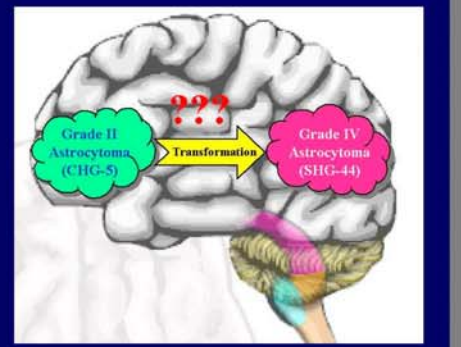




# Genetic Comparison of Two Different Grade Astrocytoma Cell Line CHG-5 & SHG-44 by cDNA Microarray Hybridization

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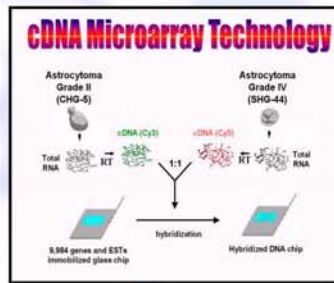


## Abstract

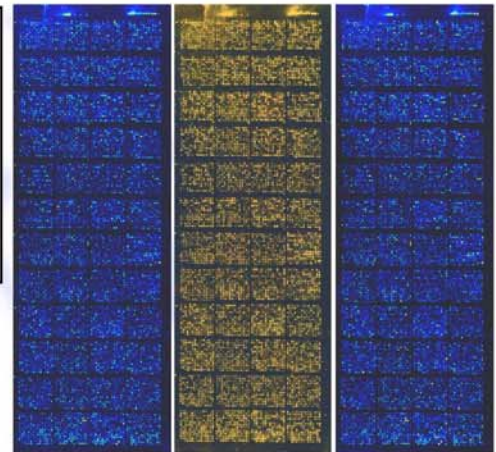
Diffuse astrocytoma WHO grade II is a well-differentiated, slowly growing tumor that has an inherent tendency to progress to anaplastic astrocytoma (WHO grade III) and eventually, to glioblastoma (WHO grade IV). By comparing the gene expression differences between a grade II (CHG-5) and a grade IV cell line (SHG-44), the aim of the present study was to identify the transformation-related genes in the most frequently occurring tumor in the brain.

By using self established 9,984 genes and ESTs cDNA microarray, the triplicated hybridization results shown 131 genes and 7 ESTs were up-regulated (ratio > 2.0) and 13 genes and 9 ESTs were down-regulated (ratio < 0.5) in the SHG-44 cell line when compare with the control low grade cell line CHG-5. 12 of the up-regulated genes had ratios over 5.0 and were regarded as turning on. According to their putative function, most of the differentially expressed genes could be classified into several groups related with cell cycle and proliferation, cell cytoskeleton & motility, apoptosis, signal transduction, invasion, metabolic pathways and so on. Some of them have been previously reported and many were first detected. For example, matrix metalloproteinases and their inhibitors have recently been shown to play a crucial role in tumor cell invasion and metastasis, our results reveal that the expression of matrix metalloproteinase 15, which has not been reported so far, is notably increased.

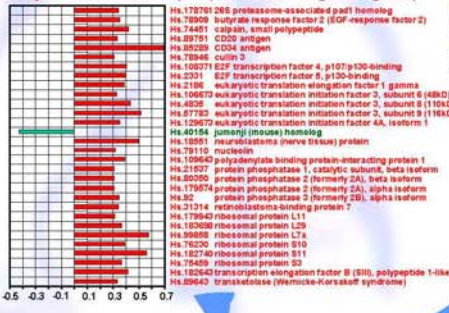
The results show the complexity of genes/pathways that may be involved in the progression of low-grade astrocytomas and to some interesting candidate genes worth further investigation. As the cell line getting rid of the variations *in vivo*, in combination with other studies including cancer tissue detection, some genes causally related to the tumor progression will possibly be found.



