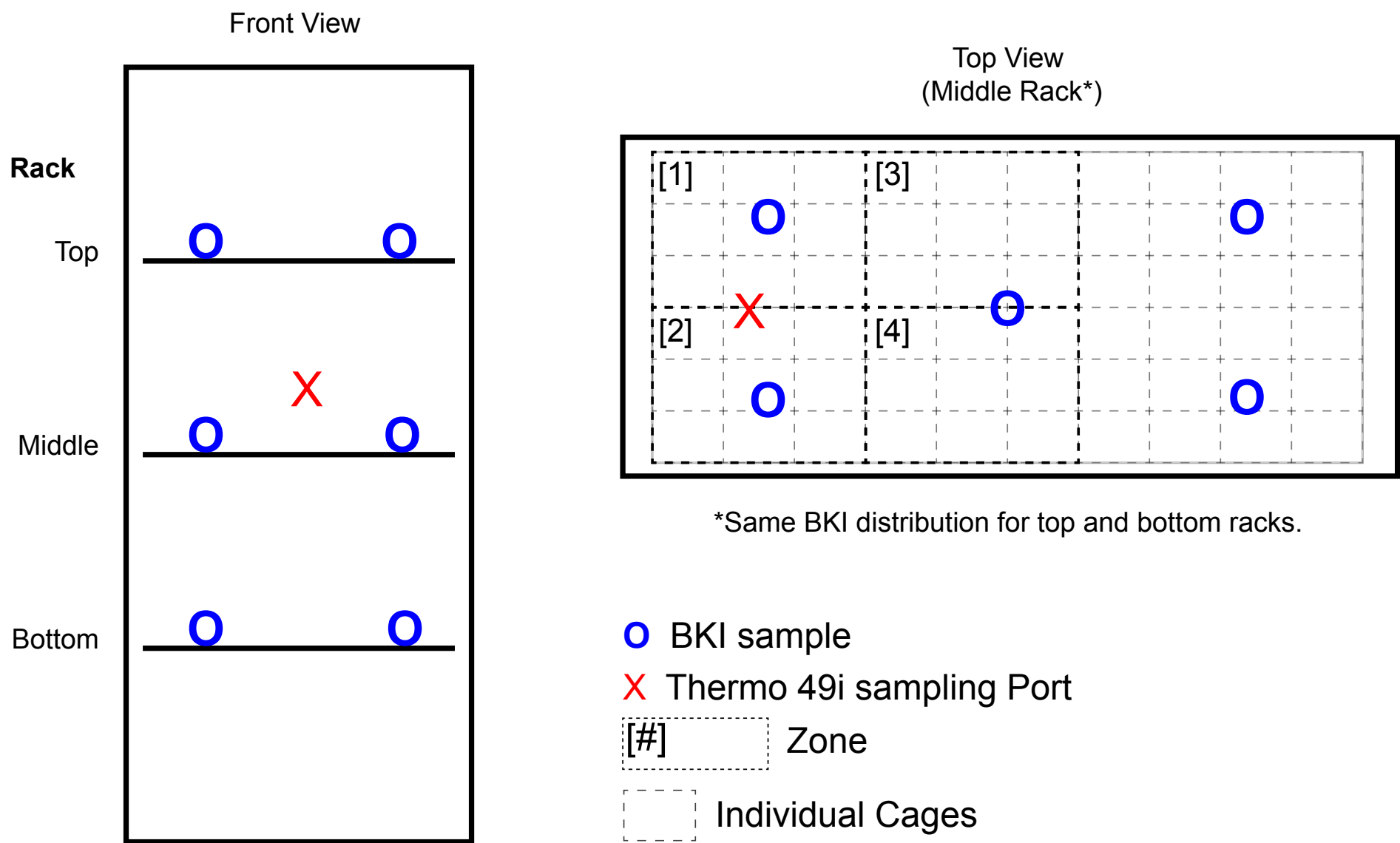


# **Development of a large-scale computer-controlled ozone inhalation exposure system for rodents**

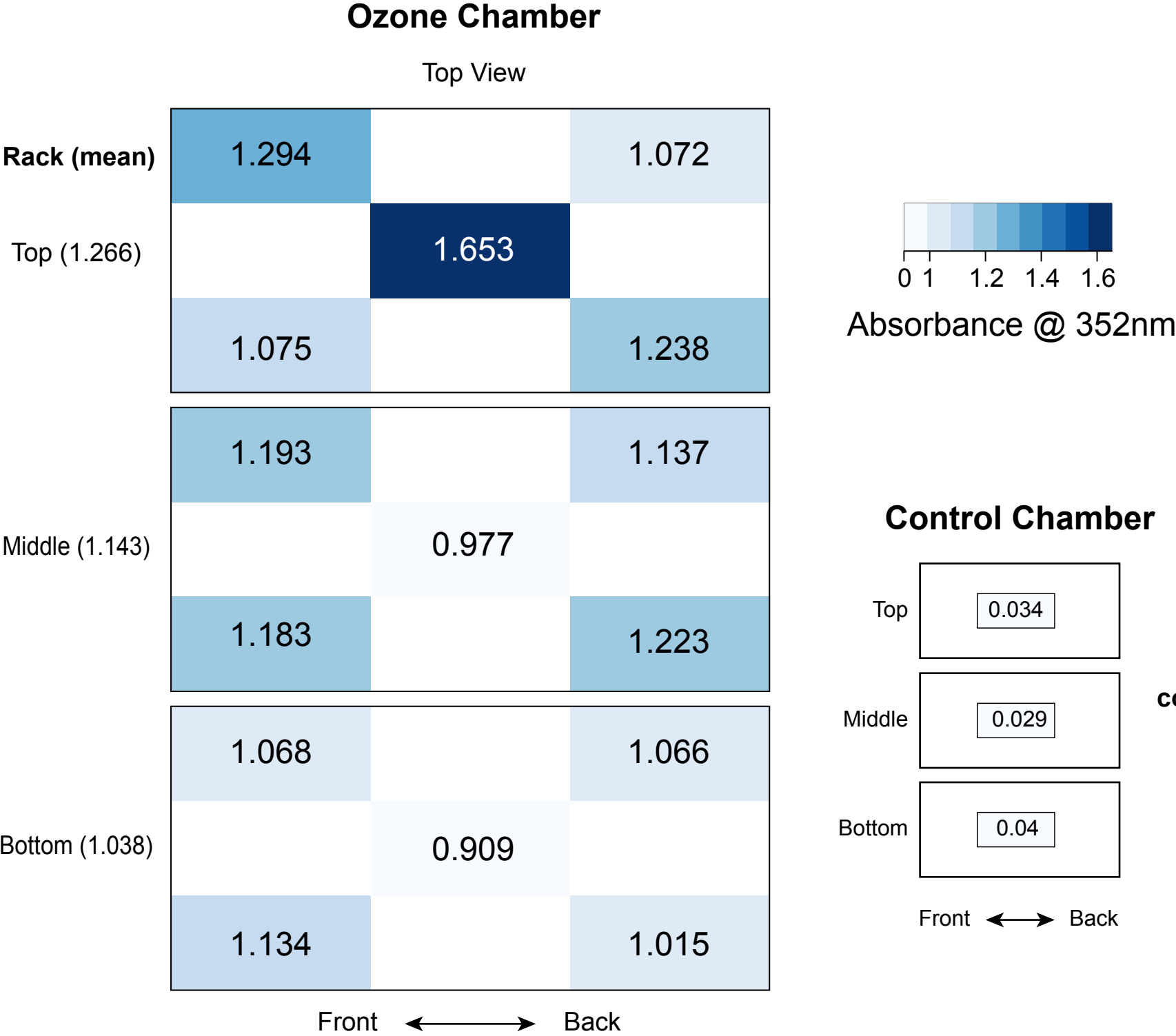
Gregory J. Smith<sup>a,\*</sup>, Leon Walsh<sup>b</sup>, Mark Higuchi<sup>b</sup>, and Samir N. P. Kelada<sup>a</sup>

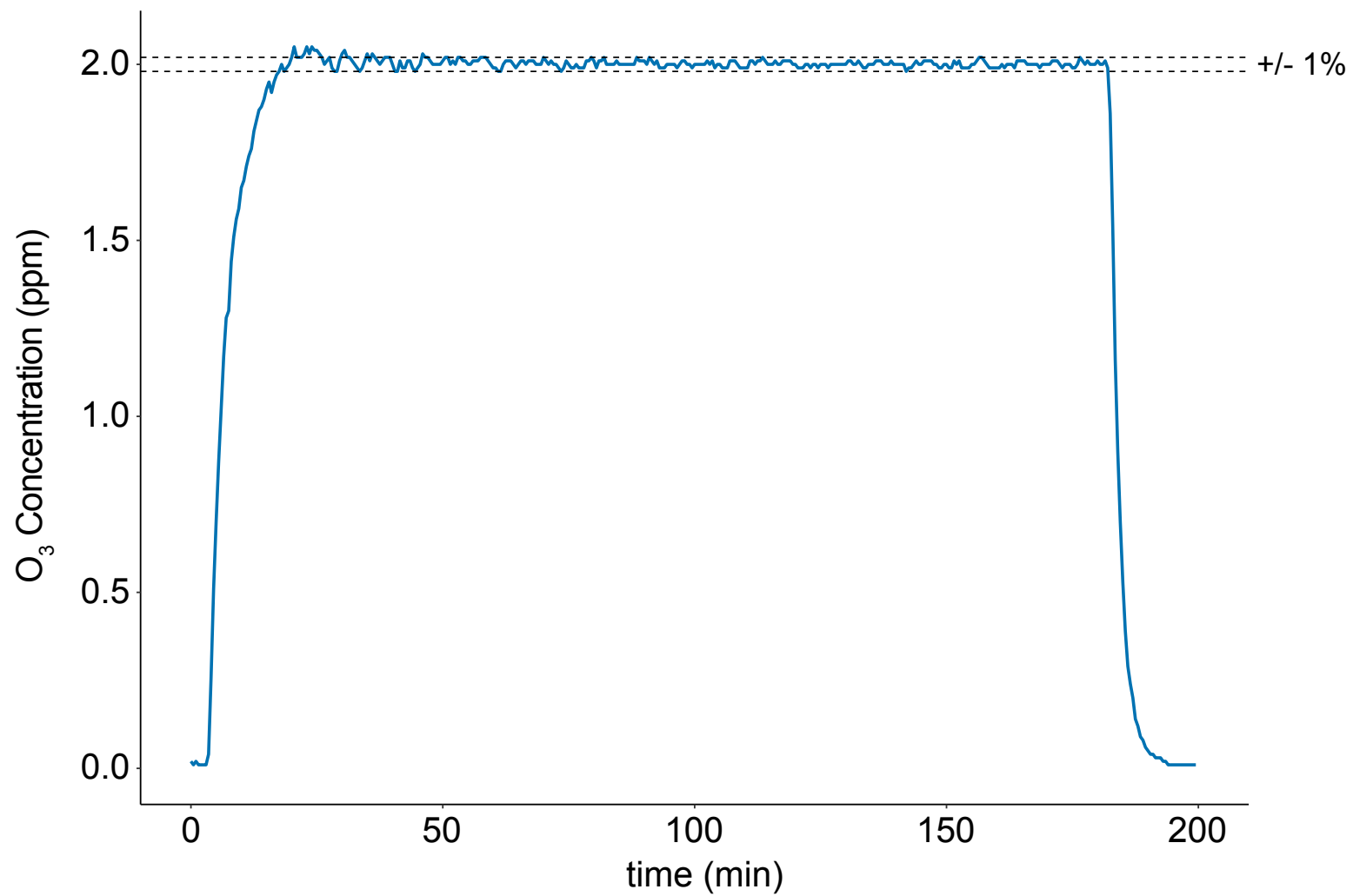
*<sup>a</sup>Department of Genetics, Curriculum in Toxicology & Environmental Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA; <sup>b</sup>United States Environmental Protection Agency, Research Triangle Park, NC, USA*

Ozone Chamber

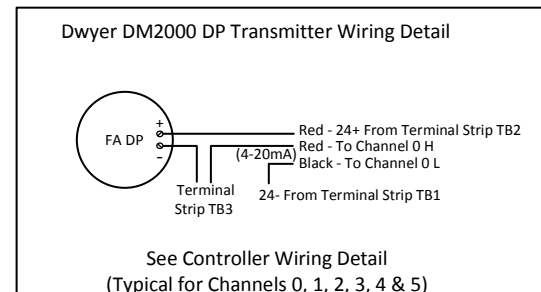
