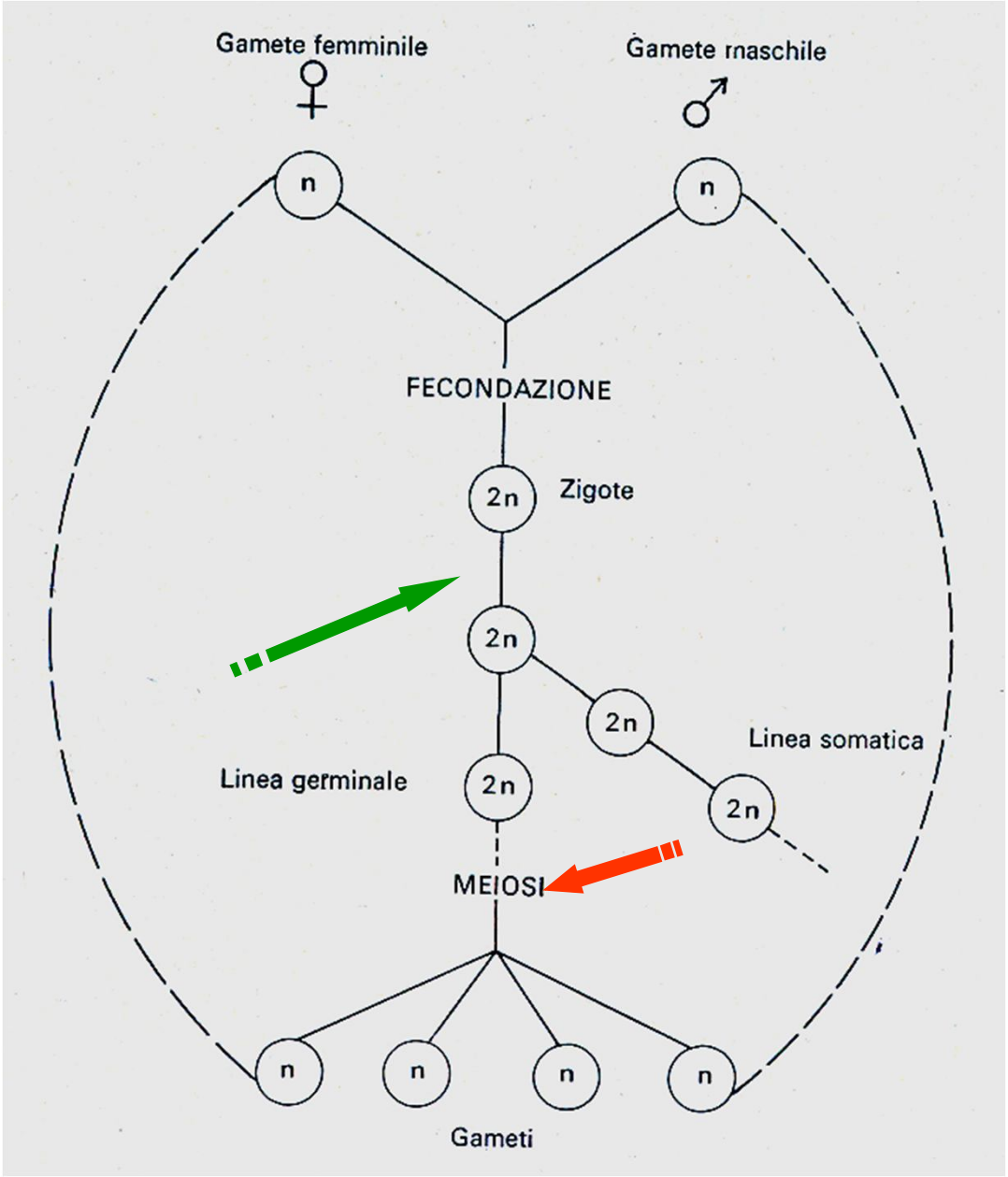
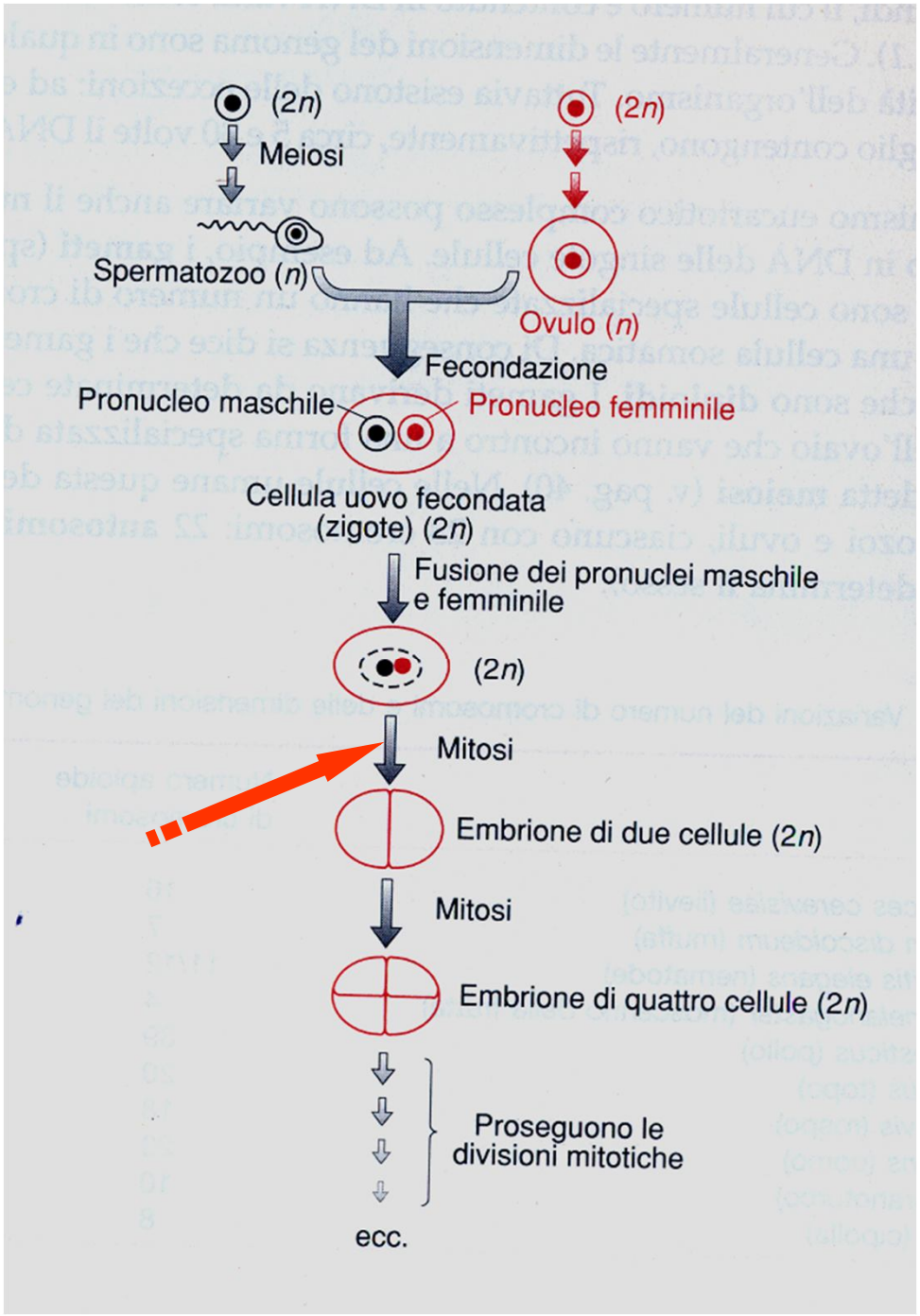
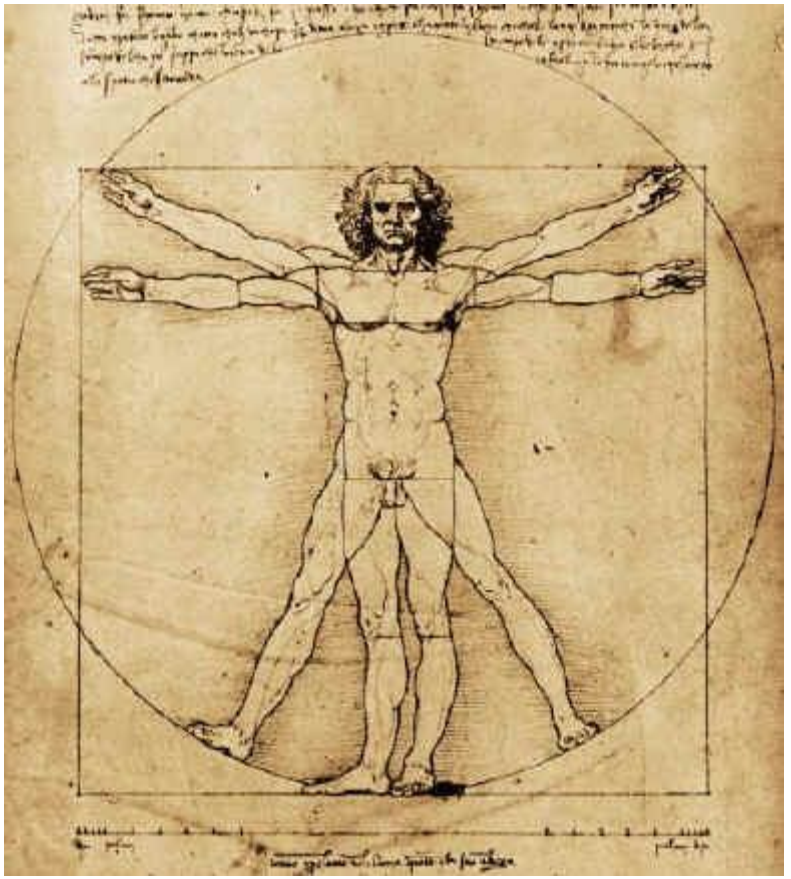
