


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GENETIC POLYMORPHISMS MAY MODULATE BONE AND ENERGY METABOLISM OF MOUNTAIN CYCLING ULTRAMARATHON ATHLETE'S



BACKGROUND: The interaction between bone and energy metabolism may be enhanced in high demanding physical activities.

AIM: We hypothesize that genetic background may modulate the exercise-associated bone and energy responses of mountain cycling ultramarathon.

METHODS:

Pre-race (T₀)

n=55 Athletes

Questionnaires

- Social-demographic

- Food frequency

Body Composition

- BIA

Anthropometry

Blood samples

N=55 [Mean age 44.8 ± 7.1 years]

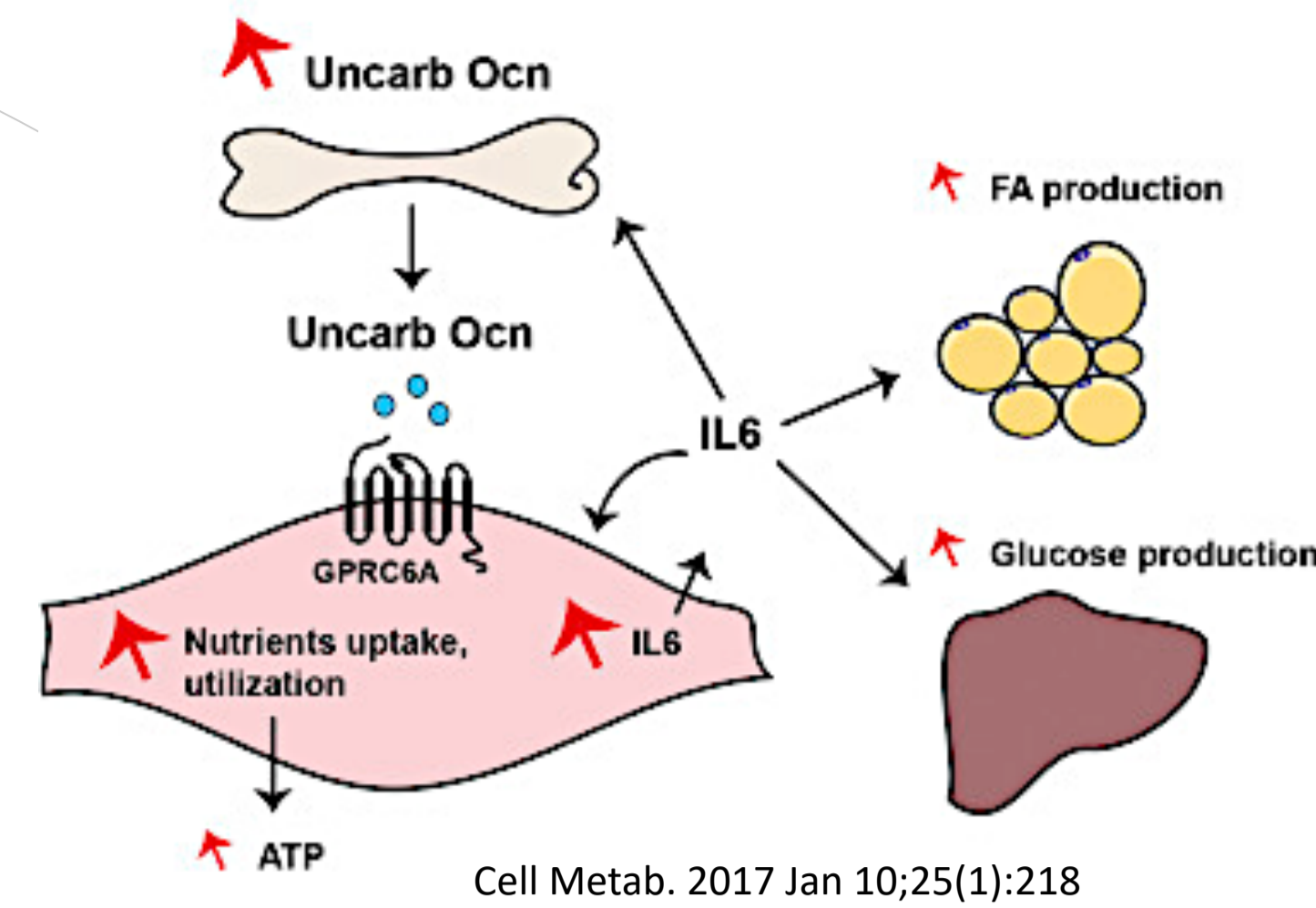
Evaluated parameters: insulin, glucose, uric acid and creatinine by standard methods; IL-6-plasma and carboxyglutamic acid residues of osteocalcin (Gla-OC)-plasma by ELISAs.

