

Table S1. Effects of chronic developmental hypoxia on body mass and cardiovascular parameters in avians, reptiles and fish

AVIANS	Stage	Body Temp (°C)	[O ₂] Control	[O ₂] Hypoxia	(A) Body mass		(B) Heart mass		(C) Heart-body weight ratio	(D) Heart rate		(E) O ₂ carrying capacity	(F) Mito capacity		(G) Cardiac Fibrosis		(H) Sympathetic activity	
					Emb	Juv or Adult	Emb	Juv or Adult	Emb	Emb	Juv or Adult	Emb	Emb	Juv or Adult	Emb	Juv or Adult	Emb	Juv or Adult
Gallus gallus domesticus (leghorn): 20-21 days	1-6 doi	37.5	21%O ₂	15%O ₂	↓ ¹ — ²		— ^{1,2}	— ¹				— ¹						
	6-12 doi	37.5	21%O ₂	15%O ₂	↓ ¹		↑ ¹	— ¹				↑ ¹						
	6-19 doi	38	21%O ₂	15%O ₂	↓ ³⁻⁷	— ⁴	↑ ³ — ⁵ ↓ ⁶		↑ ^{3,5} — ⁶				↓ ⁶				↑ ⁷	
	7-14	37.5	21%O ₂	15%O ₂	↓ ⁸							↑ ⁸						
	12-18 doi	37.5	21%O ₂	15%O ₂	↓ ¹		— ¹	— ¹				— ¹						
	16-18 doi	37.5	21%O ₂	15%O ₂	↓ ⁹		↓ ⁹											
	0-19 & 1-20 doi	37.5	21%O ₂	15%O ₂	↓ ¹⁰⁻¹⁶		↓ ^{10,15}		— ¹⁰ ↑ ^{11,13}	— ^{14,16}		↑ ^{12,15}				↑ ¹⁵		
	0-21 doi	37.5	21% O ₂	14% O ₂	↓ ^{17,18}		↓ ^{17,18}					↑ ^{17,18}						
	1-21 doi	38	21%O ₂	HB: 13%O ₂	↓ ¹⁹												↑ ¹⁹	
	0-20 doi	38	21% O ₂	HB: 13%O ₂	↓ ²⁰							↑ ²⁰						

AVIANS	Stage	Body Temp (°C)	[O ₂] Control	[O ₂] Hypoxia	(A) Body mass		(B) Heart mass		(C) Heart-body weight ratio	(D) Heart rate		(E) O ₂ carrying capacity		(F) Mito capacity		(G) Cardiac Fibrosis		(H) Sympathetic activity	
					Emb	Juv or Adult	Emb	Juv or Adult	Emb	Emb	Juv or Adult	Emb	Emb	Juv or Adult	Emb	Juv or Adult	Emb	Juv or Adult	
Gallus gallus domesticus (bovans brown): 20-21 days	1-21 doi	37.9	21%O ₂	14%O ₂	↓ ^{21,23}	↓ ²³	↑ ²¹		— ²¹			↑ ^{22,23}	↓ ²²						↑ ²³
Gallus gallus domesticus (broiler): 20-21 days	1-21 or 0-19 doi	37.8	21%O ₂	14%O ₂	↓ ^{24,26}	— ²⁴ ↓ ²⁵	— ²⁵	— ²⁵	↑ ²⁴	— ²⁶							— ²⁵	↑ ^{24,26}	↓ ²⁴ ↑ ²⁵
	1-20 doi	37.8	21%O ₂	15%O ₂	↓ ¹⁰		↓ ¹⁰		↓ ¹⁰										
	6-19 doi	37.8	21%O ₂	15%O ₂	↓ ⁴	↓ ⁴	↑ ⁴												
	9-19	37.8	21%O ₂	17%O ₂	— ²⁷		— ²⁷												
		38.9	21%O ₂	17%O ₂	— ²⁷		— ²⁷												
Gallus gallus (red junglefowl): 19-21 days	1-20 doi	37.8	21%O ₂	15%O ₂	↓ ¹⁰		↓ ¹⁰		↓ ¹⁰										
Branta canadensis (Canada goose) 28 days	0-28	37	16%O ₂	12%O ₂	— ^{28,29}							↑ ²⁹							
Anser indicus (bar-headed goose): 27-30 days	0-28	37	16%O ₂	12%O ₂	— ²⁸														