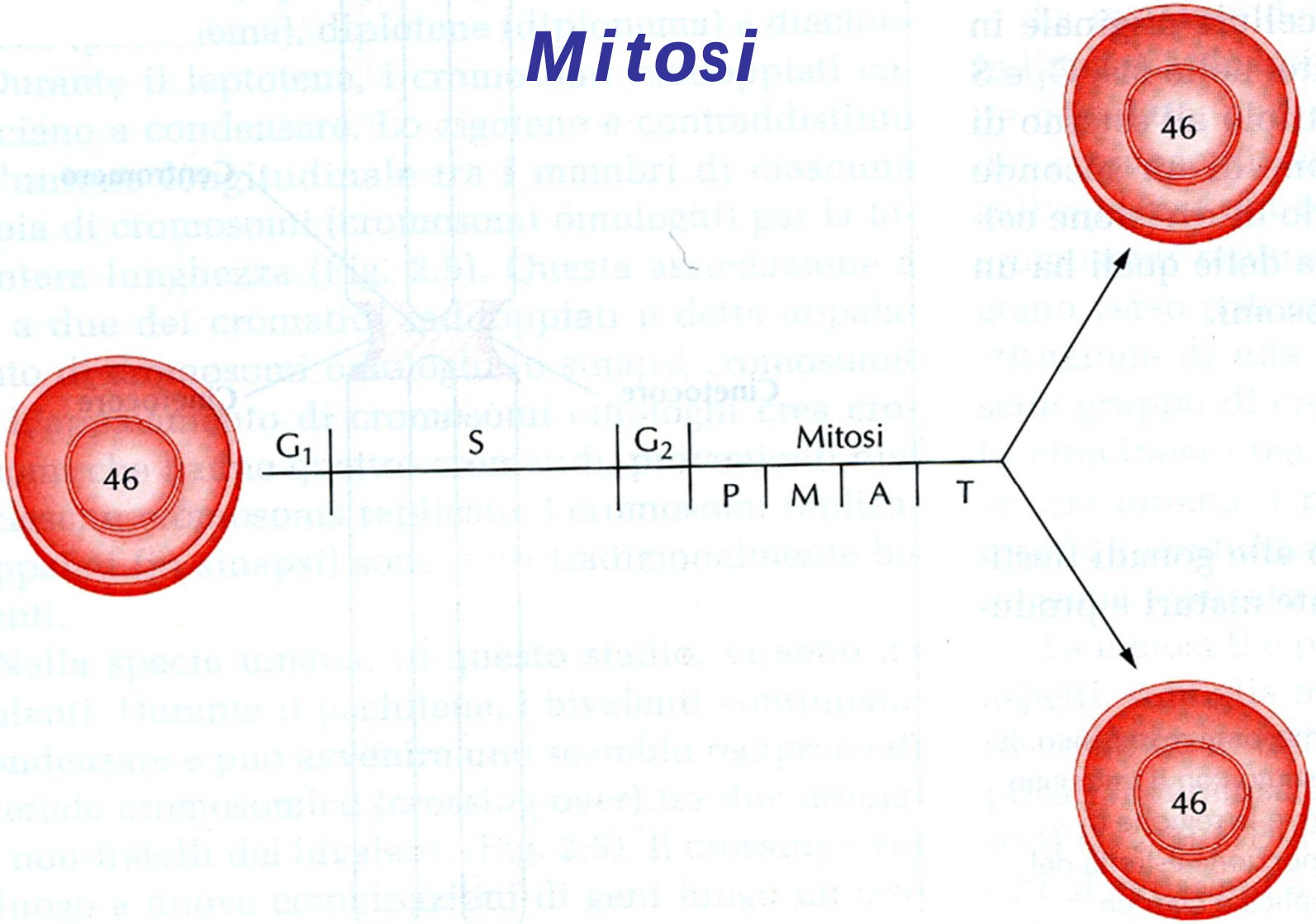
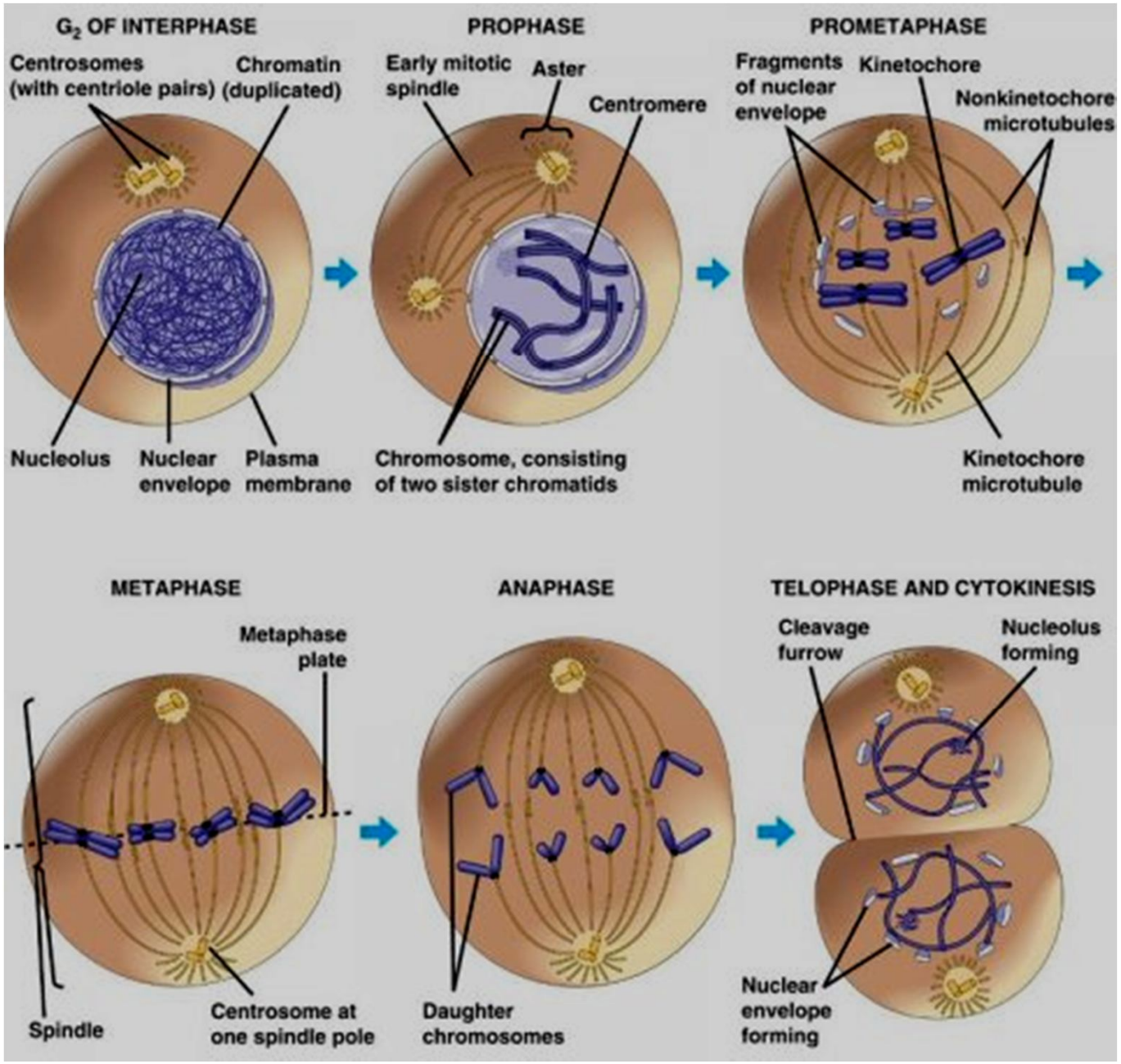