Body composition was evaluated by BIA-Quantum-X.

Participants were also categorized according to the number of courses completed (<9 or 9 courses).

Studied genetic Polymorphisms studied determined by PCR, PCR/RFLP, endpoint analysis (allelic discrimination assays):

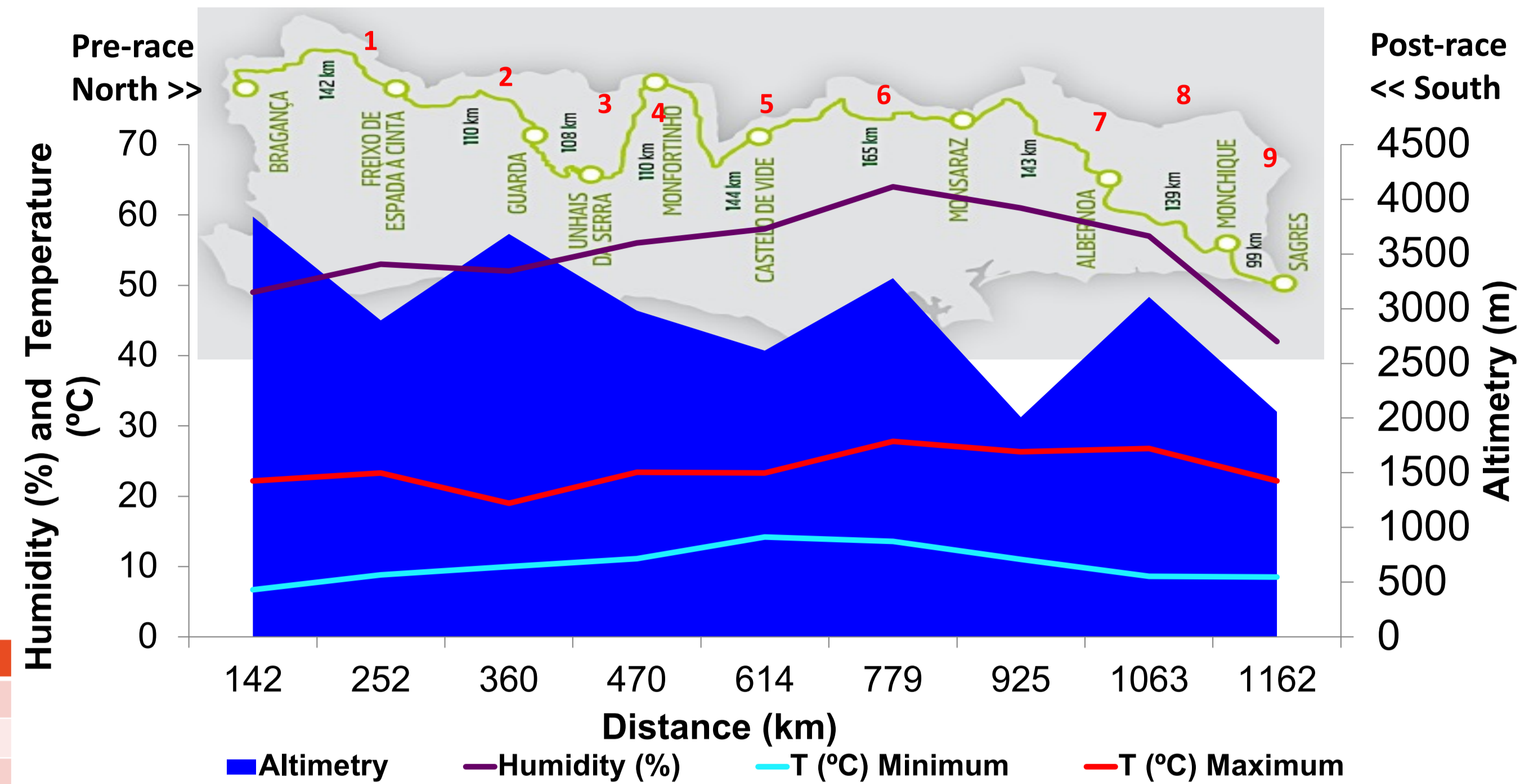
	Gene	Polymorphism	Functional
β2 Adrenergic Receptor	ADRB2	Gli16Arg (rs1042713)	AA ↑ Expression
Leptin	LEP	-2548 G/A (rs2167270)	AA ↑ Serum levels
Osteocalcin	BGLAP	-298 T/C (rs1800247)	TT ↑ Expression
Osteocalcin Receptor	GPRC6A	-298 T/C (rs2274911)	AA ↑ Circulating levels