REPTILES	Stage	Body Temp (°C)	[O ₂] Control	[O ₂] Hypoxia	(A) Body mass		(B) Heart mass		(C) Heart-body weight ratio	(D) Heart rate		(E) O ₂ carrying capacity	(F) Mito capacity		(G) Cardiac Fibrosis		(H) Sympathetic activity	
					Emb	Juv or Adult	Emb	Juv or Adult	Emb	Emb	Juv or Adult	Emb	Emb	Juv or Adult	Emb	Juv or Adult	Emb	Juv or Adult
American alligator (<i>Alligator mississippiensis</i>): 63-68 days	0-90%	30	21%O ₂	10%O ₂	↓ ^{30,34}	— ³⁵⁻³⁷ ↓ ^{38,39}	— ^{30,31}		↑ ^{30,31}	↓ ^{30,33,34}	— ³⁵	↑ ⁴⁰	— ³⁸	↑ ³⁸				
	0-80%	30	21%O ₂	10%O ₂	↓ ^{30,34}		— ³⁰		↑ ³⁰	↓ ³⁴ — ³⁰								
	0-70%	30	21%O ₂	10%O ₂	— ³⁰ ↓ ^{33,34}		— ³⁰		— ³⁰	— ³⁰ ↓ ^{33,34}							↑ ³⁴	
	0-60%	30	21%O ₂	15%O ₂	— ³⁰		— ³⁰		— ³⁰	— ³⁰								
	0-90%	30	21%O ₂	15%O ₂	— ³⁰		— ³⁰		— ³⁰	— ³⁰								
	0-80%	30	21%O ₂	15%O ₂	— ³⁰		— ³⁰		— ³⁰	— ³⁰								
	0-70%	30	21%O ₂	15%O ₂	— ³⁰		— ³⁰		— ³⁰	— ³⁰								
	0-60%	30	21%O ₂	15%O ₂	— ³⁰		— ³⁰		— ³⁰	— ³⁰								
Snapping turtle (<i>Chelydra serpentina</i>): 80-90 days	0-90%	30	21%O ₂	10%O ₂	↓ ⁴¹⁻⁴³	↓ ⁴⁴ — ⁴⁵⁻⁴⁷	↑ ⁴³		↑ ^{41-43,48}	— ⁴¹ ↑ ⁴²		↑ ⁴⁹		↑ ⁴⁷			↑ ⁴²	
	0-70%	30	21%O ₂	10%O ₂	↓ ⁴¹⁻⁴³		— ⁴³		↑ ^{41,42,48} — ⁴³	— ^{41,42}				↑ ³⁸			↑ ⁴²	

REPTILES	Stage	Body Temp (°C)	[O ₂] Control	[O ₂] Hypoxia	(A) Body mass		(B) Heart mass		(C) Heart-body weight ratio	(D) Heart rate		(E) O ₂ carrying capacity	(F) Mito capacity		(G) Cardiac Fibrosis		(H) Sympathetic activity	
					Emb	Juv or Adult	Emb	Juv or Adult	Emb	Emb	Juv or Adult	Emb	Emb	Juv or Adult	Emb	Juv or Adult	Emb	Juv or Adult
Florida red-bellied turtle (Pseudemys Nelson): 45-80 days	0-90%	30	21%O ₂	10%O ₂	↓ ⁴⁹		— ⁴⁹		↑ ⁴⁹			↑ ⁴⁹						
Leopard gecko (Eublepharis macularius): 45-53 days	0-70%	34	21%O ₂	Regional hypoxia	↓ ⁵⁰		↓ ⁵⁰		↑ ⁵⁰					↑ ³⁸				
	0-70%	28	21%O ₂	Regional hypoxia	↓ ⁵⁰		↓ ⁵⁰		↑ ⁵⁰									
Banded red snake (Lycodon rufozonatu): 50 days	10-100%	28	21%O ₂	Regional hypoxia	— ⁵¹				↑ ⁵¹									
Chinese softshell turtle (Pelodiscus sinensis): 60 days	0-100%	28	21%O ₂	Regional hypoxia	— ⁵¹				— ⁵¹									
Common wall lizard (Podarcis muralis): 42-77 days	0-100%	24	21%O ₂	HB 15%O ₂	↓ ⁵²		↑ ⁵²				↓ ^{52,53}							
	0-100%	24	21%O ₂	HB 17%O ₂	— ⁵³						↓ ⁵³							

