Figure Handling

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KAMJE
KOREAN ASSOCIATION OF MEDICAL JOURNAL EDITORS
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http://kamje.or.kr

왜 그래픽 기본을 익혀야 하는가

- 우리는 digital native가 아니다. 자라면서 배우지 못했기에 필요한 사람은 찾아서 익혀야 한다.
- Powerpoint에 익숙한 분이 많다. 그러나 PPT용 figure와 출판용 figure는 전혀 다르다.
- 투고규정에 따르면 출판용 그림이나 사진을 “Combination halftones, 600 dpi, TIFF without compression, CYMK”와 같은 형식으로 제출해야 한다. 그런데 내용을 알 수 없는 경우가 많다.

왜 그래픽 기본을 익혀야 하는가

- 복잡한 작업은 컴퓨터 그래픽 전문가에게 의뢰하는 것이 나을 수 있다.
- 사소한 작업까지 전문가의 도움에 기대는 것은 비효율적이다.
- 원본 자료를 허술하게 관리한 상태에서 그래픽 전문가에게 부탁한들 별 도움을 받지 못하는 예가 많다.
- **아는 것이 힘이다**.

강의 내용

- 디지털 시대의 의학학술지에 적합한 figure
- 기본 개념 1: 해상도
- 기본 개념 2: vector image
- 출판에 적합한 해상도
- PPT 이미지를 고해상도 TIFF로 바꾸는 방법
- Photoshop forensics
- Two more tips

기본개념 1: 해상도

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보낸사람			
받는사람	(stomachlee@skku.edu)		
참조	Springer US(@springer.com)		
받은날짜	2008/11/29 18:09:22	보낸날짜	2008/11/29 18:09:17
제목	Query for your ariticle titled "Comparison of Scoring Systems for the Prediction of Outcomes in Patients with Non-variceal Upper Gastrointestinal Bleeding – A Prospective Study"		

Article Title: "**Comparison of Scoring Systems for the Prediction of Outcomes in Patients with Non-variceal Upper Gastrointestinal Bleeding – A Prospective Study**"

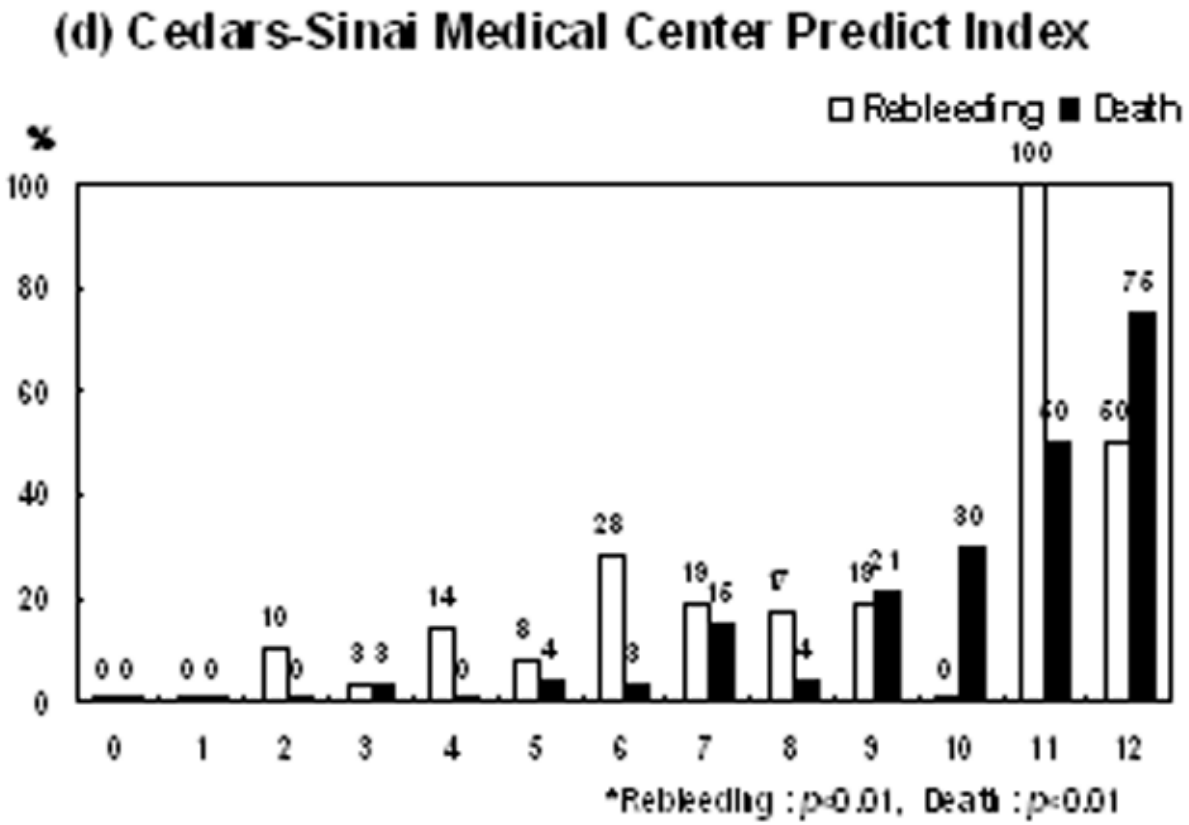
Journal Title: **Digestive Diseases and Sciences** (10620_654)

Dear Jun Haeng,

We are the typesetters of your article titled "**Comparison of Scoring Systems for the Prediction of Outcomes in Patients with Non-variceal Upper Gastrointestinal Bleeding – A Prospective Study**" to be published in "**Digestive Diseases and Sciences**".

While processing your article, we notice that, The quality of the figure 1 supplied in the article mentioned above is lesser than what is accepted by Springer. (Attached the same for your reference). If you could provide us with high-resolution figure at the earliest, it would be very helpful in taking this article through the remaining processes of proof preparation.

처음 제출한 그래픽 이미지



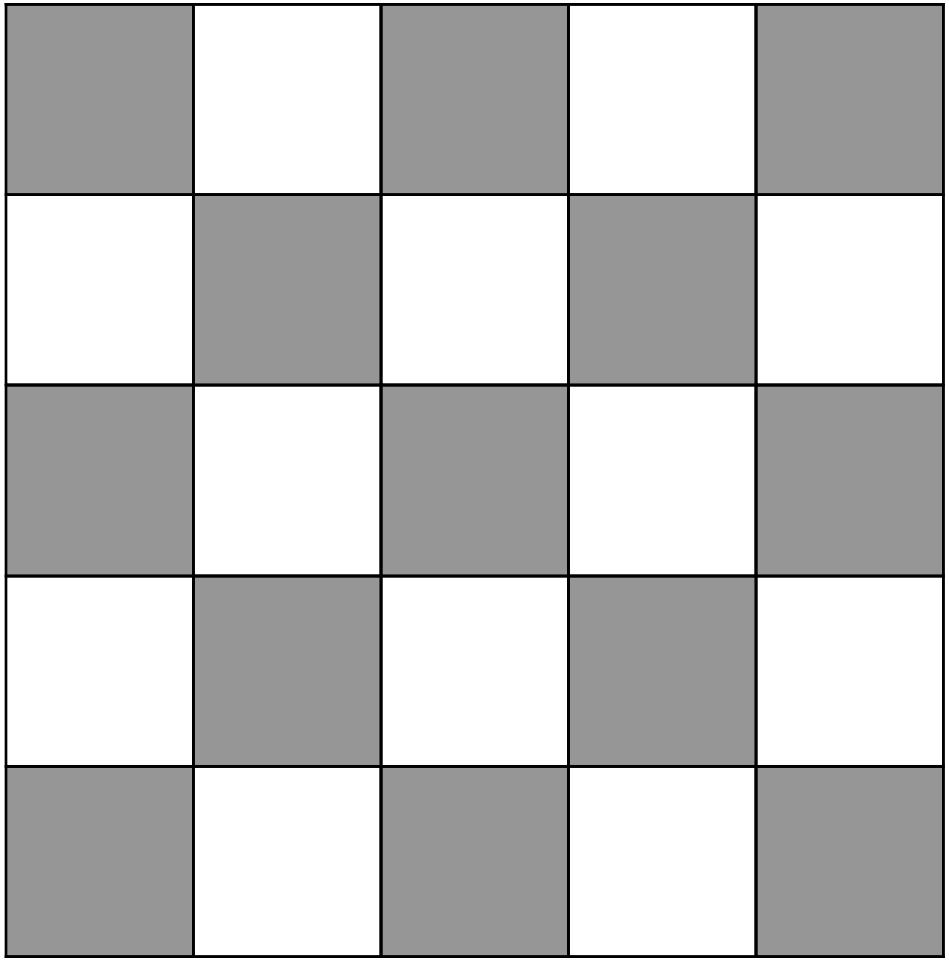
해상도란 무엇인가?

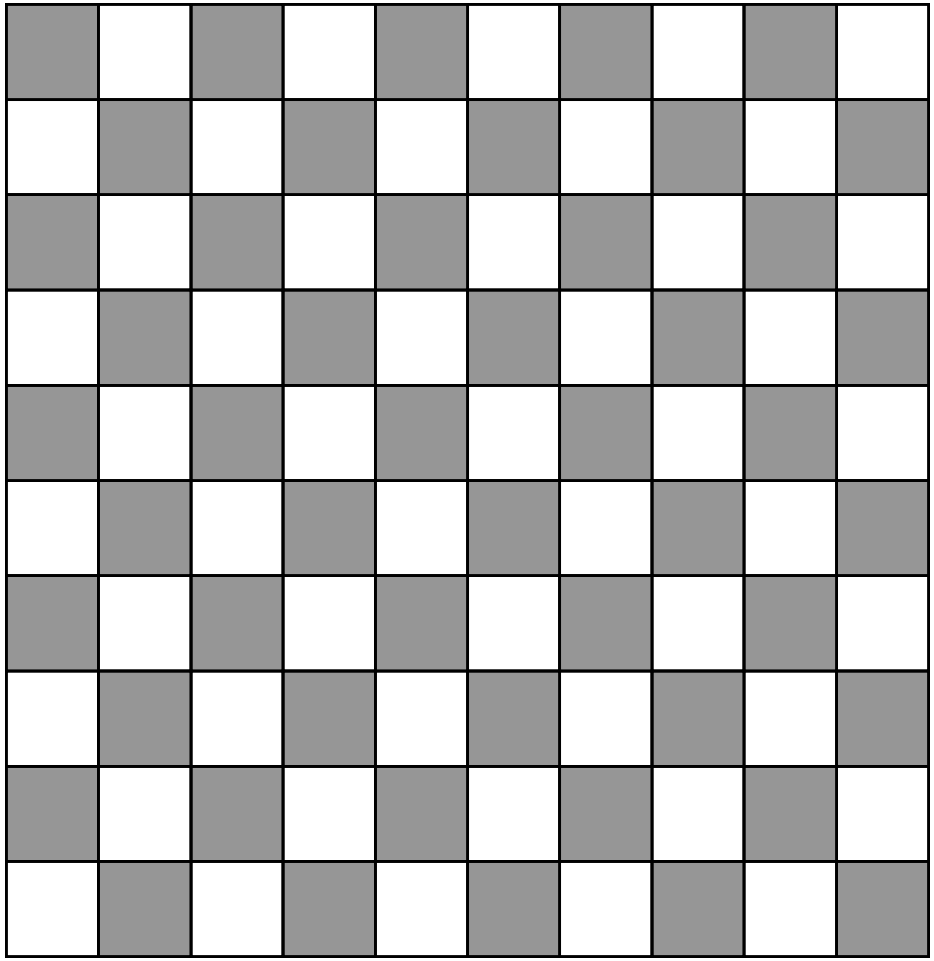
- 해상도(解像度)는 어느 일정한 단위 안에서 얼마나 더 자세하게 그 내용을 표현하는가를 나타내는 용어이다.
- 일정한 물리적 길이 단위인 1인치(25.4mm) 안에 표현되는 화소(pixel)의 수를 말한다. 단위로 dpi(dots per inch)가 쓰인다. 예를 들어, 72 dpi라고 하면 1인치 안에 72개의 점이 들어간다는 뜻이다.

http://ko.wikipedia.org/

http://www.ibiblio.org/wm/paint/auth/monet/paris/

출력시 크기가 같다면 pixel의 수가 많을수록 해상도가 높다 (높은 DPI 값)

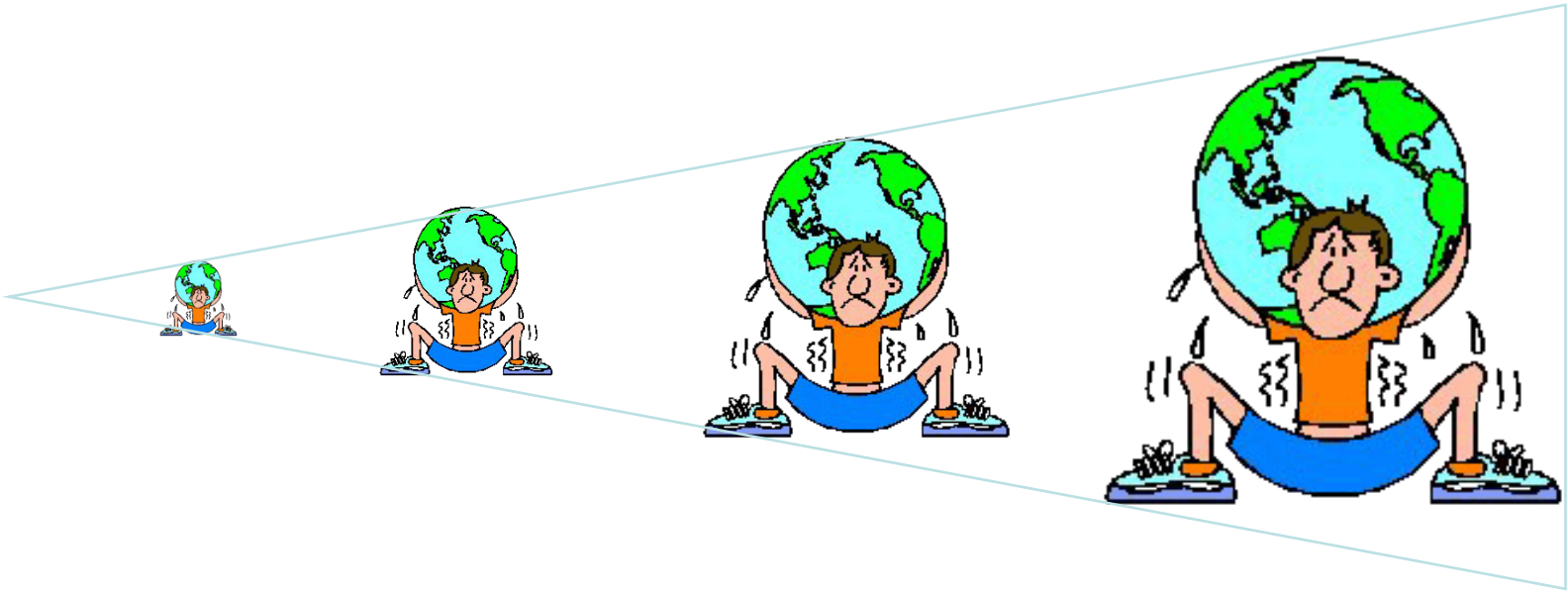




DPI = Dots / Inch

DPI value for digital image?

