BIOGRAPHICAL SKETCH

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NAME	POSITION TITLE
Bouchard, Claude	Professor and John W. Barton, Sr. Endowed Chair in Genetics and Nutrition
eRA COMMONS USER NAME (credential, e.g., agency login) BOUCHAC	

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Laval University, Quebec, Canada	B.Ped.	1962	Physical Education
University of Oregon, Eugene, USA	M.Sc.	1963	Exercise Physiology
University of Cologne and German Sporthochschule	Postgrad	1963-65	Cardiovascular Physiology
University of Texas, Austin, USA	Ph.D.	1977	Population Genetics
University of Montreal, Canada	Postdoc	1977	Genetics and Growth

A. Personal Statement

Over the last 35 years, my research has focused on the genetics of obesity and its comorbidities, as well as on the genetics of adaptation to regular exercise in terms of cardiovascular and diabetes risk factors. Evidence for a role of genetic differences in the response to regular exercise was obtained from several experimental twin studies and one large cohort of families exposed to a standardized exercise program. These projects were undertaken while I was on the faculty at Laval University in Quebec City, Canada. Subsequently, I became Executive Director of the Pennington Biomedical Research Center (PBRC) in Baton Rouge, Louisiana, and established a Human Genomics Laboratory at that institution. Our research over the past decade has allowed us to evidence several genes and sequence variants contributing to human variation in adiposity, energy metabolism, and responsiveness to regular exercise, particularly for cardiorespiratory endurance and insulin sensitivity. I was the senior advisor for 15 Ph.D. students, and I mentored more than 30 postdoctoral fellows in my laboratory over the years. Having completed my term as Executive Director of PBRC, I have resumed full-time research activities in the Human Genomics Laboratory, with an emphasis on the genomics and other OMICS predictors of the ability to respond to regular exercise and the genomic predictors of the changes in cardiovascular and diabetes risk factors, as well as the risk of developing an adverse response.

My laboratory has also had a longstanding interest in the ability to adapt to nutritional stresses and various exercise regimens. We successfully performed long-term overfeeding studies with pairs of identical twins overfed for a period of 100 days. Negative energy balance experiments for the same duration were also completed in my laboratory, again with pairs of identical twins. These experimental studies have provided the strongest evidence to date that there are considerable individual differences in the ability to adapt to nutritional challenges or to regular exercise and that there is a strong genetic component to the observed human heterogeneity. These findings have been supported by multiple observational studies performed with nuclear families, sets of twins, and foster parents and adopted children.

B. Positions and Honors

Positions and Employment

1963-65 Postgraduate work in cardiovascular exercise physiology, University of Cologne and Deutsche Sporthochschule, Research Institute on the Heart and Sports Medicine, Cologne, Germany
1965-72 Assistant Professor, Physical Education, Laval University
1969 Member of the Physical Activity Sciences Laboratory, Laval University
1969-74 Director of the Physical Activity Sciences Laboratory, Laval University
1972-79 Associate Professor, Physical Education, Laval University
1977 Postdoctoral Fellow, Human Growth Research Center, University of Montreal
1979-97 Professor, Exercise Physiology, Laval University, Ste-Foy, Quebec
1997-99 Donald B. Brown Research Chair on Obesity funded by MRC and Roche Canada

1997-99 Professor of Kinesiology, Dept. of Social and Preventive Medicine, Faculty of Medicine, Laval Univ.
1999-2010 Executive Director, George A. Bray Chair in Nutrition, and Director of Human Genomics Laboratory Pennington Biomedical Research Center, Louisiana State University System, Baton Rouge, LA
2010+ Professor, John W. Barton, Sr. Endowed Chair in Genetics and Nutrition, and Director of Human Genomics Laboratory, Pennington Biomedical Research Center, Louisiana State University System, Baton Rouge, LA

