

가

3

, , , , ,

1a 1c

2

3

4a 4k 5a 5l

6a 6b

7

8

1 : 2 :

3 : 4 :

, DNA ,

, (biochip)

, , DNA, ,

, (hybrid device)

, , , , ,

(biocomputer) 가 .

(bacteriorhodopsin) DNA (probe) 'DNA (chip)', / , (cell c
hip)', (Neuron chip)', (protein chip)', , , ,
(Lab chip)'
(biosensor)'

, DNA (micrometer scale)

DNA
400,000 (probe) DNA
DNA (hybridization)

(hybridization) (DNA (subsequence)
) - (single - stranded) DNA , (tar
get) - (double - stranded) DNA

ded) DNA DNA (label) DNA (hybridization) - (double - stran

DNA (filter hybridization) , , (gel electrophoresis)
가 , 15 30 가
(hybridization) , 가

DNA ,
DNA DNA (array) , ,

DNA des) (Peptide Nucleic Acid ; PNA) (oligonucleoti

가

- (in - situ) (photolithography)
(5,143,854).

, DNA 가 가 .

, 25 (base) , 1 가 4 ,
100 가 , 100 , DNA 가

(washing) (mask aligning) 가 가

DNA 가

(piezoelectric printing) 4가 (base)
(5,474,796).

40 50 (oligonucleotide) , (aligning)
, 가 100 μm 가 .

(micropipetting) cDNA (spotting)
(TIBTECH 16 : 301 306, 1998).

DNA D

NA

DNA , DNA (microarray) ,
(oligonucleotide) (spot)

(5,091,652). 가 가

(linear translator)가

가 가 가

가

가 가

, 가 가

(wobble)

(glass),
(polystyrene),

(polycarbonate),
(silicon oxide),

(polytetrafluorethylene),
(silicon nitride)

2

1 , 1

(label)

가

/

DNA
가

1a

1c

, 2

3

3가

(stamper)

(mastering)

2 (2P(photo - polimerization))

1a

(1)

(land)

(groove)

ne), (1) (glass), (polycarbonate), (polytetrafluorethyle
(polystyrene), (silicon oxide), (silicon nitride)

(1) 2 (wobble) (4)

(1)

er) 1b (1) (Au) (Al) (2) (SiO₂) (3) (sputt
1c

3 (compact disc) 가
1.2 mm, 1cm, 2cm, 4cm, 8cm, 12cm

4a 4k (track)

lane) 4a {X - Si(OCH₃)₃, X - SiCl₃ } (silanization) (si
(glutaraldehyde) (- NH₃)

4b (photosensitive species, R)

(silanization) (coating)

(cleaning) (washing)

4c

(wobble track) 6a

(spot) 1 100μm 가

(pick - up) 가

1

4d

4e

(coupling)

4f

4k

4c

4e

(peptide),

(protein),

(antibody), DNA, PNA,

(enzyme)

5a

5l

4

(base)

(oligonu

cleotide probe)

DNA

DNA

(design software)

(oligomer probe)

(addressing)

(IR)

(hybridization)

(labeling)

DNA

DNA

7

8

/

(drive)

(hybridization)

(signal processing)

(confocal laser)

0.45

780nm

(Laser Diode : LD)

(Numerical Aperture : NA)가

(focusing)

(three - beam focusing)

(tracking)

3

2

2 가 가 .

PMT (PhotoMultiplier Tube) (ava
lanche photodiode)

(confocal laser scanner) 가

(drive) 8 .

CD - ROM (Compact Disc Read - Only Memory)

(servo) (focusing) (tracking) (가)

(mechanism) (loading) ,
(spindle motor)

가 .

(multi - biosensor) 가 (programmable)

(oligomer) 가 ,
DNA

DNA (protein) (peptide)
(in - situ) 가 (setup)

가

가 (mixing) (washing)

가

CDR ,

,) (가

(57)

1.

;

, ; ; ;

2.

1 , .

3.

1 , (groove) (land) .

4.

3 , (wobble)

5.

1 , (glass), (polycarbonate), (polytetra
fluorethylene), (polystyrene), (silicon oxide), (silicon nitride)

6.

7.

8.

1 , , , DNA, PNA,

9.

1 ;

2 ;

3 ; ,

2, 3

4

10.

9 , 2 ,

11.