Gamete femminile
Gamete rnaschile
n
n
FECONDAZIONE
2n
Zigote
2n
2n
Linea somatica
Linea germinale
2n
2n
MEIOSI
n
n
n
n
Gameti


(2n)
Meiosi
Spermatozoo (n)
(2n)
Ovulo (n)
Fecondazione
Pronucleo maschile
Pronucleo femminile
Cellula uovo fecondata
(zigote) (2n)
Fusione dei pronuclei maschile
e femminile
(2n)
Mitosi
Embrione di due cellule (2n)
Mitosi
Embrione di quattro cellule (2n)
Proseguono le
divisioni mitotiche
ecc.

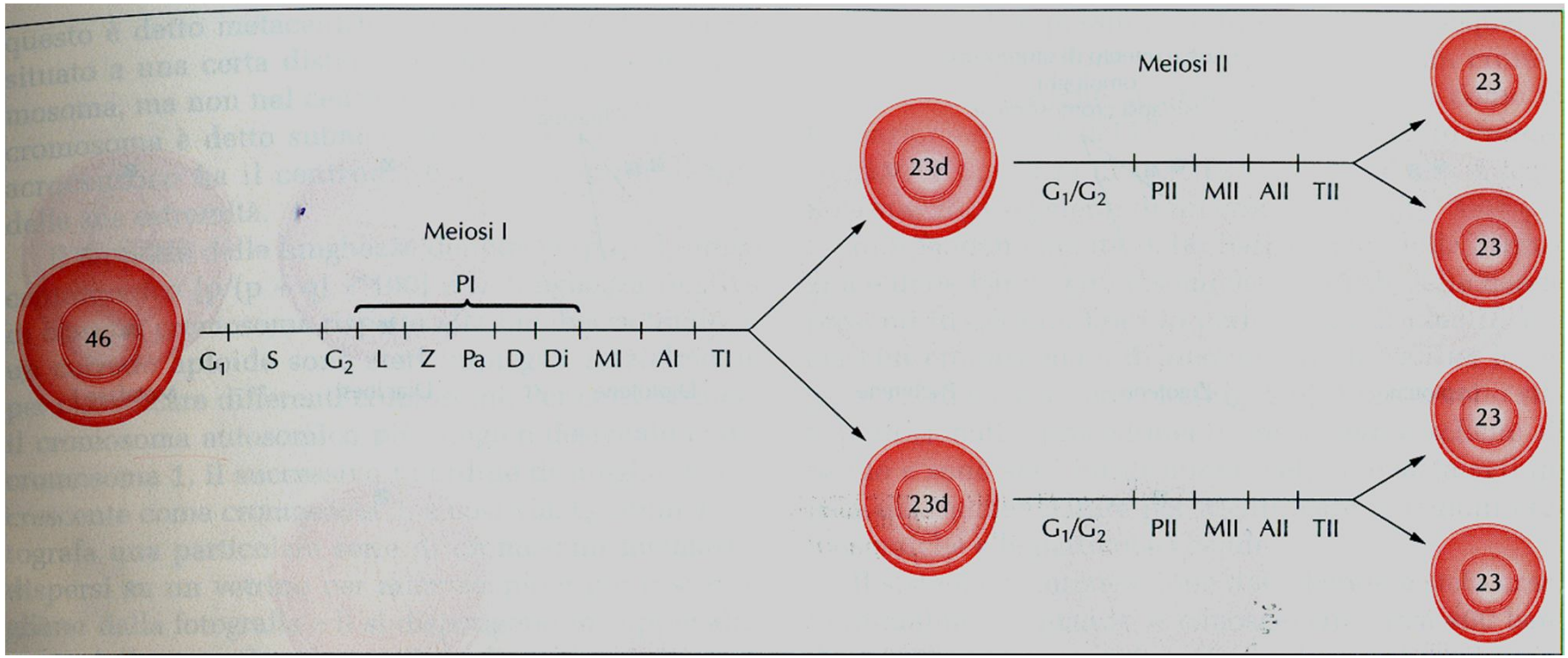


Mitosi

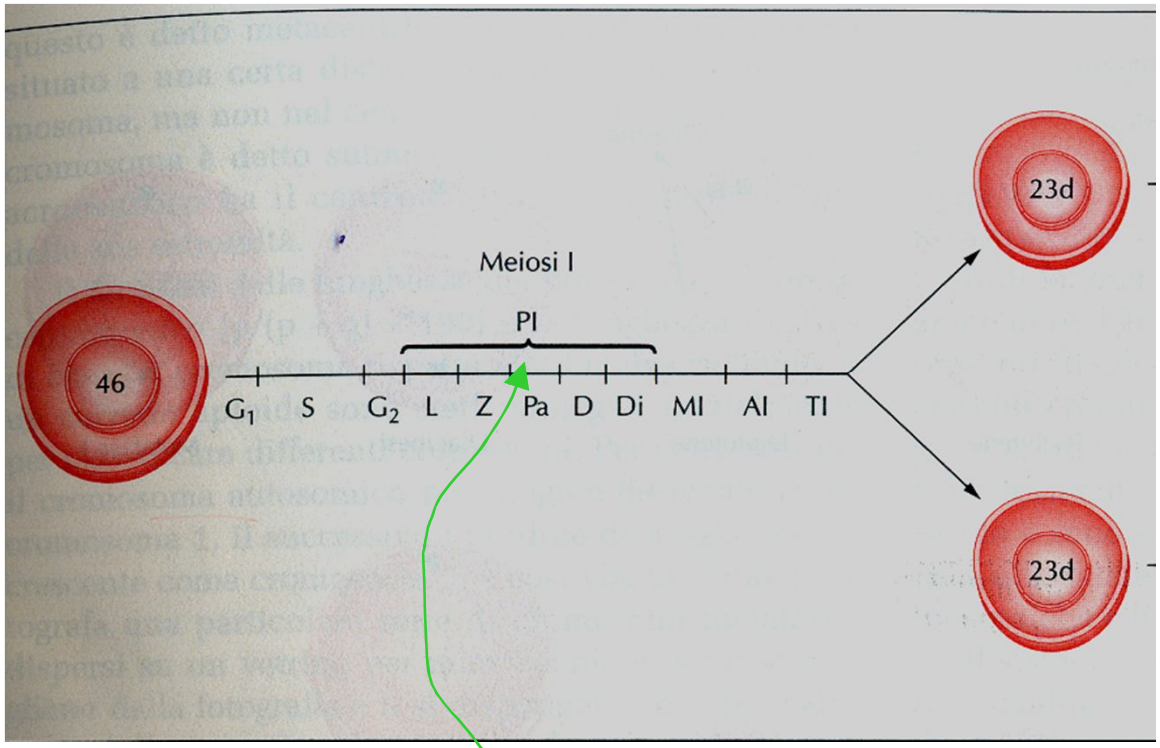



G2 OF INTERPHASE
Centrosomes (with centriole pairs)
Chromatin (duplicated)
Nucleolus
Nuclear envelope
Plasma membrane
PROPHASE
Early mitotic spindle
Aster
Centromere
Chromosome, consisting of two sister chromatids
PROMETAPHASE
Fragments of nuclear envelope
Kinetochore
Nonkinetochore microtubules
Kinetochore microtubule
METAPHASE
Metaphase plate
Spindle
Centrosome at one spindle pole
ANAPHASE
Daughter chromosomes
TELOPHASE AND CYTOKINESIS
Cleavage furrow
Nucleolus forming
Nuclear envelope forming

Meiosi

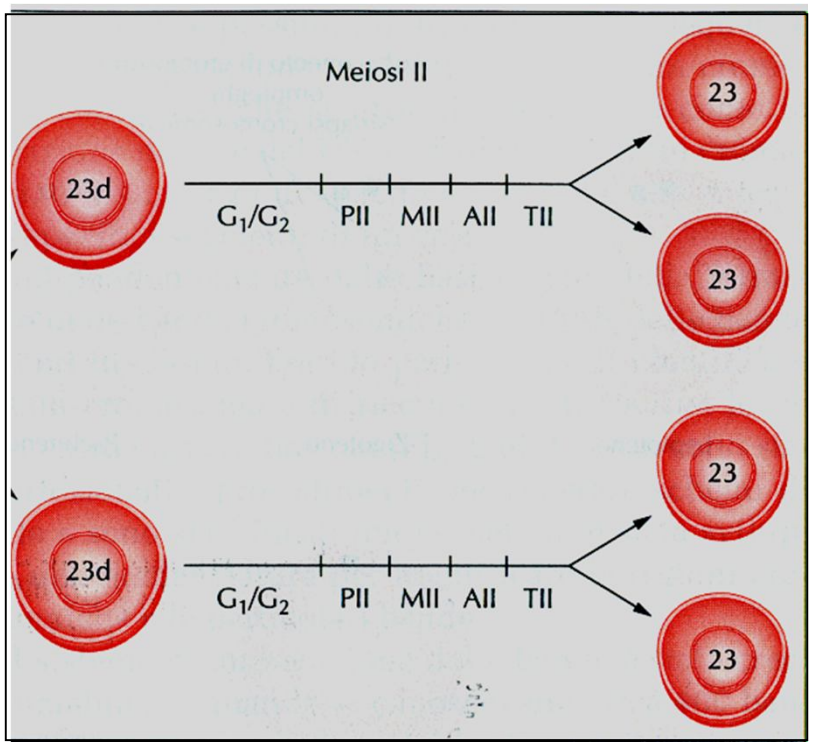

Meiosi I
PI
Meiosi II
46
G1 S G2 L Z Pa D Di MI AI TI
23d
G1/G2 PII MII AII TII
23
23
23d
G1/G2 PII MII AII TII
23
23