Honors

1991-92 President of The Obesity Society
1992 Connaught-Novo-Nordisk Lecture and Award of the Canadian Diabetes Association and the Canadian Society of Endocrinology and Metabolism. 61st Annual Meeting of The Royal College of Physicians and Surgeons of Canada. Ottawa
1993 Recipient of the Medal of the Rector of the Université de Liège, Belgium
1994 Recipient of the Willendorf Award. International Association for the Study of Obesity. Toronto
1995 Ottawa Heart Institute Alumni's W.J. Keon Award Lecture given on the occasion of the World Congress on Hypertension, Ottawa
1996 Canadian Atherosclerosis Society Sandoz Award, Royal College of Physicians and Surgeons of Canada
1997 Foreign member of the Belgium Royal Academy of Medicine, elected in 1996
1997 Albert Creff Prize from the National Academy of Medicine, Paris, France
1998 Honoris Causa Doctorate, Katholieke Universiteit Leuven, Belgium
1998 TOPS Award, North American Association for the Study of Obesity
2000 Seventh Esko Nikkola Lecture, Finnish Society of Internal Medicine, Helsinki, Finland
2001 Member of the Order of Canada
2002 The American College of Sports Medicine Honor Award, St. Louis, MO
2005 Earle W. Crampton Award for Distinguished Service in Nutrition, McGill University
2005 Past Presidents Award of the Canadian Federation of Biological Sciences, Guelph, Ontario
2002-2006 President of the International Association for the Study of Obesity
2004 Albert Stunkard Lifetime Achievement Award, North American Association for the Study of Obesity
2007 Raymond Pearl Memorial Lecturer, Human Biology Association, Philadelphia
2008 The 2008 George A. Bray Founders Award from The Obesity Society, Phoenix.
2008 Fellow of the American Association for the Advancement of Science
2008 President's Award, Clinical Research Society of Quebec
2009+ Member of Emerging Science Committee of the CARDIA Study
2009 Honoris Causa Doctorate, University of South Carolina, Columbia
2010 Fellow of the American Heart Association
2011 Honoris Causa Doctorate, University of Guelph, Ontario, Canada
2011 E.V. McCollum Award, American Society for Nutrition
2011 Honoris Causa Doctorate, Brock University, Ontario, Canada
2012 Honoris Causa Doctorate, University of Ottawa, Ontario, Canada
2013-14 Faculty Fellow of the Texas A&M Institute for Advanced Study, College Station, Texas

C. Selected Peer-reviewed Publications (Selected from more than 1,000 peer-reviewed publications, which have received about 42,000 citations with an H-index of 94)

1. Keller P, Vollaard NBJ, Gustafsson T, Gallagher IJ, Sundberg CJ, Rankinen T, Britton SL, Bouchard C, Koch LG, Timmons JA. A transcriptional map of the impact of endurance training on skeletal muscle phenotype. J Appl Physiol. 110(1):46-59, 2011. PMC3253010.
2. Sarzynski MA, Jacobson P, Rankinen T, Carlsson B, Sjöström L, Carlsson LM, Bouchard C. Association of GWAS-based candidate genes with HDL-cholesterol levels before and after bariatric surgery in the Swedish Obese Subjects Study. J Clin Endocrinol Metab. 96(6):E953-7, 2011. PMID: 21430028.
3. Dolley G, Boisclair ME, Lamarche B, Després JP, Bouchard C, Pérusse L, Vohl MC. Interactions between dietary fat intake and FASN genetic variation influence LDL peak particle diameter. J Nutrigenet Nutrigenomics. 4(3):137-45, 2011. PMID: 21646813.