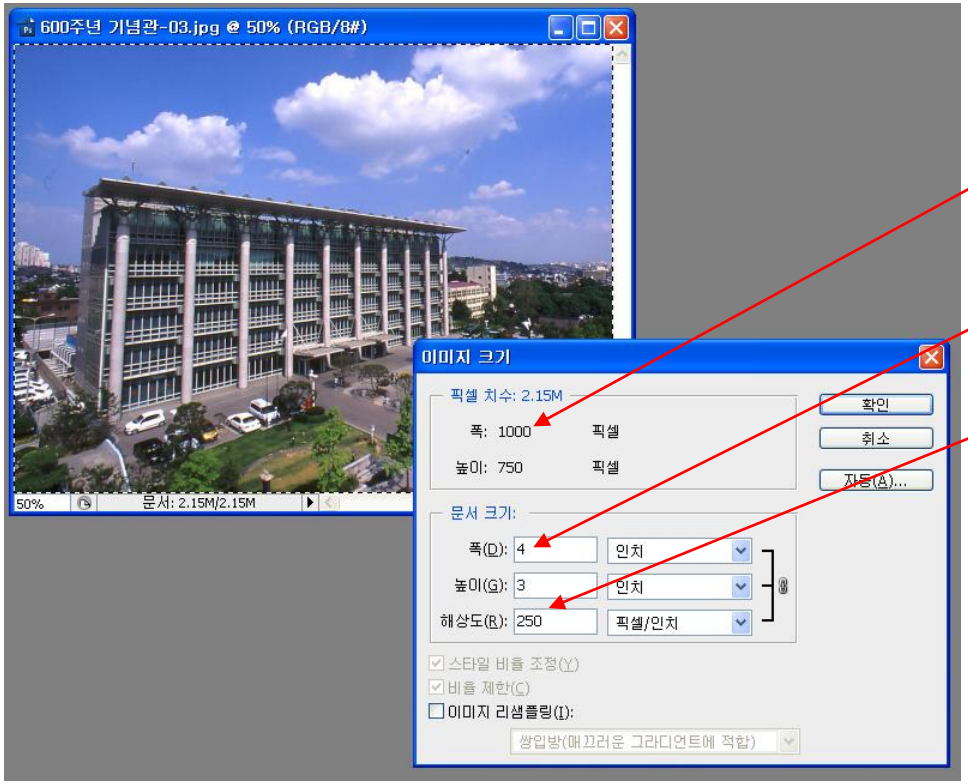
- A digitally stored image has **no inherent physical dimensions**, measured in inches or centimetres.



http://en.wikipedia.org/wiki/Dots_per_inch

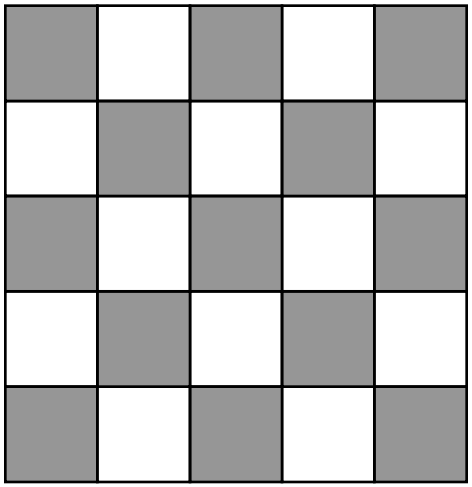
Information amount in a BMP file

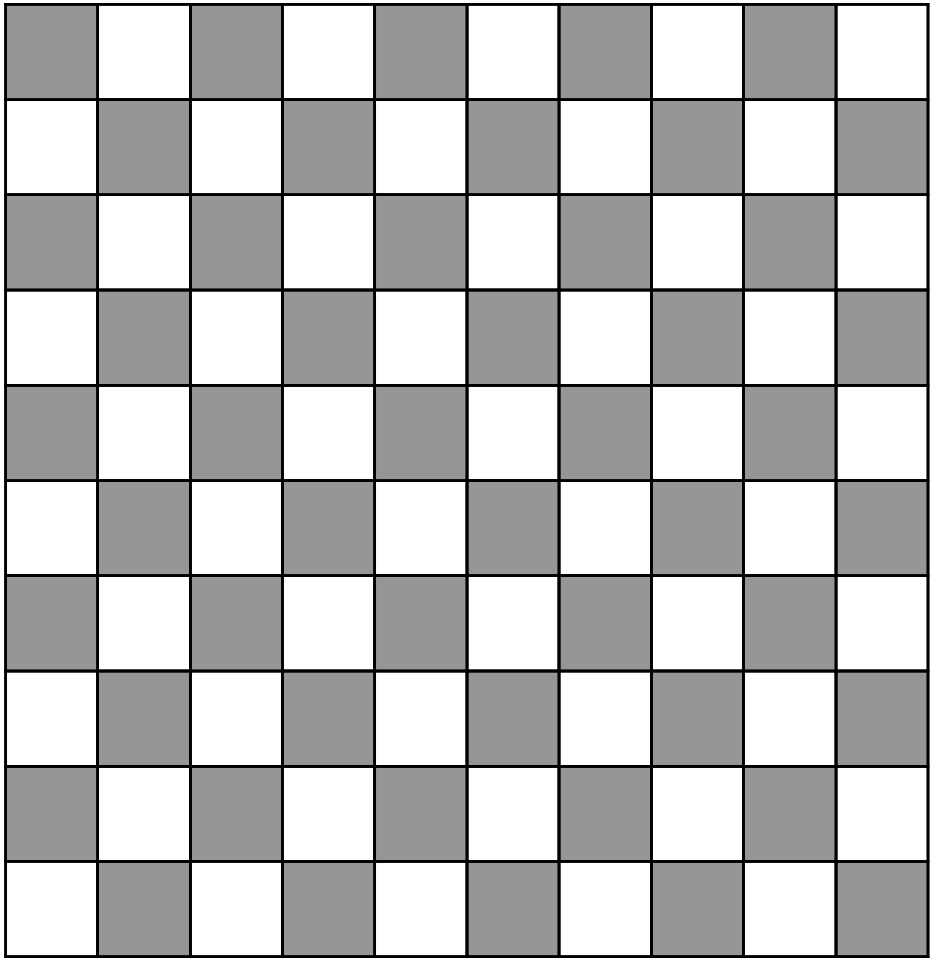
- Determined by the number of pixels
- Size (inches) x resolution (dpi) = pixel numbers



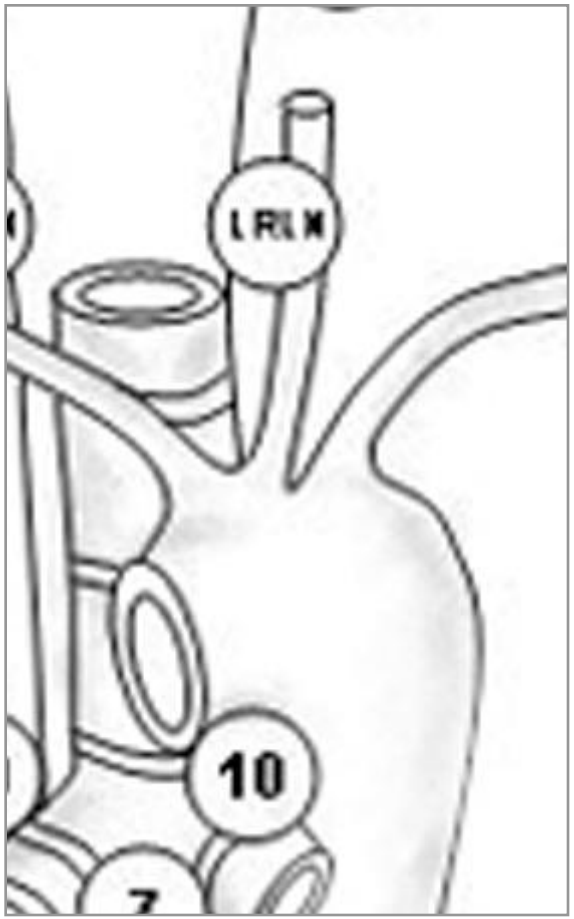
Width 1000 pixels
= 4 inches x 250 pixel/inch

Digital image에서는 pixel 수가 많을수록 정보량이 많다 (높은 해상도)

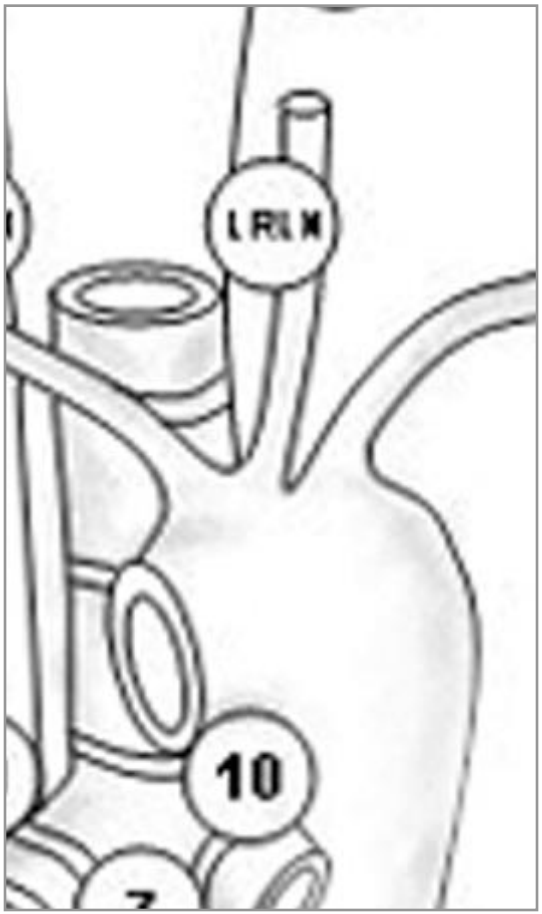




Pixel 수가 많다고 고해상도는 아니다

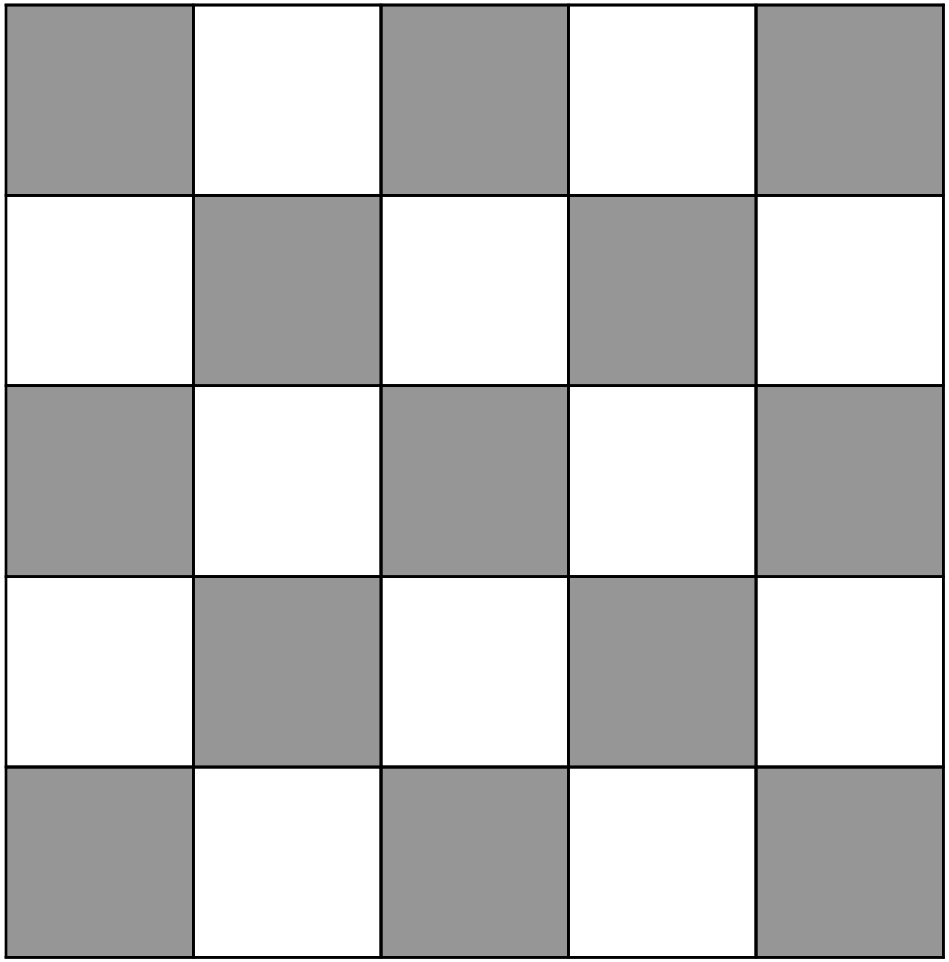


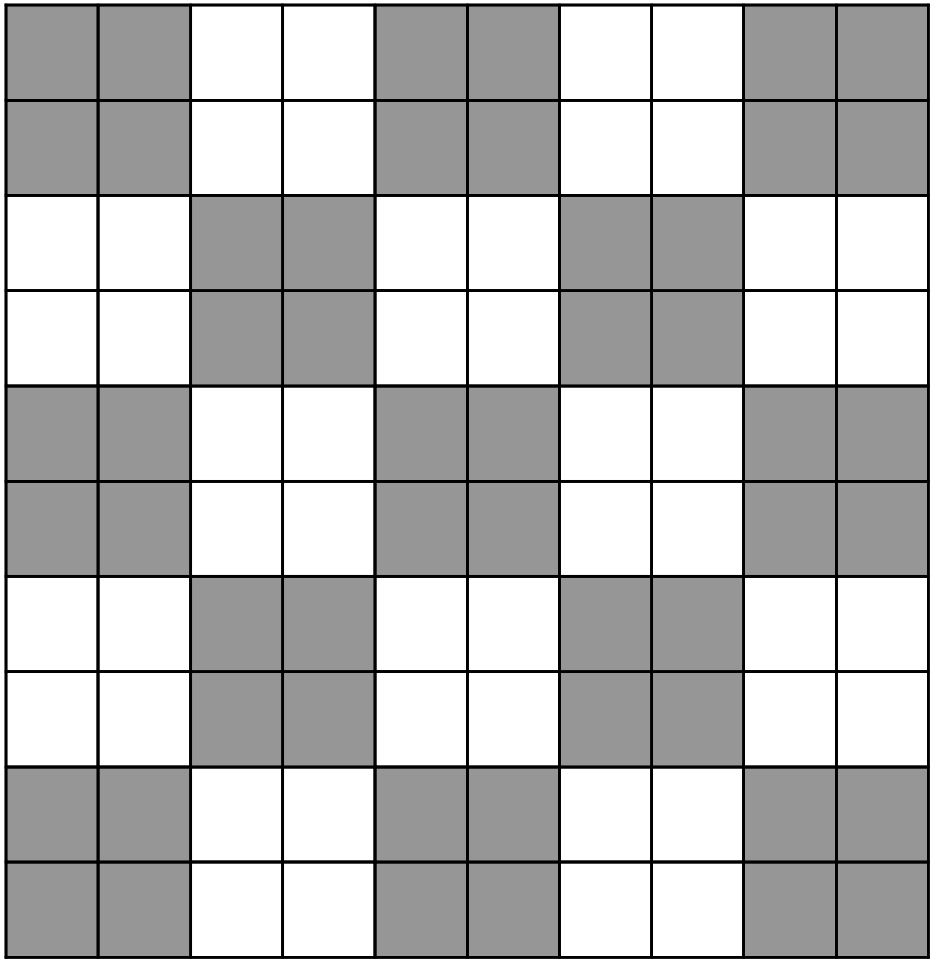
1.14 inch, 300 dpi



4 inch, 900 dpi

한번 줄인 pixel 수는 되돌이킬 수 없다





요약: 해상도

- 디지털 이미지의 정보는 pixel의 수로 결정된다.
- 어떠한 방법을 사용하더라도 한번 줄어든 이미지 정보를 증가시킬 수 없다.
- 고해상도 이미지를 얻고 싶으면 처음부터 pixel의 수가 많은 이미지를 만들 필요가 있다.
- 이미지의 변형은 항상 해상도의 저하를 동반한다. **원본이미지를 확실하게 보관해 두어야 한다**.