Viperine snake (<i>Natrix maura</i>)	0-100%	24	21%O ₂	HB 15%O ₂	— ⁵⁴					— ⁵⁴								
	0-100%	28	21%O ₂	HB 15%O ₂	↓ ⁵⁵					↑ ⁵⁵								
	0-100%	32	21%O ₂	HB 15%O ₂	↓ ⁵⁴					↓ ⁵⁴								
Class and species	Stage	Body Temp (°C)	[O₂] Control	[O₂] Hypoxia	(A) Body mass		(B) Heart mass		(C) Heart-body weight ratio	(D) Heart rate		(E) O₂ carrying capacity	(F) Mito capacity		(G) Cardiac Fibrosis		(H) Sympathetic activity	
FISH					Emb	Juv or Adult	Emb	Juv or Adult	Emb	Emb	Juv or Adult	Emb	Emb	Juv or Adult	Emb	Juv or Adult	Emb	Juv or Adult
Zebrafish (<i>Danio rerio</i>): 3-4 days	0-2 dpf	25	6.5 mg/L	0.8 mg/L						↓ ⁵⁶								
	1-5 dpf	25	7.5 mg/L	3.8 mg/L	— ⁵⁷		↑ ⁵⁷			↑ ⁵⁷								
	0-1 dpf	28	7.5 mg/L	4.3 mg/L	— ⁵⁸	↓ ⁵⁸				— ⁵⁸								
	0-1 dpf	28	6.5 mg/L	0.6 mg/L	↓ ⁵⁹													
	2-4 dpf	28	100%	5%									↓ ⁶⁰					
	0-4 dpf	28	6 mg/L	1-2 mg/L			↓ ^{61,62}			↓ ^{61,62}								
	1-15 dpf	28	7.5 mg/L	3.3 mg/L	↓ ⁶³							↑ ⁶³						
	1-5 dpf	28	7.5 mg/L	3.8 mg/L	— ⁵⁷		↑ ⁵⁷			↑ ⁵⁷								
	5-9 dpf	28	7.5 mg/L	1.5 mg/L						↓ ⁶⁴							↑ ⁶⁴	
	1-5 dpf	28	7.5 mg/L	1.5 mg/L			↑ ⁶⁵			↓ ⁶⁵		↑ ⁶⁵						
	1-10 dpf	28	7.5 mg/L	1.5 mg/L			↑ ⁶⁵			↑ ⁶⁵		↑ ⁶⁵						
	0-10 dpf	28	7.5 mg/L	1.5 – 1.9 mg/L						↓ ⁶⁶								
	0-12 dpf	25	6.5 mg/L	0.8 mg/L						↓ ⁵⁶								

