

1154-92-608

Anita Layton* (anita.layton@uwaterloo.ca), , Canada. *A system biology approach for understanding sex differences in hypertension.*

Hypertension is a global health challenge: it affects one billion people worldwide and is estimated to account for > 60% of all cases or types of cardiovascular disease. In part because sex differences in blood pressure regulation mechanisms are not sufficiently well understood, fewer hypertensive women achieve blood pressure control compared to men, even though compliance and treatment rates are generally higher in women. Thus, we seek to identify which factors contribute to the sexual dimorphism in response to anti-hypertensive therapies targeting the renin angiotensin system. To accomplish that goal, we develop sex-specific blood pressure regulation models. Sex differences in the renin angiotensin system, baseline aldosterone level, and the reactivity of renal sympathetic nervous activity are represented. We conduct simulations to explain females' resistance to developing hypertension, and the higher effectiveness of angiotensin receptor blockers in treating hypertensive women (but not men), compared to angiotensin converting enzyme inhibitors. These sex-specific models are a major step towards personalized medicine. (Received September 08, 2019)