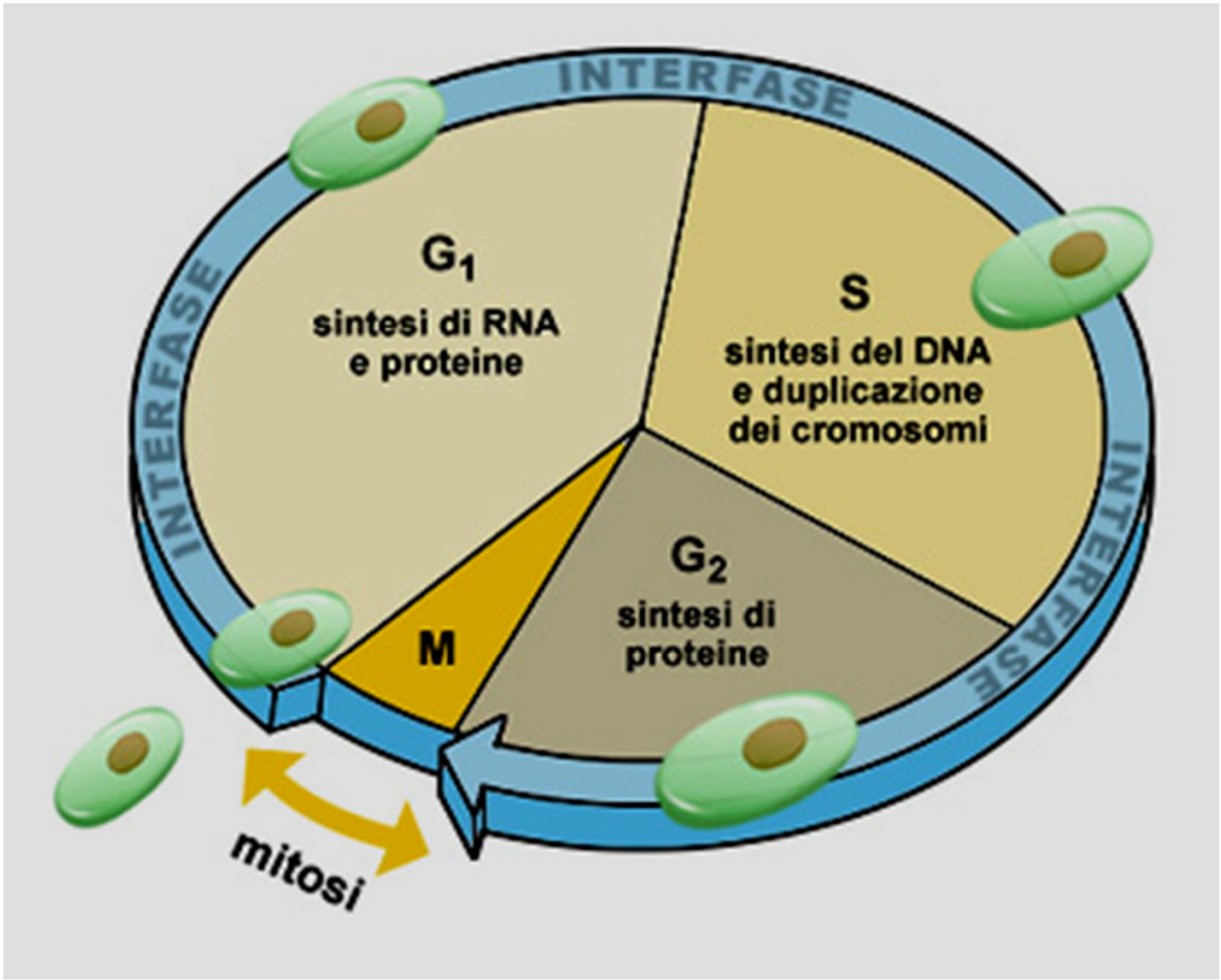
Meiosi: 1a divisone

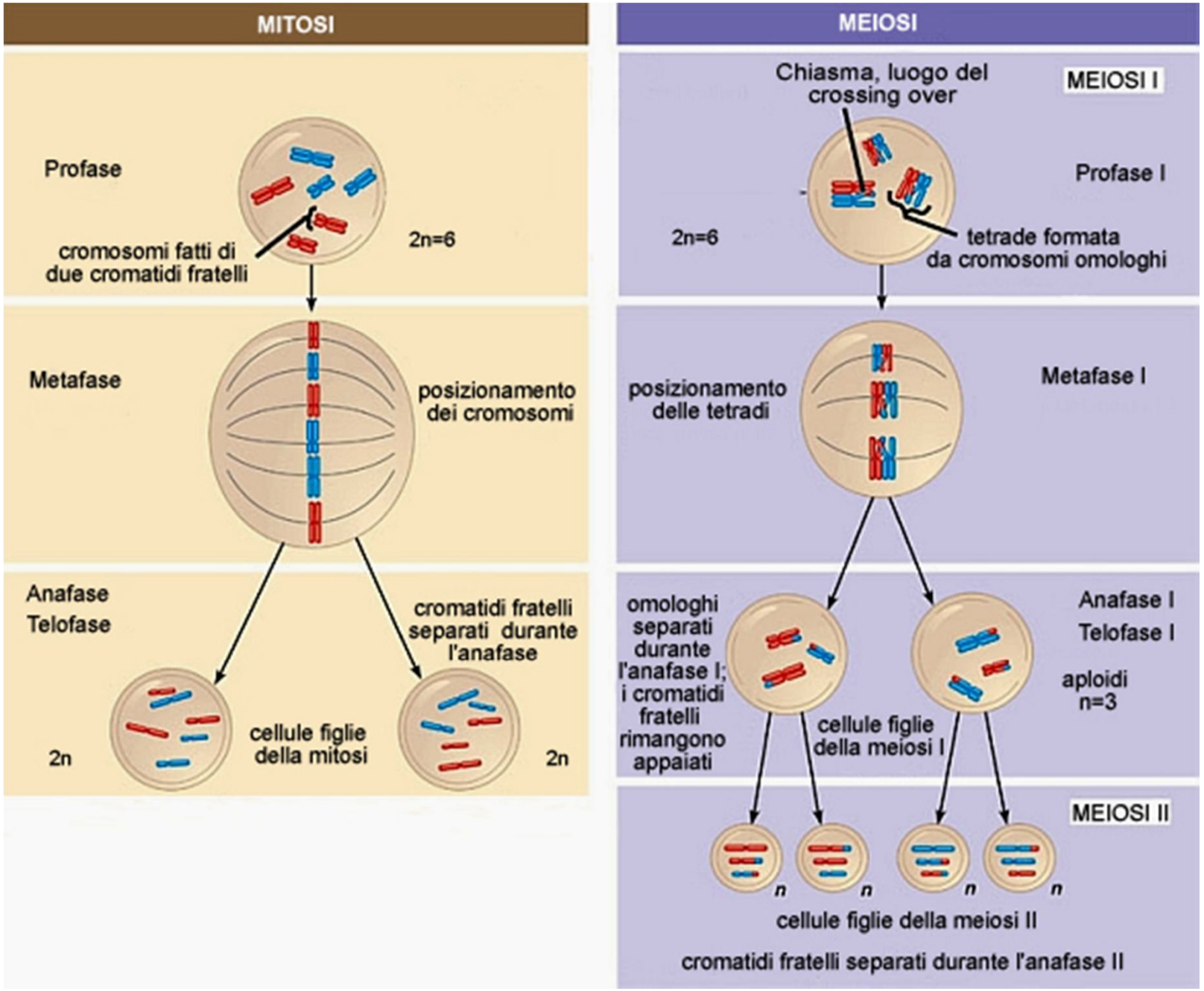


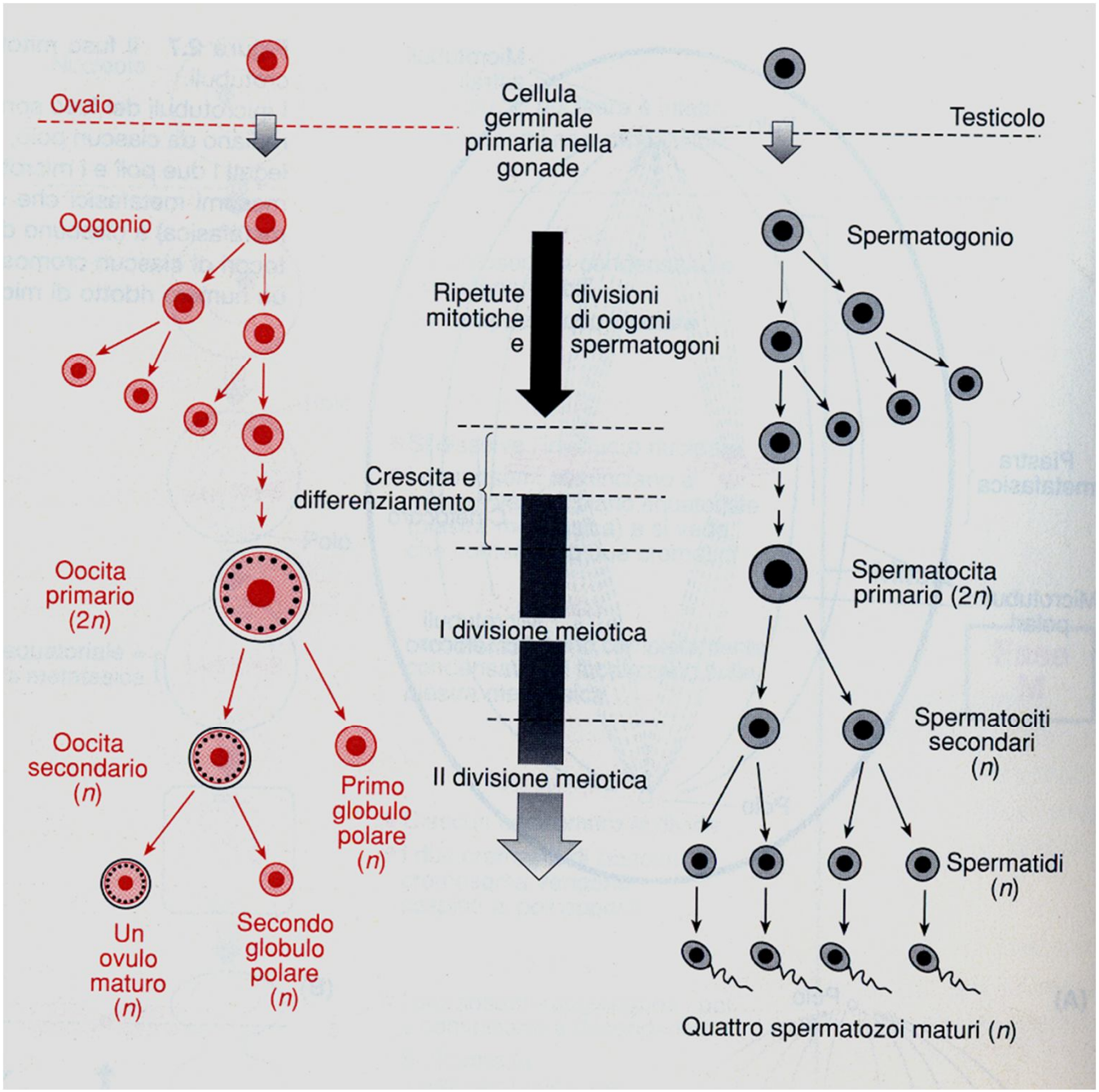
