

Genetic mapping of QTLs controlling the ISIAH hypertensive rat behavior in an open field tests



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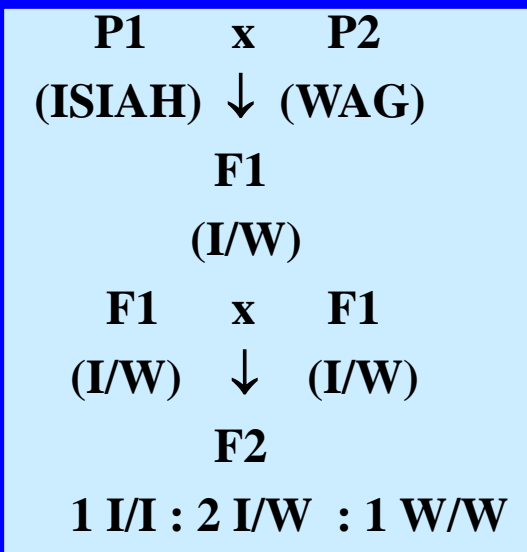


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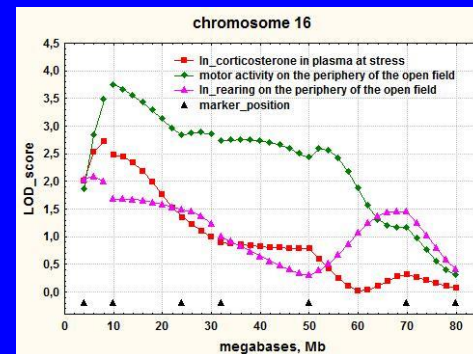
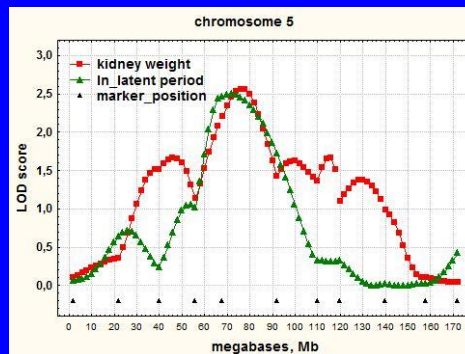
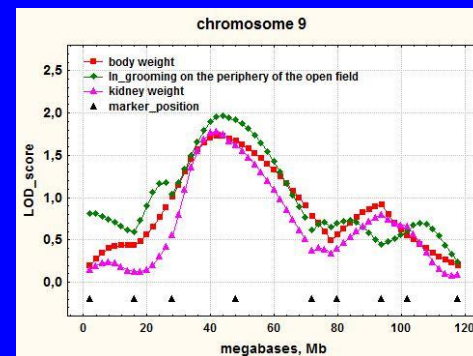
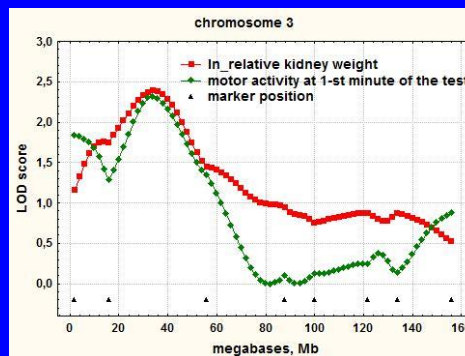
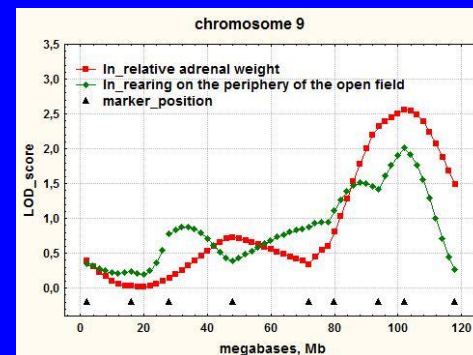
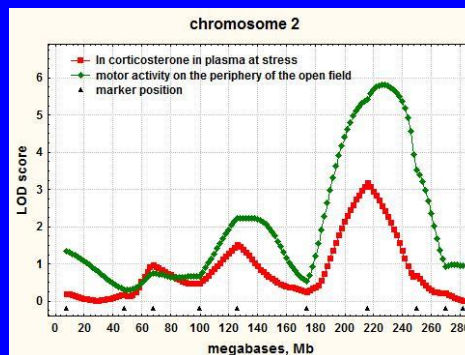
Traits studied	Hypertensive ISIAH rats	Normotensive WAG rats
Basal blood pressure, mm Hg	175 ± 4.8 ***	135 ± 3.4
Blood pressure at stress, mm Hg	215 ± 5.9***	140 ± 5.1
Body weight, g	302 ± 4.52	310 ± 5.03
Adrenal glands weight, mg	52.88 ± 1.467 ***	43.43 ± 0.852
Kidney weight, g	2.105 ± 0.027 ***	1.621 ± 0.034
Heart weight, g	1.096 ± 0.025 *	1.014 ± 0.028
Basal corticosterone in plasma, ug/100 ml	5.4 ± 1.64*	1.4 ± 0.28
Corticosterone in plasma at stress, ug/100 ml)	32.1 ± 2.2	31.0 ± 0.8
Motor activity at 1-st minute of the test	46 ± 3.7**	23 ± 4.6
motor activity on the periphery of the open field	552 ± 71***	207 ± 25.4
Grooming on the periphery of the open field	12 ± 2.2*	5.6 ± 1.5
Rearing on the periphery of the open field	61 ± 11.7**	21 ± 3.94
Defecation score	16 ± 2.3	15 ± 2.8
Latent period, s	20 ± 3.5**	65 ± 12