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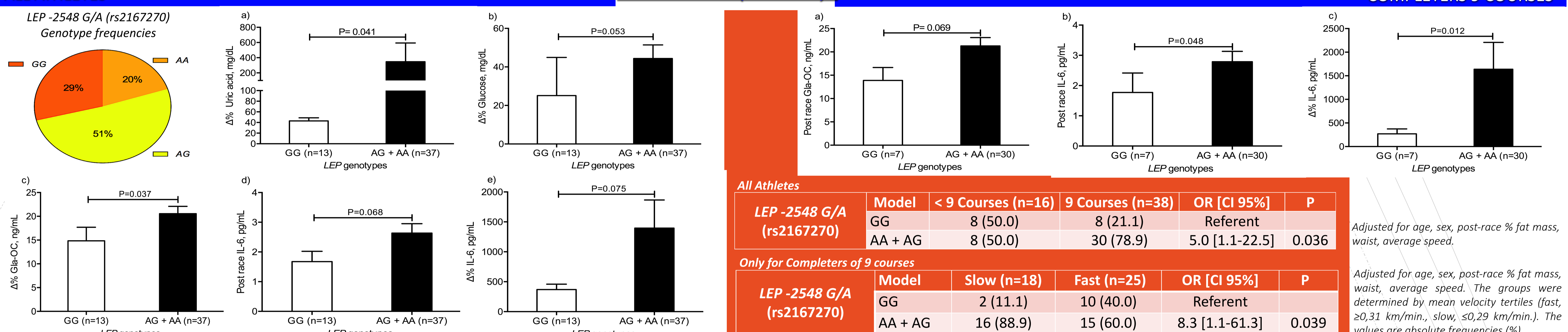
Acknowledgments



1 course: Braga to Freixo; 2 course: Freixo to Guarda; 3 course: Guarda to Unhais da Serra; 4 course: Unhais da Serra to Monfortinho; 5 course: Monfortinho to Castelo de Vide; 6 course: Castelo de Vide to Monsaraz; 7 course: Monsaraz to Albenoa; 8 course: Albenoa to Monchique; 9 course: Monchique to Sagres.

RESULTS:

ALL ATHLETES

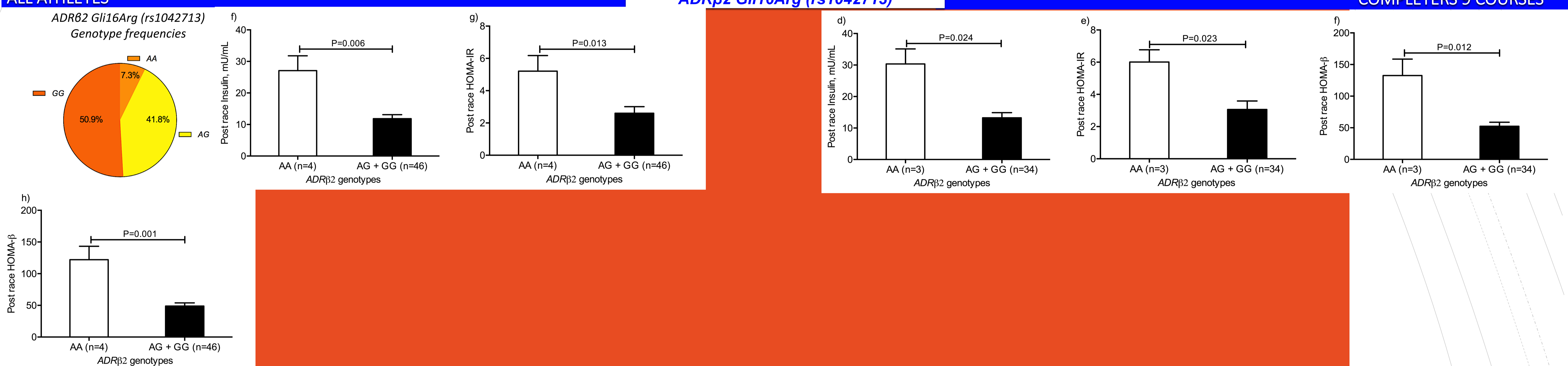


LEP -2548 G/A (rs2167270)	Model	All Athletes		OR [CI 95%]	P
		< 9 Courses (n=16)	9 Courses (n=38)		
GG		8 (50.0)	8 (21.1)	Referent	0.036
AA + AG		8 (50.0)	30 (78.9)	5.0 [1.1-22.5]	