9 , 2 ,

2 1 , 1

12.

9 , 3

13.

(label) 1 ;

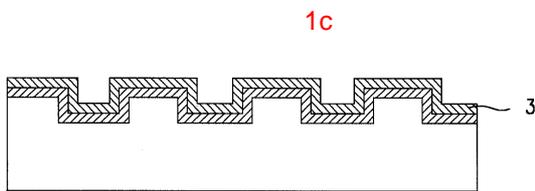
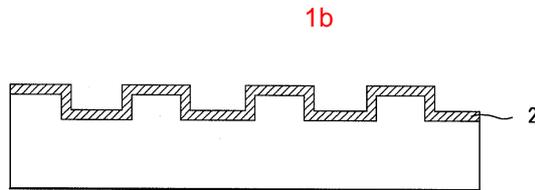
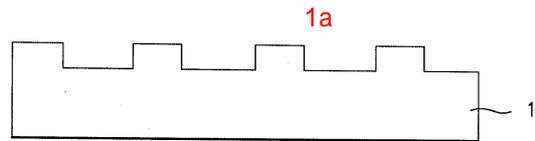
2 ; ,

14.

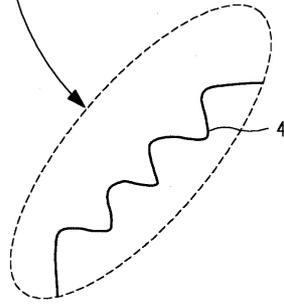
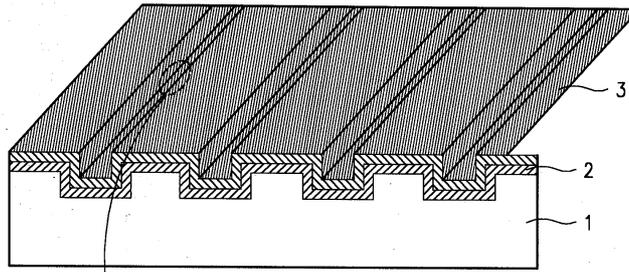
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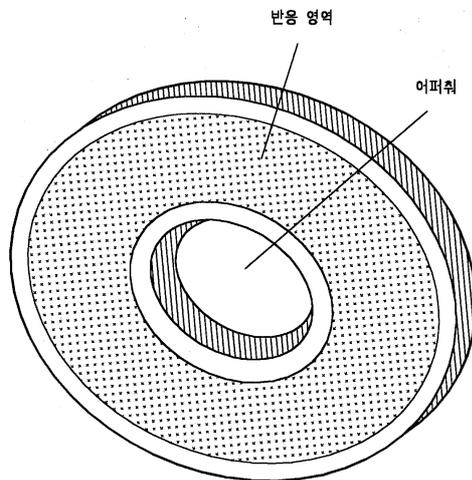
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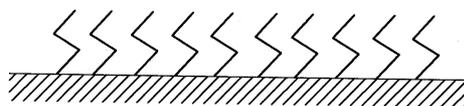
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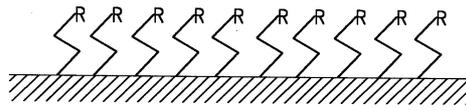
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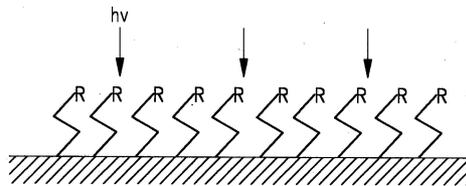
4a