질문: 모든 graphic image에는 해상도라는 개념이 존재하는가?

- 해상도라는 concept가 없는 graphic image가 있다. 이를 vector image라고 부른다.

기본 개념 2:Vector Image

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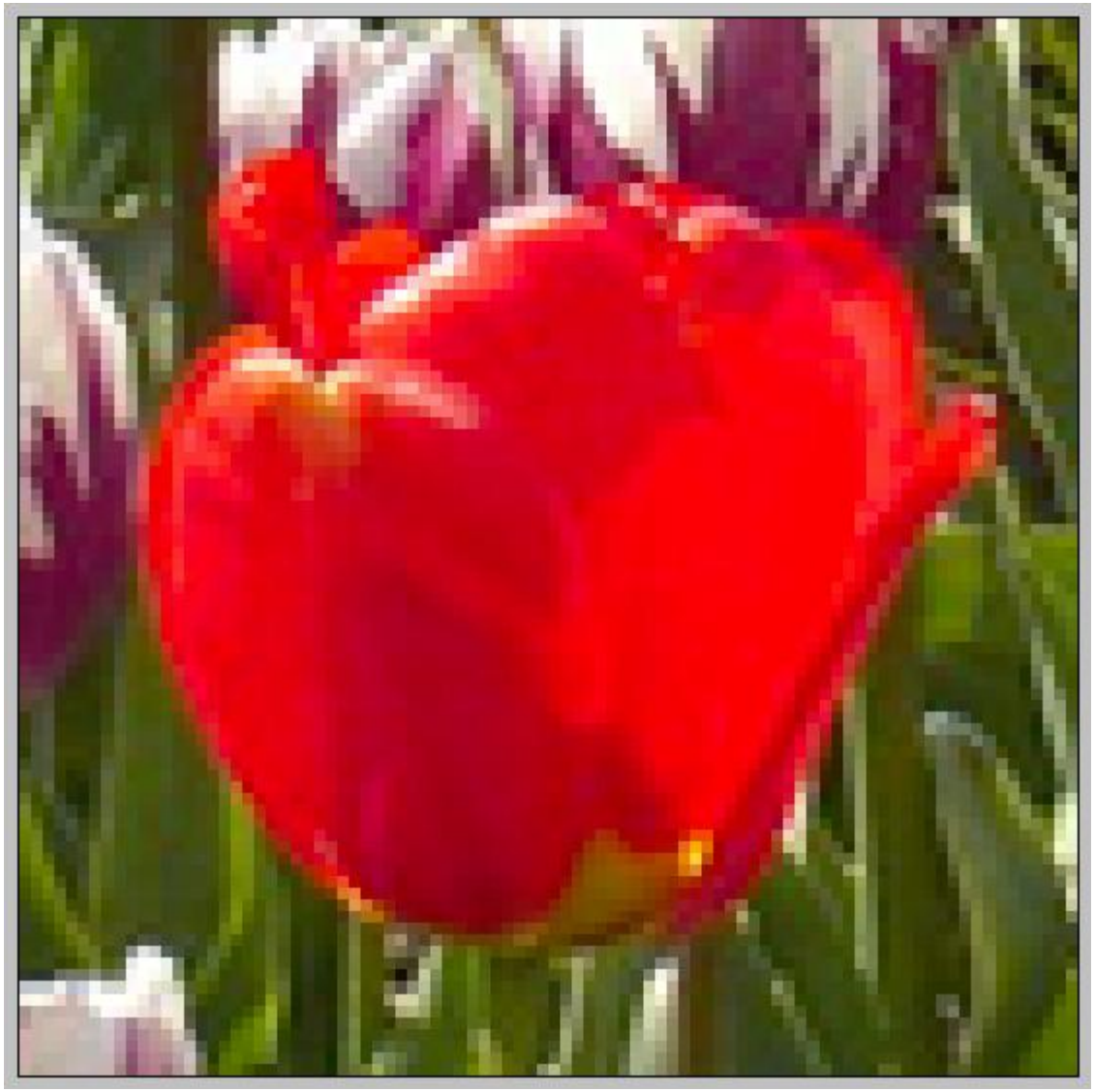
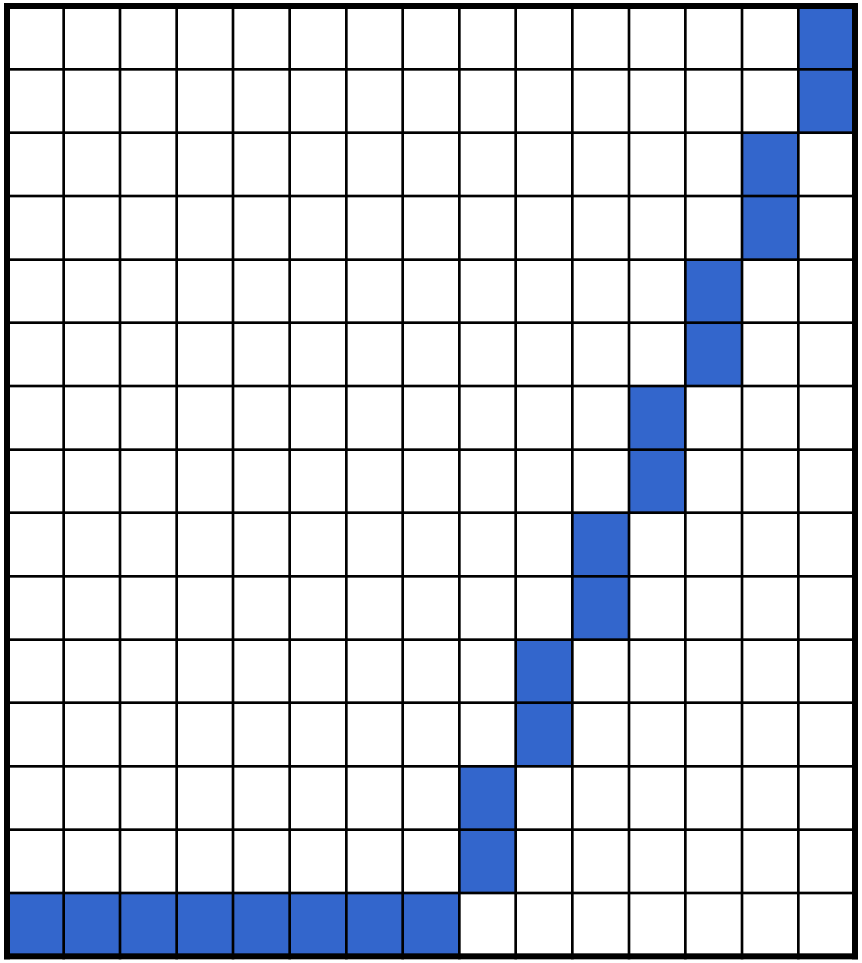
Digital camera로 찍은 image는 전형적인 bitmap image 다. 확대를 하지 않으면 매우 자연스럽게 보인다.

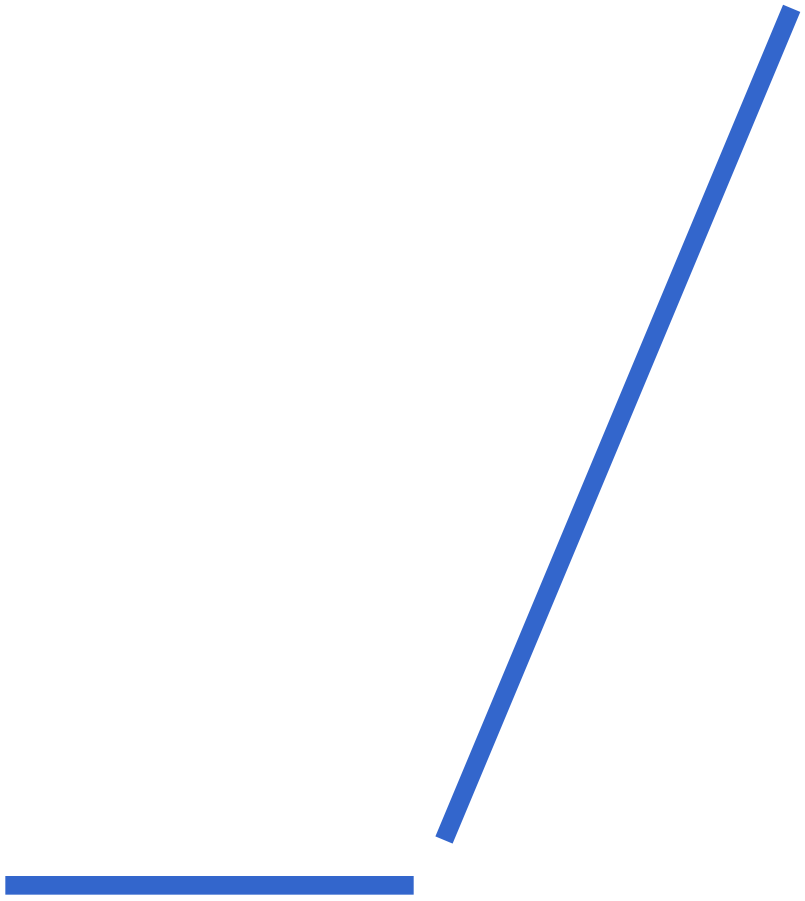


Pixel이 보이도록 크게 확대하면 격자구조를 볼 수 있다.

선을 그리는 두 가지 방법



Bitmap (=rastor) image



Vector image

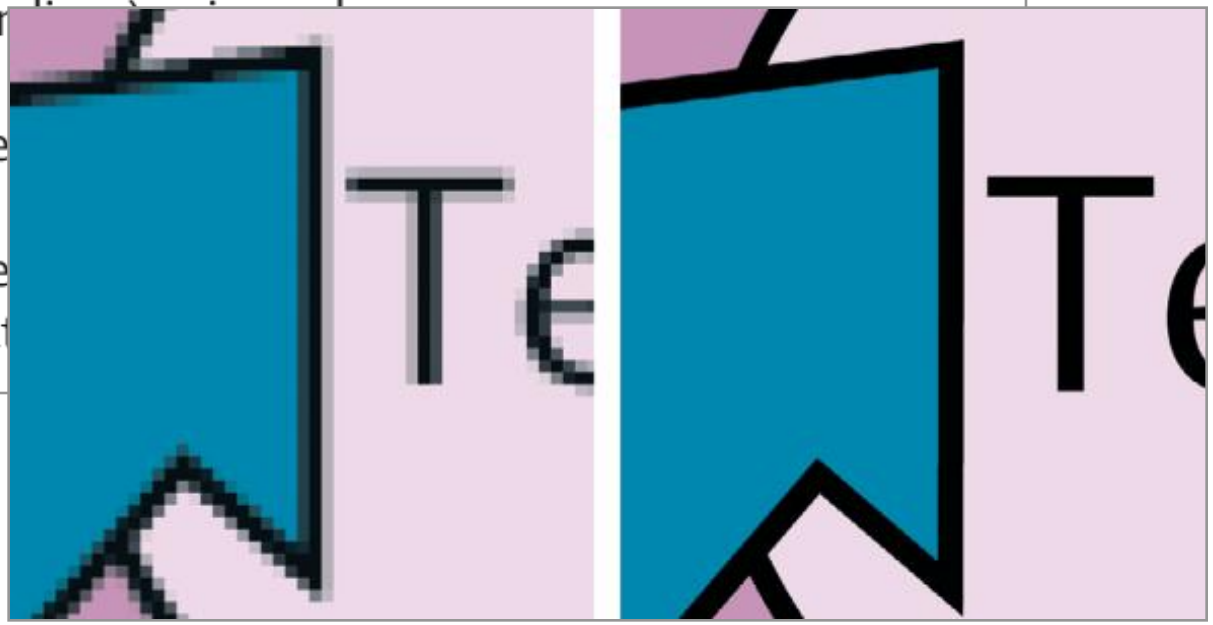
Is my image a vector file?

To ensure that your image is a vector drawing please conduct the following test:

1 In the document zoom in to the diagram 500% or more.

2 Check if lines such as curves have lost any quality, are appearing pixelated (made up of small squares rather than clear

3 If they are same file mentione check tha



http://www.thelancet.com/webfiles/images/clusters/thelancet/EESartwork.pdf

우리가 흔히 사용하는 format은 대부분 bitmap format이다

File Format	Pertinent Application
DICOM	PACS
JPEG	PowerPoint, web-based display
TIFF	Print output, journal publication
PSD	Print output, when arrows or labels are necessary
GIF	Web-based display
EPS	Vector graphics
PDF	Distribution, web-based or otherwise
PICT	Some Macintosh applications use this format though it is largely replaced by the other formats
PNG	New format, may replace JPEG eventually

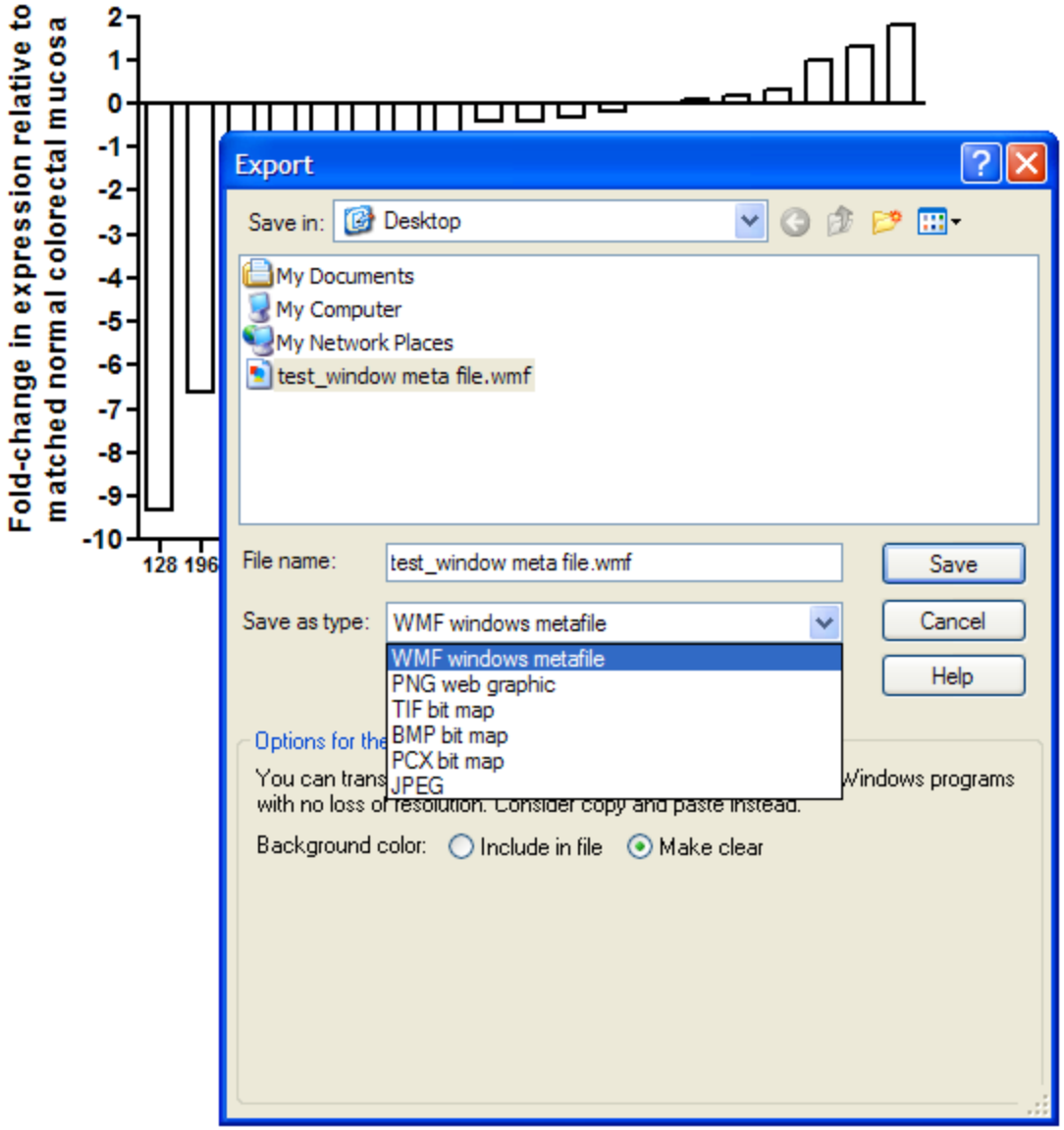
Note.—PICT = PICTure; PNG = portable networks graphics; PSD = PhotoShop document.