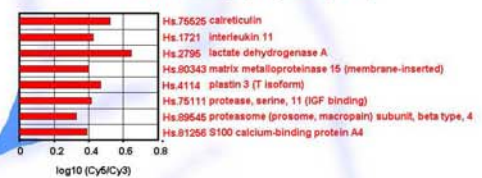
CHG-5 (Cy3) hybridized image, cDNA microarray combined image, SHG-44 (Cy5) hybridized image



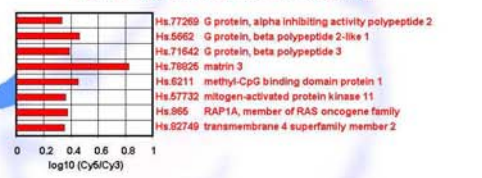
## Cell Cycle & Proliferation (29 up and 1 down-regulated genes)



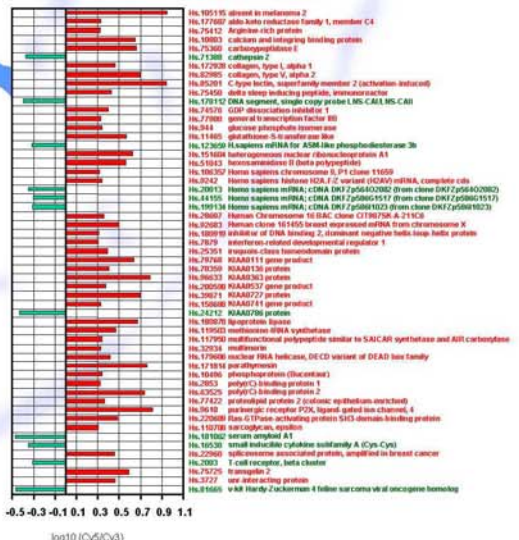
## Metastasis & Invasion (8 up-regulated genes)



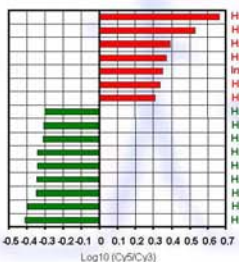
## Signal Transduction (8 up-regulated genes)



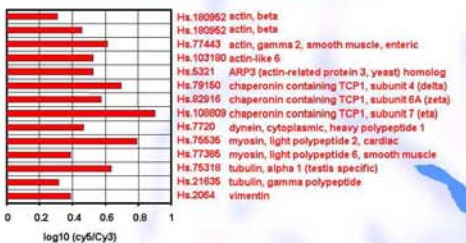
## Others (44 up- and 11 down-regulated genes)



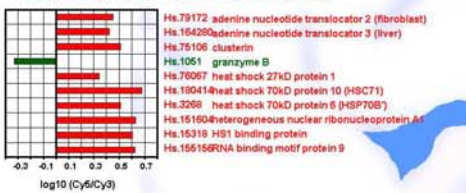
## ESTs (7 up and 9 down-regulated)



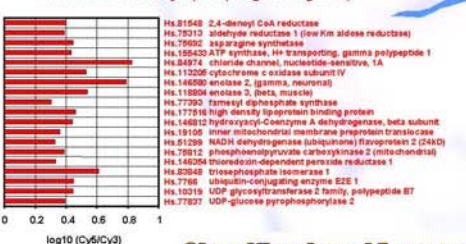
## Cytoskeleton & Motility (14 up-regulated genes)



## Apoptosis (9 up and 1 down regulated genes)



## Metabolic Pathways (19 up-regulated genes)



## Classification of Astrocytoma

	World Health Organization -WHO (Grade)	Mayo (Grade)	Cell Line
Low Grade	Piloicytic Astrocytoma (I)		
Low Grade	Astrocytoma (II)	Astrocytoma (I)	
Low Grade	Astrocytoma (II)	Astrocytoma (II)	CHG-5
High Grade	Anaplastic Astrocytoma (III)	Astrocytoma (III)	
High Grade	Glioblastoma Multiforme (IV)	Astrocytoma (IV)	SHG-44

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