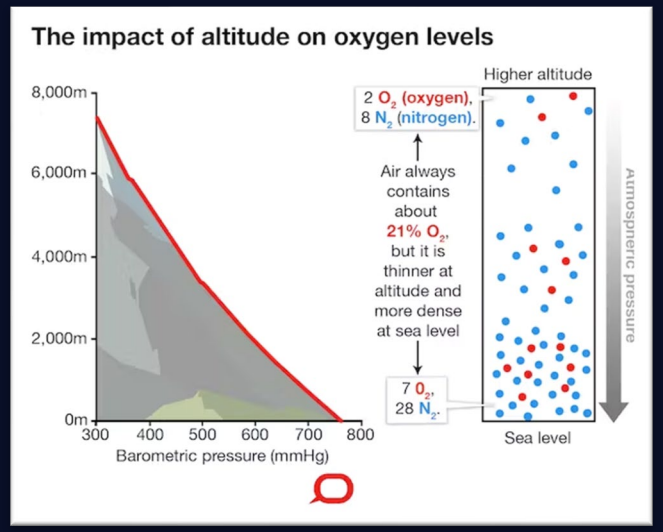
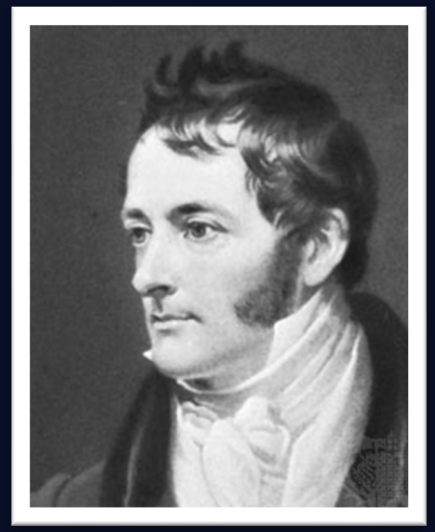
Steamboat Altitude Advantage Training Systems

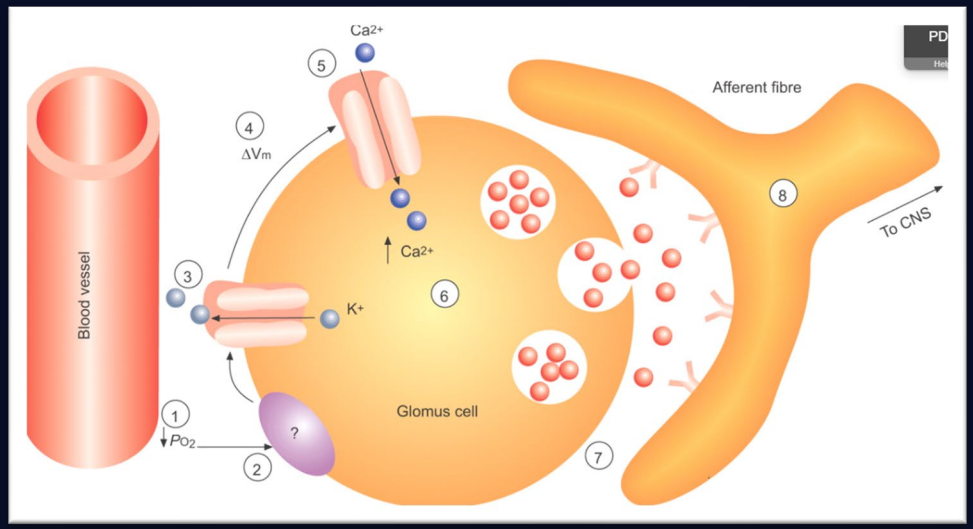
The University of Wyoming is 1 of 3 Universities above Threshold