LaBerge. J Vasc Interv Radiol 2003;14:1223-1229

우리가 흔히 사용하는 프로그램은 대부분 bitmap 제작용이다

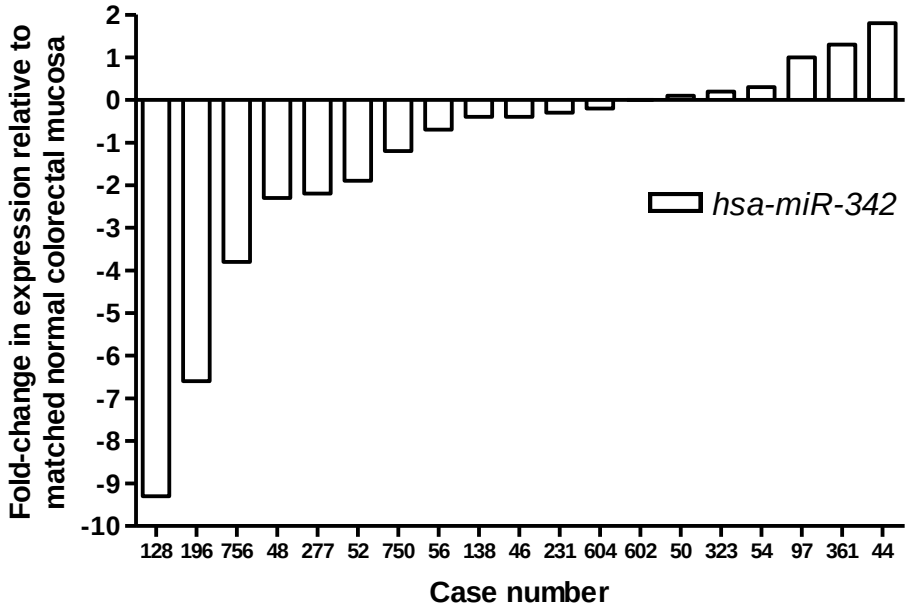
- Bitmap (=raster) image
  - Photoshop
  - Cameras
  - Scanners
- Vector image
  - Adobe illustrator
  - Corel draw
  - **Prism**

Making a vector file in Prism



Insertion of the WMF file

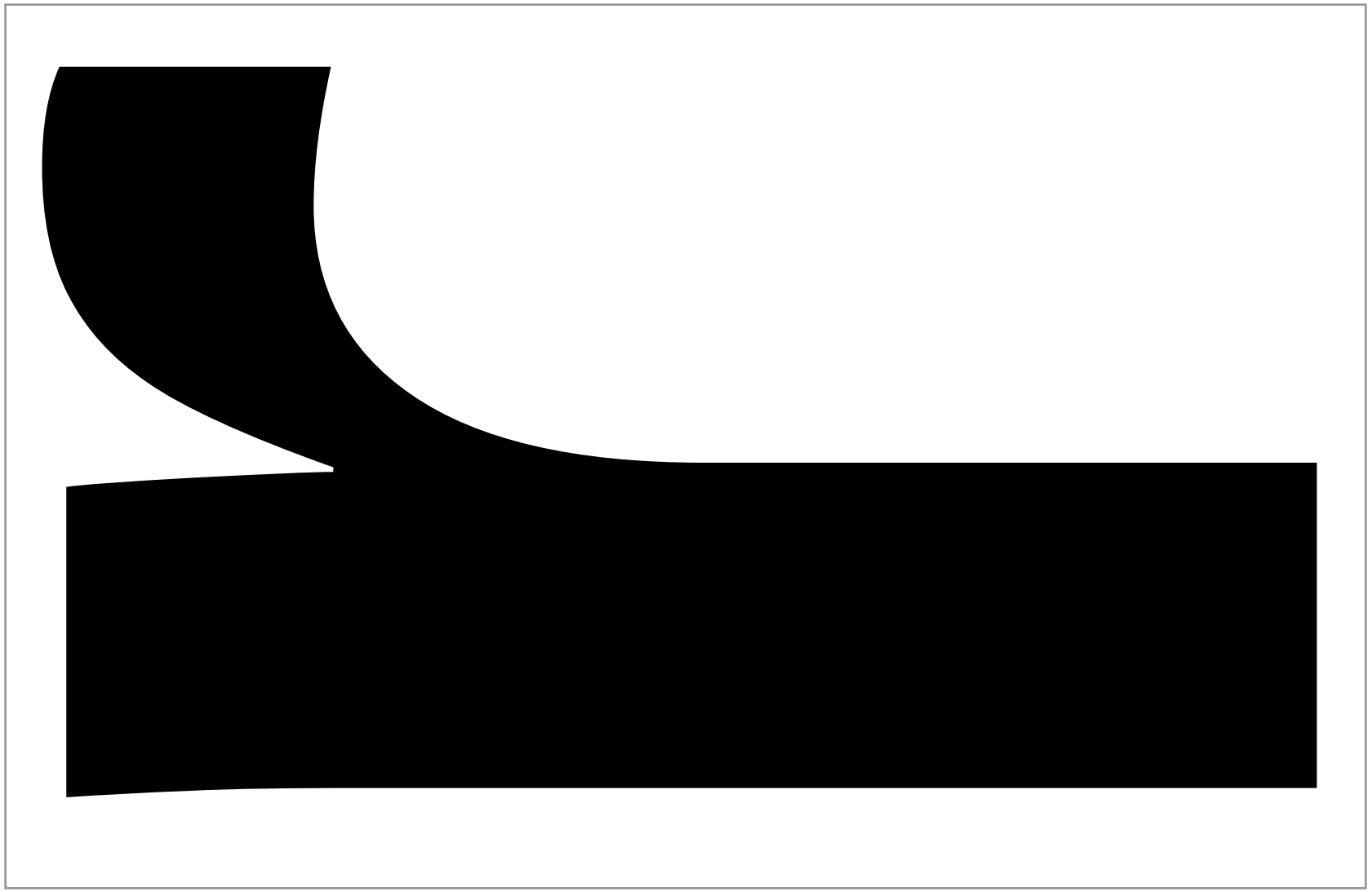
- File size: 5,158 bytes



Windows Metafile (WMF) is a vector graphics format which also allows the inclusion of raster graphics.

X10 enlargement

X100 enlargement



Some journals may requires vector drawings

Accepted file types

- For graphs and diagrams we prefer to accept vector drawings. These files would ideally be created in a program such as Adobe Illustrator or Corel Draw and saved as an encapsulated postscript (**.eps**) or portable document format (**.pdf**) files for uploading on-line.

- Other accepted vector files are Corel Draw (**.cdt**) and Adobe Illustrator (**.ai**). Please email these directly to the article editor as these formats are not supported for uploading.

http://www.thelancet.com/webfiles/images/clusters/thelancet/EESartwork.pdf

요약: vector image

- 선을 그리는 방법은 두 가지가 있다. Bitmap (=rastor)와 vector.
- 격자구조로 이루어진 bitmap에서는 해상도라는 개념이 필수적이다.
- Vector에서는 확대하여도 격자구조가 발생하지 않는다.
- 최고의 해상도를 얻기 위해서는 vector program을 이용하여 figure를 작성한 후 마지막에 필요한 해상도의 bitmap 파일로 변경하는 것이 좋다.

출판에 적절한 해상도?

이 준 행

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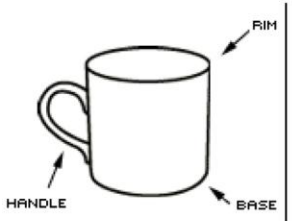
Acceptable resolutions. It is extremely important that the proper resolution be used when submitting digital artwork. Low resolution graphics are commonly misused in print projects.

This occurs when a graphic is placed that has a DPI resolution too low for print quality. Unfortunately, the problem doesn't arise until the plating or printing of a job.

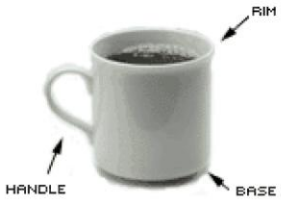
The minimum requirements for resolution in raster files are:

- 1200 DPI/PPI for monochrome
  This resolution applies to images that are purely black and white. Images such as line graphs (shown left) fall in this category.
- 300 DPI/PPI for halftones (CMYK/Grayscale)
  This resolution is for images containing pictures only. For example, an image not containing text labeling or thin lines (shown center)
- 600 DPI/PPI for combination halftones.
  This resolution is for images containing pictures and text labeling and/or thin lines (shown right).



MONOCHROME IMAGE


HALFTONE



COMBINATION HALFTONE

Color space requirements. All digital art submitted **must** be bitmap (Monochrome), grayscale, or CMYK.

Graphics in the RGB color space (or Indexed color) **will not separate correctly**. They are very difficult to detect before plating or even going to press.

It is extremely important to check every scan/file for correct color format before saving and submitting your work.

출판을 위한 해상도 선정 원칙

- Color: 300 dpi
- Gray scale: 300 - 600 dpi [required for photos, without text]
- Combination art (combo): 600 - 900 dpi [required for photos and text]
- Line art (monochrome 1-bit image): 900 - 1200 dpi [B&W text only]

DPI = Dots / Inch

그러나 최종 편집된 페이지에서 그림이 어떤 크기가 될지를 알 수 없다는 문제가 있다

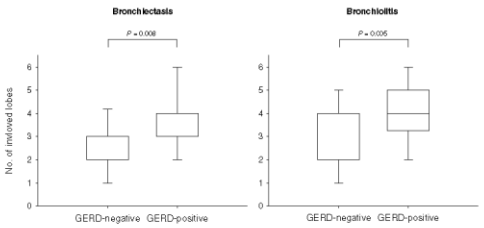


FIGURE 1. Box-and-whiskers graph of the quantitative imaging analysis showing the number of involved lobes with bronchiectasis and bronchiolitis. Bronchiolitis is defined as the presence of centrilobular small nodules (< 10 mm in diameter) or branching nodular structures (tree-in-bud pattern) on HRCT. The ends of the boxes indicate the 25th and 75th percentiles, and the lines in the bars indicate the median value. The 10th and 90th percentiles are indicated with whiskers. In the patients without GERD, the median numbers of involved lobes with bronchiectasis and bronchiolitis are both 2. In the patients with GERD, the median numbers of involved lobes with bronchiectasis and bronchiolitis are both 4. Bronchiectasis and bronchiolitis were observed in more lobes in pateints with GERD than in patients without GERD (p = 0.008 and p = 0.009, respectively).

In addition, patients with GERD were more likely to have AFB-positive sputum smear results in comparison with patients without GERD. These findings suggest that further studies to investigate the nature of the association between GERD and NTM lung disease are needed. If GERD is causative, its treatment may be critical. If GERD is secondary to more advanced lung disease, its treatment may be less important in managing the lung disease.

Our study had some limitations. First, this study did not include a control group. However, our principal goal was to investigate the prevalence of GERD in patients with the nodular bronchiectatic form of NTM lung disease, and ours is the only study to use 24-h pH monitoring to determine this.

Second, a significant proportion (34 of 92 patients, 37%) of screened patients did not perform 24-h esophageal pH monitoring. Then, the study group did not accurately reflect total population of patients with NTM lung disease. In particular, the study group had a significantly higher proportion of patients with *M abscessus* infection than the total group. This is very significant because it has been shown that patients with *M abscessus* infection have a higher rate of gastroesophageal abnormalities.

Third, we used accepted criteria used by gastroenterologists for the diagnosis of GERD, but these may not apply for a person to be susceptible to NTM infection by possible aspiration. For example, it is not known if someone has to have a pH
4 for > 4% of the study time to place NTM in his or her lungs. Also, the patients were only studied for 24 h, which does not exclude that aspiration may have occurred at other times not studied.

Although we showed that GERD is prevalent in patients with NTM lung disease, the nature of this relationship remains uncertain. Our study was not designed to investigate a possible causal association between GERD and NTM lung disease. Our data are consistent with GERD causing or contributing to the development or progression of NTM lung disease via recurrent exposure of the pulmonary parenchyma to the acidity of the refluxed gastric contents. Alternatively, GERD might be a secondary phenomenon. Patients with NTM lung disease might be at increased risk for abnormal reflux because of the increased pressure gradient across the diaphragm during frequent coughing and changes in pulmonary mechanics.

In addition, non-acid reflux as well as acid reflux may be present in patients with NTM lung disease. The measurement of acid reflux using esophageal pH monitoring is just a marker for possible aspiration but may not be related to the pathogenesis of NTM infection. In fact, it is possible that the increased use of acid suppressants with a resultant aspiration of relative alkaline pH into the esophagus may actually make the environment more favorable to NTM infection and the relative alkaline pH exacerbate further aspiration.

In conclusion, our study showed that patients with the nodular bronchiectatic form of NTM lung disease have a high prevalence of GERD. However, most patients with NTM lung disease and GERD lacked the typical symptoms of heartburn and regur-

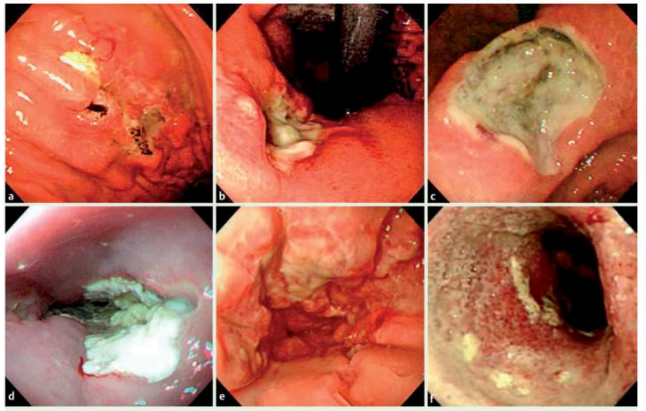


Figure 1 Endoscopic appearances of primary upper gastrointestinal NK-/T-cell lymphoma. **a** Superficial/erosive type (patient 1): several superficial erosions of various sizes in a continuous focal pattern in the body of the stomach. **b** Ulcerative type (patient 2): a round 1.5-cm well defined deep ulcer in the body of the stomach. **c** Ulcerative type (patient 3): round 2-cm well defined deep ulcer at the angle of the stomach. **d** Ulcerative type (patient 4): a long irregular 4-cm well defined deep ulcer in the mid esophagus. **e** Ulceroinfiltrative type (patient 5): diffuse ill defined ulcers of various sizes in a continuous pattern in the lower esophagus. **f** Ulceroinfiltrative type (patient 6): diffuse ill defined ulcers of various sizes in a continuous pattern in the second portion of the duodenum.