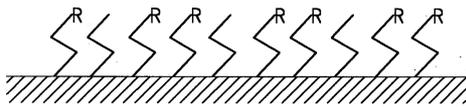
4b



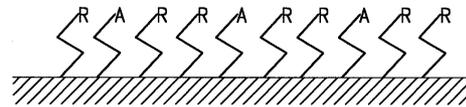
4c



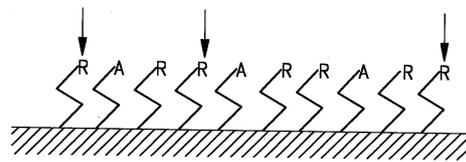
4d



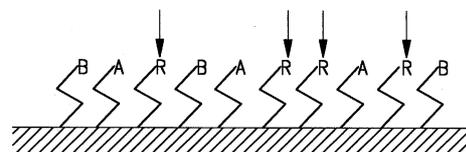
4e



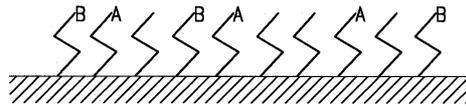
4f



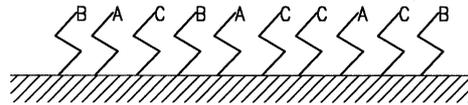
4i



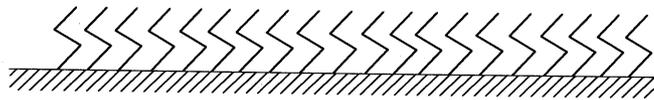
4j



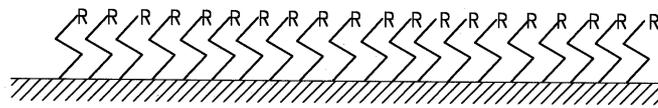
4k



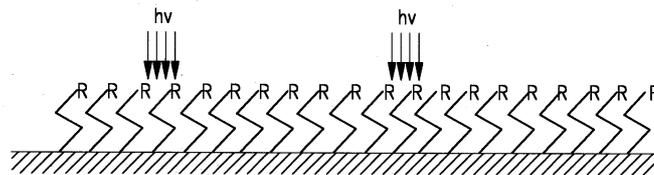
5a



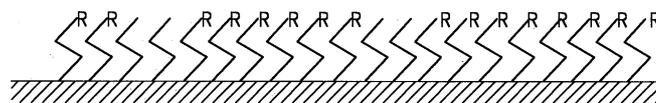
5b



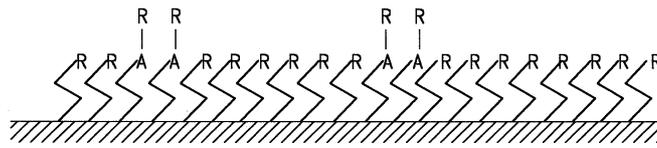
5c



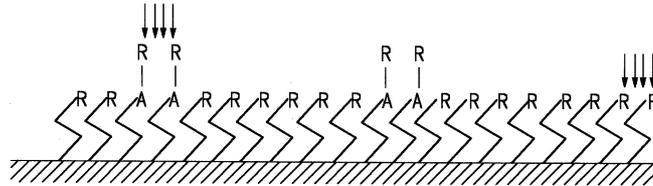
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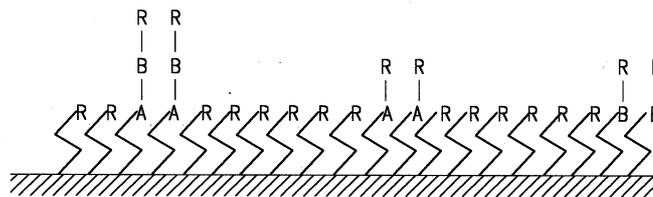
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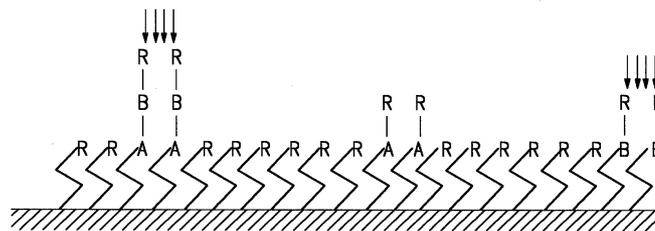
5f