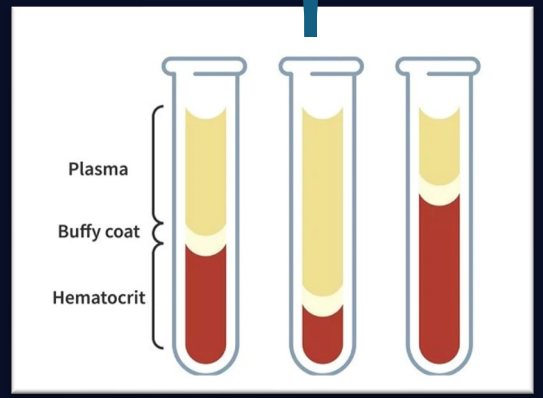
University	City	Elevation	
Wyoming	Laramie, WY	7,220 ft	2200 m
Northern Arizona	Flagstaff, AZ	6,980 ft	2128 m
Air Force	CO Springs, CO	6,620 ft	2017 m
Southern Utah	Cedar City, UT	5,796 ft	1767 m
Colorado	Boulder, CO	5,360 ft	1634 m
Colorado State	Fort Collins, CO	5,190 ft	1582 m

“Thin” air is a powerful physiological stimulus



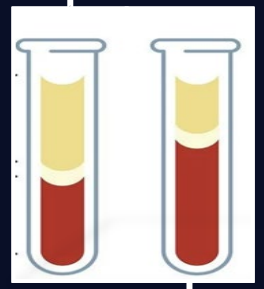




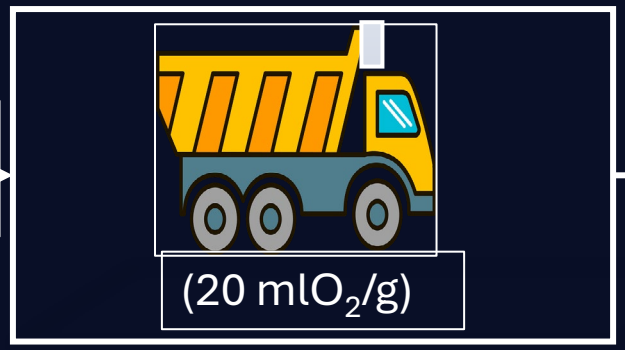


The “only” reason Why I’m not an Olympian

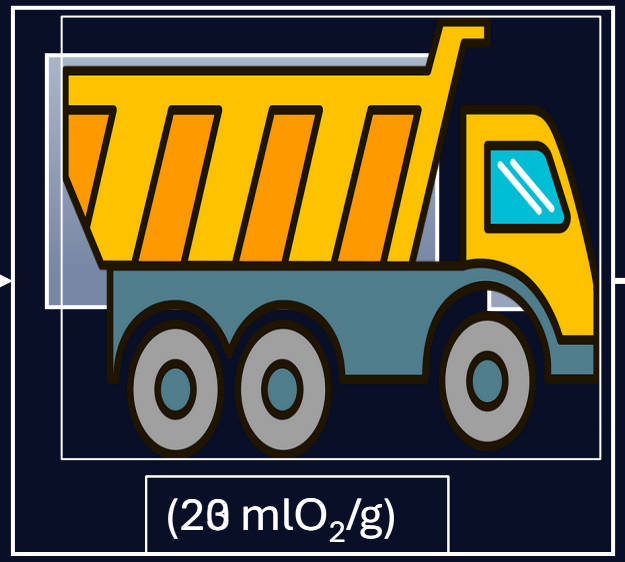
Sea Level Blood



Laramie Blood



(20 mlO_2/g)