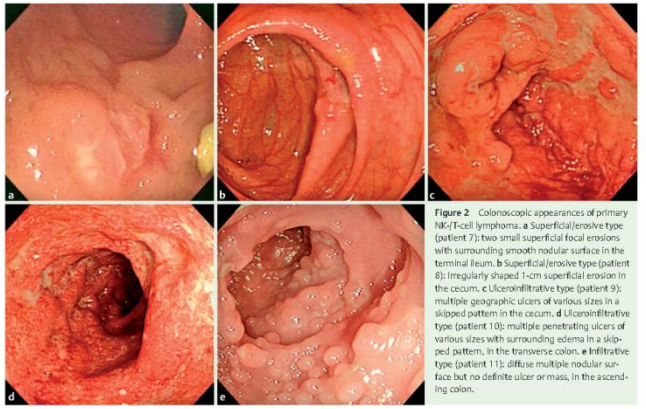
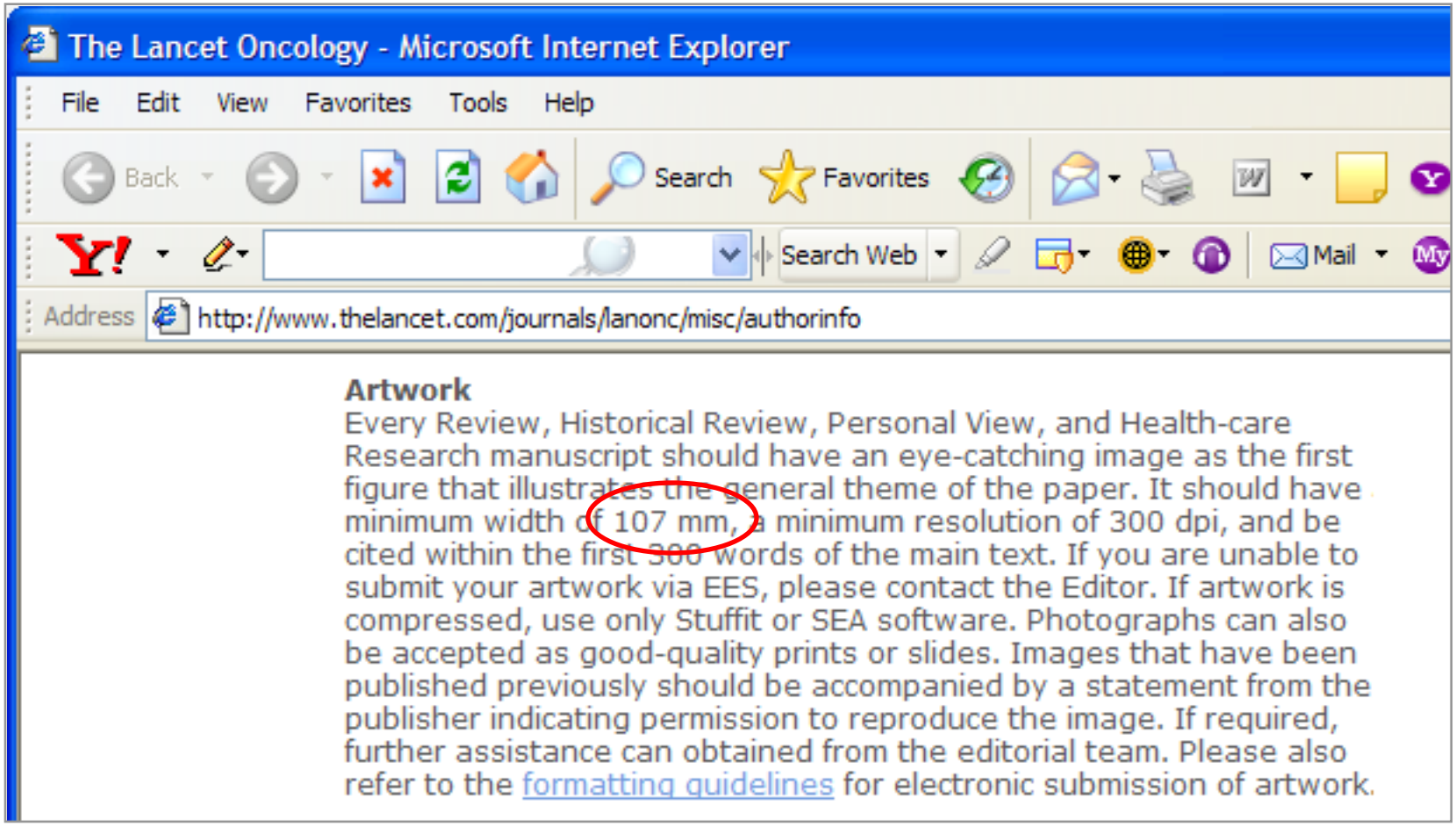


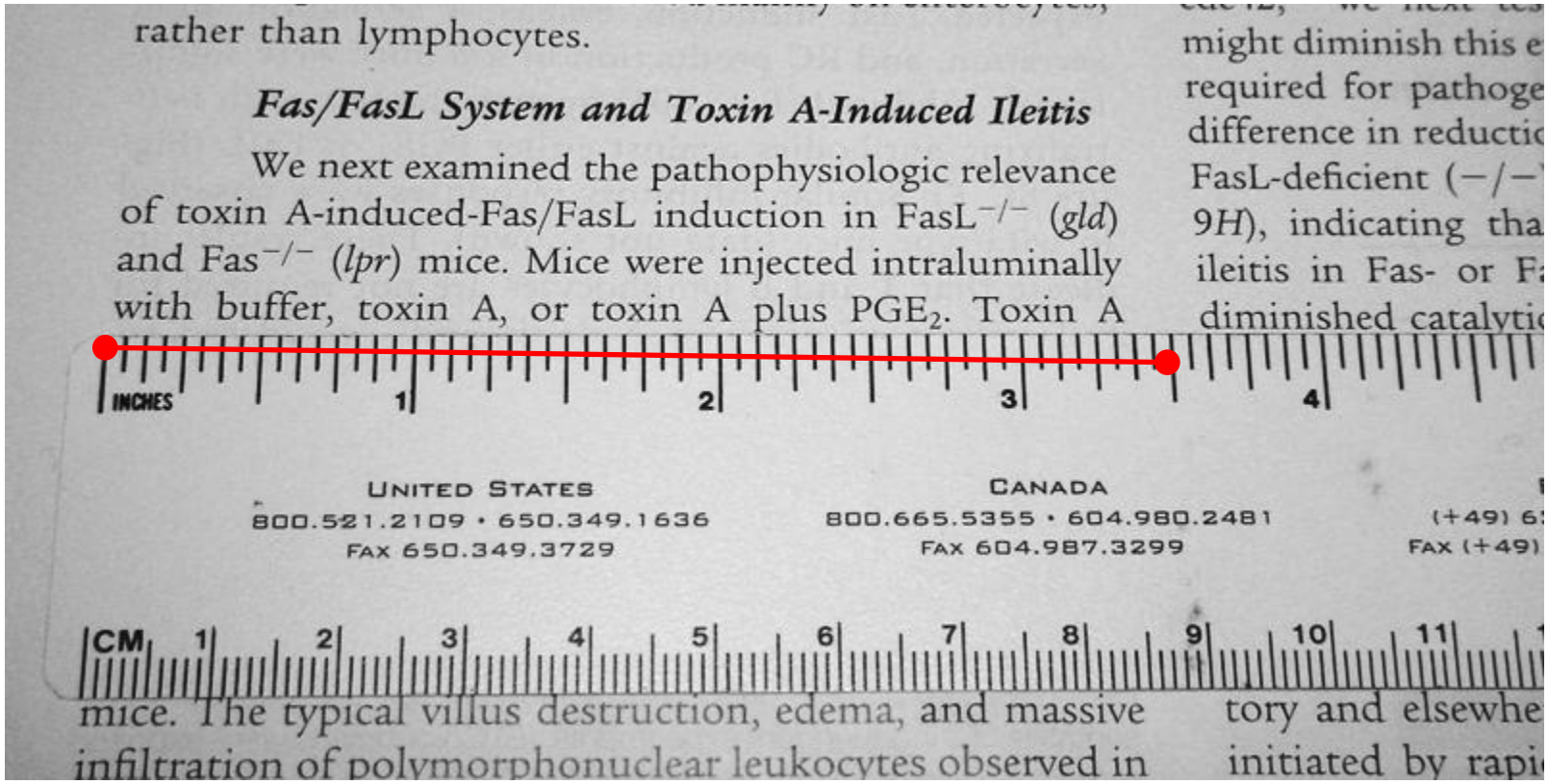
Figure 2 Colonoscopic appearances of primary NK-/T-cell lymphoma. **a** Superficial/erosive type (patient 7): two small superficial focal erosions with surrounding smooth nodular surface in the terminal ileum. **b** Superficial/erosive type (patient 8): irregularly shaped 1-cm superficial erosion in the cecum. **c** Ulceroinfiltrative type (patient 9): multiple geographic ulcers of various sizes in a skipped pattern in the cecum. **d** Ulceroinfiltrative type (patient 10): multiple penetrating ulcers of various sizes with surrounding edema in a skipped pattern, in the transverse colon. **e** Infiltrative type (patient 11): diffuse multiple nodular surface but no definite ulcer or mass, in the ascending colon.

Only a few journals recommend the size of the artwork



http://www.thelancet.com/journals/lanonc/misc/authorinfo

One column is usually < 3.5 inch



4 inch, 900 dpi로 작업을 하면 대부분의 경우에 문제가 없다

Kim. Gastroenterology 2007;133:875-886

요약: 출판에 적절한 해상도

- 그림의 종류에 따라 출판용 해상도가 다르다.
- 디지털 이미지는 dimension이 없으므로 dpi 수치 자체로는 의미가 없다. 투고규정에 그림 크기에 대한 언급이 포함되어야 한다.

PowerPoint 이미지를 고해상도 TIFF로 바꾸는 방법

이 준 행

성균관대학교 의과대학 삼성서울병원

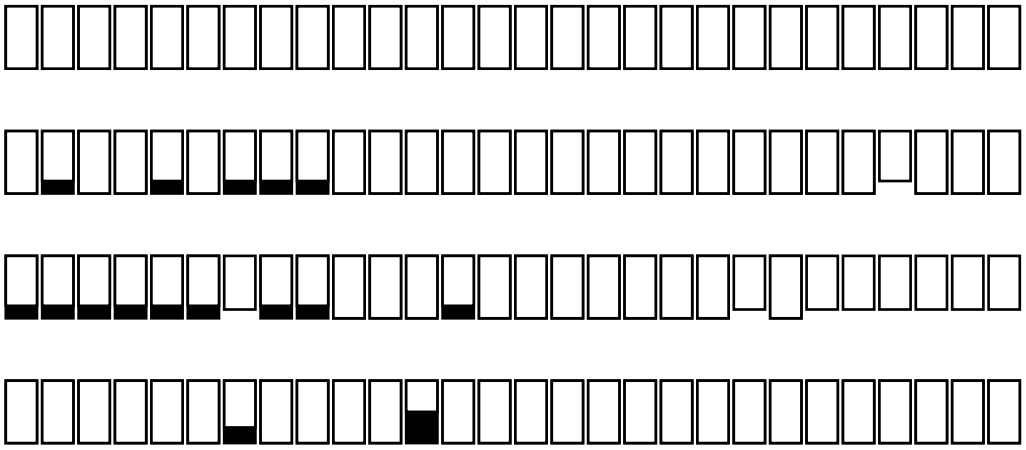
(i)

459 (4 clones)

469 (5 clones)

975 (5 clones)

991 (4 clones)

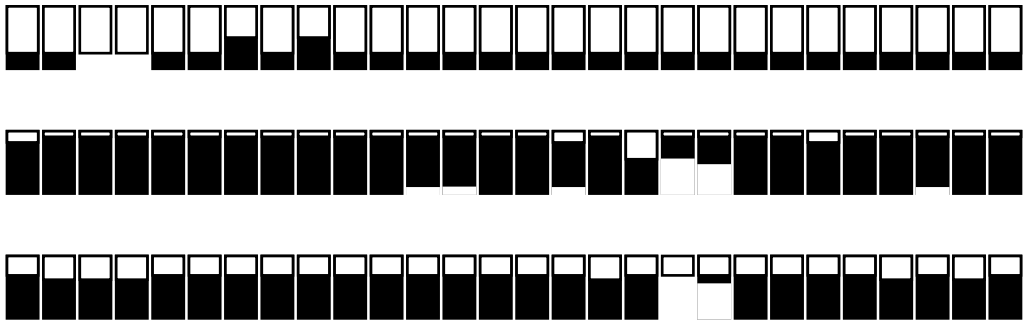


(ii)

455 (4 clones)

128T (11 clones)

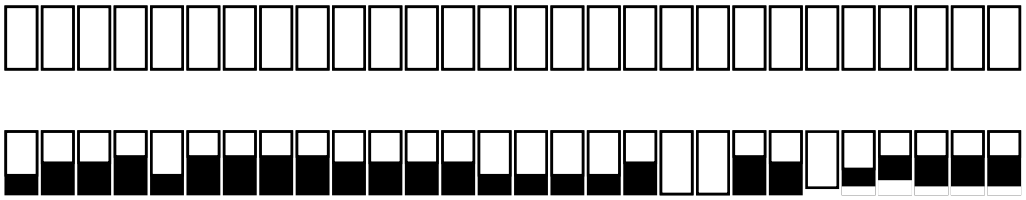
231T (13 clones)