4. Sarzynski MA, Rankinen T, Sternfeld B, Fornage M, Sidney S, Bouchard C. SNP-by-fitness and SNP-by-BMI interactions from seven candidate genes and incident hypertension after 20 years of follow-up: the CARDIA Fitness Study. J Hum Hypertens. 25(8): 509-18, 2011. PMC3034111.
5. Rankinen T, Sung YJ, Sarzynski MA, Rice TK, Rao DC, Bouchard C. Heritability of submaximal exercise heart rate response to exercise training is accounted for by nine SNPs. J Appl Physiol. 112(5):892-7, 2012. PMC3311659.
6. Sung YJ, Wang L, Rankinen T, Bouchard C, Rao DC. Performance of genotype imputations using data from the 1000 Genomes Project. Hum Hered. 73(1):18-25, 2012. PMC3322630.
7. Bouchard C, Blair SN, Church TS, Earnest CP, Hagberg JM, Hakkinen K, Jenkins NT, Karavirta L, Kraus WE, Leon AS, Rao DC, Sarzynski MA, Skinner JS, Slentz CA, Rankinen T. Adverse metabolic response to regular exercise: Is it a rare or common occurrence? PLoS One. 7(5):e37887, 2012. PMC3364277.
8. Rice TK, Sarzynski MA, Sung YJ, Argyropoulos G, Stütz AM, Teran-Garcia M, Rao DC, Bouchard C, Rankinen T. Fine mapping of a QTL on chromosome 13 for submaximal exercise capacity training response: the HERITAGE Family Study. Eur J Appl Physiol. 112:2969-78, 2012. PMID: 22170014.
9. Sarzynski MA, Jacobson P, Rankinen T, Carlsson B, Sjostrom L, Bouchard C, Carlsson LMS. Changes in uric acid levels following bariatric surgery are not associated with SLC2A9 variants in the Swedish Obese Subjects Study. PLoS One. 7(12):e51658, 2012. PMC3522707.
10. Plourde M, Vohl MC, Bellis C, Carless M, Dyer T, Dolley G, Marette A, Després JP, Bouchard C, Blangero J, Pérusse L. A variant in the LRRFIP1 gene is associated with adiposity and inflammation. Obesity (Silver Spring). 21:185-92, 2013. PMID: 23505185.
11. Phillips BE, Williams JP, Gustafsson T, Bouchard C, Rankinen T, Knudsen S, Smith K, Timmons JA, Atherton PJ. Molecular networks of human muscle adaptation to exercise and age. PLoS Genet. 9:e1003389, 2013. PMC3605101.
12. Pérusse L, Rankinen T, Hagberg JM, Loos RJ, Roth SM, Sarzynski MA, Wolfarth B, Bouchard C. Advances in exercise, fitness, and performance genomics in 2012. Med Sci Sports Exerc. 45(5):824-31, 2013. PMC3640622.
13. Ghosh S, Vivar JC, Sarzynski MA, Sung YJ, Timmons JA, Bouchard C, Rankinen T. Integrative pathway analysis of a genome-wide association study of VO2max response to exercise training. J Appl Physiol. 115(9):1343-59, 2013. PMC3841836.
14. Saunders TJ, Tremblay MS, Després JP, Bouchard C, Tremblay A, Chaput JP.Sedentary behaviour, visceral fat accumulation and cardiometabolic risk in adults: a 6-year longitudinal study from the Quebec Family Study. PLoS One. 8:e54225, 2013. PMC3541147.
15. Katzmarzyk PT, Hu G, Cefalu WT, Mire E, Bouchard C. The importance of waist circumference and BMI for mortality risk in diabetic adults. Diabetes Care. 36(10):3128-30, 2013. PMC3781507.
16. Sarzynski MA, Bouchard C. The challenging case for nutrigenetic predictors of metabolic responses to dietary interventions. Diabetes Care. 36:3379-81, 2013. PMC3816865.
17. Ghosh S, Vivar JC, Sarzynski MA, Sung YJ, Timmons JA, Bouchard C, Rankinen T. Integrative pathway analysis of a genome-wide association study of VO2max response to exercise training. J Appl Physiol. 115(9):1343-59, 2013. PMC3841836.
18. Gallant AR, Tremblay A, Pérusse L, Després JP, Bouchard C, Drapeau V. Parental eating behavior traits are related to offspring BMI in the Québec Family Study. Int J Obes (Lond). 37(11):1422-6, 2013. PMID: 23399776.
19. Chaput JP, McNeil J, Després JP, Bouchard C, Tremblay A. Short sleep duration as a risk factor for the development of the metabolic syndrome in adults. Prev Med. 57(6):872-7, 2013. PMID: 24099879.
20. Katzmarzyk PT, Greenway FL, Heymsfield SB, Bouchard C. Clinical utility and reproducibility of visceral adipose tissue measurements derived from dual-energy X-ray absorptiometry in white and African American adults. Obesity (Silver Spring). 21(11):2221-4, 2013. PMC3819404.
21. Thomas DM, Martin CK, Lettieri S, Bredlau C, Kaiser K, Church T, Bouchard C, Heymsfield SB. Can a weight loss of one pound a week be achieved with a 3500-kcal deficit? Commentary on a commonly accepted rule. Int J Obes (Lond). 37(12):1611-3, 2013. PMID: 23628852.
22. Roberts LD, Boström P, O'Sullivan JF, Schinzel RT, Lewis GD, Dejam A, Lee YK, Palma MJ, Calhoun S, Georgiadi A, Chen MH, Ramachandran VS, Larson MG, Bouchard C, Rankinen T, Souza AL, Clish CB, Wang TJ, Estall JL, Soukas AA, Cowan CA, Spiegelman BM, Gerszten RE. β-Aminoisobutyric Acid induces browning of white fat and hepatic β-oxidation and is inversely correlated with cardiometabolic risk factors. Cell Metab. 19(1):96-108, 2014. PMID: 24411942.