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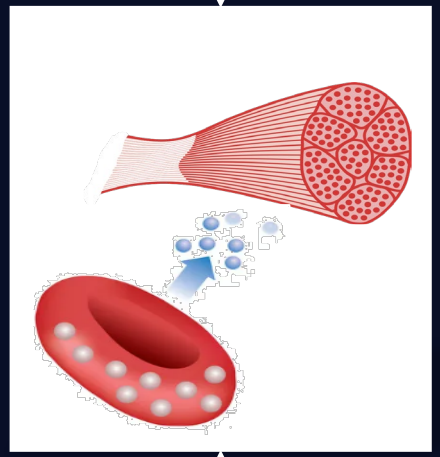
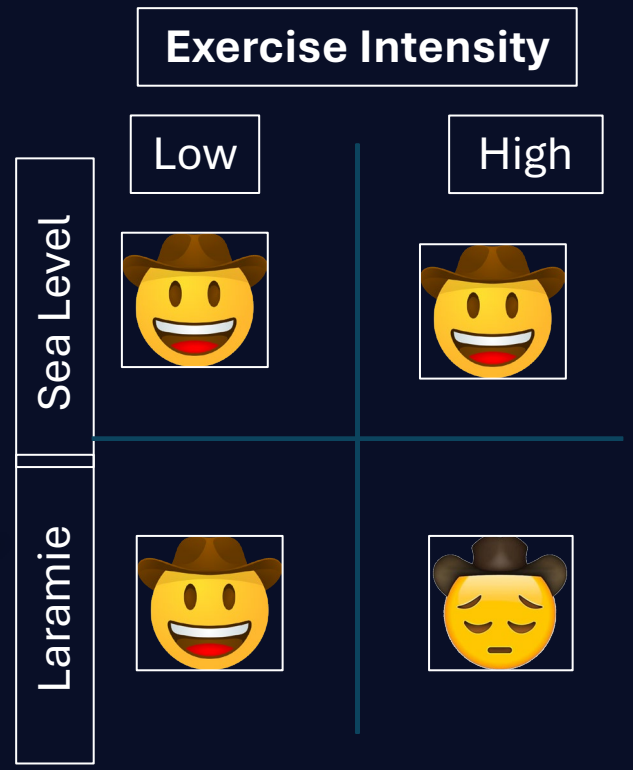
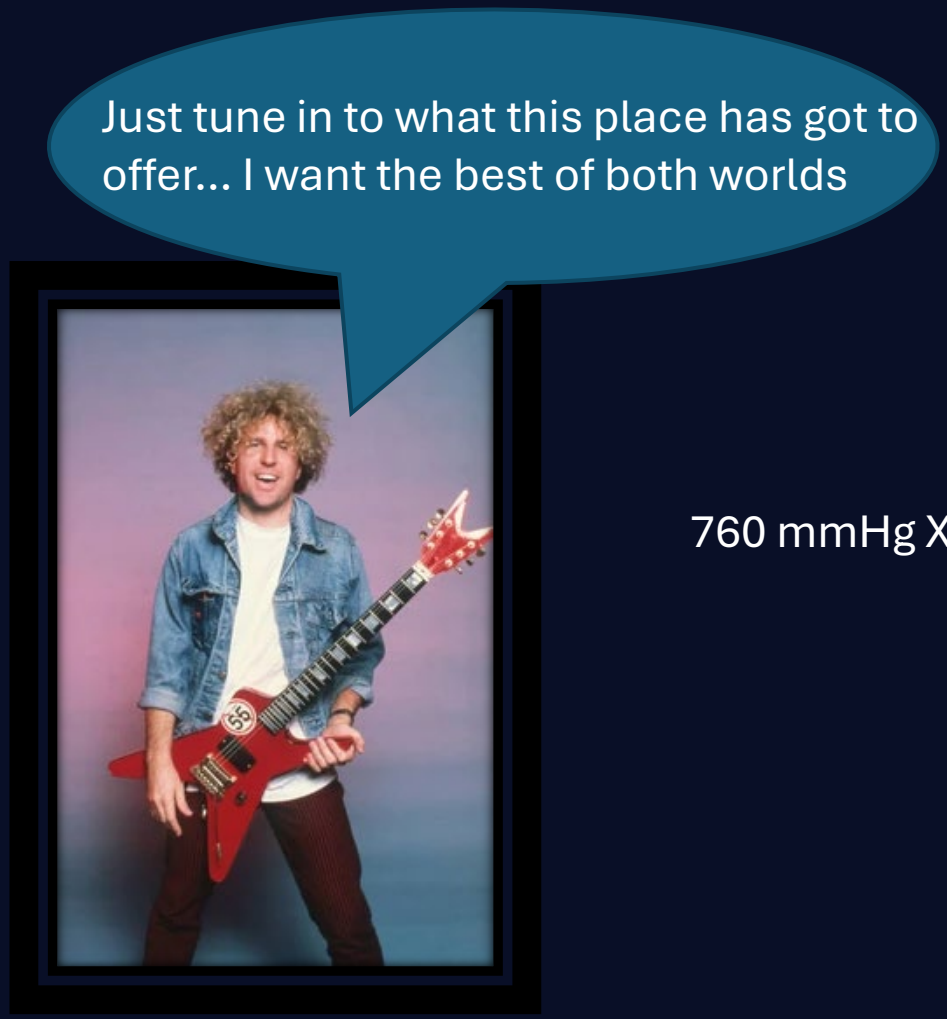