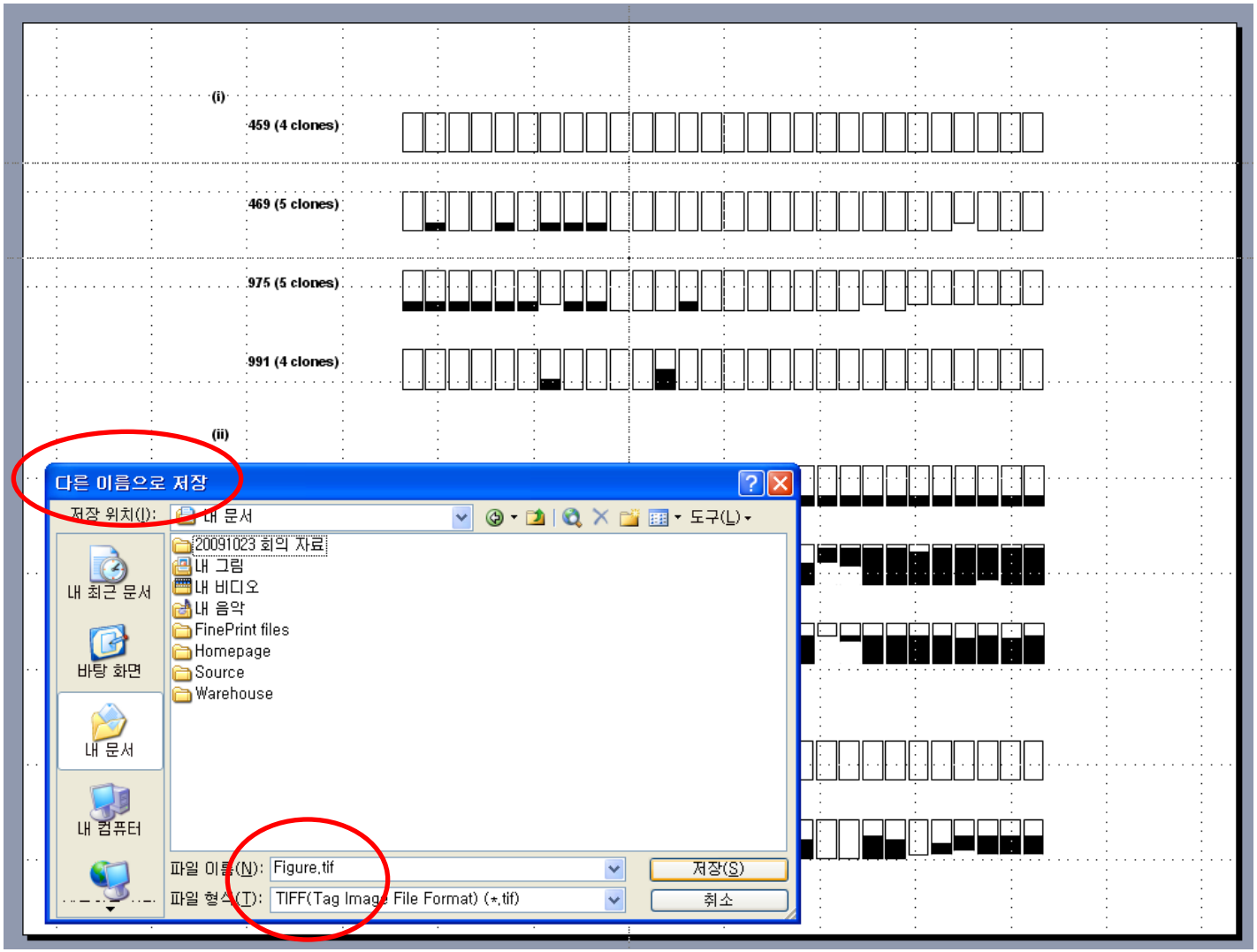
(iii)

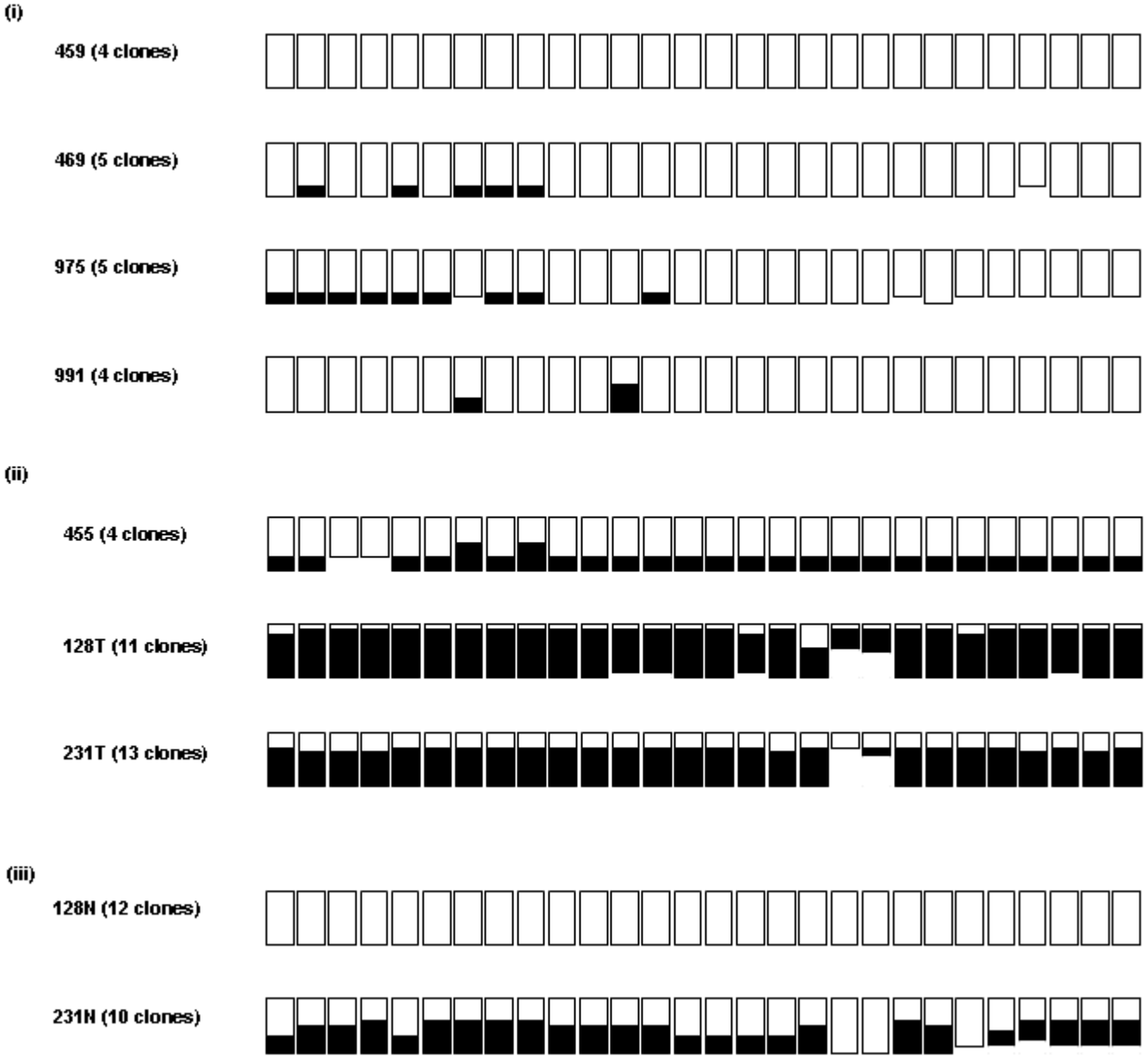
128N (12 clones)

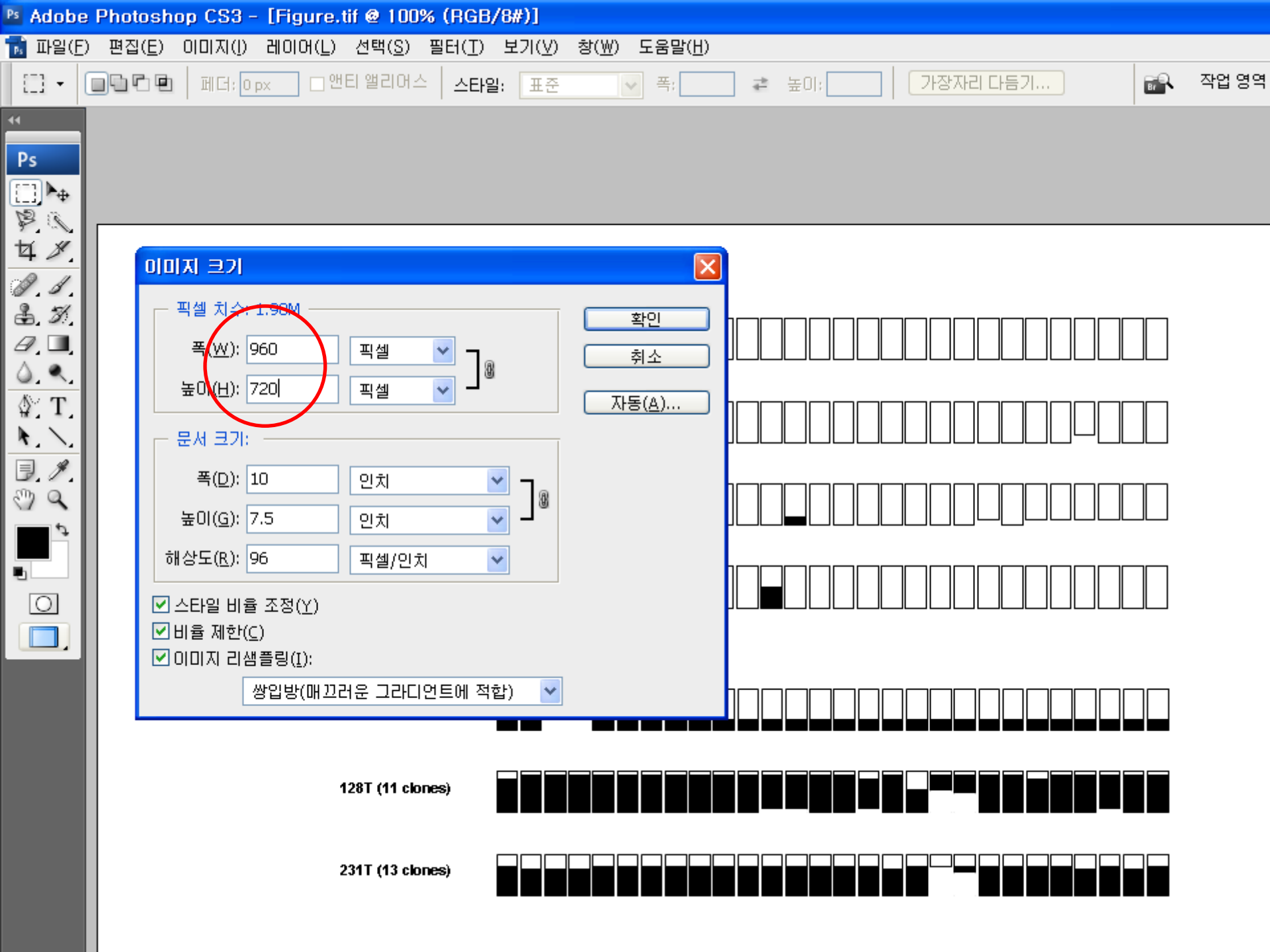
231N (10 clones)



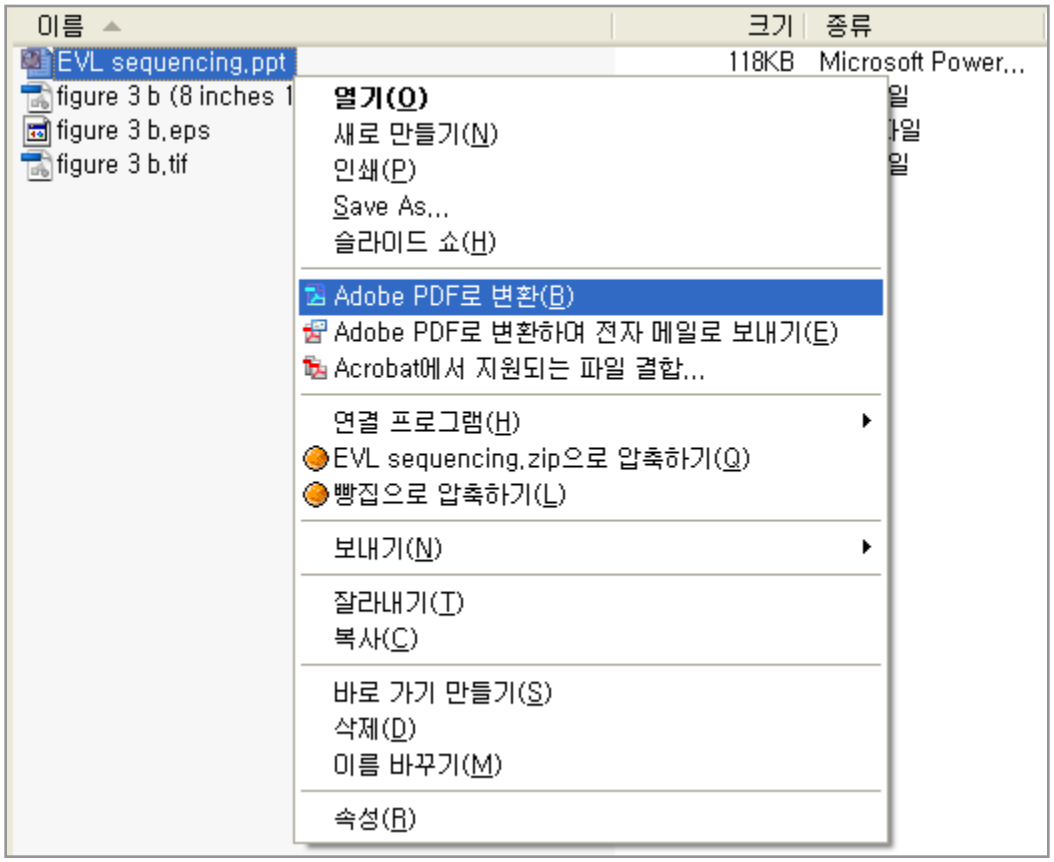
PowerPoint에서 손쉽게 TIFF로 만들기



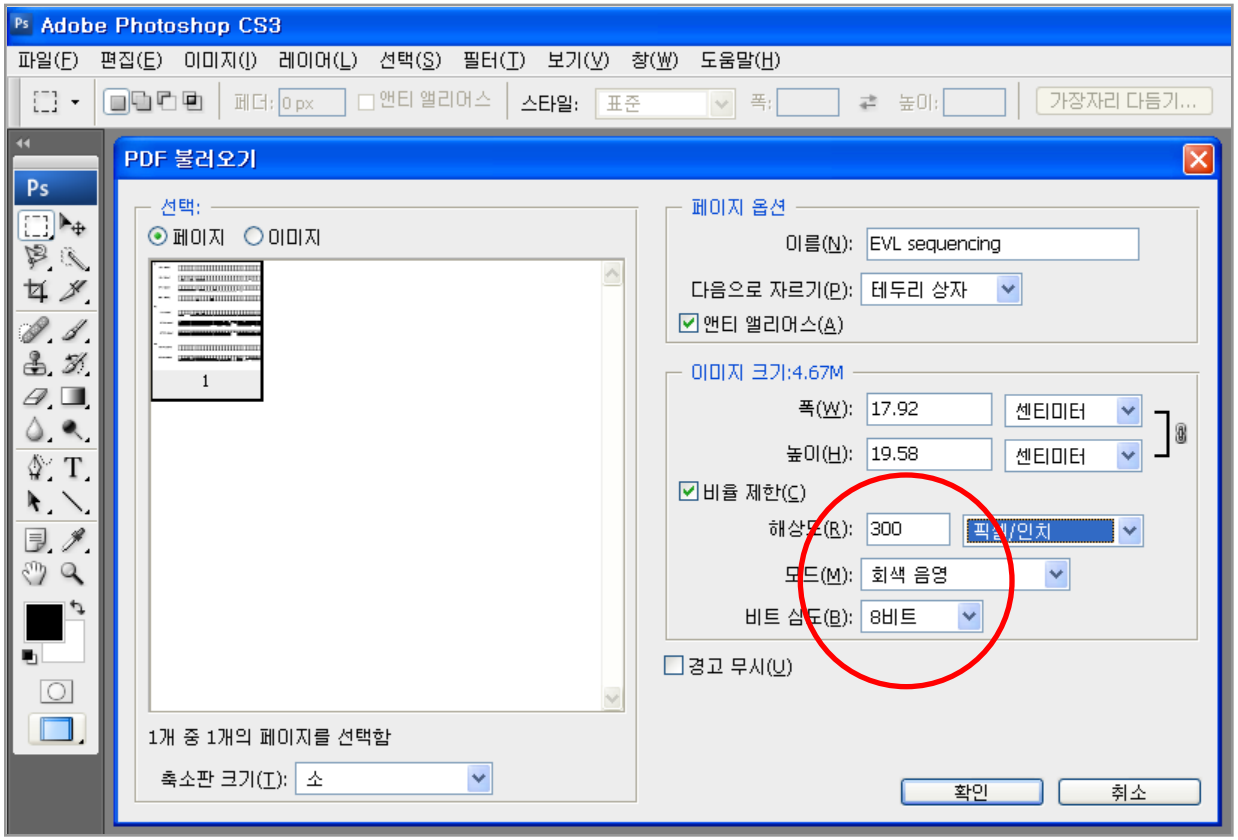

(i)
459 (4 clones)
469 (5 clones)
975 (5 clones)
991 (4 clones)
(ii)
455 (4 clones)
128T (11 clones)
231T (13 clones)
(iii)
128N (12 clones)
231N (10 clones)


