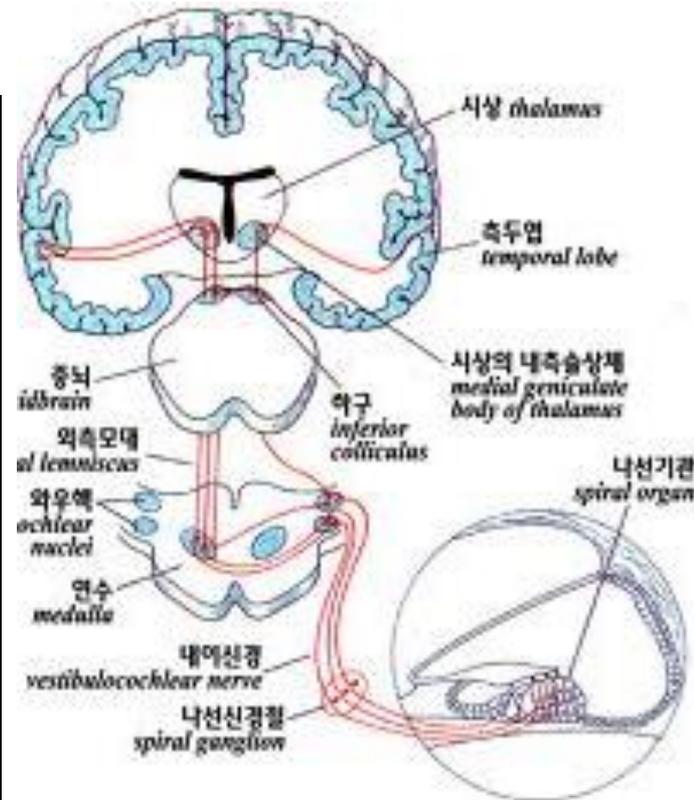
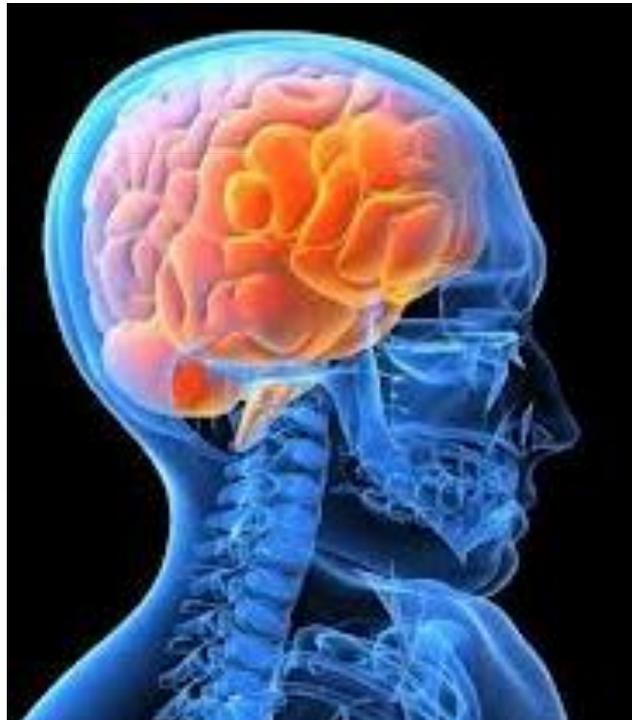
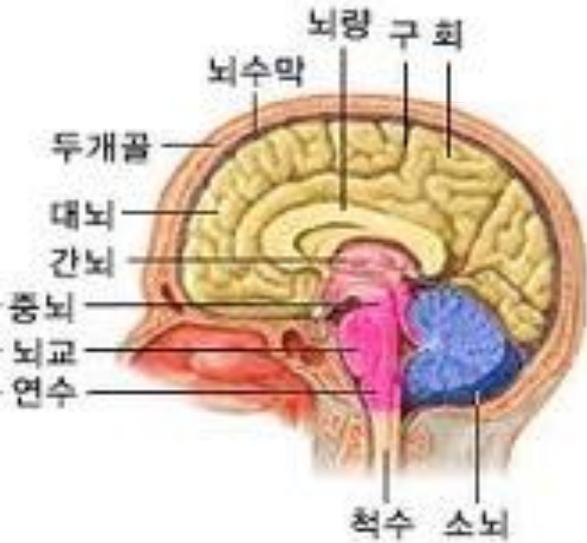
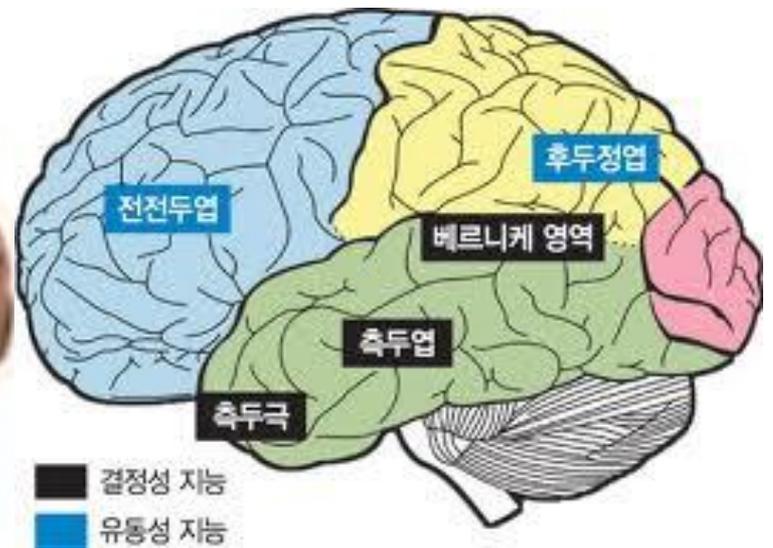
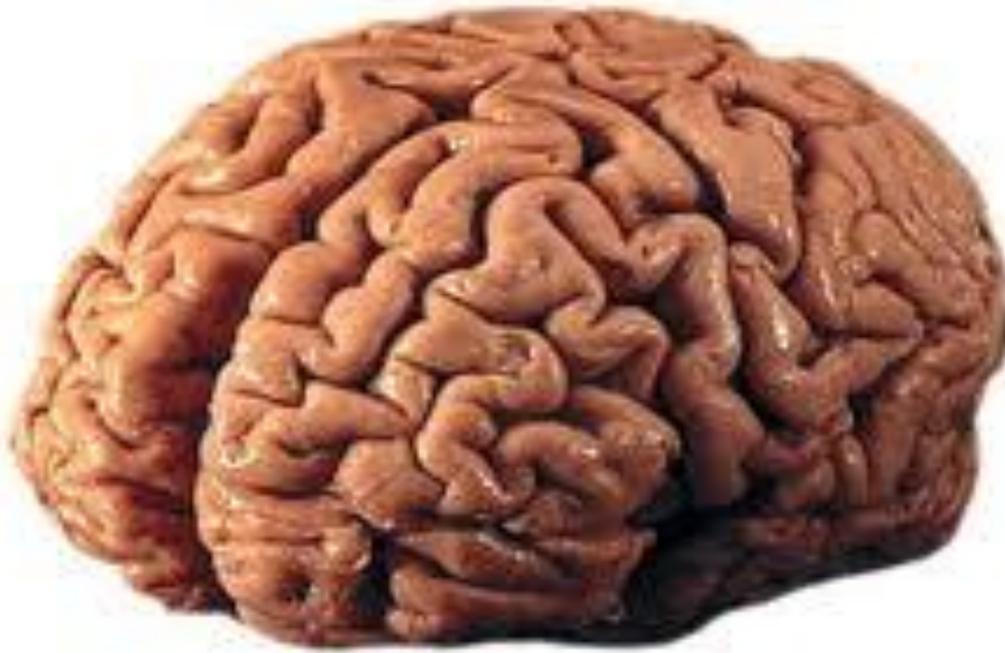