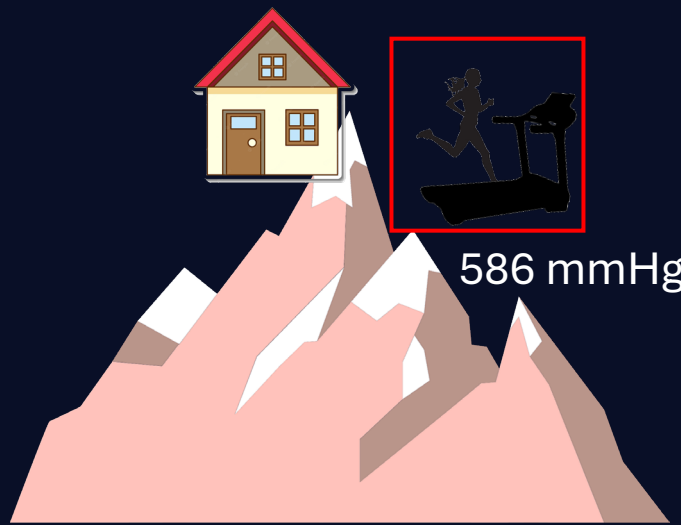


Live High , Train Low



586 mmHg X 21% = 123mmHg

760 mmHg X 21% = 159mmHg



586 mmHg X **27%** 159mmHg

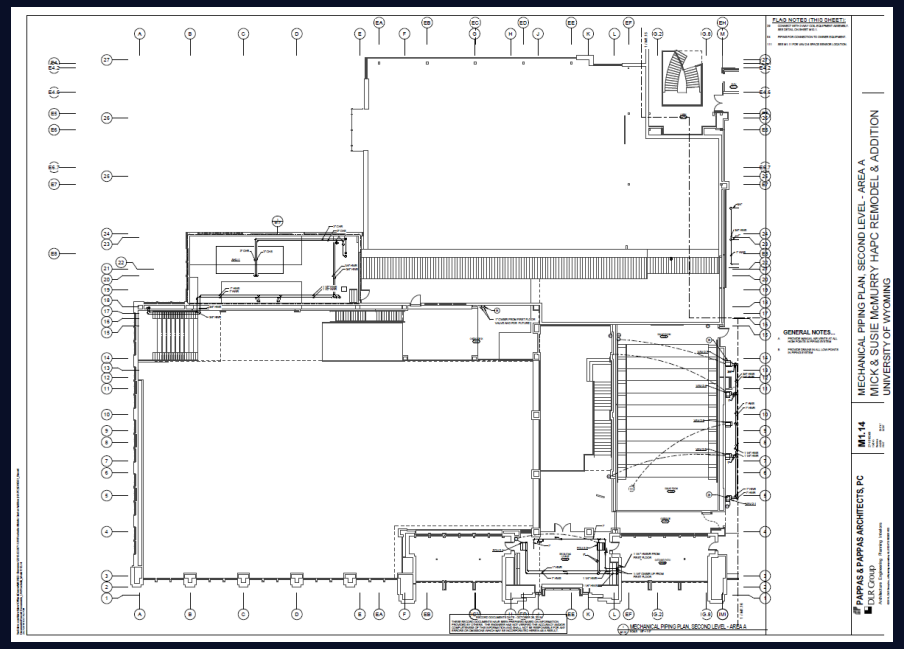
What is my vision for SAATS

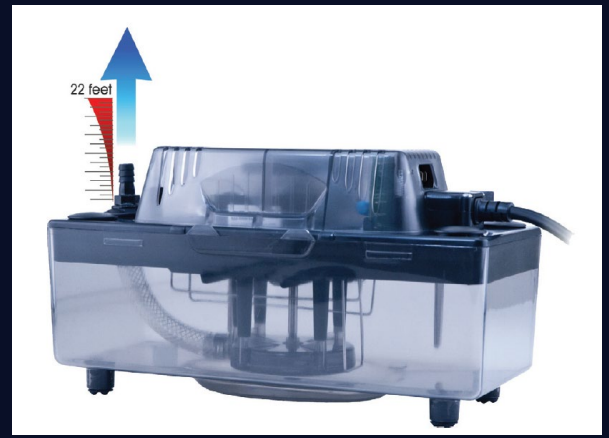
- Live High – Train Low performance cente in Laramie
  - 4-week training camps for individuals & teams
  - Live in Laramie (7,220’)
  - Train in Hyperoxic Chamber (simulated 2,000’)
    - 2-4 sessions / week of high intensity training
    - Physiological and performance testing before and after
  - Long Term – A separate business associated with UW

What have I been up to?

Cool idea! But it's too hot in there.

What have I been up to?





What have I been up to?

The HAPC altitude room is a great tool for our cross country and distance runners at UW. Being able to live at a high altitude but implement workouts at sea level is a very unique opportunity. Up to this point, we have only scratched the surface in using it because the temperatures inside the room reach levels that seem to offset the lower elevation benefits. With the ability to keep the room cooler, we will use this resource much more often and are excited to take advantage of the technology.

The basketball team specifically could benefit from utilizing the space as an acclimatization (on-boarding) process to conditioning at altitude. Many may have anxiety or angst when it comes to performing at altitude and this gives us a viable option to better prepare them physically and mentally for that task.