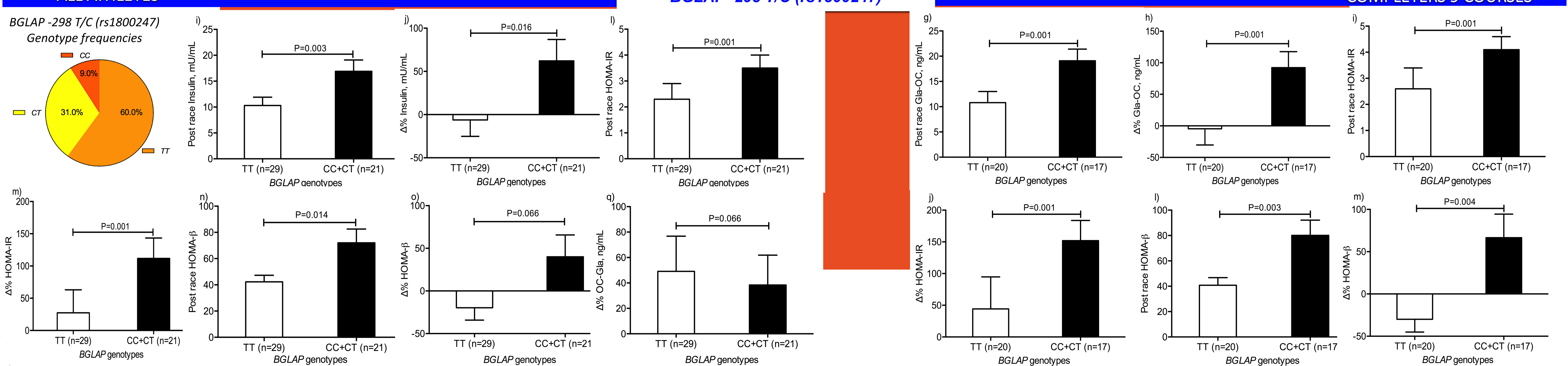
LEP -2548 G/A (rs2167270)	Model	Only for Completers of 9 courses		OR [CI 95%]	P
		Slow (n=18)	Fast (n=25)		
GG		2 (11.1)	10 (40.0)	Referent	0.039
AA + AG		16 (88.9)	15 (60.0)	8.3 [1.1-61.3]	

Adjusted for age, sex, post-race % fat mass, waist, average speed. The values are absolute frequencies (%).

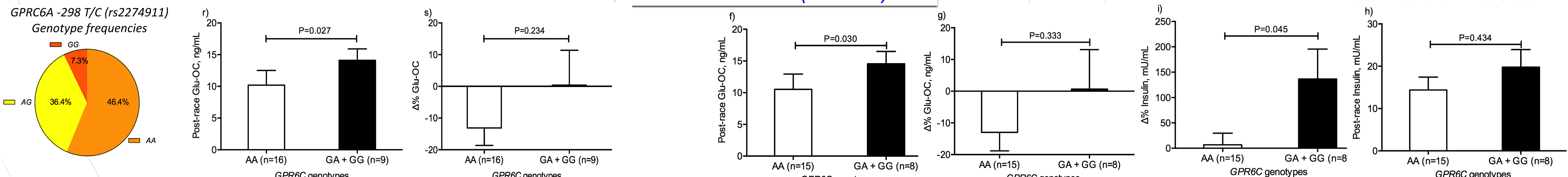
ALL ATHLETES



ALL ATHLETES



ALL ATHLETES



CONCLUSIONS:

The LEP, ADRB2 and BGLAP genetic polymorphisms, related to bone and energy metabolism, may modulate the performance of competing athletes. This work supports a hypothesis of the influence of a co-modulatory action between genetic factors and mediators released during a strenuous exercise for long periods of time.

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