectal Cancer: Detailing Genetic Changes in Disease: An OCI study has important implications for increased precision in screening patients with familial colorectal cancer. Drs. Robert Bristow and Steven Gallinger found that specific single and larger-scale mutations in the MUTHY gene lead to defective proteins that can no longer repair DNA in an orderly manner—which ultimately produce colorectal cancer. Genetic mutations in this repair gene, and ultimately DNA repair proteins, are associated clinically with increased cancer risk. [Pubmed abstract].

September

Autoimmune Liver Disease: Clarifying the Importance of a Diagnostic Marker: Antimitochondrial antibodies (AMA) are well recognized to be the hallmark of a chronic autoimmune biliary disease called primary biliary cirrhosis (PBC) and were formally considered disease specific. Dr. Jenny Heathcote evaluated 15 patients given a diagnosis of autoimmune hepatitis over a follow-up period of 1 to 27 years. The team determined that although all patients had detectable AMA throughout follow up, none subsequently developed PBC. Therefore, AMA detection may not, in fact, mean the patient has PBC and patients can be managed with only medication for their autoimmune hepatitis if they do not develop PBC over the long term. [Pubmed abstract].

The Royal College of Physicians and Surgeons of Canada recognized OCI Scientist Dr. Aaron Schimmer with the 2008 Royal College Medal in Medicine for his original work as an early-career clinician-scientist.

Prestigious Cancer Award Presented to UHN Researcher

Dr. John Dick was awarded American Association for Cancer Research's GHA Clowes Memorial Award—one of the most exalted awards within the international cancer research community—for his contributions to understanding leukemia.

OCI Researcher Receives Summit Award

Dr. Frances Shepherd was awarded one of two prestigious Premier's Summit Awards in Medical Research for her substantial and distinguished ongoing contributions to the field of lung cancer.

The province will provide $2.5M in funding over the next five years towards expanding investigations into the areas of screening, detection and early prevention, population and patient genomic profiling, and correlative molecular research in lung cancer.

Killam Prize Awarded to UHN Researcher

UHN congratulates TWRI Director Dr. Peter St. George-Hyslop on receiving the nationally-renowned and esteemed Killam Prize—governed by the Canada Council for the Arts—for his seminal research into the causes and mechanisms of neurodegenerative diseases.

Recognizing a UHN Champion of Vision Research

Dr. Martin Steinbach has been recognized by the international Association for Research in Vision & Opthalmology (ARVO) as the 2009 Kupfer Awardee. The award recognizes his distinguished public service on behalf of eye and vision research.

T Cell & Spinal Cord Injury Pioneers Inducted into Hall of

Male Fertility: Cancer Protein Involved in Sperm Development: Dr. Hitoshi Okada has revealed that a well-known cancer protein may be a possible molecular target in male infertility. Mice unable to make the Bat3 protein—responsible for regulating cell death—were completely infertile, indicating Bat3 is essential for the survival and maintenance of male germ cells. The study also demonstrated Bat3 is important for proper chromosome pairing during the exchange of genetic information. [Pubmed abstract].

October

Immunity: Mechanics Behind Signal Control: An OCI team is providing protein evidence to better understand the mechanics behind a specific kind of calcium regulation in immune diseases. Dr. Mitsu Ikura and his team drew out, section by section, the mechanics required by the protein STIM1 to detect calcium levels. The structure has led to the discovery of the previously unidentified 'EF-hand' domain which, in combination with the SAM domain, detects and responds to calcium. Mutations in this machinery can lead to dysfunctional immune cell activity. [Pubmed abstract].

November

Cardiology: Preventing Risky Heart Cell Remodeling After Injury: Acute or chronic ischemic injury patients who are also at a high risk of congestive heart failure may benefit from preclinical evidence showing that injected skeletal myoblasts improve cardiac function following injury. Dr. Ren-Ke Li and colleagues Drs. Richard Weisel and Terrence Yau found that, regardless of injection time, these cells improved global heart function and preserved heart wall thickness/elasticity in non-injured areas of the heart. [Pubmed abstract].