Crossing Ower

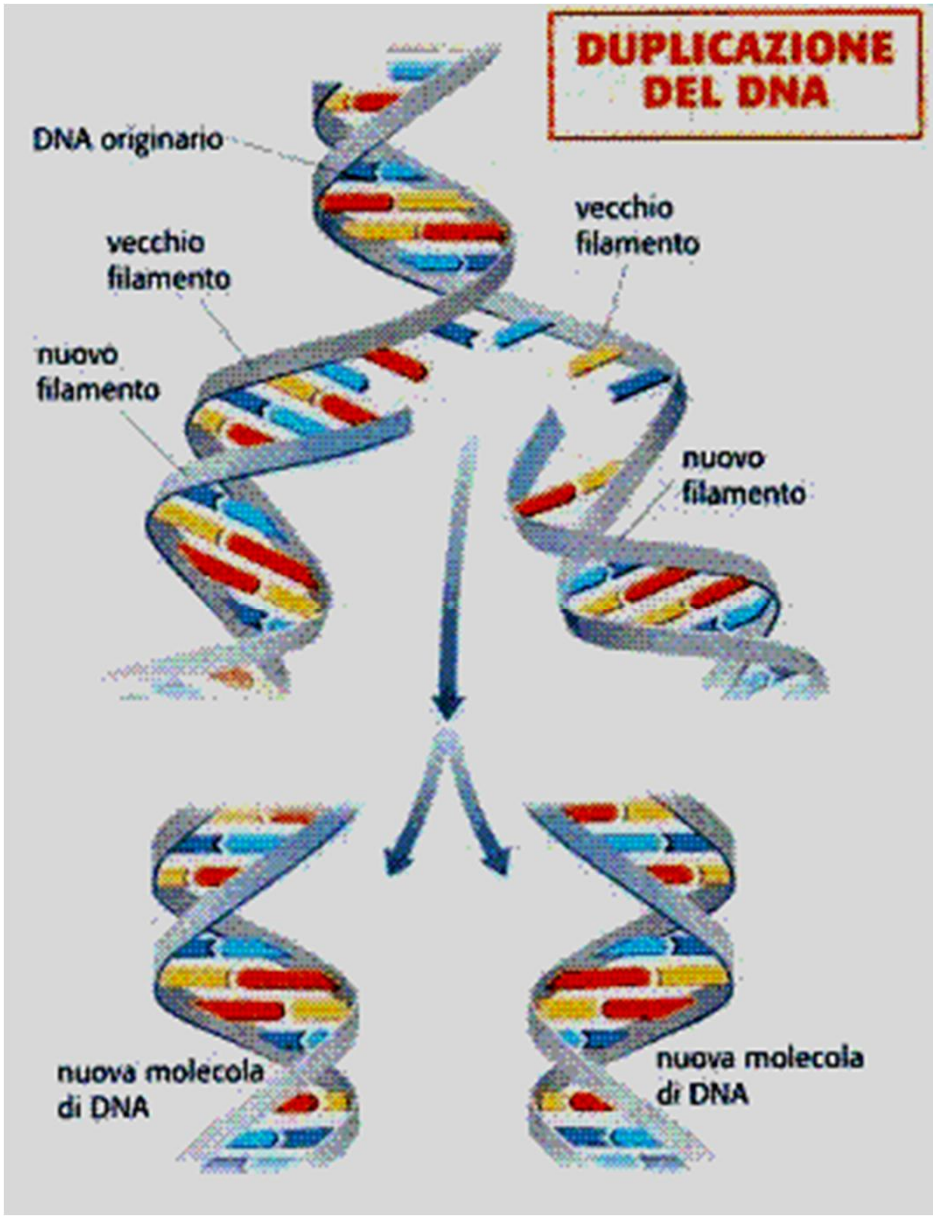
Meiosi: 2a divisione

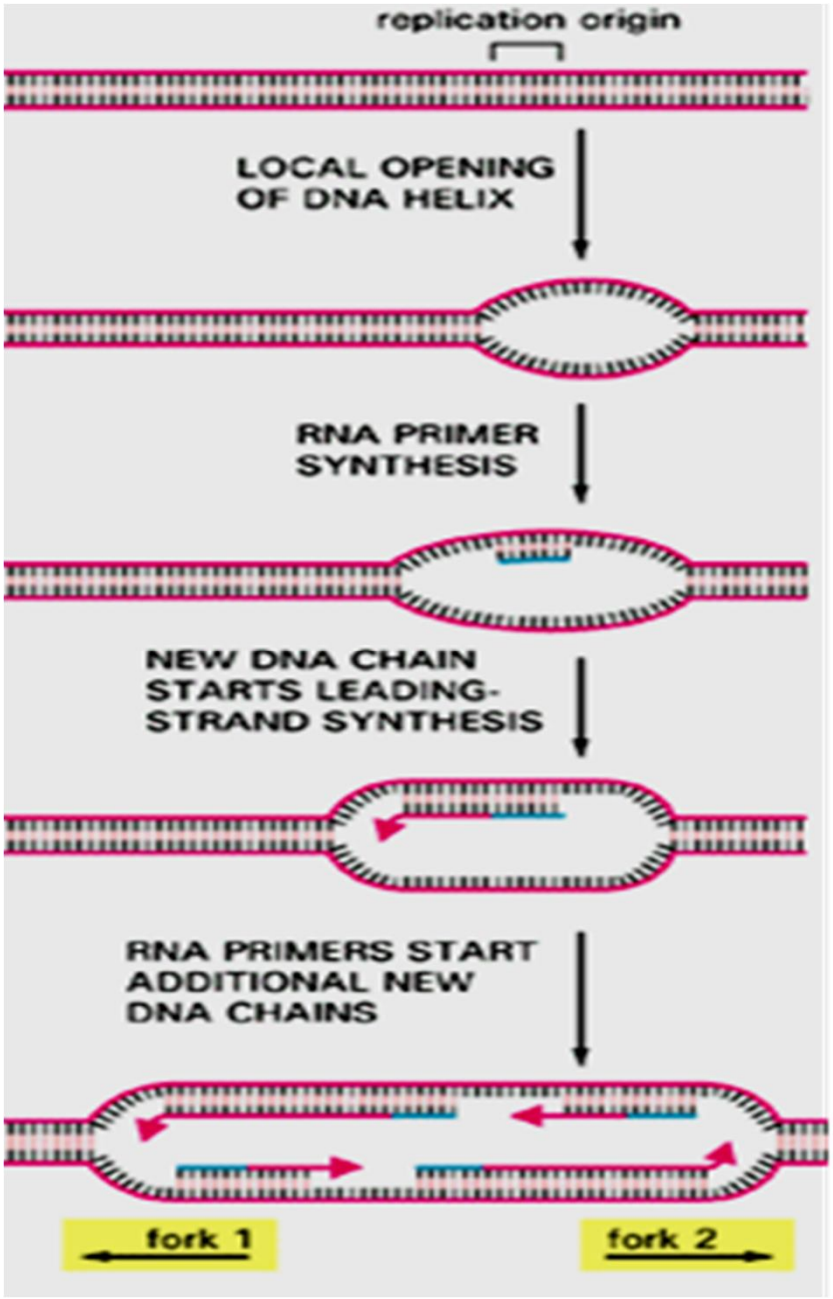


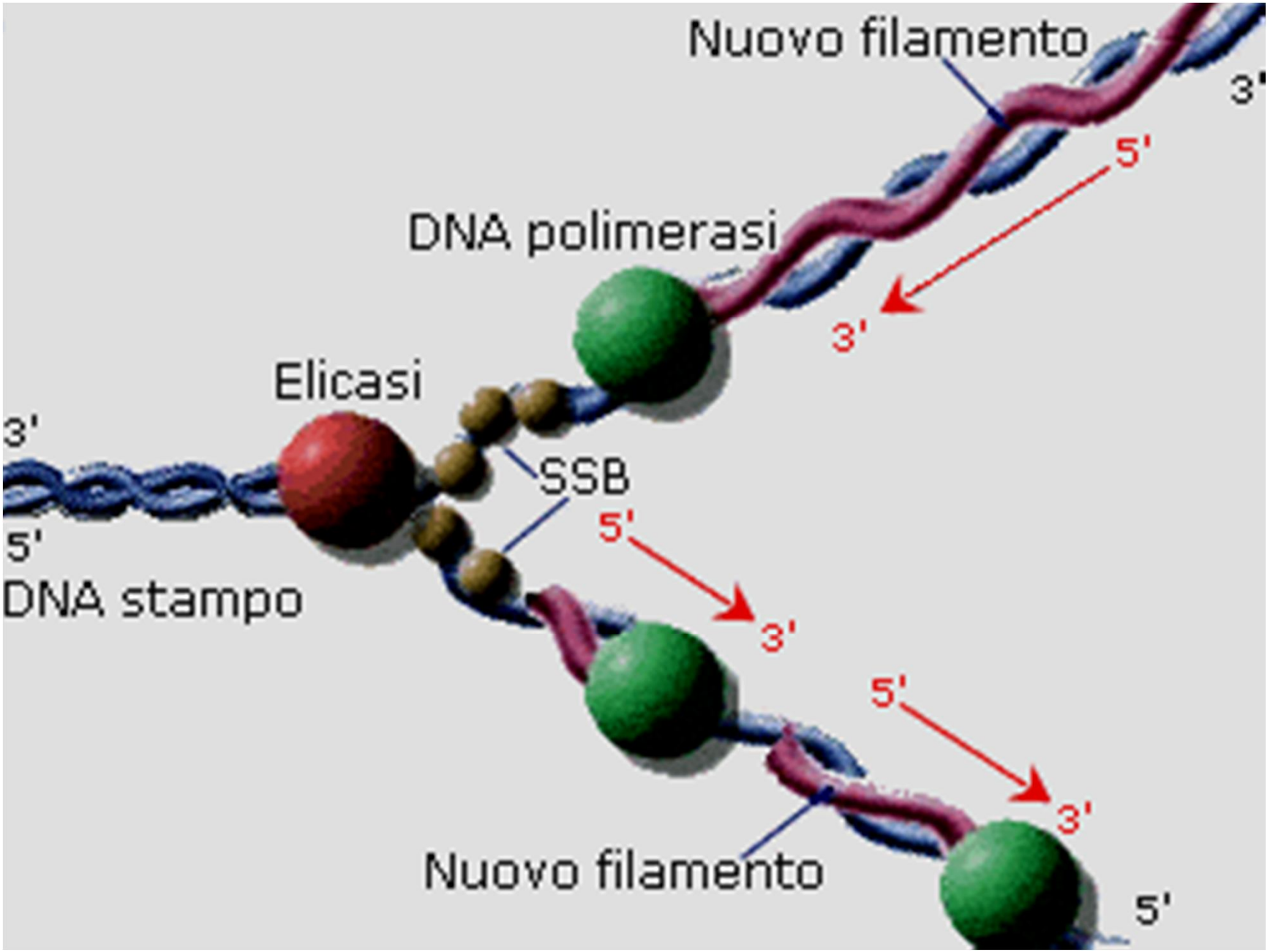

INTERFASE
INTERFASE
INTERFASE
G1
sintesi di RNA
e proteine
S
sintesi del DNA
e duplicazione
dei cromosomi
G2
sintesi di
proteine
M
mitosi

