Daniel Gagnon, PhD
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Key positions

2025-2028	Elected Councillor (Thermal Physiology), Environmental and Exercise Physiology Section, American Physiological Society.
Since 2025	Member, Planetary Health Working Group, Canadian Cardiovascular Society
Since 2025	Secretary, Board of directors, Société québécoise d'hypertension artérielle
2024-2025	Visiting professor, Heat and Health Research Centre, The University of Sydney, Australia.
Since 2022	Associate professor, École de kinésiologie et des sciences de l'activité physique, Université de Montréal, Canada.
2020-2022	Assistant professor, École de kinésiologie et des sciences de l'activité physique, Université de Montréal, Canada.
2016-2020	Assistant research professor, Département de pharmacologie et physiologie, Université de Montréal, Canada.
Since 2016	Researcher, Montreal Heart Institute, Canada

Relevant work in the area of the proposed talk

My doctoral research investigated the effect of biological sex on temperature regulation during exercise in the heat, with an emphasis on differentiating between biophysics from physiology:

Gagnon D, Kenny GP. Sex modulates whole-body sudomotor thermosensitivity during exercise. *J Physiol*. 2011. doi: 10.1113/jphysiol.2011.219220

Gagnon D, Kenny GP. Sex differences in thermoeffector responses during exercise at fixed requirements for heat loss. *J Appl Physiol*. 2012. doi: 10.1152/japplphysiol.00637.2012

Gagnon D, Crandall CG, Kenny GP. Sex differences in postsynaptic sweating and cutaneous vasodilation. *J Appl Physiol*. 2013. doi: 10.1152/japplphysiol.00877.2012

Collectively, these studies demonstrated that sex-related differences in temperature regulation during exercise in the heat are largely minimized when accounting for body mass and the rate of metabolic heat production during exercise. However, we did observe that sweating capacity is reduced in females, albeit at very high combinations of exercise intensity and hot environmental conditions, and that a reduced cholinergic sensitivity of eccrine sweat glands underlies this observation. These findings were summarized in an invited review article:

Gagnon D, Kenny GP. Does sex have an independent effect on thermoeffector responses during exercise in the heat? *J Physiol*. 2012. doi: 10.1113/jphysiol.2012.240739

Currently, we are studying how biological sex and reproductive hormone status affect the neural control of body temperature during heat stress (https://osf.io/rmtfa/overview). This research is motivated by several epidemiological studies that observed greater mortality in older females during extreme heat events, as we highlighted in a recent review article:

Debray A, Sardar S, Deshayes TA, Mornas A, Oubouchou K, Ouazaa Y, Gagnon D. Sex-related differences in temperature regulation during heat stress from childhood to older age. *Auton Neurosci*. 2025. doi: 10.1016/j.autneu.2025.103294

Selected publications

I have contributed to 104 peer-reviewed publications, 65 of which have been published since establishing my independent research program in 2016. Significant contributions to research include:

1) Heat acclimation: We advanced our understanding of how the human body adapts to heat exposure, by demonstrating that heat acclimation improves the neural control of body temperature (PMID: 32011734). This finding was published in the *Journal of Physiology* (2024 Impact factor [IF]: 4.4, Quartile [Q]: 1, Rank: 10/87 physiology) and the article was selected as an editor's choice. We also studied how heat acclimation alters cardiac (PMID: 32822213), renal (PMID: 32495481), and cognitive (PMID: 34710341) functions during heat exposure. Lastly, we studied how the cellular responses to heat exposure change with acclimation (PMID: 36621798, 38062080). We summarized these results in a commissioned review (PMID: 37885125) that received "Top Viewed Article" distinction.

2) Pathophysiology of heat-related cardiac risk: We used nuclear imaging technique to provide the first quantification of myocardial blood flow requirements (i.e., the amount of blood the heart requires to perform its work) during heat exposure (PMID: 38857500). We showed that myocardial blood flow requirements nearly double during heat exposure in younger adults, healthy older adults and older adults living with heart disease. We further showed that the myocardial blood flow requirements of heat exposure are sufficient to predispose to myocardial ischemia, which is a known trigger for adverse cardiovascular events. This finding was published in *Annals of Internal Medicine* (2024 IF: 15.2; Q1, Rank: 9/332, general & internal medicine) and was accompanied by an editorial that highlighted the clinical implications of the results.

3) Strategies to reduce physiological heat strain: We have studied simple strategies to minimize the physiological strain of heat exposure. We showed that fan use reduces the increase in core temperature and cardiac work of older adults exposed to hot and humid heat (PMID: 39504526, 40728792). These results were published in the *New England Journal of Medicine* (2024 IF: 78.2; Q1, Rank: 2/332 general & internal medicine) and *JAMA Network Open* (2024 IF: 9.7; Q1, Rank: 14/332 general & internal medicine). In these same articles, we also showed that fan use worsens physiological strain during exposure to very hot and dry heat. In these conditions, wetting the skin with water reduced cardiac strain and sweating while improving perceptions.

4) Positioning thermal physiology at the forefront of heat adaptation: I have contributed to high impact review articles and commentaries that highlight how thermal physiology is uniquely positioned to tackle the challenges posed by extreme heat and design effective adaptation strategies. I contributed as second author to a comprehensive literature review of the human physiological responses to heat exposure (PMID: 35679471), published in the journal *Physiological Reviews* (2024 IF: 28.1, Q1, Rank: 1/87 physiology). I then contributed as first author to a literature review that laid out how physiology underlies the epidemiology of heat impacts (PMID: 40602791), published in the journal *Physiology* (2024 IF: 10.3, Q1, Rank: 3/87 physiology). Lastly, I contributed as third author to a commentary (PMID: 40760044) in the journal *Nature* (2024 IF: 48.55, Q1, Rank: 2/135 multidisciplinary sciences) that highlighted the need to focus on human physiology to develop effective heat adaptation strategies.