뇌종양의 항암치료



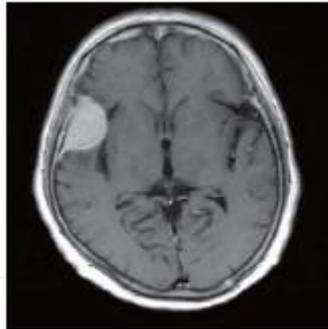
뇌종양의 종류

- 원발부위에 따른 분류

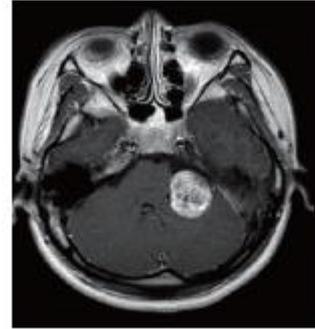
- 원발성 뇌종양
- 전이성 뇌종양

- 악성도

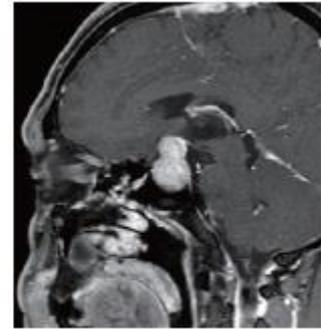
- 양성 뇌종양



뇌 수막종

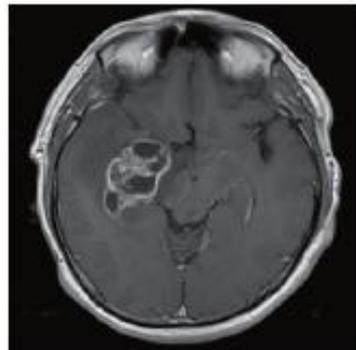


청신경초종

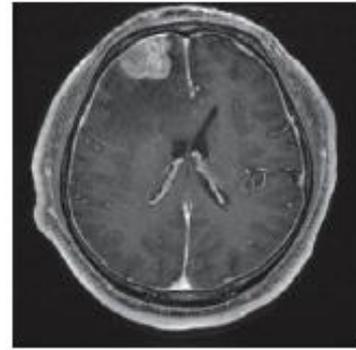


뇌하수체선종

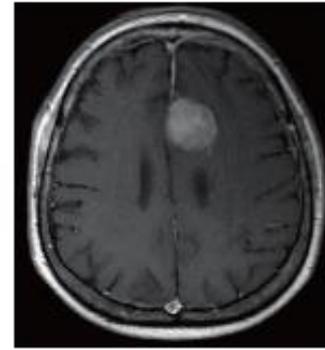
- 악성 뇌종양



교모세포종



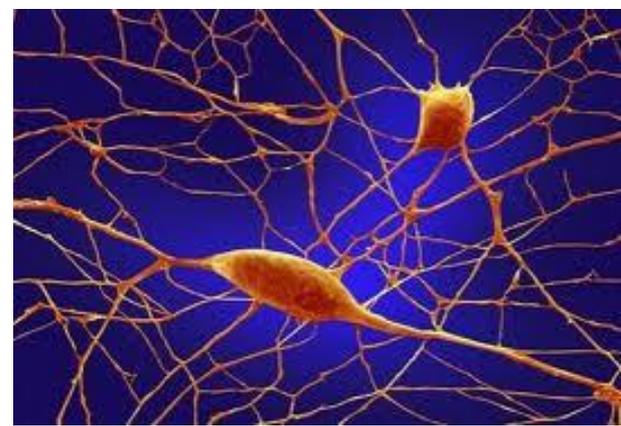
원발성 뇌 임파선종



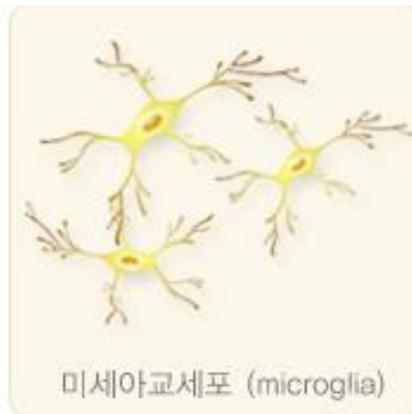
전이성 뇌종양

뇌교종(Glioma)이란?

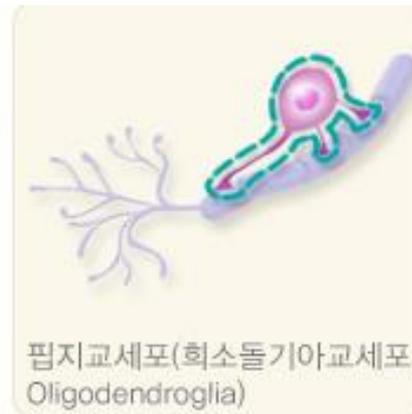
- 뇌안의 교세포에서 기원하는 종양
- 악성 뇌교종 (malignant glioma)
 - 교모세포종 (glioblastoma)
 - 역형성 (anaplastic)
 - 성상 교세포종 (별세포종, Astrocytoma)
 - 핍지 교세포종 (희돌기세포종, Oligodendroglioma)
 - 상의세포종 (Ependymoma)



성상교세포 (Astrocyte)



미세아교세포 (microglia)



핍지교세포(희소돌기아교세포, Oligodendroglia)

뇌종양의 발생빈도

- 전체 암의 0.9%
- 원발성 뇌종양: 11명/10만명
악성 뇌종양: 6-7명/10만명
- 원발성 뇌종양의 호발연령
50대 (16.5%) > 60대(15.%) > 70대(15.1%)
- 남성 : 여성 = 1.2 : 1
신경교종 남성 > 여성
수막종 남성 < 여성

뇌종양 증상 (1)

구토, 오심, 두통



간질발작, 경련

시력감퇴
시야결손



청력감퇴, 이명
기억감퇴

뇌종양 증상 (2)

- 점차 진행되는 한쪽 마비 또는 감각이상
- 유즙분비, 무월경, 외형의 변화, 체중증가
말단비대



뇌종양의 진단

- 가장일반적인 검사: **MRI**
- CT, 혈관 조영술, 요추천자 사용



MRI 검사

-방사선 노출이 없음.