Adobe Photoshop CS3 - [Figure.tif @ 100% (RGB/8#)]
파일(F) 편집(E) 이미지(I) 레이어(L) 선택(S) 필터(T) 보기(V) 창(W) 도움말(H)
이미지 크기
픽셀 치수: 1.98M
폭(W): 960 픽셀
높이(H): 720 픽셀
문서 크기:
폭(D): 10 인치
높이(G): 7.5 인치
해상도(R): 96 픽셀/인치
스타일 비율 조정(Y)
비율 제한(C)
이미지 리샘플링(I):
쌍입방(매끄러운 그라디언트에 적합)
확인
취소
자동(A)...
128T (11 clones)
231T (13 clones)

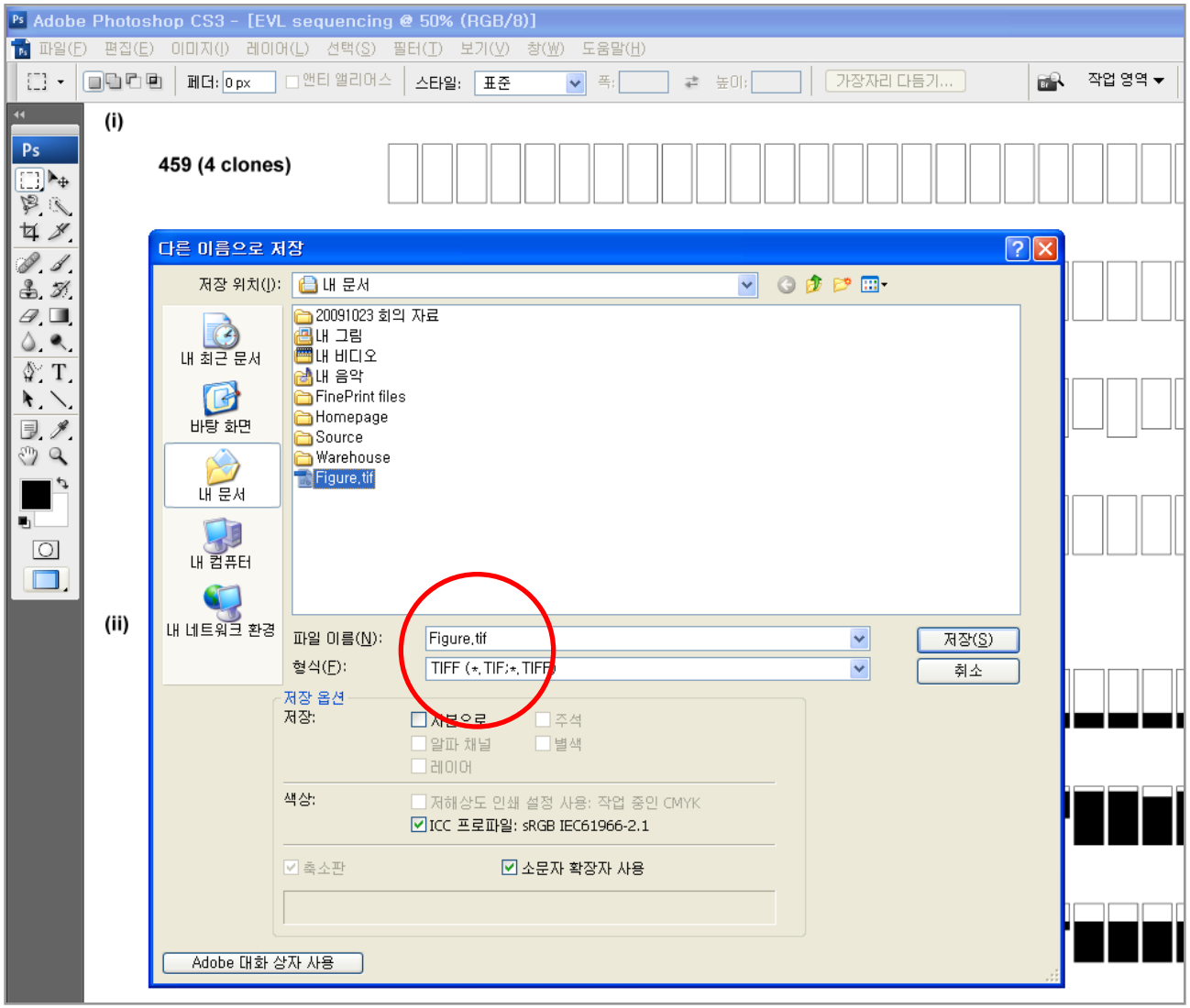
Acrobat를 이용하여 PDF 파일로 변환



PDF 파일을 Photoshop으로 불러온다



Photoshop에서 TIFF 파일로 저장한다



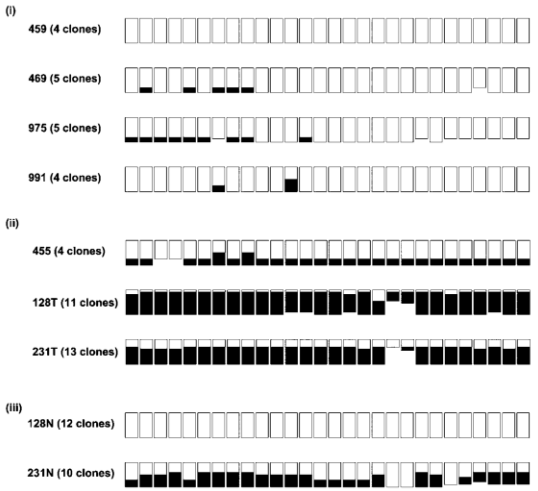


Figure 3 *EVL*/*hsa-miR-342* locus CpG methylation in colorectal carcinogenesis: evidence for a 'field defect' of *EVL*/*hsa-miR-342* locus CpG methylation in colorectal cancer. Bisulfite genomic sequencing results are shown for the *EVL*/*hsa-miR-342* CpG island from (i) normal colorectal mucosa from four individuals without cancer, (ii) colorectal cancer tissue from three individuals and (iii) normal appearing colorectal mucosa from two patients with concurrent colorectal cancer. The numbers in the left column represent patient identifiers. The number of clones sequenced from each patient sample is indicated in parentheses. Matched tumor (T) and normal (N) colorectal mucosa were analysed from patients no. 128 and no. 231 with results shown in (ii) and (iii). Each bar represents one CpG dinucleotide and the proportion of methylated CpGs is indicated by black shading. The height of the bar is representative of the number of informative clones at a given CpG site.

identify genes that are (a) overexpressed in colorectal cancer based on results from three relevant gene expression profiling studies (Alon *et al*., 1999; Notterman *et al*., 2001; Zou *et al*., 2002) and (b) PicTar-predicted targets of *hsa-miR-342*. Eleven genes satisfied these criteria and are presented in Supplementary Table S3.

Discussion

In this study, we confirmed that silencing of *hsa-miR-342* is a common event in colorectal cancer and provided evidence for coordinate epigenetic silencing of an intronic microRNA and its host gene in human cancer. Given that roughly half of microRNA genes are located in introns (Rodriguez *et al*., 2004; Kim and Kim, 2007; Saini *et al*., 2007), we suggest that this mode of coordinate silencing may represent a more general mechanism of microRNA suppression in human cancer.

Our data also suggest that methylation of the *EVL*/*hsa-miR-342* locus is an early event in colorectal carcinogenesis, given that it is detectable in 67% of adenomas, as well as in 56% of histologically normal colorectal mucosal specimens from patients with concurrent colorectal cancer. Based on these observations, we propose that the methylated DNA corresponding to the *EVL*/*hsa-miR-342* locus may merit further investigation as a biomarker for non-invasive disease detection or risk prediction for colorectal cancer, especially in light of its apparent specificity for colorectal cancer.

With respect to carcinogenesis, the data suggest a model in which the aberrant methylation of *EVL*/*hsa-miR-342* precedes histologically apparent neoplastic alterations in the colon and leads to an early expansion of precancerous progenitor cells carrying methylated CpG islands at the *EVL*/*hsa-miR-342* locus. The presence of methylation of *EVL*/*hsa-miR-342* in normal appearing colorectal mucosa may reflect an acquired, early epigenetic change in the pathogenesis of colorectal cancer. Alternatively, it could also be the consequence of clonal expansion of rare, normal colorectal epithelial cells that carry a methylated *EVL*/*hsa-miR-342* locus as a part of their normal physiological state (Ohm and Baylin, 2007; Widschwendter *et al*., 2007).

Given that *EVL* and *hsa-miR-342* are coordinately silenced, we cannot determine *a priori* whether suppression of *EVL*, *hsa-miR-342* or both is the relevant event in colorectal carcinogenesis. EVL is a member of the Ena/VASP protein family, which are actin-associated proteins involved in a variety of processes related to

PowerPoint 파일 → 고해상도 TIFF

- PowerPoint file (vector image)를 직접 TIFF로 변환하면 960x720 px의 저해상도 TIFF로 바뀐다.
- Acrobat를 이용하여 PDF 파일(vector image)로 변환한다.
- Photoshop을 이용하여 PDF 파일을 고해상도 bitmap 이미지로 불러온다. 이 과정에서 적당한 해상도를 지정할 수 있다. 통상 300-600 px/inch 면 충분하다.
- 압축하지 않은 상태에서 TIFF 형식으로 저장한다.

Image Forensics

- Good science requires reliable data -

이 준 행

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뉴스 화면이 영화 속 장면?
- 中 전투기 훈련장면 논란

신원롄보가 지난 23일 보도한 젠(殲)-10(J-10) 전투기의 미사일 발사 등 훈련장면이 지난 1986년 개봉된 영화 '탑건(TOP GUN)'과 너무나 유사하다는 것이다.

조선일보 2011-1-27

Published July 6, 2004
JCB

Feature

What's in a picture? The temptation of image manipulation

Mike Rossner[1] and Kenneth M. Yamada[2]
[1]Managing Editor, The Journal of Cell Biology
[2]Editor, The Journal of Cell Biology, and the National Institute of Dental and Craniofacial Research, National Institutes of Health

- Data must be reported directly, not through a filter based on what you think they "should" illustrate to your audience.
- For every adjustment that you make to a digital image, it is important to ask yourself, "Is the image that results from this adjustment still an accurate representation of the original data?"
- If the answer to this question is "no," your actions may be construed as misconduct.

J Cell Biol 2004:166:11-15

Image modification

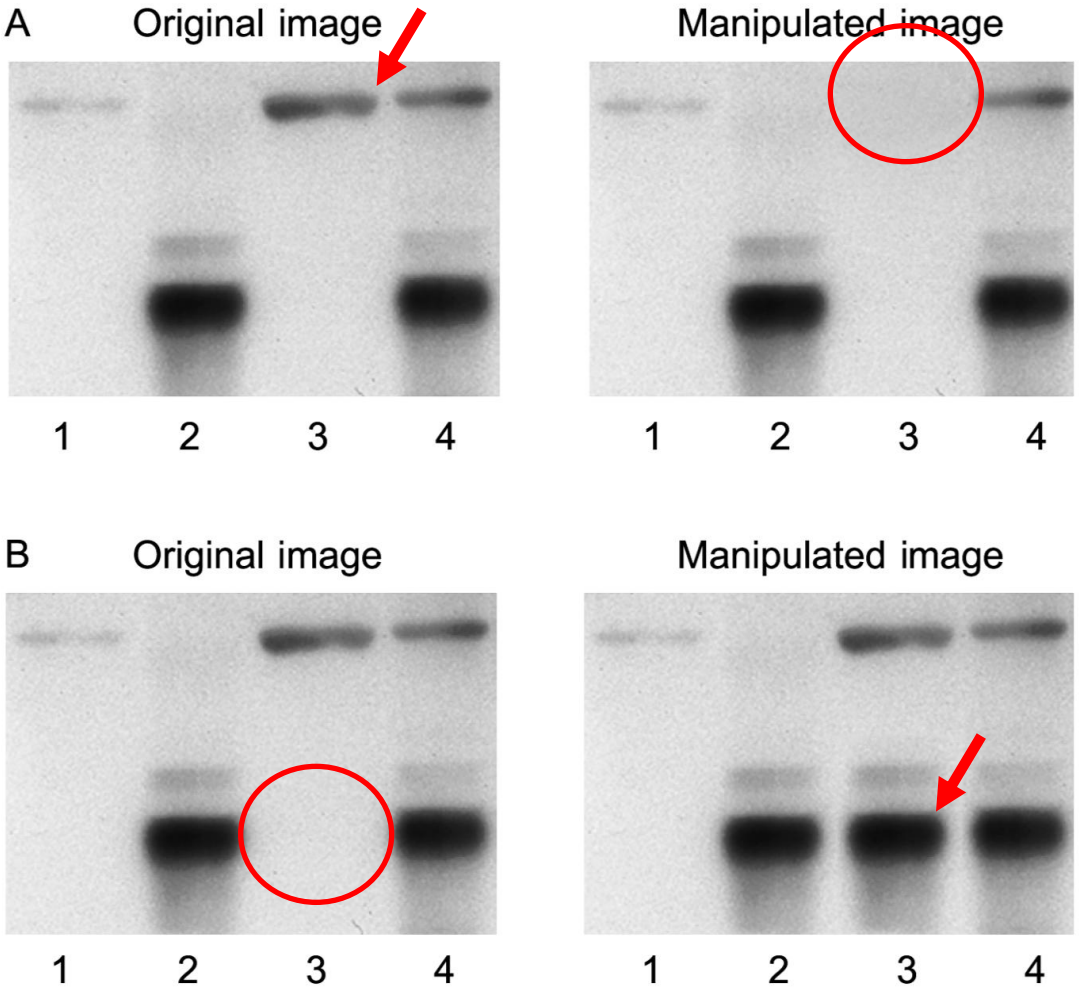
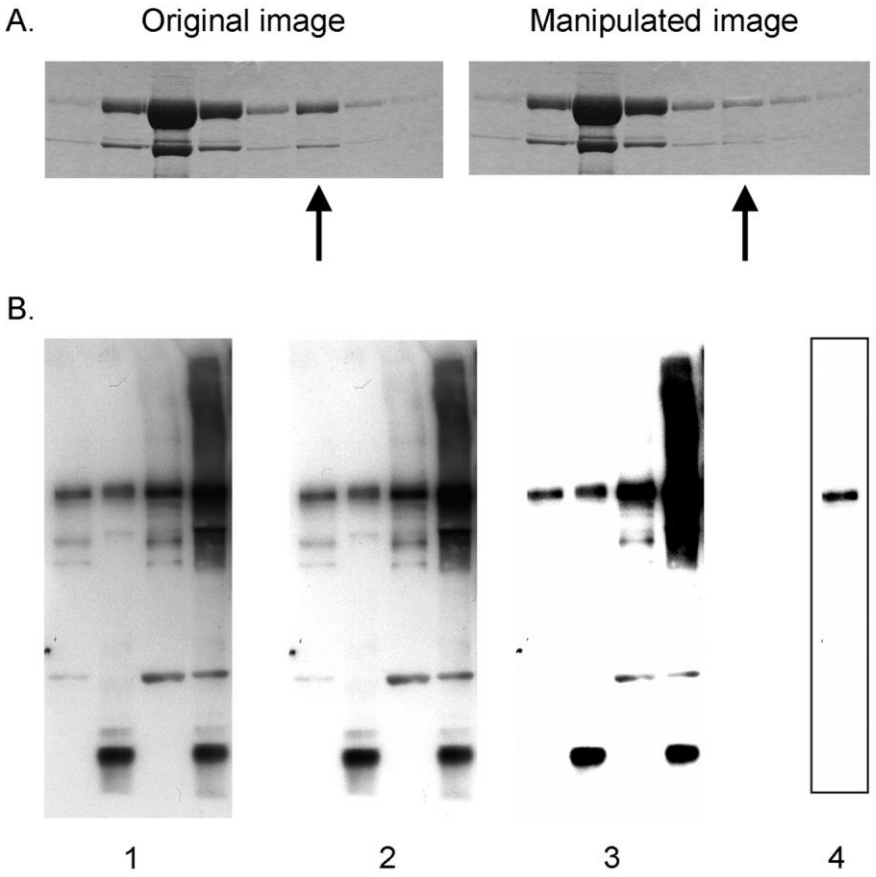


Figure 1. **Gross manipulation of blots.** (A) Example of a band deleted from the original data (lane 3). (B) Example of a band added to the original data (lane 3).