Pilot Study – Fall 2024

Body Composition

Participant	Bodyweight (kg)		Body Fat		Lean Mass (kg)	
	Pre	Post	Pre	Post	Pre	Post
1	58.2	57.6	21.1%	19.8%	46.0	46.2
2	64.8	63.5	20.3%	20.3%	51.6	50.6
3	70.6	70.3	9.6%	10.7%	63.8	62.8
5	64.0	64.77	36.6%	33.0%	40.6	43.4

- One athlete demonstrated a 3.6% drop in body fat while also gaining 3.4kg in lean mass! There could be some effect of hydration status making this effect look greater than physiologically possible. However, the VO2 kinetic results suggest that there was a significant change in body composition within this athlete.

Performance

Participant	Absolute VO_{2max} (L/m)		Relative VO_{2max} (mL/Kg/min)		3k Time (mm:ss)	
	Pre	Post	Pre	Post	Pre	Post
1	2.5	2.9	43.2	50.0	11:54	11:12
2	3.8	3.8	59.0	59.2	09:32	09:46
3	4.2	4.3	59.6	61.3	09:17	09:23
5	2.0	2.1	30.8	32.1	12:26	12:20

- In the 2 athletes with the greatest changes in VO2max large improvements in 3k time were evident.

Pilot Study – Fall 2024

4 x 4min Interval Training

	Avg. Ex. HR		Avg. Rec. HR		Watts		Distance (m)		Perceived Exertion	
Participant	Session 1	Session 6	Session 1	Session 6	Session 1	Session 6	Session 1	Session 6	Session 1	Session 6
1	180	179	124	117	2343	2551	2343	2551	14	12
2	181	182	143	135	2562	3555	2562	3555	14	13
3	178	176	147	128	3604	3783	3604	3783	15	15
5	177	163	130	133	2664	2734	2664	2734	13	12