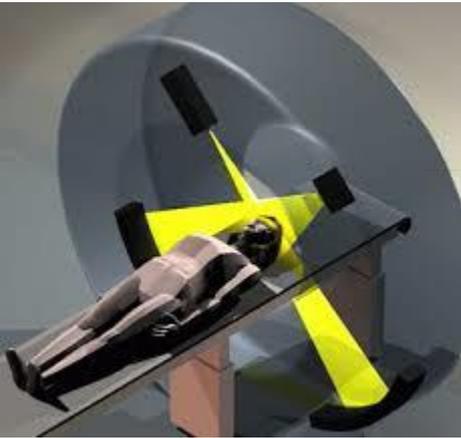
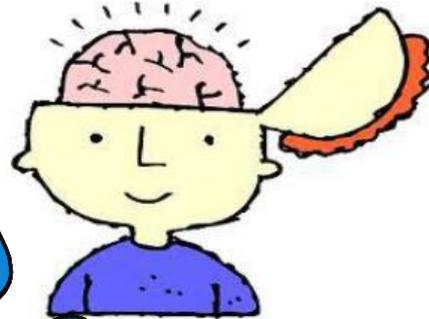


PET, CT 추가검사

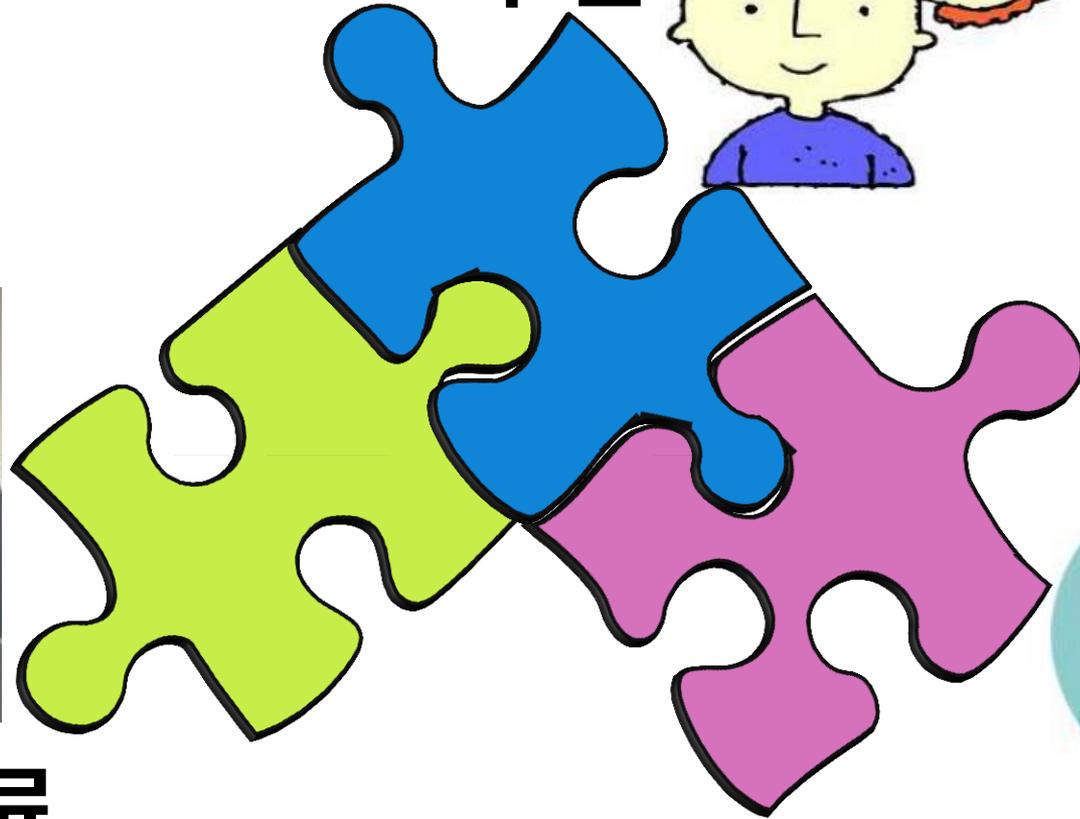
종양에 특이하게 반응하는 방사선 동위물질을 사용하여
정확한 진단 필요 시

뇌종양의 치료는?

수술



방사선치료



항암화학치료

세포독성 항암화학요법

- 항암제는 무제한적으로 자라고 급속히 성장하는 특성을 가진 암세포에 작용하여 암세포의 증식과 성장을 억제하는 것



항암 화학요법의 방법

- 정제, 캡슐 형태로 약을 경구로 투여하는 방법
- 주사제를 정맥 등으로 투여하는 방법
- 그외에서 특수하게 척수강 등으로 주사제를 투여하는 경우



항암화학 요법



뇌종양의 항암약제 (세포독성)

Cell-cycle specific drugs

Hormones

Steroids

Etoposide (VP-16)

Hydroxyurea

Methotrexate (MTX)

Procarbazine

Temozolomide (Temodar)

Non cell-cycle specific drugs

Cisplatin (CDDP)

Carmustine (BCNU)

Lomustine (CCNU)

Irinotecan (CPT-11)

Rapamycin

Vincristine (VCR)