Class and species	Stage	Body Temp (°C)	[O ₂] Control	[O ₂] Hypoxia	(A) Body mass		(B) Heart mass		(C) Heart-body weight ratio	(D) Heart rate		(E) O ₂ carrying capacity	(F) Mito capacity		(G) Cardiac Fibrosis		(H) Sympathetic activity	
					Emb	Juv or Adult	Emb	Juv or Adult		Emb	Emb		Juv or Adult	Emb	Juv or Adult	Emb	Juv or Adult	Emb
FISH																		
	0-3 dpf	28	7.5 mg/L	1.5 – 1.9 mg/L						↓ ⁶⁶								
	0-30 dpf	28	7.5 mg /L	4.3 mg /L	— ⁵⁸	↓ ⁵⁸				↑ ⁵⁸								
	1-5 dpf	31	7.5 mg/L	3.8 mg/L	— ⁵⁷		↑ ⁵⁷			↑ ⁵⁷								
Rainbow trout (<i>Oncorhynchus mykiss</i>): 60-90 days	25-36 dpf	10	10 mg /L	5 mg /L	↓ ⁶⁷													
	0-57 dpf	11	100%	34%	↓ ⁶⁸	↑ ⁶⁸												
	0-45 dpf	10	100%	30%	↓ ⁶⁹						↑ ⁶⁹							
Chinook salmon (<i>Oncorhynchus tshawytsch</i>): 90-150 days	0-1 dph	10	10 mg /L	5.5 mg /L		↓ ⁷⁰												
	0-1 dph	15	10 mg /L	5.5 mg /L		↓ ⁷⁰												
Small-spotted catshark (<i>Scyliorhinus canicula</i>): 240-270 days	0-28 wpf	15 and 20	100% air sat	50% air sat	— ⁷¹													
Grass carp (<i>Ctenopharyngodon idellus</i>): 1-3 days	0-1 dpf	22	7.0 mg/L	1.0 mg/L	↓ ⁷²													

Class and species	Stage	Body Temp (°C)	[O ₂] Control	[O ₂] Hypoxia	(A) Body mass		(B) Heart mass	(C) Heart-body weight ratio		(D) Heart rate		(E) O ₂ carrying capacity	(F) Mito capacity		(G) Cardiac Fibrosis		(H) Sympathetic activity	
					Emb	Juv or Adult	Emb	Juv or Adult	Emb	Juv or Adult	Emb	Juv or Adult	Emb	Juv or Adult	Emb	Juv or Adult	Emb	Juv or Adult
European seabass (<i>Dicentrarchus labrax</i>): 9 days	28-50 dph	15	7.35 mg/L	2.95 mg/L	— ⁷³	↓ ⁷³												
	28-50 dph	20	7.35 mg/L	2.95 mg/L	— ⁷³	— ⁷³												
	30-38 dph	19	9.3 mg/L	3,7 mg/L		↓ ⁷⁴												
Atlantic salmon (<i>Salmo salar</i>): 57-75 days	0-100 dpf	8	11.9 mg/L	5.96 mg/L		— ⁷⁵												

Abbreviations: HB, hypobaric hypoxic; dpf, days post fertilisation; dph, days post hatch; wpf, weeks post-fertilisation; di, days of incubation; %O₂, % oxygen saturation. Average gestation period for each species is given for each species in column 1.

Table S2. Effects of chronic developmental hypoxia on mammalian body mass and cardiovascular parameters

MAMMALS	Stage (GD)	Body Temp (°C)	[O ₂] Control	[O ₂] Hypoxia	(A) Body mass		(B) Heart mass		(C) Heart-body weight ratio	(D) Heart rate		(E) O ₂ carrying capacity	(F) Mito capacity		(G) Cardiac Fibrosis		(H) Sympathetic activity	
					Fetal	Juv or Adult	Fetal	Juv or Adult	Fetal	Fetal	Juv or Adult	Fetal	Fetal	Juv or Adult	Fetal	Juv or Adult	Fetal	Juv or Adult
Rat (<i>Rattus norvegicus</i>): 21-23 days	6-20	37	21%O ₂	13%O ₂	— ⁷⁶⁻⁷⁸	— ⁷⁷	— ^{76,77}	— ⁷⁷	— ^{76,77}		— ⁷⁷	↑ ⁷⁸	↓ ⁷⁹ — ⁷⁹					↑ ⁷⁷
	10-20	37	21%O ₂	12%O ₂						— ⁸⁰								↑ ⁸⁰
	15-20	37	21%O ₂	10%O ₂	↓ ^{81,82}	— ⁸¹	— ⁸²	— ⁸²	— ⁸²		— ⁸¹	↑ ⁸²						
	15-21	37	21%O ₂	10.5%O ₂	↓ ⁸³		— ⁸³		↑ ⁸³							↑ ⁸³		
	15-21	37	21%O ₂	12%O ₂	↓ ^{84,85}		— ⁸⁵			— ⁸⁵						↑ ⁸⁵		
	15-21	37	21%O ₂	11%O ₂	↓ ⁸⁶	— ⁸⁶	↑ ⁸⁶		↑ ⁸⁶								↑ ⁸⁶	
Mouse (<i>Mus musculus</i>): 19-21 days	14-20	37	21%O ₂	12%O ₂	↓ ⁸⁷	— ⁸⁷											↑ ⁸⁷	
	6-18	37	21%O ₂	14%O ₂									↑ ⁸⁸ ↓ ⁸⁸					
Guinea pig (<i>Cavia porcellus</i>): 59-72 days	58-70	38	21%O ₂	12%O ₂	— ⁸⁹													
	49-63	38	21%O ₂	10.5%O ₂	↓ ⁹⁰		— ⁹⁰		↑ ⁹⁰						↑ ⁹⁰			
	35-60	38		Uterine Artery Constriction	— ⁹¹	↓ ⁹¹												
	25-64	38	21%O ₂	10%O ₂	↓ ⁹²								↑ ⁹² ↓ ⁹²					
	50-64	38	21%O ₂	10.5%O ₂	↓ ⁹²								— ⁹³ ↓ ⁹²	↓ ^{94,95} — ⁹⁵				