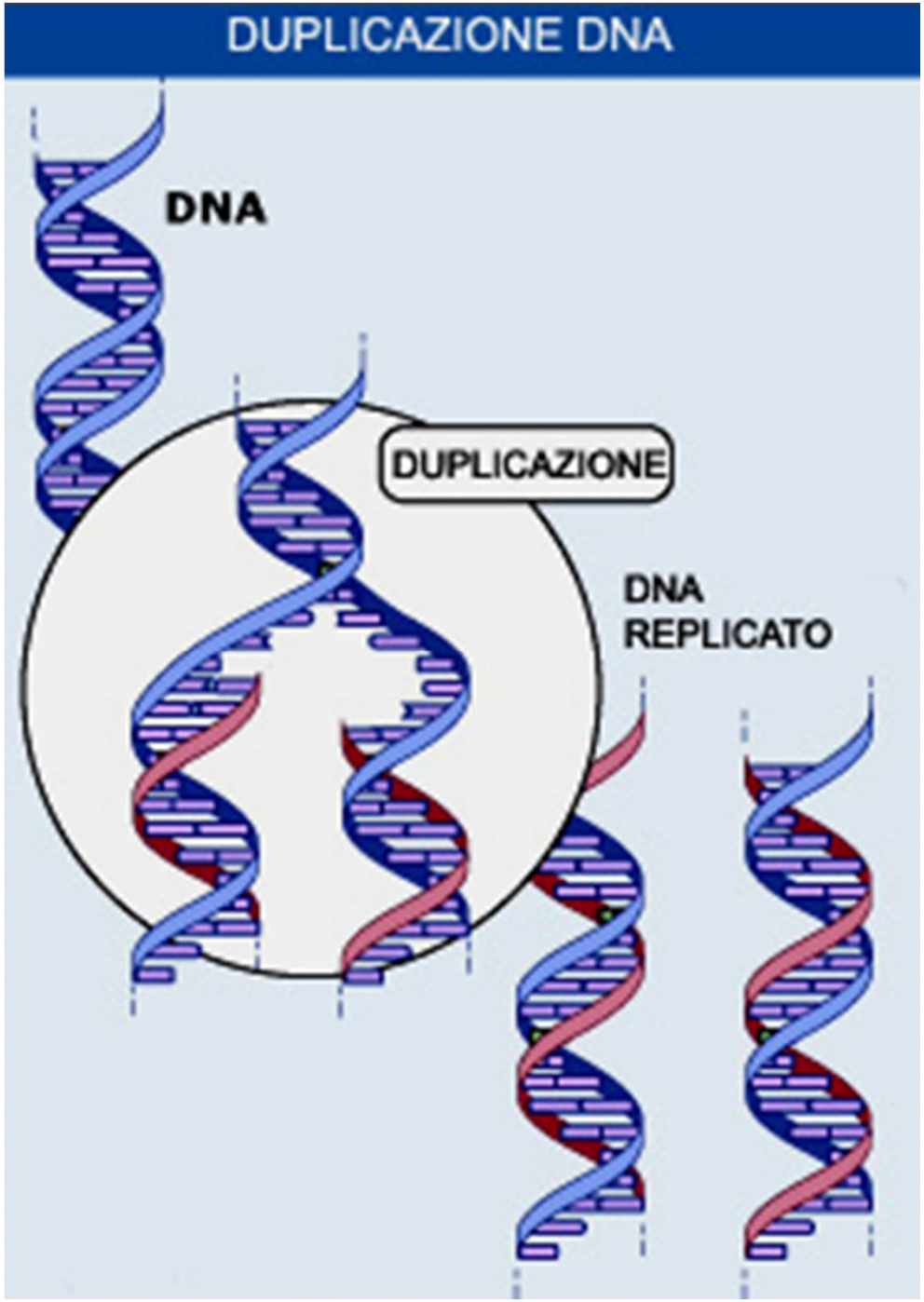

MITOSI
Profase
cromosomi fatti di due cromatidi fratelli
2n=6
Metafase
posizionamento dei cromosomi
Anafase
Telofase
cromatidi fratelli separati durante l'anafase
2n
cellule figlie della mitosi
2n
MEIOSI
Chiasma, luogo del crossing over
MEIOSI I
Profase I
2n=6
tetrade formata da cromosomi omologhi
posizionamento delle tetradi
Metafase I
omologhi separati durante l'anafase I; i cromatidi fratelli rimangono appaiati
Anafase I
Telofase I
aploidi n=3
cellule figlie della meiosi I
MEIOSI II
n
n
n
n
cellule figlie della meiosi II
cromatidi fratelli separati durante l'anafase II


Ovaio
Cellula germinale primaria nella gonade
Testicolo
Oogonio
Spermatogonio
Ripetute mitotiche e divisioni di oogoni spermatogoni
Crescita e differenziamento
Oocita primario (2n)
Spermatocita primario (2n)
I divisione meiotica
Oocita secondario (n)
Primo globulo polare (n)
Spermatociti secondari (n)
II divisione meiotica
Spermatidi (n)
Un ovulo maturo (n)
Secondo globulo polare (n)
Quattro spermatozoi maturi (n)

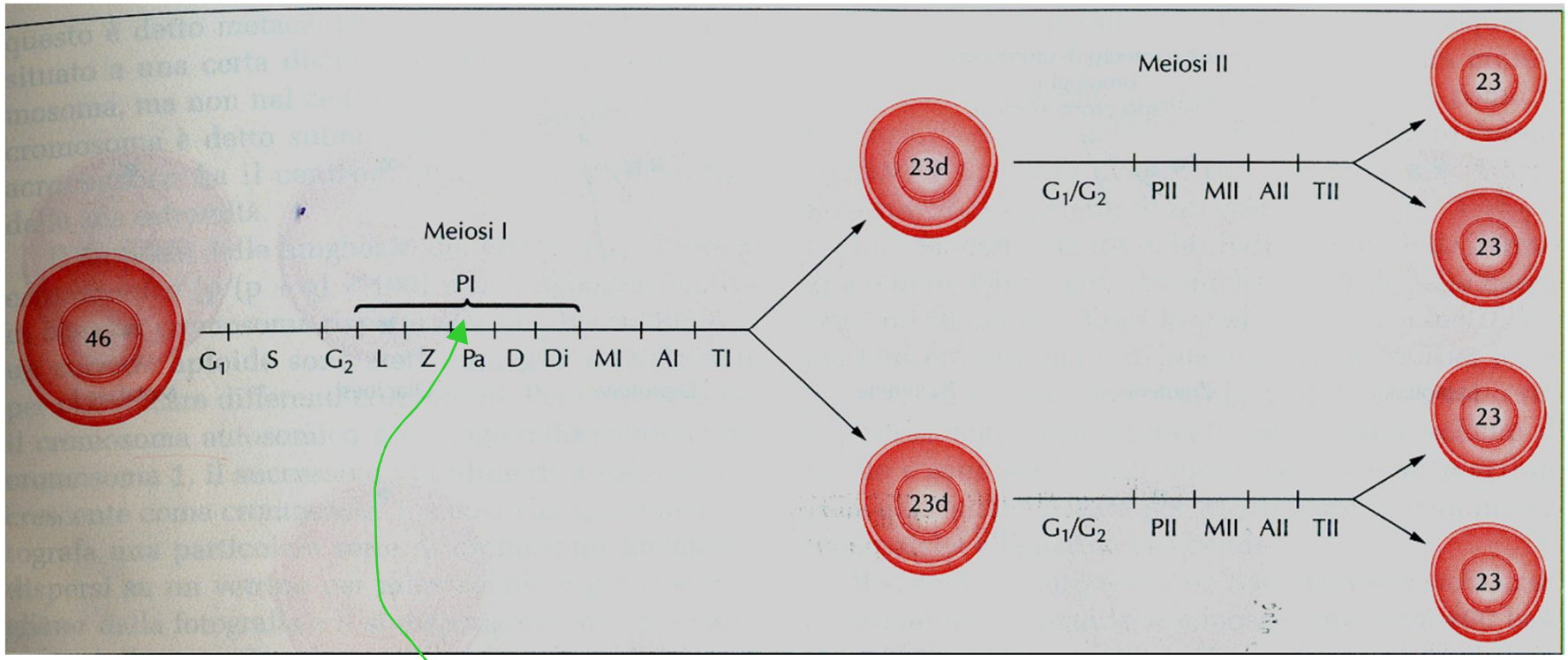

DUPLICAZIONE DEL DNA
DNA originario
vecchio filamento
nuovo filamento
vecchio filamento
nuovo filamento
nuova molecola di DNA
nuova molecola di DNA


replication origin
LOCAL OPENING
OF DNA HELIX
RNA PRIMER
SYNTHESIS
NEW DNA CHAIN
STARTS LEADING-
STRAND SYNTHESIS
RNA PRIMERS START
ADDITIONAL NEW
DNA CHAINS
fork 1
fork 2

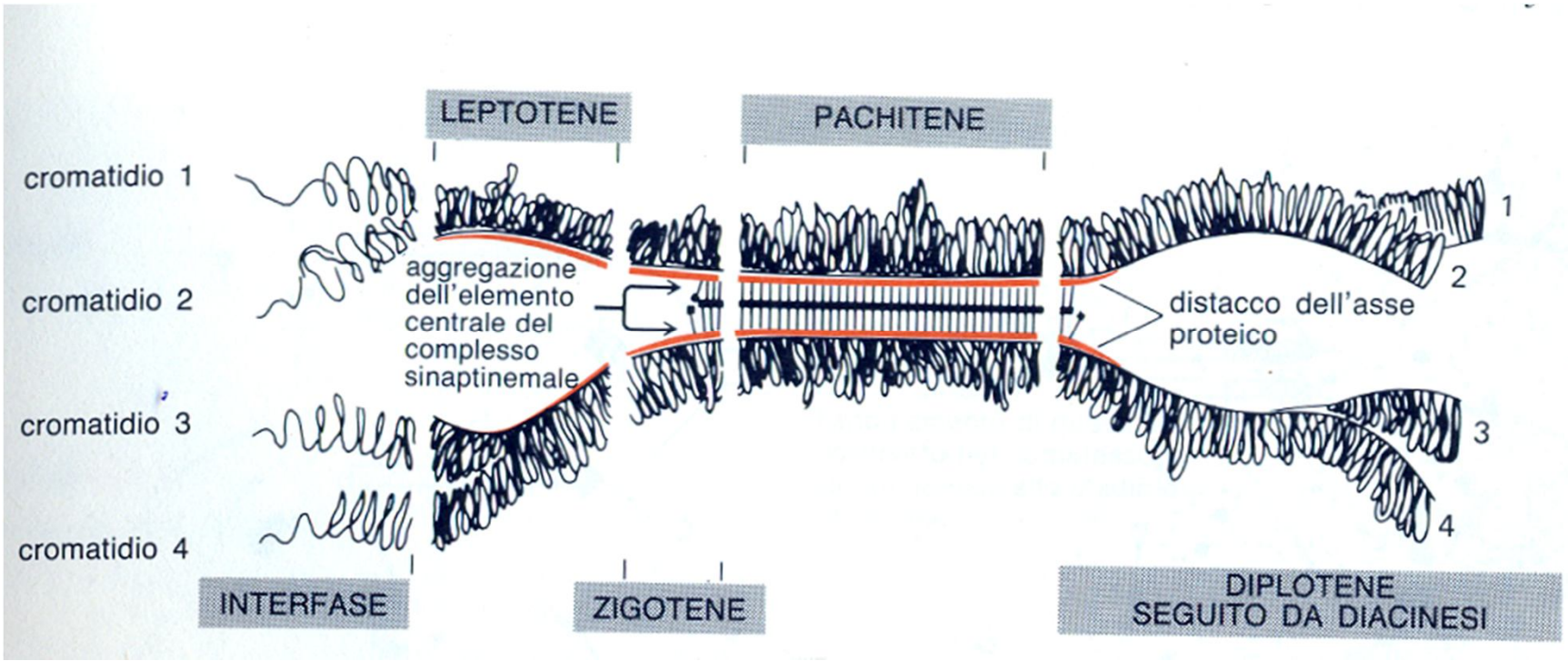

Nuovo filamento
3'
5'
DNA polimerasi
3'
Elicasi
3'
SSB
5'
5'
DNA stampo
3'
5'
3'
Nuovo filamento
5'