교모세포종(Glioblastoma) 의 표준치료

The NEW ENGLAND
JOURNAL of MEDICINE

Radiotherapy plus Concomitant
and Adjuvant Temozolomide for Glioblastoma

수술

LMWH
Steroids
AED

TMZ daily x 40-49 d

4 weeks

5 d

4 weeks

5 d

4 weeks

5 d

X 6 cycles

1wk

6wk

11wk

15wk

19wk

23wk

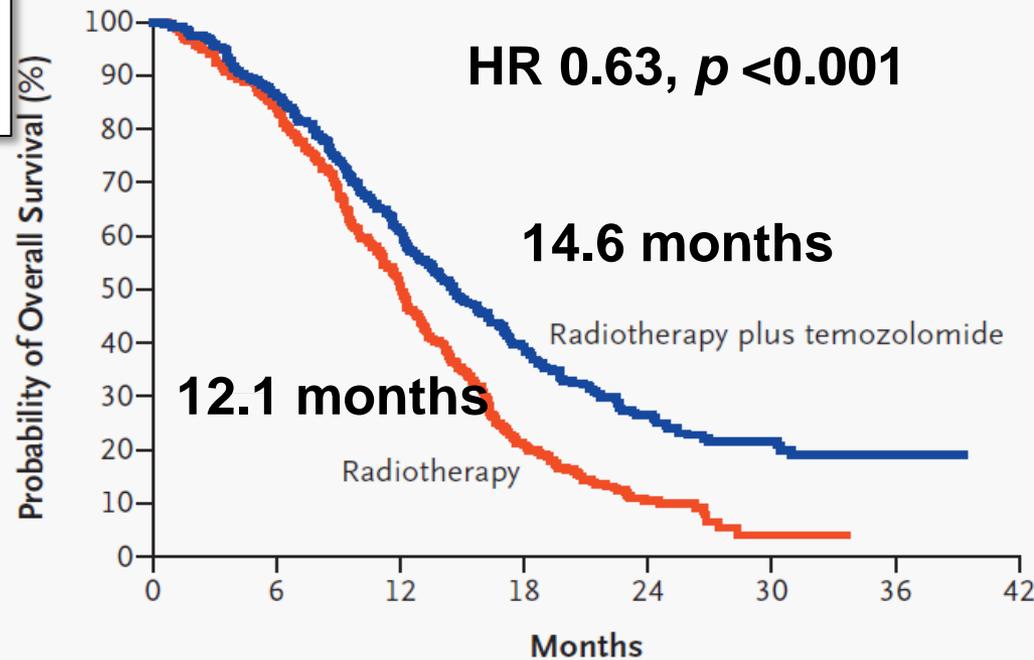
Max 6 weeks

방사선치료
30 x 2 Gy

교모세포종(Glioblastoma) 의 표준치료

*The NEW ENGLAND
JOURNAL of MEDICINE*

Radiotherapy plus Concomitant
and Adjuvant Temozolomide for Glioblastoma



No. at Risk

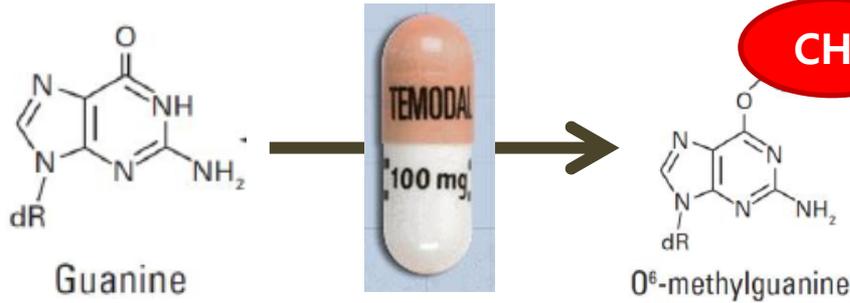
Radiotherapy	286	240	144	59	23	2	0
Radiotherapy plus temozolomide	287	246	174	109	57	27	4

Stupp R. et al. N Engl J Med. 2005 Mar;352:987-96

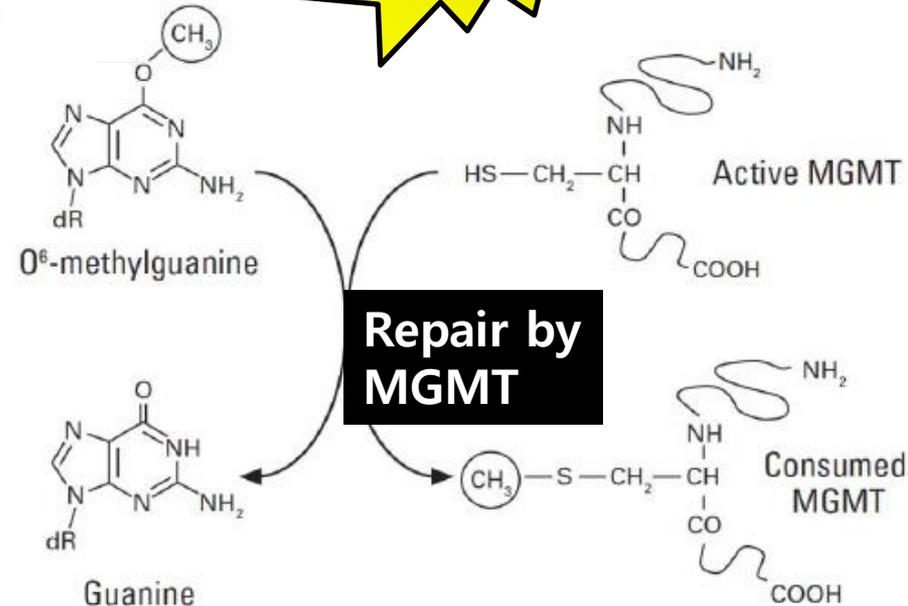
Temozolomide (Temodal®)



