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An Individual Variation Study of Global Cerebral Ischemia in Rats Using Microarray

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Objectives

The aim of the present study is to probe candidate genes which were involved in the global cerebral ischemia and to understand the individual difference of ischemia in rats by using Rat Ref-12 Expression Bead Chip (Illumina, Inc., San Diego, CA).

Materials and Methods

○ Material

We compared hippocampus of Panax ginseng (PG) with those of Panax quinquefolius (PQ) after four vessel occlusion by using Rat Ref 12 Expression Bead Chip (Illumina, In., San Diego, CA).

○ Methods

- After an adaptation period of 1 week, 12 rats were randomly divided into three groups: A control group and two (PG, PQ)treatment groups of ten rats each.
- Bilateral common carotid arteries were exposed and carefully separated from the carotid sheath, cervical sympathetic and vagus nerves through a ventral cervical incision. The next day, both common carotid arteries were occluded for 10 min. while the animals awake.
- RNA Preparation(tissue)

Results and Discussion

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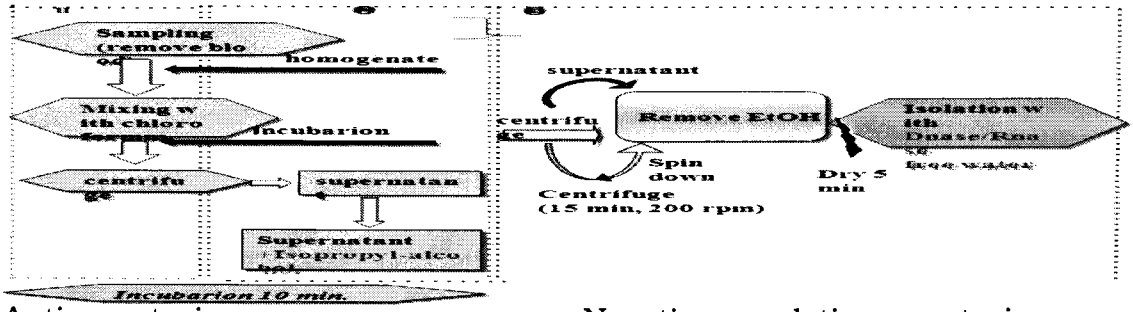


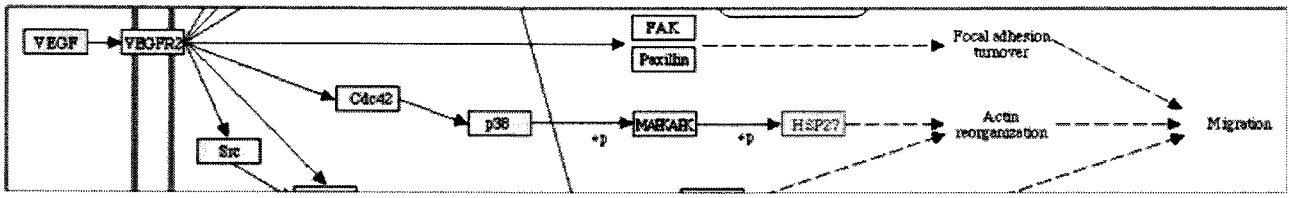
Anti-apoptosis

TargetID	Fold(제제후/사망상	Gene symbol
ILMN_1374332	4.092430738	Hspb1
ILMN_1359200	5.202741398	Timp1
ILMN_1352642	11.2554435	Spp1
ILMN_1358490	4.542781765	Cdc2a
ILMN_1357229	3.570009714	Ccl2
ILMN_1650285	3.401535156	Hmox1
ILMN_1353924	2.898219775	Anxa1
ILMN_1354419	2.601255301	Bcl2a1
ILMN_1372371	2.305976803	F2r

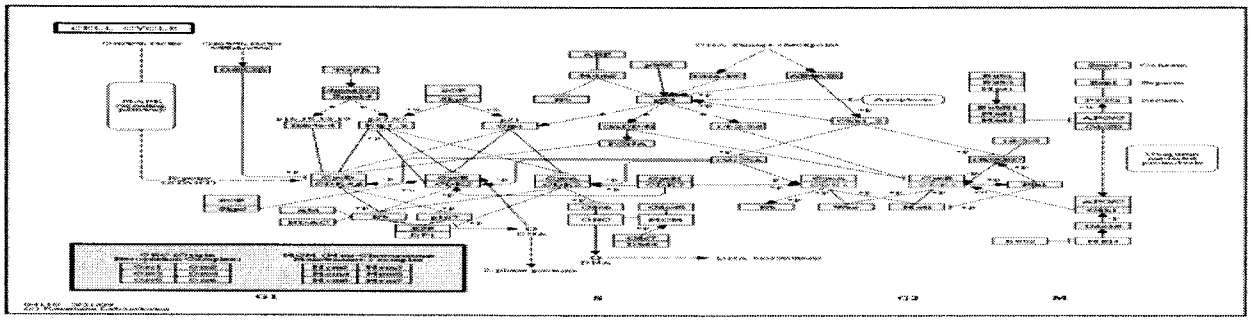
Negative regulation-apoptosis

TargetID	Fold(고려인삼/서양삼)	Gene symbol
ILMN_1374332	4.092430738	Hspb1
ILMN_1352642	11.2554435	Spp1
ILMN_1358490	4.542781765	Cdc2a
ILMN_1357229	3.570009714	Ccl2
ILMN_1650285	3.401535156	Hmox1
ILMN_1353924	2.898219775	Anxa1
ILMN_1354419	2.601255301	Bcl2a1

Hspb1 : Involved in stress resistance and actin organization., similarity:Belongs to the small heat shock protein (HSP20) family



Cdc2a : Plays a key role in the control of the eukaryotic cell cycle. It is required in higher cells for entry into S-phase and mitosis.



Conclusion : Hspb1, Spp1, Cdc2a, Ccl2, Hmax1, Anxa1, and Bcl2a1 were found to be up-regulated in the PG group which may become new targets for ischemic study.