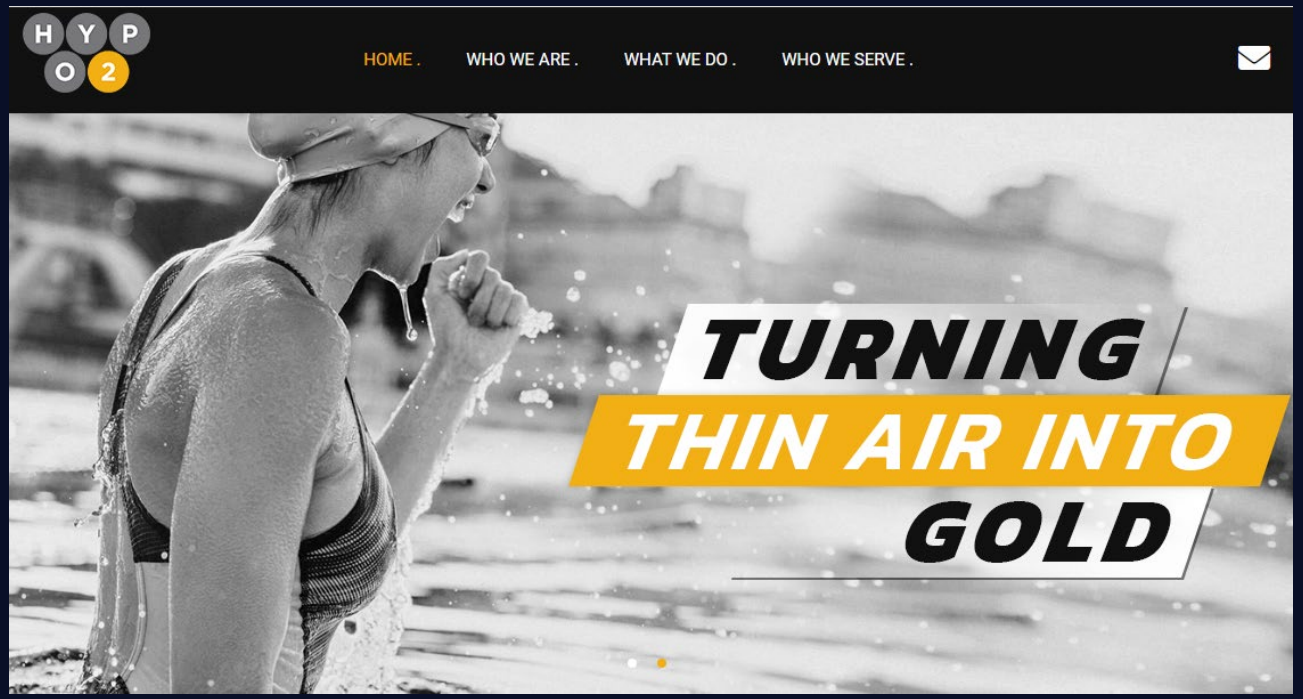
- After 4 weeks of training athletes were producing more power, at a similar heart rate, while demonstrating lower heart rates during recovery, and reporting similar or reduced perceived exertion (i.e., it felt easier to do more work).

47 x 15 second Interval Training

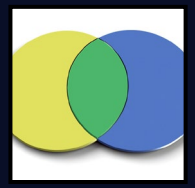
	Avg. Ex. HR		Avg. Rec. HR		Watts		Distance (m)		Perceived Exertion	
Participant	Session 1	Session 6	Session 1	Session 6	Session 1	Session 6	Session 1	Session 6	Session 1	Session 6
1	178	171	172	166	2858	3096	2835	3824	13	12
2	184	177	168	171	3958	3980	3955	3988	14	15
3	167	172	157	156	3709	3867	3781	3864	16	15
5	168	177	165	159	3218	3157	3184	3546	13	9

- Some athletes greatly increased total power output while reducing perceived exertion. Participant 5 is notable because average HR during the intervals was higher, but they still reported that the workout was much easier.

Expansion to a stand-alone business



How would SAATs improve UW & Laramie



Interdisciplinary

- Outdoor Rec & Tourism Mgmt
- STEM Fields
- Athletics

Research Potential

- Unique Data
- Grant Collaboration
- Could be 1 of 3 locations in the USA

Entrepreneurial

- Fee for service
- Separate business from UW

Economic Development

- Visit Laramie
- Laramie Chamber Business Alliance

We can dream!

ACT
ALTITUDE CONTROL TECHNOLOGY

ACT-O2™

Budgetary Estimate

Who are SAATs customers?

- Amateur teams and individual athletes
  - High school teams during summer
  - Remote workers / recreational athletes with the ability to travel during summer

- University of Wyoming Athletes
  - Distance runners
    Football
  - XC Ski

Swimming
Soccer
Basketball
Wrestling
Volleyball

TERREX

- Professional teams and individual athletes
  - USA Mountain Bike (has camps in Winter Park, CO already)


Yes
Voice
Exit
Yes
Do I care about
the organization?
No
Loyalty
Neglect
Do I feel like I can change the situation?
No

Steamboat Altitude Advantage Training Systems

1.5%