- Oral alkylating agent
- DNA 에 methyl group 을 붙임



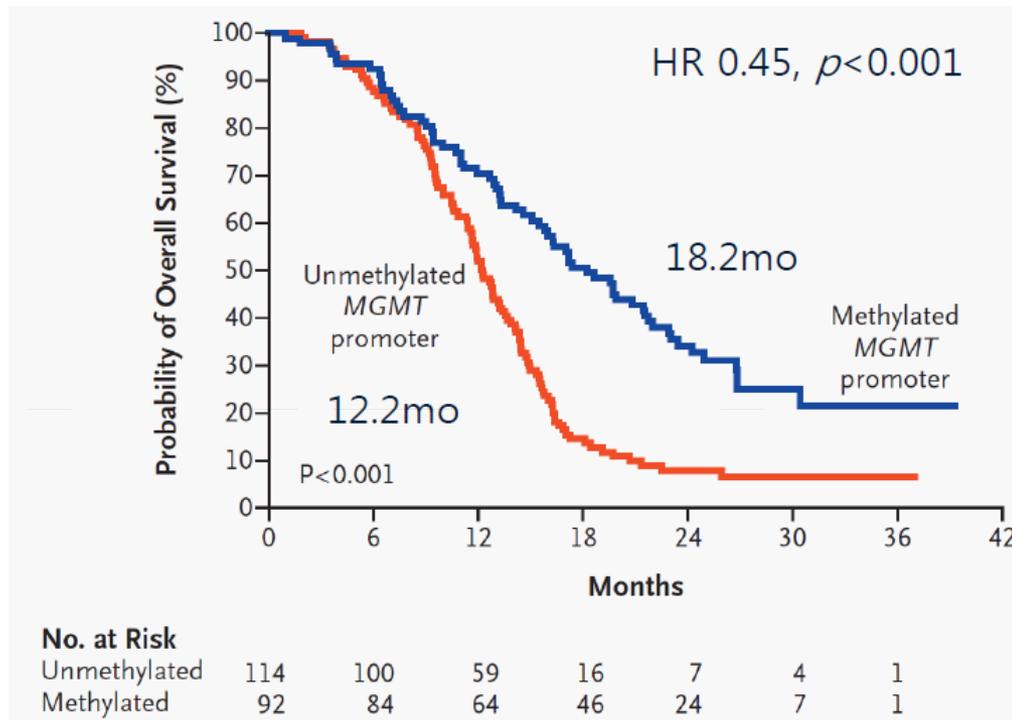
- MGMT 란?
(O⁶-methylguanine DNA methyltransferase)
Alkylating agent에 의해 손상받은 DNA 를 회복



Temozolomide (Temodal®)



MGMT (O6-methylguanine DNA methyltransferase)



Methylated MGMT 는 교모세포종의
Good prognostic factor !!

Temozolomide (Temodal®)



- 부작용



피곤



백혈구, 혈소판 감소

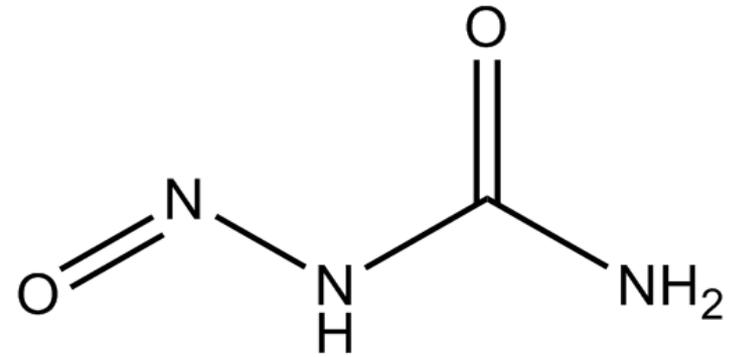


오심/구토



설사

Nitrosourea



- Carmustine
- Lomustine
- **P**rocarbazine: Alkylating agents
- Lomustine(**C**CNU)
- **V**incristine

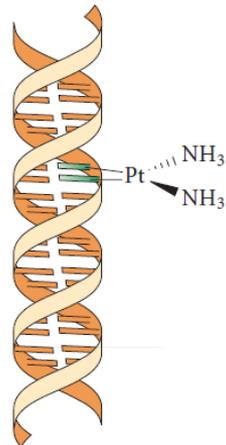
PCV

- PCV 의 부작용
오심, 구토, 골수기능 억제,
탈모, 두통
졸음, 우울, 불면, 신경독성

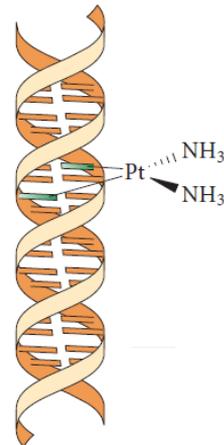


Cisplatin (CDDP)

- 대표적 세포독성 항암제
- Guanine과 결합→DNA 합성을 억제

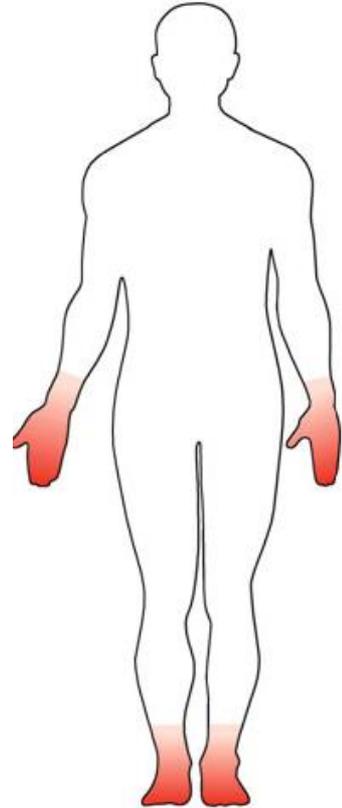


Major intrastrand crosslink



Minor interstrand crosslink

- 부작용
오심/구토, 신장독성
신경장애 (Glove and stocking)



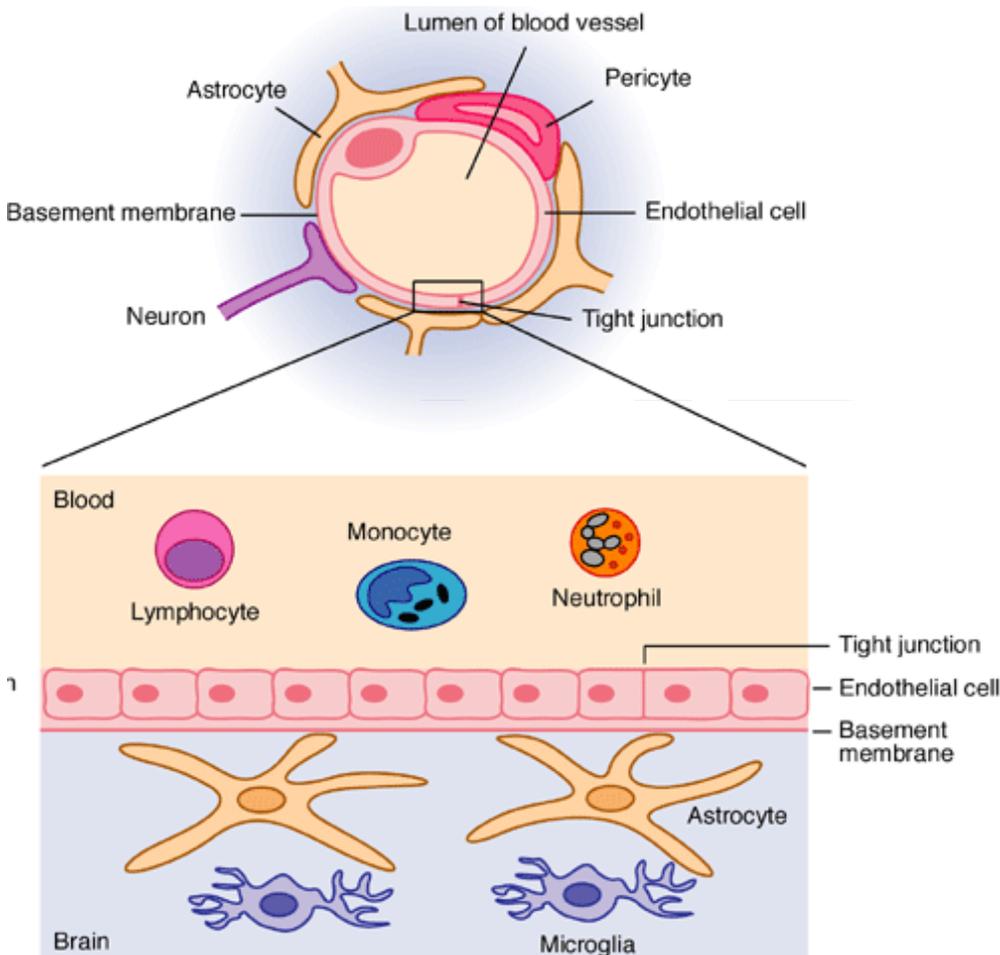
Irinotecan (CPT-11)