Regenerative Medicine: Directing Cell Growth: Using mouse ES cells, Dr. Gordon Keller and his team showed that signals from the Notch pathway can direct hemangioblasts, precursors of blood and blood vessel cells, to grow into heart cells. This re-directed growth pathway occurs when the Notch signaling coordinates the activity of two other paths, the BMP and Wnt pathways, which are key in early stages of development. This provides insight into a novel approach to generating large numbers of heart cells for regenerative therapies. [Pubmed abstract].

Immunity: Stressing the Importance of Checkpoints: The immune system protein Fas—critical to maintaining homeostasis in the peripheral lymphoid organs—is an essential checkpoint governing T and memory B cell homeostasis. Dr. Tak Mak and assistant scientist Dr. Zhenyue Hao created a mouse model to show that, in mice lacking the Fas gene in B cells, these B cells infiltrate the liver and lungs causing multiple organ failure, altered lymphoid architecture, and dramatic changes in T cell signaling. [Pubmed abstract].

December

Chronic Hepatitis: Moving Towards New Treatments: As published in this month's New England Journal of Medicine, Dr. Jenny Heathcote and an international team of investigators have shown that tenofovir DF—an oral drug currently approved for the treatment of HIV-1—should be considered as an option for the treatment of chronic hepatitis B virus (HBV) infection. Tenofovir DF had superior antiviral efficacy over adefovir with similar safety profiles and was effective in suppressing HBV DNA levels in patients who had, and had not, previously received lamivudine [Pubmed abstract].

Fame

Drs. Tak Mak and Charles H Tator were selected as 2009 inductees to the Canadian Medical Hall of Fame. The award recognizes outstanding contributions to medical science that have improved health and well-being.

April

UHN Research Gets Boost from OICR: UHN's Cancer Stem Cell program, led by Dr. John Dick, received $17M from the Ontario Institute for Cancer Research to continue its efforts in identifying cancer stem cells. UHN researchers are involved in other funded projects including the Imaging Research Laboratories, Robarts Research Institute in London; and the One Millimetre Cancer Challenge, led by Sunnybrook Research Institute.

Celebrating PMH: On Thursday May 1, 2008 the UHN community commemorated Princess Margaret Hospital's 50th anniversary. Festivities highlighted a half-century of care, education and research.

June

Campbell Family Donation Sparks Creation of New Institute: In early June, UHN announced a $37.5M gift that will create the new Campbell Family Cancer Research Institute (CFCRI) housed at the Ontario Cancer Institute. Funding for the new institute will support a high content tumour bank, a state-of-the-art advanced molecular profiling lab and research in tumour metabolism, cancer stem cells, cancer genomics, proteomics, informatics, and guided therapeutics.

August

Landmark Funding Awarded to UHN: The Canada Foundation for Innovation (CFI) announced a $119.9M investment towards UHN's Advanced Therapeutics Research Platform. The award—the largest in UHN's history—includes $92.3M in new funding towards construction projects at Venus/TWRI, OCI and TGRI. It will fund significant new equipment across 7 research themes including signaling, clinical studies, stem cells, medical imaging, immunity, biomarkers, and drug discovery programs. CFI also announced a contribution of $27.6M in institutional operating funding related to the award.

October

2M Boost to TWRI Hepatitis Program: A multidisciplinary team of investigators led by Dr. Jenny Heathcote was awarded $2M NIH funding towards the creation of a Clinical Centre for Chronic Hepatitis B at TWH. The only clinical centre in Canada to be funded, the centre will support a clinical therapeutic trial and infrastructure examining dual antiviral therapy.

November

Stem Cell Network Supports UHN Research: A UHN project is one of 10 new awards announced by the national Stem Cell Network. The large, multi-disciplinary initiative led by OCI's Dr. Gordon Keller will produce liver cells from human embryonic stem cells and induced human pluripotent stem cells to test toxicity levels of drugs related to drug metabolism. Research will improve the drug discovery process and increase the potential for patient-specific therapy—a breakthrough that would mean less animal testing and results more applicable to human biology.

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