QTL (quantitative trait locus) analysis

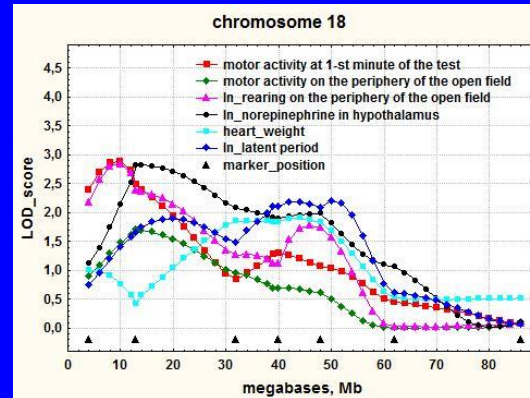
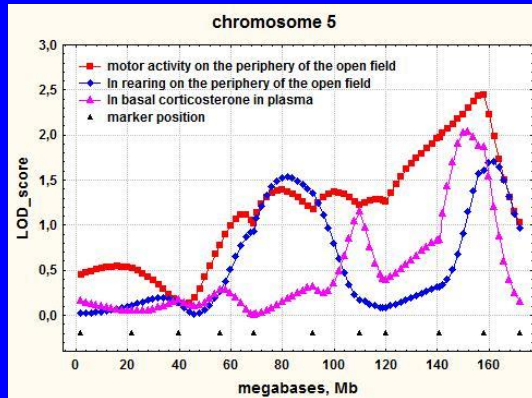
Loci common for traits associated with the hypertensive status of ISIAH rats and their behavior in the open field tests in the group of F₂(ISIAHxWAG) males aged as 3-4-month old



Experimental male rats:
two groups of F₂(ISIAHxWAG)
1) aged as 3-4 month old (n=103)
2) aged as 6 month old (n=126)



Loci common for traits associated with the hypertensive status of ISIAH rats and their behavior in the open field tests in the group of F₂(ISIAHxWAG) males aged as 6-month old



RESULTS

A search for common loci showed that some loci associated with behavior overlap with loci associated with one or more of the analyzed traits characterizing the hypertensive status of ISIAH rats: body weight, weight of the adrenal glands, kidney and heart, plasma corticosterone concentration at rest and under stress, and the concentration of norepinephrine in the hypothalamus.

CONCLUSION

The results obtained in this study can be used to determine candidate genes in genetic loci associated with behavioral patterns of hypertensive ISIAH rats. Candidate genes in QTLs that control behavioral patterns of ISIAH rats can either be closely linked to genes involved in the control of traits associated with the hypertensive status of these rats, or, in some loci, may have a pleiotropic effect on both behavior and on the manifestation of traits associated with the hypertensive status of ISIAH rats.

- **ACKNOWLEDGMENT**

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