- *Camptotheca acuminata* 로 부터 추출된 항암제 Camptothecin의 합성제재
- DNA 복제에 반드시 필요한 Topoisomerase I 을 억제 →
- 부작용
설사, 장염
백혈구감소, 혈소판 감소



세포독성 항암치료의 한계점(1)

➤ **Blood Brain Barrier**를 통과가 어려움

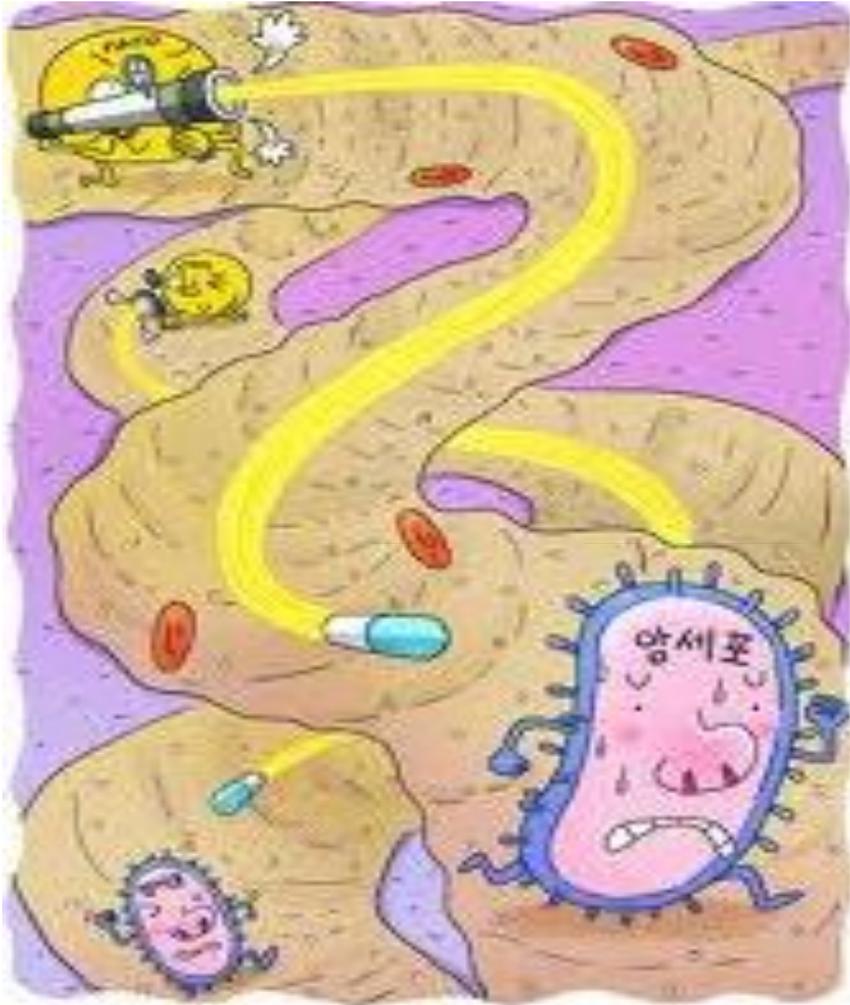


세포독성 항암치료의 한계점(2)