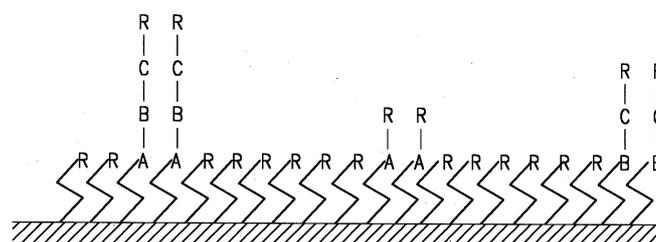
5g



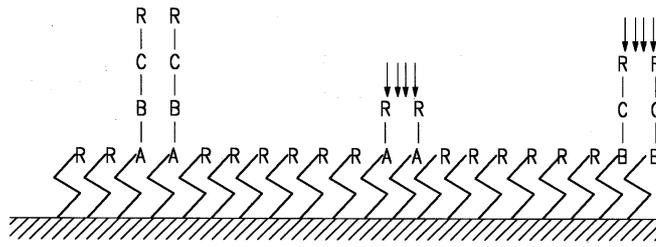
5h



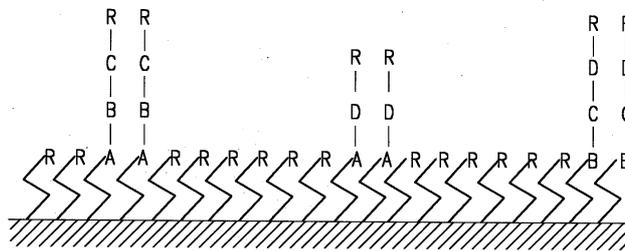
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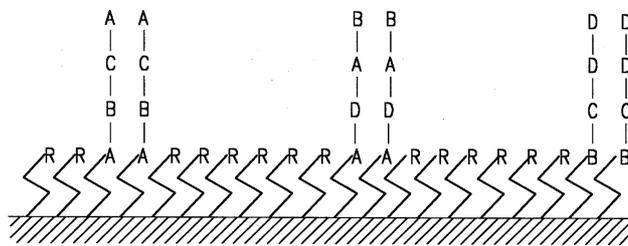
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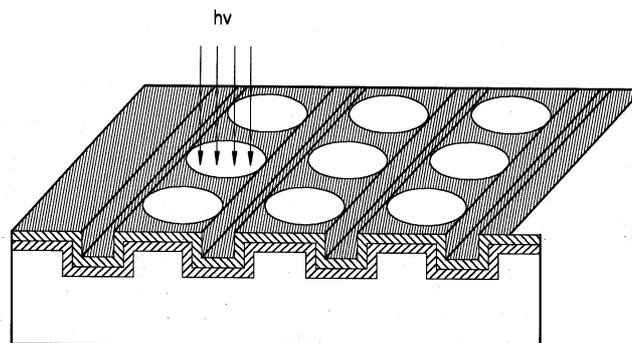
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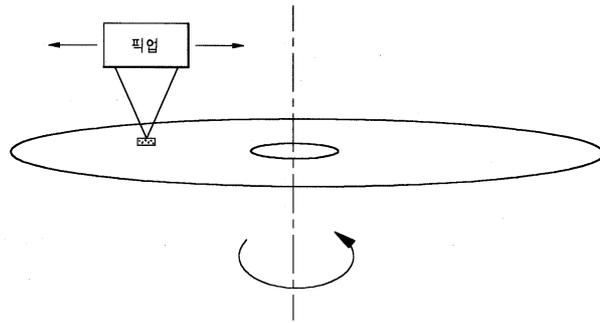
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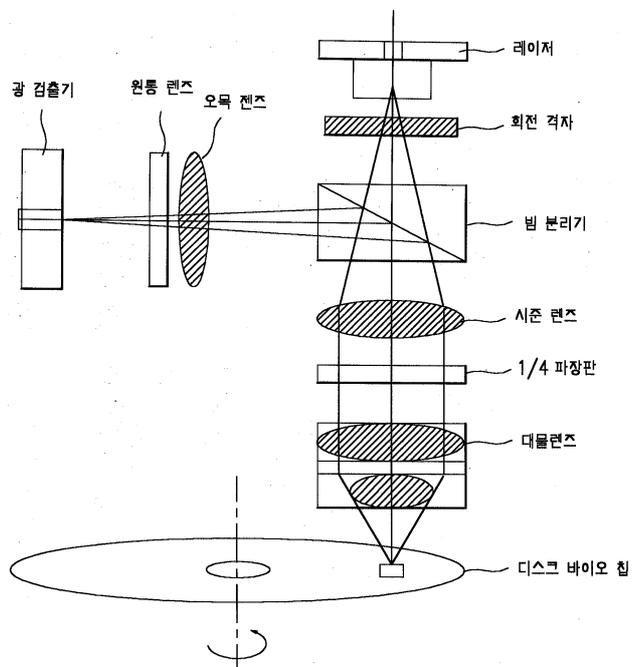
6a



6b



7



8