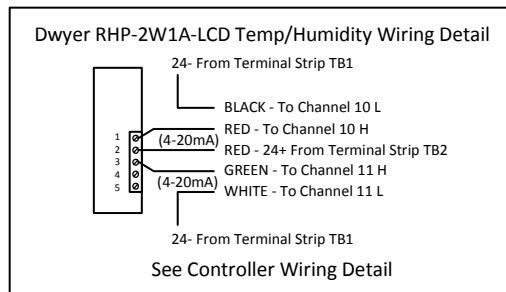
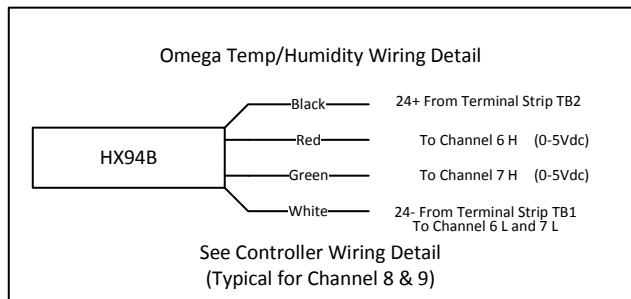
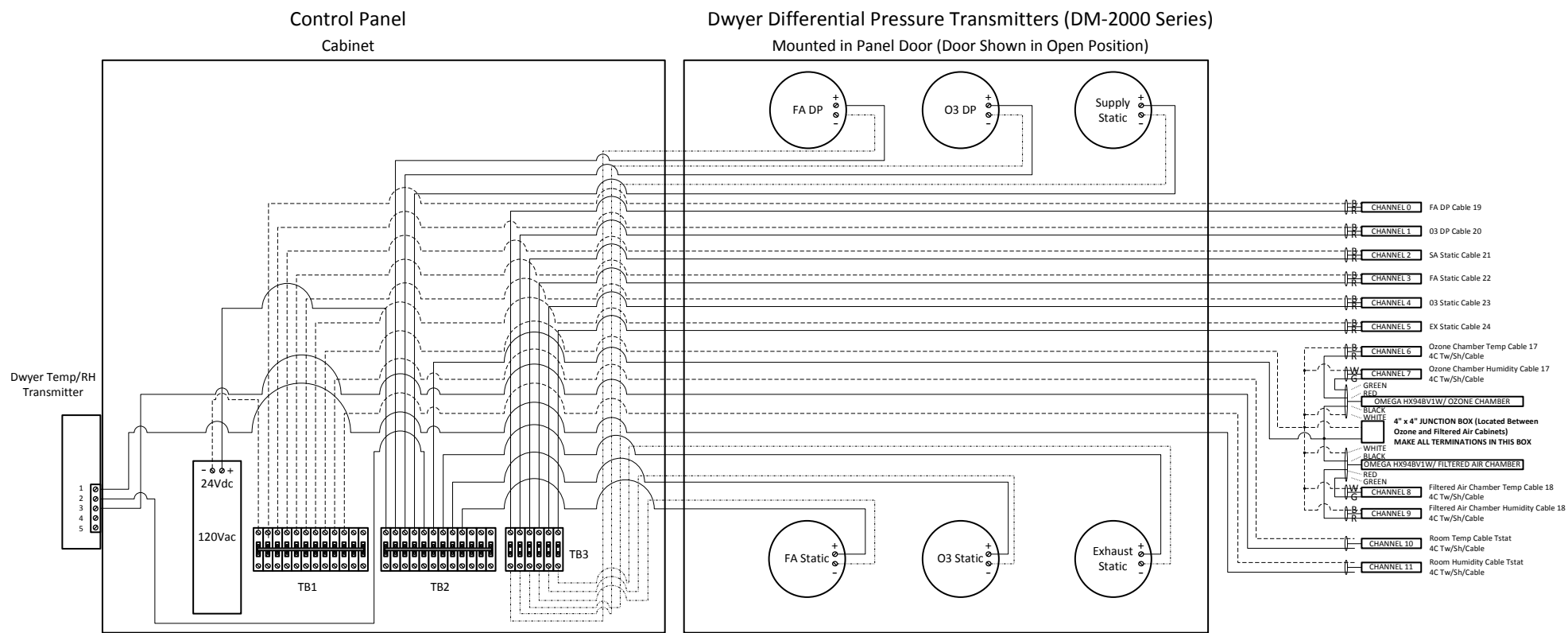


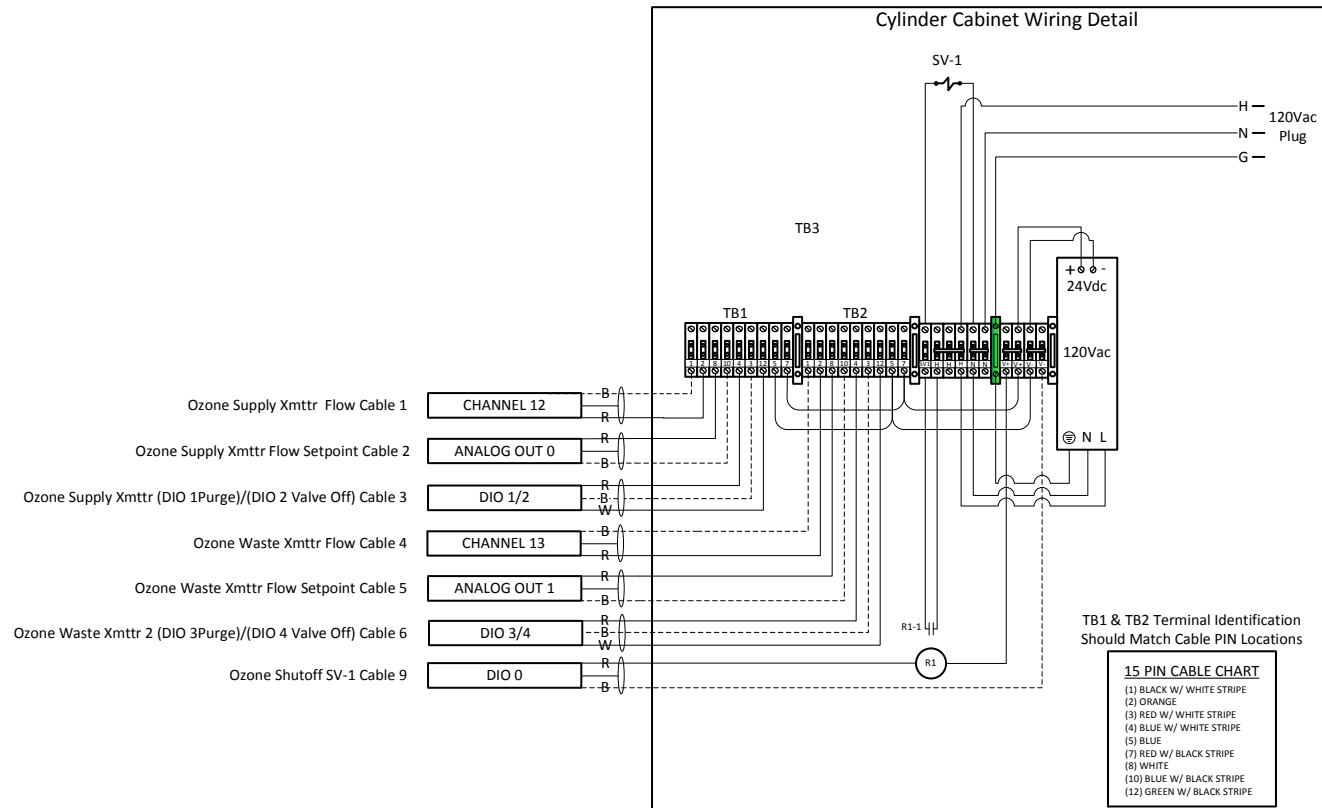
**Supplemental Figure 1.** Location of Thermo49i sampling port, BKI assay dishes, and zones for modeling the effect of subject placement on biological response.





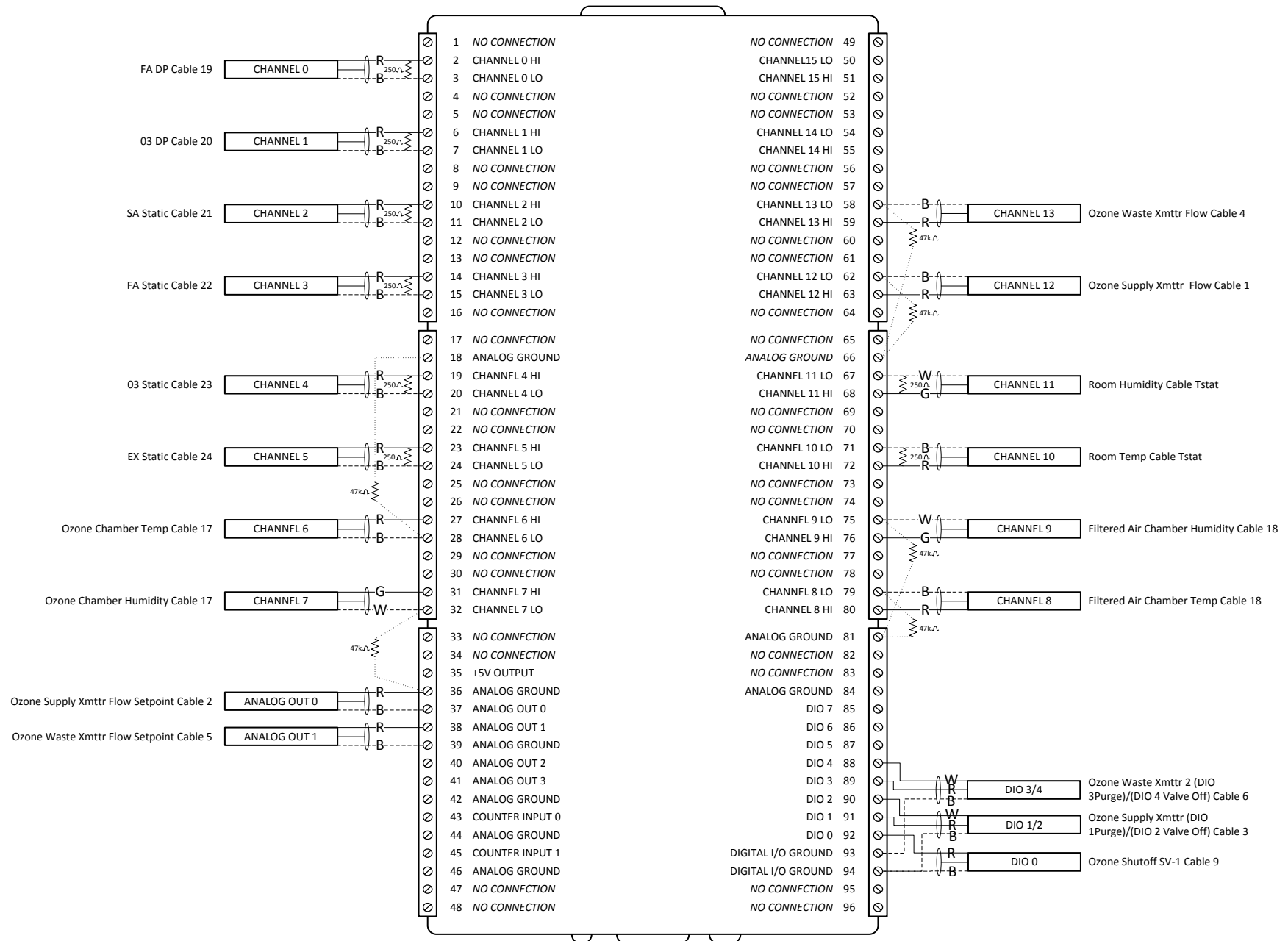
**Supplemental Figure 3.** Concentration profile of an exposure conducted with 50 mice present in the chamber. Plot represents a 30-second running average concentration over time.





PIN #	Function
1	0-5Vdc Flow Signal Common
2	0-5Vdc Flow Signal Output
3	Common
4	Purge
5	Power Supply Common