23. Thomas DM, Weedermann M, Fuemmeler BF, Martin CK, Dhurandhar NV, Bredlau C, Heymsfield SB, Ravussin E, Bouchard C. Dynamic model predicting overweight, obesity, and extreme obesity prevalence trends. Obesity (Silver Spring). 22(2):590-7, 2014. PMC3842399.
24. Chaput J.-P., Perusse L, Despres J.-P., Tremblay A, Bouchard C. Findings from the Quebec Family Study on the etiology of obesity: Genetics and environmental highlights. Curr Obes Rep. 3:54-66, 2014. PMC3920031.
25. Bouchard C, Tchernof A, Tremblay A. Predictors of body composition and body energy changes in response to chronic overfeeding. Int J Obes (Lond). 38(2):236-42, 2014. PMC3773296.
26. Bray GA, Bouchard C, editors. Handbook of Obesity: Epidemiology, Etiology, and Physiopathology, Third Edition. Boca Raton, FL: CRC Press, 2014.
27. Perusse L, Rice TK, Bouchard C. Genetic component to obesity: Evidence from genetic epidemiology. In: Bray GA, Bouchard C, editors. Handbook of Obesity: Epidemiology, Etiology, and Physiopathology, Third Edition. Boca Raton, FL: CRC Press, 2014. p. 91-104.
28. Bray GA, Bouchard C, editors. Handbook of Obesity: Clinical Applications, Fourth Edition. Boca Raton, FL: CRC Press, 2014.

D. Research Support

Ongoing Research Support

European Union 277936 Timmons, J. 1/1/2012 – 12/31/2015
META-PREDICT–Developing Predictors of the Health Benefits of Exercise for Individuals
This study will use established genomics and other OMICS to generate classifiers that predict the responses to exercise therapy, with an emphasis on the exercise-induced changes in insulin sensitivity. C. Bouchard and T. Rankinen are Co-PIs of the Pennington Biomedical component of the EU grant.

NIH/NIGMS Institutional Center Grant Gettys, TW 8/1/2011 – 7/30/2016
Supported Through the Center of Biomedical Research Excellence (COBRE) Program
I serve as a mentor to a COBRE-funded project taking an integrated genomic, biological, and behavioral approach to unravel the complexity and causes of variation in HDL due to gene-exercise and gene-nutrition interactions.

John W. Barton, Sr. Chair in Genetics and Nutrition 7/2010+
and Pennington Biomedical Research Foundation
Funds are provided by the Endowed Chair and the Foundation for salary support and research expenses in the area of interest of the Chair holder.

Completed Research Support

NIH (NHLBI) R01 HL045670 Bouchard, C./T. Rankinen 2/1/2006 – 1/31/2013
HERITAGE Family Study, Phase 4
In this renewal period, our main goal was to include the positional cloning efforts of four QTLs for the response of cardiorespiratory fitness and hemodynamic phenotypes to regular exercise, to resolve them in terms of candidate genes and allelic variants, and to functionally confirm them. Transferred Principal Investigator responsibilities to Tuomo Rankinen in June 2008. No-cost extension until 1/31/2013.
Role: Investigator

Prince Faisal Bin Fahad International Prize for Arab Sport Development Research 4/11/12 – 12/31/13
Predicting an Elite Endurance Athlete Status: A Genome-Wide Exploration
Role: Principal Investigator