- 복용중인 항경련제등의 약물과의 다양한 약물 상호작용이 불가피함
 - 효과에 영향을 미침
 - 부작용을 예측하기 어려움



표적치료 요법

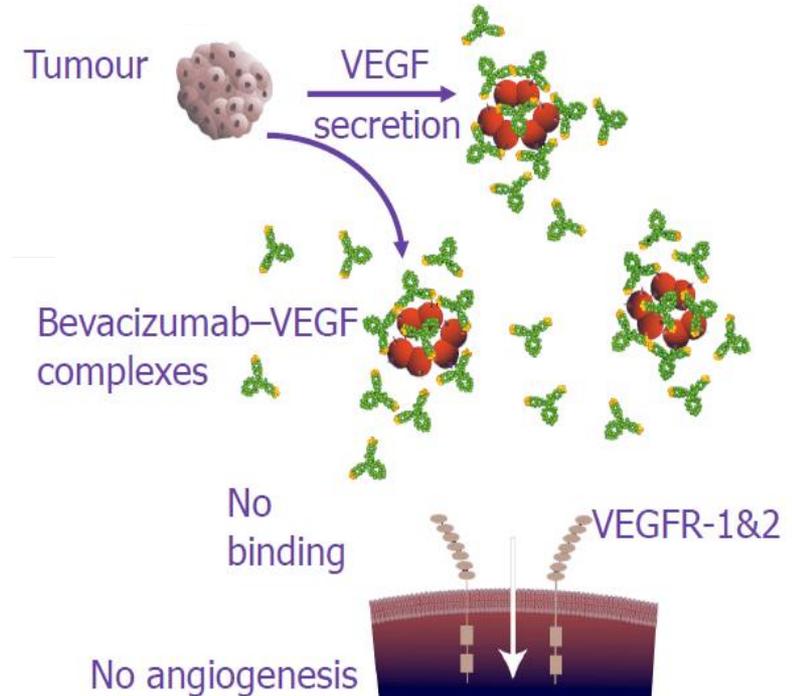
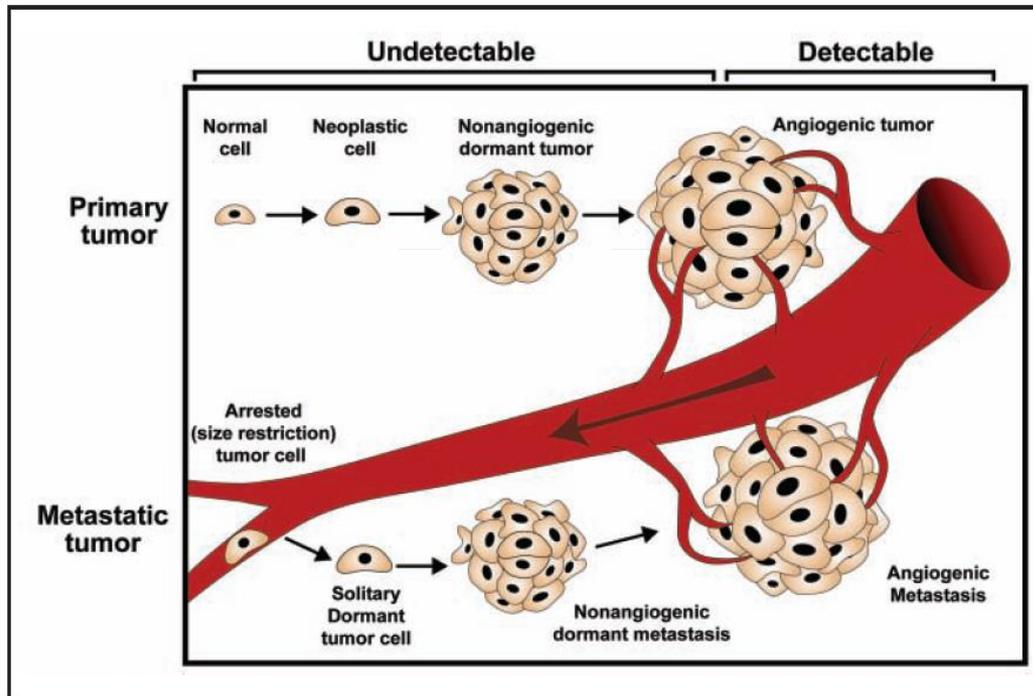


- 암의 복제와 증식에 영향을 미치는 물질만을 선택적으로 억제
- 정상세포 손상이나 누적독성이 적다.
- 기존의 항암제에 비해 약제내성이 적다.

Bevacizumab(Avastin[®])



- 암의 혈관형성을 억제하는 표적치료제
- 폐암, 대장암, 신장암, 난소암에 사용중



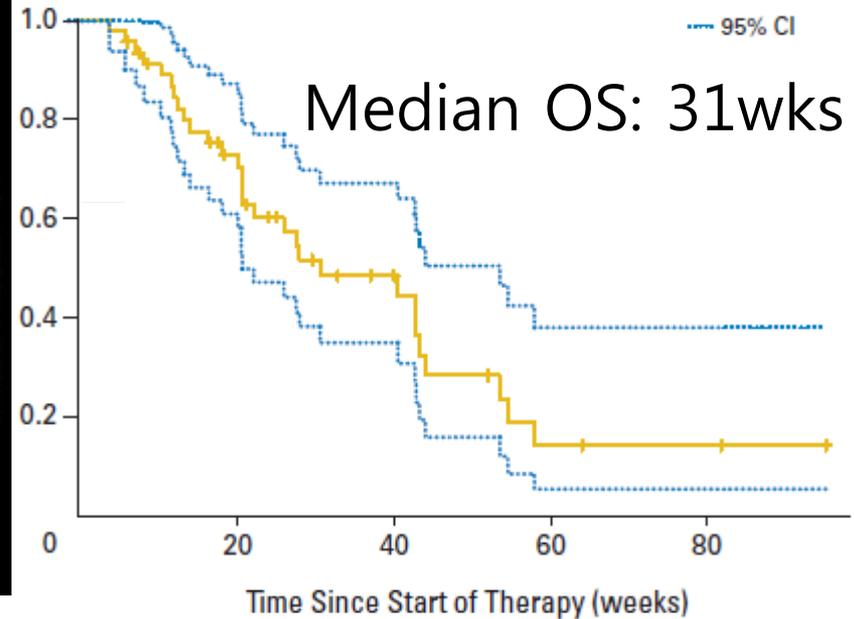
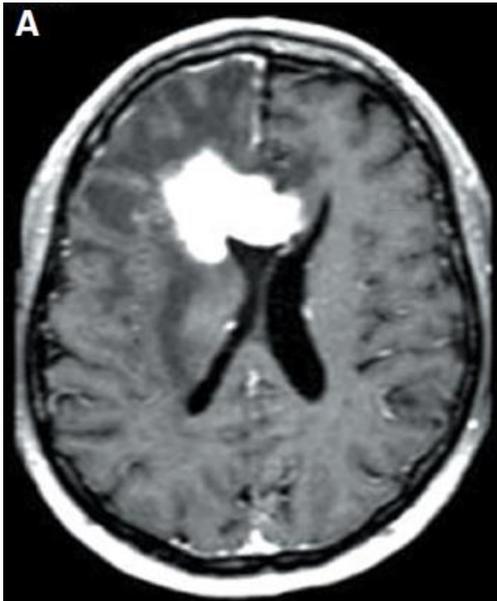
Bevacizumab(Avastin[®])



JOURNAL OF CLINICAL ONCOLOGY

ORIGINAL REPORT

Phase II Trial of Single-Agent Bevacizumab Followed by Bevacizumab Plus Irinotecan at Tumor Progression in Recurrent Glioblastoma



Kreisl. et al. J Clin Oncol. 2009 Feb 10;27(5):352:740-5

Cediranib (AZD2171)