7	Power Supply +24Vdc
8	Remote Setpoint Input
10	Remote Setpoint Common
12	Valve Off Control
1 & 2	0-5Vdc Flow Signal Output
3 & 4	Purge
3 & 12	Valve Off Control
5 & 7	24 Vdc Power Supply to Mass Flow Controller
8 & 10	0-5Vdc Remote Setpoint

## Gas Cylinder Cabinet Wiring



USB-2416-4AO Multi Functional DAQ Device Wiring

Point Address	Point Type	Point Description	Cable #	Wire Color	Further Description
DO0	Digital Output	Solenoid Valve SV-1	9	Red	Relay 5 in Cylinder Cabinet/120V Omega Solenoid
Ground				Black	Connected to Relay 5 Common
DO1	Digital Output	Mass Flow Xmttr 1 Purge	3	Red	Relay 1 in Cylinder Cabinet/Connected to PIN 4 AALBORG 15 PIN Cable
Ground				Black	Relay 1 & 2 in Cylinder Cabinet
DO2	Digital Output	Mass Flow Xmttr 1 Valve Off	6	White	Relay 2 in Cylinder Cabinet/Connected to PIN 12 AALBORG 15 PIN Cable
DO3	Digital Output	Mass Flow Xmttr 2 Purge		Red	Relay 3 in Cylinder Cabinet/Connected to PIN 4 AALBORG 15 PIN Cable
Ground				Black	Relay 3 & 4 in Cylinder Cabinet
DO4	Digital Output	Mass Flow Xmttr 2 Valve Off		White	Relay 4 in Cylinder Cabinet/Connected to PIN 12 AALBORG 15 PIN Cable
AO0	0-5Vdc	Mass Flow Xmttr 1 Flow Setpoint	2	Red	Connected to PIN 8 AALBORG 15 PIN Cable
Ground				Black	Connected to PIN 10 AALBORG 15 PIN Cable
