TREMBLAY, JOHANNE

Membru de Onoare, CANADA

PhD, Professor of Medicine

Theme Leader, Cardiometabolic Axis, CRCHUM

Biographical Sketch. Dr. Tremblay received her PhD in *Biomedical Sciences* from University of Montreal in 1982 under the supervision of the doctor Jacques Genest. After two years of post-doctoral fellowship supported by the Heart and Stroke Foundation of Canada at the Clinical Research Institute of Montreal and Vanderbilt University, in Nashville, USA, she came back to the University of Montreal and was awarded a scholarship from Fonds de la recherche en santé du Québec (FRSQ) from 1984-1996. She received her first Medical Research Council grant in 1984 and has been funded continuously since by the Canadian Institutes of Health Research (CIHR). In 1993, she received the *Young Investigator Award* from the Canadian Hypertension Society and the *Prix du Jeune Chercheur* from the Société Québécoise d'Hypertension in 1994. She acted as Chair of the Multidisciplinary Research Groups and Scholarship committees of FRSQ, deputy Chair of the *Molecular Biology* study section at the Canadian *Heart and Stroke Foundation* and Chair of the *Cardiovascular System B Committee* of the CIHR. In 2002, she was President of the *Club de Recherches Cliniques* du Québec. In 2003, she was President of the *Canadian Hypertension Society* and she was President of the Société Québécoise *d'Hypertension Artérielle* from 2005 to 2007 and received the *Prix reconnaissance* from this Society in 2010. She is author or co-author of over 250 scientific publications and holds several patents and was member of the editorial Boards of Journal of Hypertension, American Journal of Hypertension and the Canadian Journal of Cardiology. She is Fellow of the Canadian Academy of Health Sciences and of the American Heart Association and Member of the Scientific Committee of the Collčge International de Recherche Servier. She is the co-founder and Chief Scientific Officer of Prognomix Inc. Her expertise includes the genetics of cardiovascular diseases and hypertension in the context of the Personalized Medicine.

Research Interests. Research interest focussing on *genomics of hypertension*, cardiovascular diseases and vascular complications of diabetes, can be divided into five major themes:

1. *Molecular characteristics of the receptors of the natriuretic peptide (ANP)*. After identification of cGMP as the mediator of the natriuretic peptide family and the particulate guanylyl cyclase A as its main receptor, she has identified, in the promoter of the receptor a dinucleotide repetition in the spontaneously hypertensive rat (SHR), which modifies the activity of a cyclic GMP-response element and has cloned the first protein, GREBP, which binds specifically to this new cis-element.

2. She has identified an *hypertension-related calcium-regulated gene (HCaRG)*. This gene induces dramatic changes in cell phenotypes when stably transfected, including arrest of cells in the G2M phase of the cell cycle, acquisition of features of cell differentiation and increased cell motility. She has generated transgenic mice in the kidneys to demonstrate that HCaRG accelerates kidney repair and mice survival after ischemia-reperfusion injury.

3. She has uncovered *new ethiology of Cushing syndrome* by ectopic expression of several receptors, including gastric inhibitory polypeptide. She has also demonstrated the ectopic expression of another type of receptor, the β-adrenergic receptor, which results in hyperplasia of the adrenal gland. She is pursuing our studies on the identification of the molecular mechanisms of this syndrome.

4. Using congenic rat models of hypertension, she demonstrated an association of HSP70 and HSP27 genes with blood pressure and heart hypertrophy respectively and abnormal activity of guanylyl cyclase in several rat congenic strains of chromosome 2 locus. Since then, she has produced *novel models of genetically-designed rat strains* including a genetic model of familial dyslipidemia, of metabolic

syndrome and vascular hypertrophy. She has also determined by total genome scan, the QTL of stress response and of stress gene expression of kidney weight and apoptosis. She mapped for the first time the expression levels of members of the heat stress protein family which led to the discovery of a common locus where the heat stress transcription factor maps and to the novel field of genetical genomics which combines whole genome expression and genomic markers to identify eQTL and common transcription factors.

5. In *Genetics of hypertension and T2D complications*, she is studying a family cohort of the French-Canadian population by whole genome scans of these families. Being member of the Genetic Committee of ADVANCE trial she has performed GWAS analysis of intermediated trait of vascular complications of type 2 diabetic patients and pursuing the development of predictive tests for these complications.

References: http://www.montreal-diabetes-research-center.org/en/tremblay/tremblay.asp.