- 경구용, VEGFR 억제제, PDGFR 억제제
- 24시간내 종양혈관을 정상화 함

-5

-1

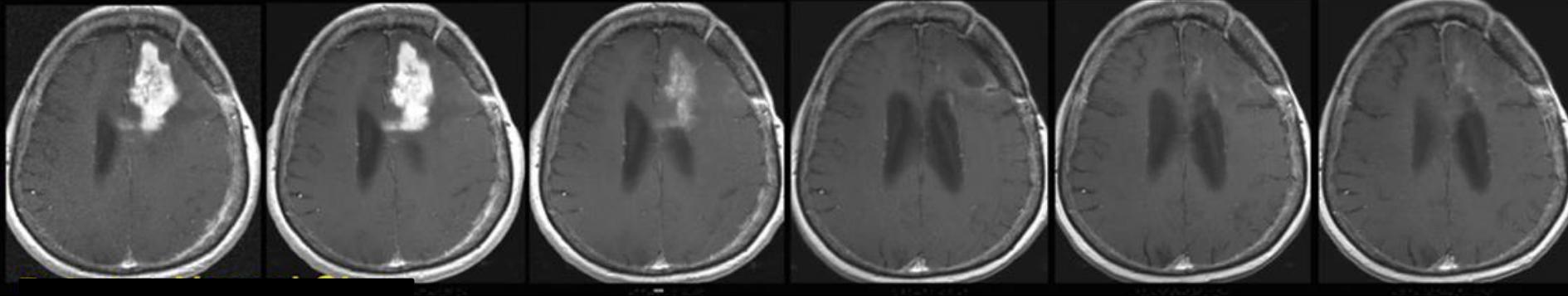
+1

+27

+55

+111

Post-contrast T1-weighted MRI

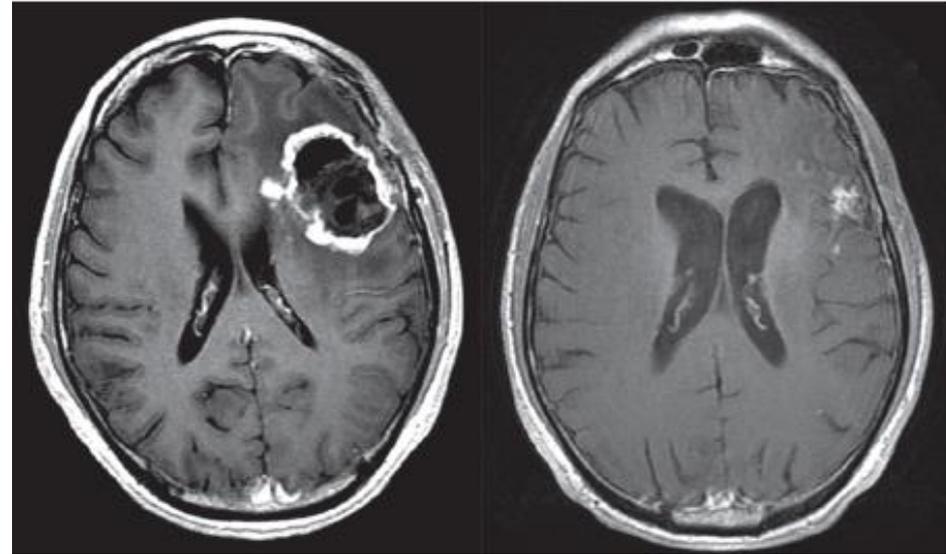


Cilengitide(EMD121974)

JOURNAL OF CLINICAL ONCOLOGY

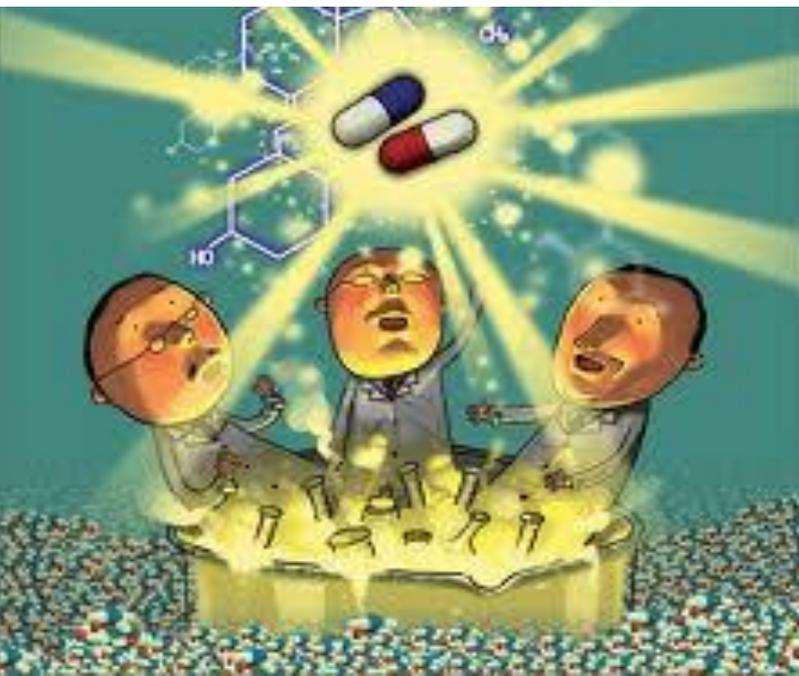
ORIGINAL REPORT

Randomized Phase II Study of Cilengitide, an Integrin-Targeting Arginine-Glycine-Aspartic Acid Peptide in Recurrent Glioblastoma Multiforme



- 1st integrin inhibitor
- Integrin
 - Migration/Invasion, Proliferation
- Randomized phase II study in recurrent GBM
N=81:Arm A(500mg/d), Arm B(2000mg/d)
RR 5% vs 13%, 6mo PFS 10% vs 15%

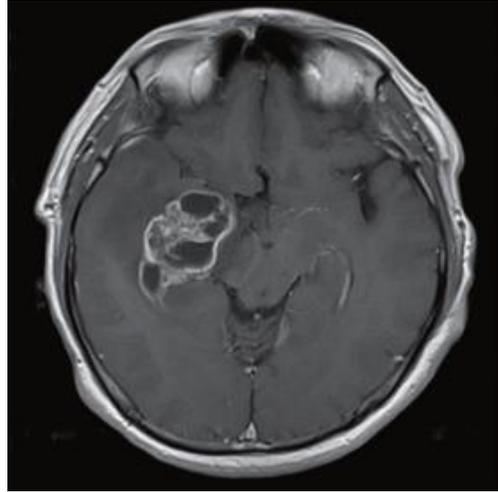
Reardon. et al. J Clin Oncol. 2008 DEC ;26:5610-5617



다양한 전문분야의 협력이 필수!!



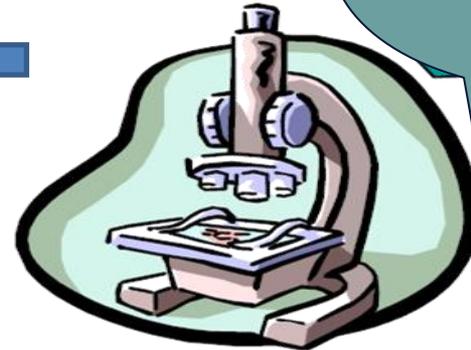
두통과 구토가 심해요



수술합시다.



악성 교모세포종입니다.



약물치료와 방사선치료를 받으셔야 합니다.

