***SUPPLEMENTAL RESULTS***

***Responses to Alterations in Two Parameters:*** The data describing the rate of vascular response with the addition of a second stimulus are presented in supplementary figures (SM-Figure) 1-8. SM-Figure 1-4 illustrates the response of *ex vivo* proximal gracilis arterioles and SM-Figure 5-8 presents the responses to *in situ* distal cremaster arterioles.

In the *ex vivo* proximal gracilis muscle arterioles, SM-Figure 1 describes the rate of the response to increasing concentrations of adenosine while exposed to increasing concentrations of norepinephrine (panel A), increasing intravascular pressure (panel B), decreasing superfusate oxygen content (panel C), and increasing intralumenal flow rates (panel D). SM-Figure 2 summarizes the rate of the response to increasing concentrations of norepinephrine in the presence of increasing concentrations of adenosine (panel A), increasing intravascular pressure (panel B), decreasing superfusate oxygen content (panel C), and increasing intralumenal flow rates (panel D). SM-Figure 3 presents the rate of the response to increasing intravascular pressure while challenged with increasing concentrations of adenosine (panel A), increasing norepinephrine concentrations (panel B), decreasing superfusate oxygen content (panel C), and intralumenal flow rates (panel D). SM-Figure 4 describes the rate of the response to decreasing superfusate oxygen content while exposed to increasing concentrations of adenosine (panel A), norepinephrine (panel B), intravascular pressure (panel C), and intralumenal flow rates (panel D).

In the *in situ* distal cremaster arterioles, SM-Figure 5 presents the rate of vascular response to increasing concentrations of adenosine while in an environment with increasing concentrations of norepinephrine (panel A), increasing intravascular pressure (panel B), and increasing superfusate oxygen content. SM-Figure 6 presents the rate of response to increasing concentrations of norepinephrine while challenged with increasing concentrations of adenosine (panel A), intravascular pressure (panel B), and superfusate oxygen content (panel C). SM-Figure 7 presents the rate of response to increasing intravascular pressure while exposed to increasing concentrations of adenosine (panel A), norepinephrine (panel B), and superfusate oxygen content (panel C). Finally, SM-Figure 8 presents the rate of vascular response to increasing superfusate oxygen content in the presence of increasing concentrations of adenosine (panel A), increasing concentrations of norepinephrine (panel B), and increasing intravascular pressure (panel C).

***FIGURE LEGENDS***

**SM Figure 1.** Changes in the slope (b ± CI) of the line fit to the rate of vascular response under increasing concentrations of adenosine in response to imposed challenges of (A) norepinephrine concentrations of 10-10, 10-8, 10-6 M, (B) intravascular pressure of +20, 40, 60 mmHg, (C) superfusatae oxygen content of 10 and 0%, and (D) intralumenal flow rates of +10, 20, 30 ml/min. Responses are in *ex vivo* proximal gracilis muscle resistance arterioles of rats. n=8 observations for each data point.

**SM Figure 2.** Changes in the slope (b ± CI) of the line fit to the rate of vascular response under increasing concentrations of norepinephrine in response to imposed challenges of (A) adenosine concentrations of 10-9, 10-7, 10-5 M, (B) intravascular pressure of +20, 40, 60 mmHg, (C) superfusatae oxygen content of 10 and 0%, and (D) intralumenal flow rates of +10, 20, 30 ml/min. Responses are in *ex vivo* proximal gracilis muscle resistance arterioles of rats. n=8 observations for each data point.

**SM Figure 3.** Changes in the slope (b ± CI) of the line fit to the rate of vascular response under increasing intravascular pressure in response to imposed challenges of (A) adenosine concentrations of 10-9, 10-7, 10-5 M, (B) norepinephrine concentrations of 10-10, 10-8, 10-6 M, (C) superfusatae oxygen content of 10 and 0%, and (D) intralumenal flow rates of +10, 20, 30 ml/min. Responses are in *ex vivo* proximal gracilis muscle resistance arterioles of rats. n=8 observations for each data point.

**SM Figure 4.** Changes in the slope (b ± CI) of the line fit to the rate of vascular response under decreasing superfusate oxygen content in response to imposed challenges of (A) adenosine concentrations of 10-9, 10-7, 10-5 M, (B) norepinephrine concentrations of 10-10, 10-8, 10-6 M, (C) intravascular pressure of +20, 40, 60 mmHg, and (D) intralumenal flow rates of +10, 20, 30 ml/min. Responses are in *ex vivo* proximal gracilis muscle resistance arterioles of rats. n=8 observations for each data point.

**SM Figure 5.** Changes in the slope (b ± CI) of the line fit to the rate of vascular response under increasing intralumenal flow in response to imposed challenges of (A) adenosine concentrations of 10-9, 10-7, 10-5 M, (B) norepinephrine concentrations of 10-10, 10-8, 10-6 M, (C) intravascular pressure of +20, 40, 60 mmHg, and (D) superfusate oxygen content of 10 and 0%. Responses are in *ex vivo* proximal gracilis muscle resistance arterioles of rats. n=8 observations for each data point.

**SM Figure 6.** Changes in the slope (b ± CI) of the line fit to the rate of vascular response under increasing concentrations of adenosine in response to imposed challenges of (A) norepinephrine concentrations of 10-10, 10-8, 10-6 M, (B) intravascular pressure of +10, 20, 30 mmHg, and (C) superfusatae oxygen content of 10 and 21%. Responses are in *in situ* distal cremaster muscle resistance arterioles of rats. n=8 observations for each data point.

**SM Figure 7.** Changes in the slope (b ± CI) of the line fit to the rate of vascular response under increasing concentrations of norepinephrine in response to imposed challenges of (A) adenosine concentrations of 10-9, 10-7, 10-5 M, (B) intravascular pressure of +10, 20, 30 mmHg, and (C) superfusatae oxygen content of 10 and 21%. Responses are in *in situ* distal cremaster muscle resistance arterioles of rats. n=8 observations for each data point.

**SM Figure 8.** Changes in the slope (b ± CI) of the line fit to the rate of vascular response under increasing intravascular pressure in response to imposed challenges of (A) adenosine concentrations of 10-9, 10-7, 10-5 M, (B) norepinephrine concentrations of 10-10, 10-8, 10-6 M, and (C) superfusatae oxygen content of 10 and 21%. Responses are in *in situ* distal cremaster muscle resistance arterioles of rats. n=8 observations for each data point.

**SM Figure 9.** Changes in the slope (b ± CI) of the line fit to the rate of vascular response under increasing superfusate oxygen content in response to imposed challenges of (A) adenosine concentrations of 10-9, 10-7, 10-5 M, (B) norepinephrine concentrations of 10-10, 10-8, 10-6 M, and (C) intravascular pressure of +10, 20, 30 mmHg. Responses are in *in situ* distal cremaster muscle resistance arterioles of rats. n=8 observations for each data point.