AO1	0-5Vdc	Mass Flow Xmttr 2 Flow Setpoint	5	Red	Connected to PIN 8 AALBORG 15 PIN Cable
Ground				Black	Connected to PIN 10 AALBORG 15 PIN Cable
Channel 0 Hi	4-20mA*	Filtered Air Chamber Differential	19	Red	COM on Dwyer DP Xmttr
Channel 0 Lo				Black	Power Supply Ground
Channel 1 Hi	4-20mA*	Ozone Chamber Differential	20	Red	COM on Dwyer DP Xmttr
Channel 1 Lo				Black	Power Supply Ground
Channel 2 Hi	4-20mA*	Supply Air Static	21	Red	COM on Dwyer DP Xmttr
Channel 2 Lo				Black	Power Supply Ground
Channel 3 Hi	4-20mA*	Filtered Air Chamber Static	22	Red	COM on Dwyer DP Xmttr
Channel 3 Lo				Black	Power Supply Ground
Channel 4 Hi	4-20mA*	Ozone Cabinet Static	23	Red	COM on Dwyer DP Xmttr
Channel 4 Lo				Black	Power Supply Ground
Channel 5 Hi	4-20mA*	Exhaust Static	24	Red	COM on Dwyer DP Xmttr
Channel 5 Lo				Black	Power Supply Ground
Channel 6 Hi	0-5Vdc**	Ozone Chamber Temperature	17	Red	Connected to Red Lead Wire on OMEGA HX94B
Channel 6 Lo		Common		Black	Connected to White Lead Wire on OMEGA HX94B
Channel 7 Hi	0-5Vdc**	Ozone Chamber Humidity		Green	Connected to Green Lead Wire on OMEGA HX94B
Channel 7 Lo		Common		White	Connected to White Lead Wire on OMEGA HX94B
Channel 8 Hi	0-5Vdc**	Filtered Air Chamber Temperature	18	Red	Connected to Red Lead Wire on OMEGA HX94B
