

DAFTAR ISI

	Halaman
HALAMAN JUDUL	i
HALAMAN PENGESAHAN	ii
HALAMAN PERNYATAAN	iii
PRAKATA	v
DAFTAR ISI	vii
DAFTAR TABEL	ix
DAFTAR GAMBAR	x
GLOSSARY	xi
INTISARI	xiii
ABSTRACT	xiv
BAB I PENDAHULUAN	1
A. Latar Belakang Masalah	1
B. Perumusan Masalah	6
C. Tujuan Penelitian	6
D. Keaslian Penelitian	7
E. Manfaat Penelitian	9
BAB II TINJAUAN PUSTAKA	10
A. Tinjauan Pustaka	10
1. Astrositoma	10
a. Diffuse astrositoma	10
b. Pilocytic astrositoma	15
2. Jars sinyal PI3K/Akt/Mtor	15
3. PI3K	16
4. Akt	19
5. mTOR	20
6. Ki67	22
7. MMP9	23
8. Receptor tyrisun kinase (RTK)	23
9. Jars sinyal Ras/Raf/MEK/ERK	24
10. Jars sinyal Wnt	25
11. Messenger ribonucleic acid (mRNA)	25
B. Landasan Teori	26
C. Kerangka Teori	27
D. Kerangka Konsep	28
E. Hipotesis	28

BAB III METODE PENELITIAN	29
A. Rancangan Penelitian	29
B. Tempat dan Waktu Penelitian	29
C. Populasi Penelitian	29
D. Subyek Penelitian	29
E. Estimasi Besar Sampel Penelitian	30
F. Alat dan Bahan Penelitian	30
G. Alur Penelitian	31
H. Jalannya Penelitian	31
I. Identifikasi Variabel Penelitian	35
J. Definisi Operasional	35
K. Analisis Data	36
L. Persetujuan Etika Penelitian	36
BAB IV HASIL	37
BAB V PEMBAHASAN	43
BAB VI SIMPULAN dan SARAN	56
RINGKASAN	57
SUMMARY	90
DAFTAR PUSTAKA	102
LAMPIRAN	113

DAFTAR TABEL

	Halaman
Tabel 1 Urutan primer	34
Tabel 2 Kondisi PCR	34
Tabel 3 Karakteristik subyek	39
Tabel 4 Distribusi usia insidensi astrositoma tiap grade	39
Tabel 5 Karakteristik berdasar grading histopatologik	40
Tabel 6 Ekspresi mRNA tiap-tiap grade	40
Tabel 7 Korelasi ekspresi mRNA dengan tingkat proliferasi	41

DAFTAR GAMBAR

		Halaman
Gambar 1	Kerangka Teori	27
Gambar 2	Kerangka Konsep	28
Gambar 3	Alur Penelitian	31
Gambar 4	Identifikasi Variabel Penelitian	35
Gambar 5	Astrositoma fibriler	37
Gambar 6	Astrositoma anaplastik	38
Gambar 7	Glioblastoma	38
Gambar 8	Boxplot ekspresi mRNA-PI3K, mRNA-Akt, mRNA-mTOR, mRNA-KI67 dan mRNA-MMP9 tiap-tiap grading histopatologik	41

GLOSSARY

Akt/PKB	=	<i>protein kinase B</i>
ATP	=	<i>adenosin triphosphate</i>
BAD	=	<i>Bcl-2 associated death promoter</i>
BAX	=	<i>BCL2 associated X protein</i>
Bcl-2	=	<i>B cell lymphoma protein 2</i>
BRAF	=	<i>B rapidly accelerated fibrosarcoma gene/protein</i>
CBTRUST	=	<i>the central brain tumor registry of the united states</i>
cDNA	=	<i>copy of deoxyribonucleic acid</i>
CDK	=	<i>cyclin dependent kinase</i>
CT scan	=	<i>computerized tomography scan</i>
DR	=	<i>dokter</i>
EGBs	=	<i>eosinophilic granular bodies</i>
EGFR	=	<i>epithelial growth factor receptor</i>
ERK	=	<i>extracellular-signal-regulated kinase</i>
GAPDH	=	<i>glyceraldehyde 3-phosphate dehydrogenase</i>
GBM	=	<i>glioblastoma multiforme</i>
GF	=	<i>growth factor</i>
GTPase	=	<i>guanosine triphosphatase</i>
HE	=	<i>haematoxylin-eosin</i>
IDH	=	<i>isocitrate dehydrogenase</i>
JNK	=	<i>janus kinase</i>
Ki67	=	<i>kiel 67 protein, a cell proliferation marker</i>
MAPK	=	<i>mitogen activated protein kinase</i>
MEK	=	<i>mitogen activated protein kinase/extracellular-signal-regulated kinase kinase</i>
MGMT	=	<i>O6 methylguanine DNA methyltransferase</i>
MMP9	=	<i>matrix metalloproteinase 9</i>
MRI	=	<i>magnetic resonance imaging</i>
mRNA	=	<i>messenger ribonucleic acid</i>
mTOR	=	<i>mechanistic/mammalian target of rapamycin</i>
NFκB	=	<i>nuclear factor kappa B</i>
PA	=	<i>pilocytic astrocytoma</i>
PDK	=	<i>phosphoinositide-dependent kinase</i>
PDGFRA	=	<i>platelet derived growth factor receptor A</i>

PH	=	<i>pleckstrin homology</i>
PI3K	=	<i>phosphatidylinositol-3 kinase</i>
PI3KCA	=	<i>phosphatidylinositol-3 kinase catalyticA</i>
PIK3R1	=	<i>phosphatidylinositol-3 kinase relulatory 1</i>
PIP	=	<i>phosphatidylinositol-4,5-biphosphonate</i>
PKC	=	<i>protein kinase C</i>
PTEN	=	<i>phosphatase and tensin homolog deleted on chromosome 10</i>
qPCR	=	<i>quantitative/real time polymerase chain reaction</i>
Raf	=	<i>rapidly accelerated fibrosarcoma gene/protein</i>
Ras	=	<i>rat sarcoma gene/protein</i>
rpm	=	<i>rotation per minute</i>
RS	=	<i>rumah sakit</i>
RSUP	=	<i>rumah sakit umum pusat</i>
RTK	=	<i>receptor tyrosine kinases</i>
STAT	=	<i>signal tanducer activation transcription</i>
TGF	=	<i>transforming growth factor</i>
TSC	=	<i>tuberous sclerosis protein complex</i>
WHO	=	<i>world health organization</i>
Wnt	=	<i>wingless int</i>