J Cell Biol 2004:166:11-15

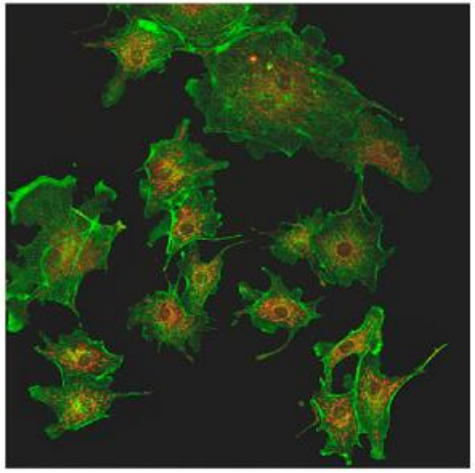
Brightness and contrast adjustment



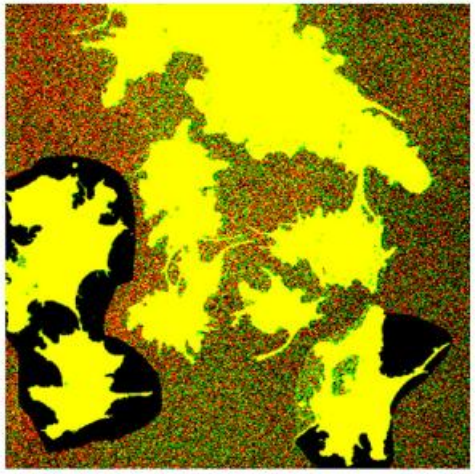
J Cell Biol 2004:166:11-15

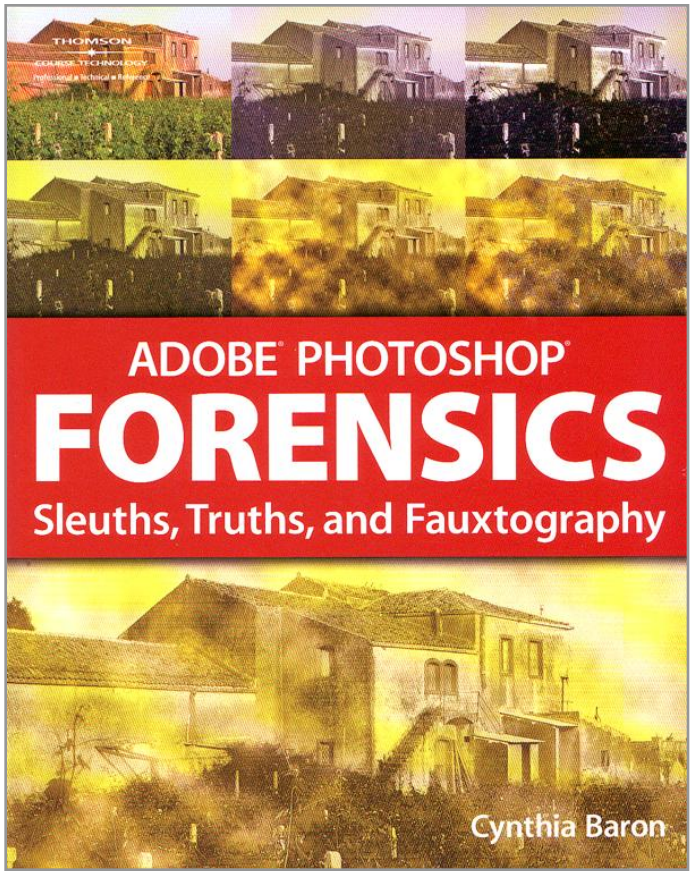
Image manipulation was found by simple contrast adjustment

Manipulated image



Manipulation revealed by contrast adjustment





J Cell Biol 2004:166:11-15

요약: Image forensics

- 의학학술지에 제출된 이미지의 조작여부를 편집실에서 육안으로 확인하는 것은 매우 어렵다.
- Contrast, brightness 조절과 같은 기본적인 Photoshop screening을 통하여 상당히 많은 조작된 이미지를 찾을 수 있다.
- 편집과정에 image screening routine을 추가할 것을 권합니다.

Two More Tips

이 준 행

성균관대학교 의과대학 삼성서울병원

JPG: a source of confusion

- Relatively small file size
- Developed for the Internet
- Lossy compression: decreased image quality by every saving step
- Useful for photos: standard image format for compact digital cameras
- Not useful for line-art: ***NEVER*** use for line-art figures considering submission to a journal
- Will be mostly replaced with PNG format

JPEG may be used for photos

All photographic images

- Photographic documentation can be accepted as Photoshop (**.psd**), tiff (**.tif**), jpeg (**.jpg**), encapsulated postscript (**.eps**), portable document format (**.pdf**), or Powerpoint (**.ppt**) files.

- All supplied photographs and scans should be supplied 20% larger than they will appear in *The Lancet* and have a resolution of 300dpi. This will ensure better quality processing of your images. Example sizes are:
  90mm for a 75mm column width
  130mm for a 107 mm column width
  185mm for a 154 mm column width.

http://www.thelancet.com/webfiles/images/clusters/thelancet/EESartwork.pdf

What's wrong with this figures?

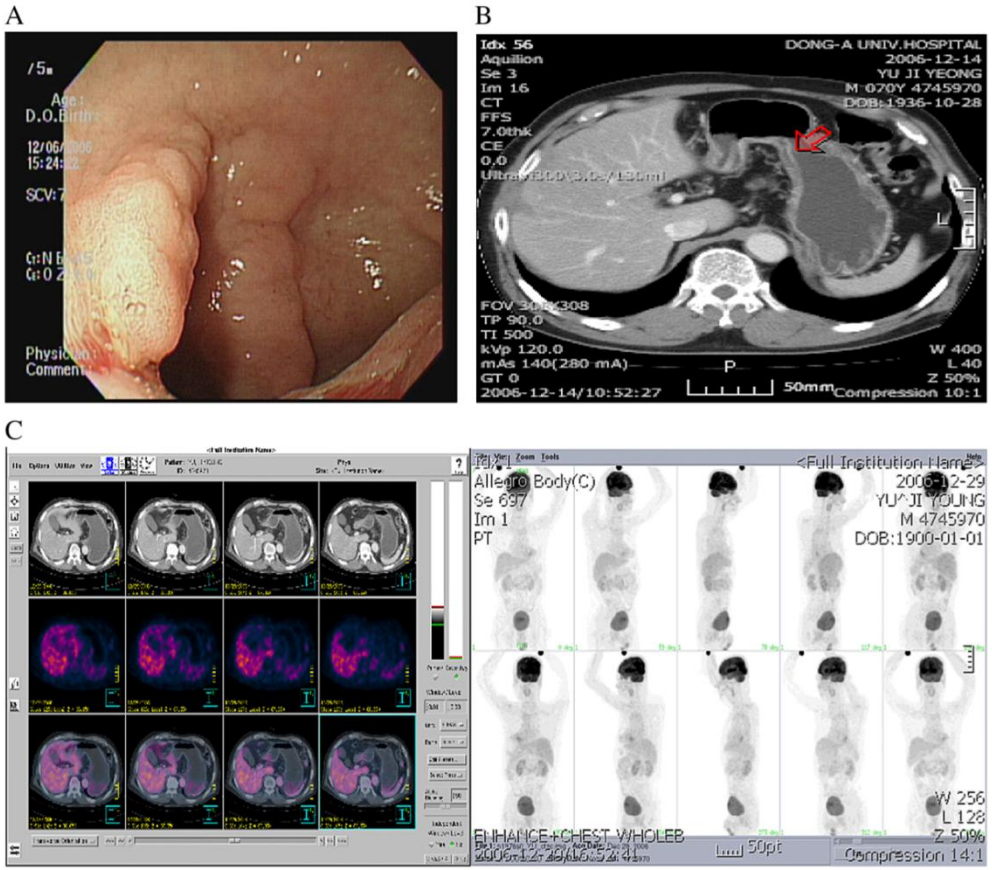
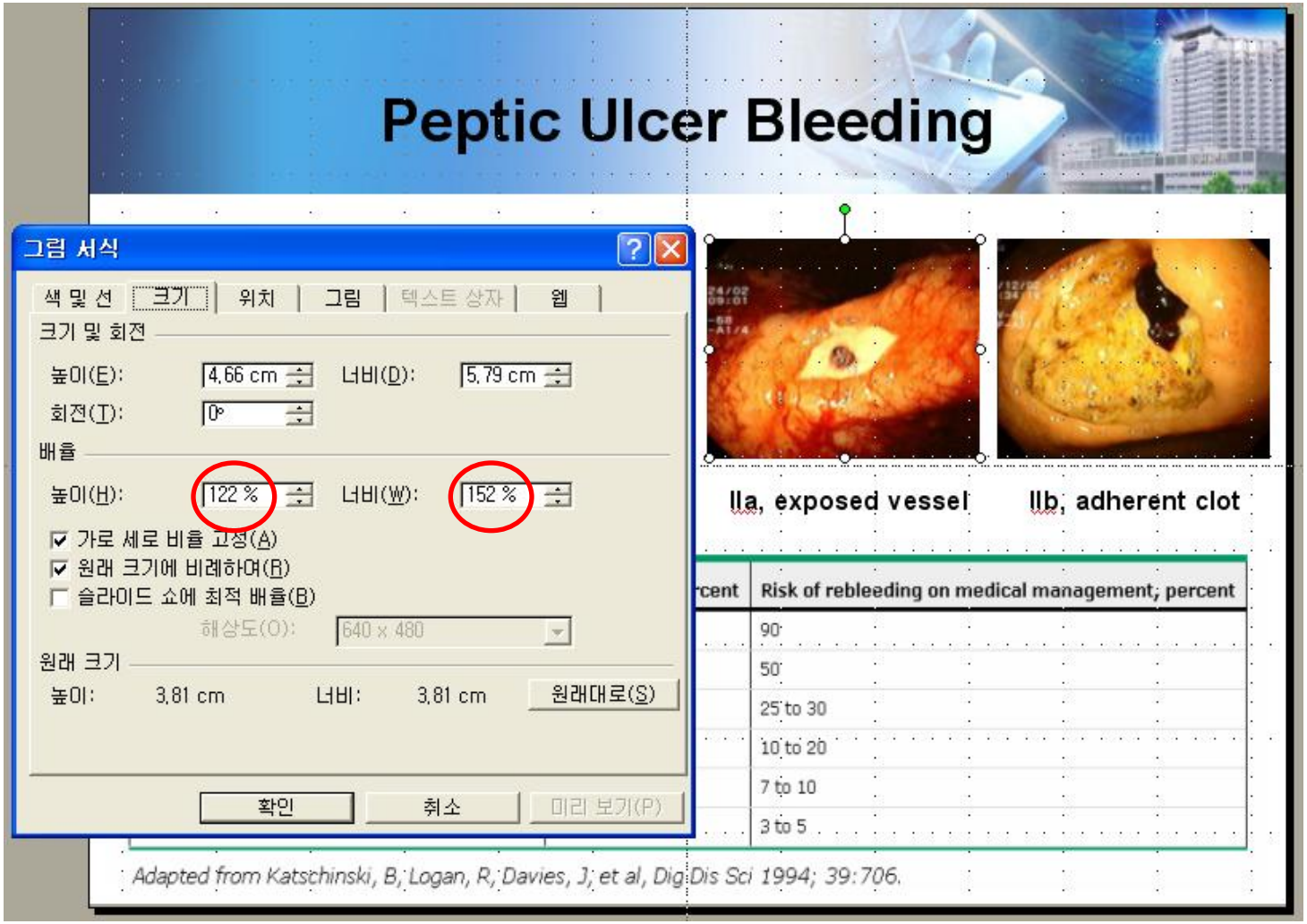


Figure 1. A. Endoscopic finding. Well-demarcated, elevated nodular lesion can be seen at anterior wall of antrum. B. Conventional CT finding. Focal irregular wall thickness can be seen at anterior wall of antrum, but shows no lymph node or distant metastasis. C. Representative FDG-PET image of a patient with early gastric cancer without lymph node metastasis or distant metastasis. Transversal slices of respectively PET-CT fusion and FDG-PET show no highlighting pathological FDG-PET uptake in the gastric wall. No lymph node or distant metastases can be observed. Coronal slice of total body FDG-PET examination with physiological FDG-PET shows no uptake in the gastric wall. Again, no lymph node or distant metastasis is observed.

Scand J Gastroenterol 2009

가로 세로 비율


Peptic Ulcer Bleeding
그림 서식
색 및 선
크기
위치
그림
텍스트 상자
웹
크기 및 회전
높이(E): 4.66 cm
너비(D): 5.79 cm
회전(T): 0°
배율
높이(H): 122 %
너비(W): 152 %
가로 세로 비율 고정(A)
원래 크기에 비례하여(R)
슬라이드 쇼에 최적 배율(B)
해상도(O): 640 x 480
원래 크기
높이: 3.81 cm
너비: 3.81 cm
원래대로(S)
확인
취소
미리 보기(P)
IIa, exposed vessel
IIb, adherent clot
Risk of rebleeding on medical management; percent
90
50
25 to 30
10 to 20
7 to 10
3 to 5
Adapted from Katschinski, B; Logan, R; Davies, J; et al, Dig Dis Sci 1994; 39:706.

Take home message

- 디지털 시대에 적합한 figure 제작법 확립과 이에 대한 교육이 필요하다.
- Figure 종류에 따라서 출판에 필요한 해상도가 달라진다.
- 편집과정에 image screening routine이 추가되어야 한다.

경청해 주셔서 감사합니다.