Channel 8 Lo		Common		Black	Connected to White Lead Wire on OMEGA HX94B
Channel 9 Hi	0-5Vdc**	Filtered Air Chamber Humidity		Green	Connected to Green Lead Wire on OMEGA HX94B
Channel 9 Lo		Common		White	Connected to White Lead Wire on OMEGA HX94B
Channel 10 Hi	4-20mA*	Room Temperature	T'Stat	Red	Connected to Terminal 1 on Dwyer RHP-2W1X-LCD Xmttr
Channel 10 Lo		Common		Black	Connected to TB1 in Wall Cabinet
Channel 11 Hi	4-20mA*	Room Humidity		Green	Connected to Terminal 3 on Dwyer RHP-2W1X-LCD Xmttr
Channel 11 Lo		Common		White	Connected to TB1 in Wall Cabinet
Channel 12 Hi	0-5Vdc**	Mass Flow Xmttr 1 Flow	1	Red	Connected to PIN 2 AALBORG 15 PIN Cable
Channel 12 Lo		Common		Black	Connected to PIN 1 AALBORG 15 PIN Cable
Channel 13 Hi	0-5Vdc**	Mass Flow Xmttr 2 Flow	4	Red	Connected to PIN 2 AALBORG 15 PIN Cable
Channel 13 Lo		Common		Black	Connected to PIN 1 AALBORG 15 PIN Cable
Channel 14 Hi		Not Used			
Channel 14 Lo		Not Used			
Channel 15 Hi		Not Used			
Channel 15 Lo		Not Used			

\* 4-20mA Inputs require a 250 Ohm resistor to be wired from Channelx Hi and Lo terminals of the USB-2416-4AO DAQ Device.

\*\* 0-5Vdc Inputs require a 47k Ohm resistor to be wired from Channelx Lo to Analog Ground on the USB-2416-4AO DAQ Device.

## USB-2416-4AO Multi Functional DAQ Device Wiring Detail