Table S3. Common pathological cardiovascular signatures in juvenile and adult vertebrates that were exposed to chronic developmental hypoxia

Pathological signatures observed in mammals from hypoxic pregnancies	Birds	Crocodylians	Squamates and testudines	Fish
Catch up growth ^{81,84,96-100}	Yes ^{4,24} (2/5)	Yes ³⁵⁻³⁷ (3/5)	Yes ⁴⁵⁻⁴⁷ (3/4)	Yes ^{68,73,75} (3/9)
Increased heart/body weight ratio ⁸⁵	Yes ^{3,5,11,13,24} (5/10)	Yes ³⁵⁻³⁹ (4/4)	Yes ^{46,47} (2/3)	Unknown
Fibrosis ^{85,101,102}	Yes ¹⁵ (1/2)	Unknown	Unknown	Unknown
Ventricular wall thinning ⁹⁹	Yes ¹⁵ (1/2)	Unknown	Unknown	Unknown
Ventricular wall thickening ¹⁰³	Yes ^{23,104} (1/3)	Unknown	Unknown	Unknown
Aortic wall thickening ¹⁰⁵	Unknown	Unknown	No ¹⁰⁶ (1/1)	Unknown
Systemic hypertension ^{22,80,100,102,105,107}	Yes ²³ (1/1)	No ¹⁰⁸ (1/1)	No ^{44,106} (2/2)	Unknown
Enhanced Sympathetic tone ^{96,98,109}	Yes ²⁴ (1/1)	Yes ^{35,36} (2/2)	Unknown	Unknown
Mitochondrial dysfunction ^{88,94,95,107}	Unknown	No ³⁸ (1/1)	No ^{45,47} (2/2)	Unknown
Increased sensitivity to hypoxia, anoxia or ischemia ^{80,81,85,98,109-111}	Unknown	No ^{36,37,108} (3/3)	No ^{46,112} (2/2)	Unknown
Diastolic dysfunction ^{85,103,109}	Yes ¹⁵ (1/3)	No ^{36,39} (2/2)	Unknown	Unknown
Systolic dysfunction ¹⁰⁷	Yes ^{15,24} (2/3)	No ^{36,39} (2/2)	Unknown	Unknown
Enhanced contractility ^{96,109}	Yes ²³ (1/2)	No ³⁶ (1/1)	Unknown	Unknown
Pulmonary hypertension ^{103,113,114}	Unknown	Unknown	No ¹⁰⁶ (1/1)	Unknown
<i>References in first column are from mammalian studies of chronic developmental hypoxia (CDH). Red and green colours indicate the presence or absence of the response, respectively. Grey colour indicates that the parameter has yet to be studied in this vertebrate class. Fractions in brackets indicate the percentage of papers that found the result (e.g. 1/3 = one in three papers found this result).</i>				

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