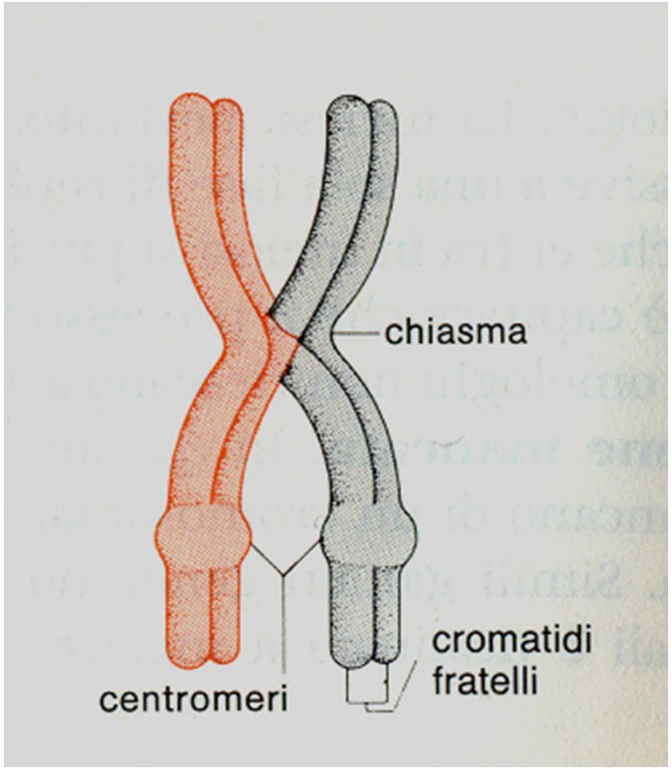

DUPLICAZIONE DNA
DNA
DUPLICAZIONE
DNA
REPLICATO

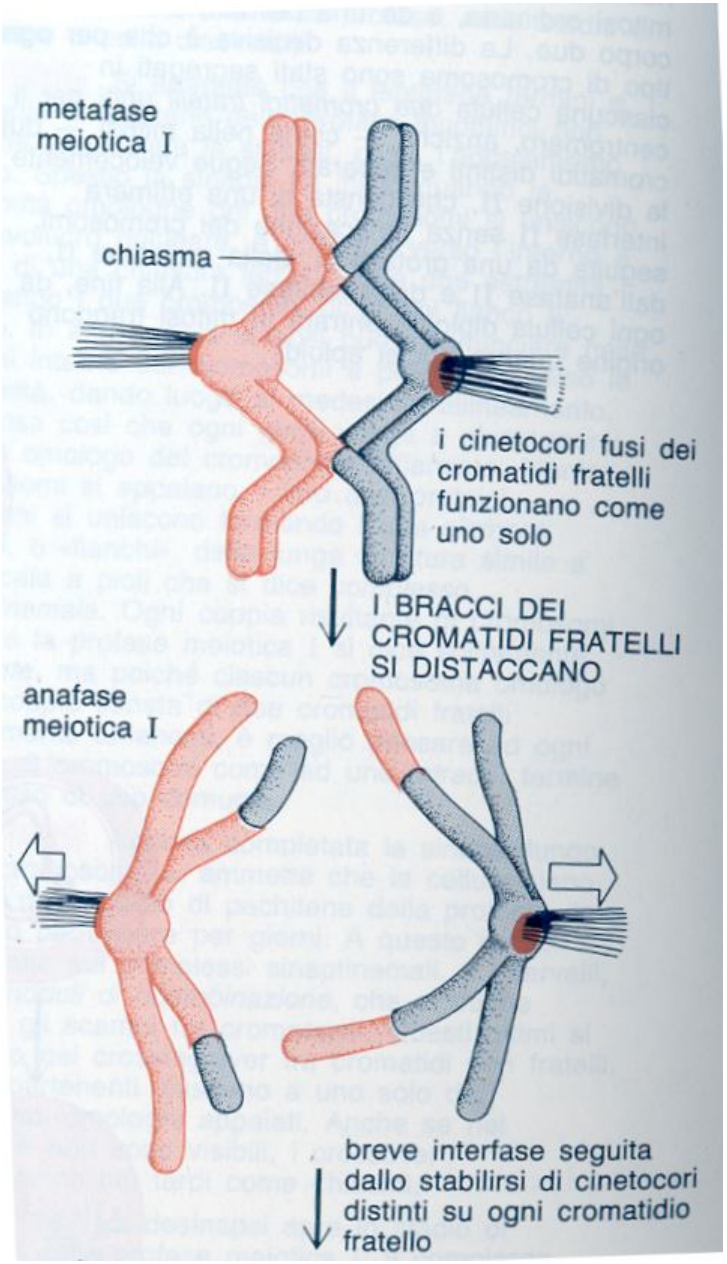
Meiosi

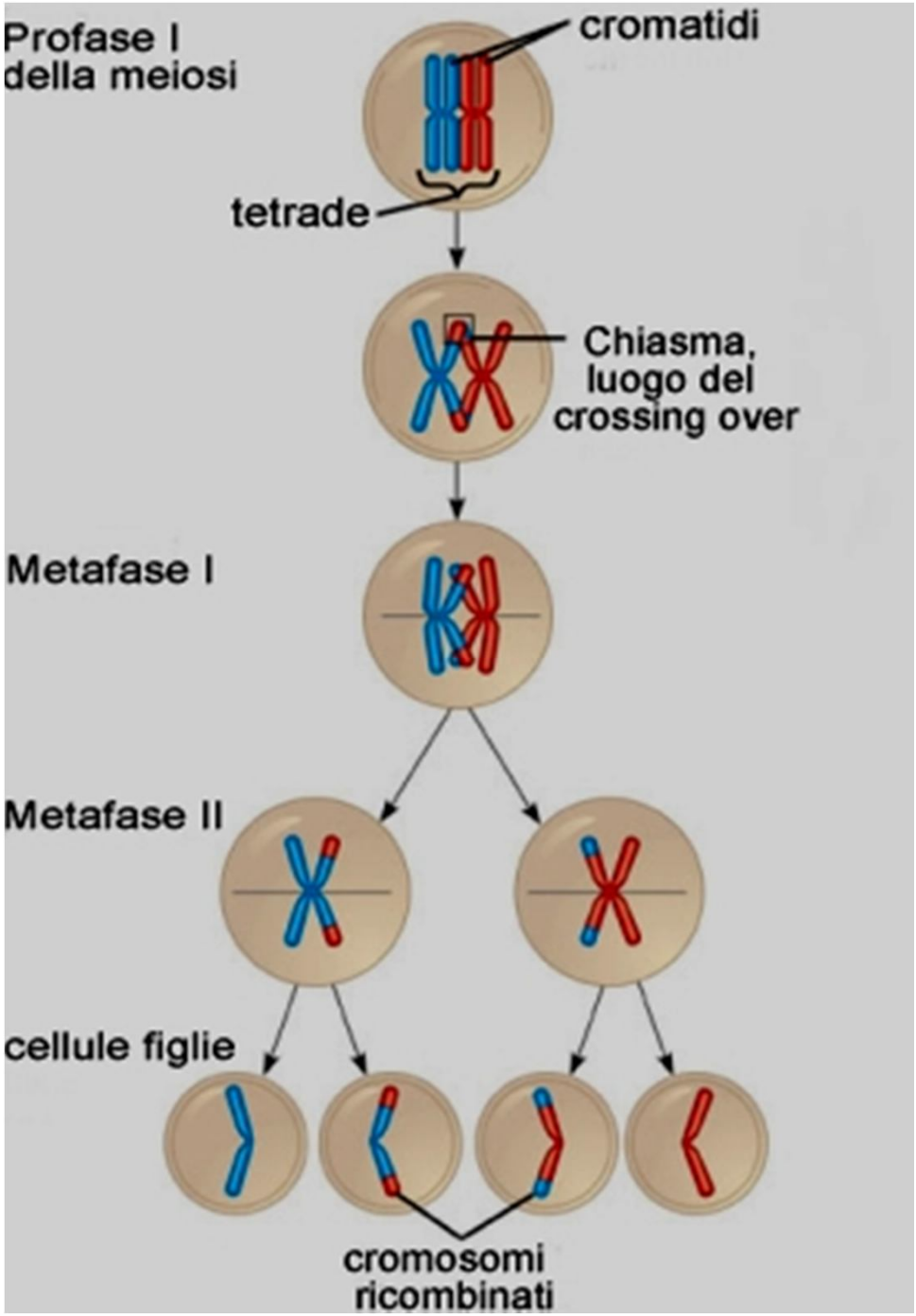


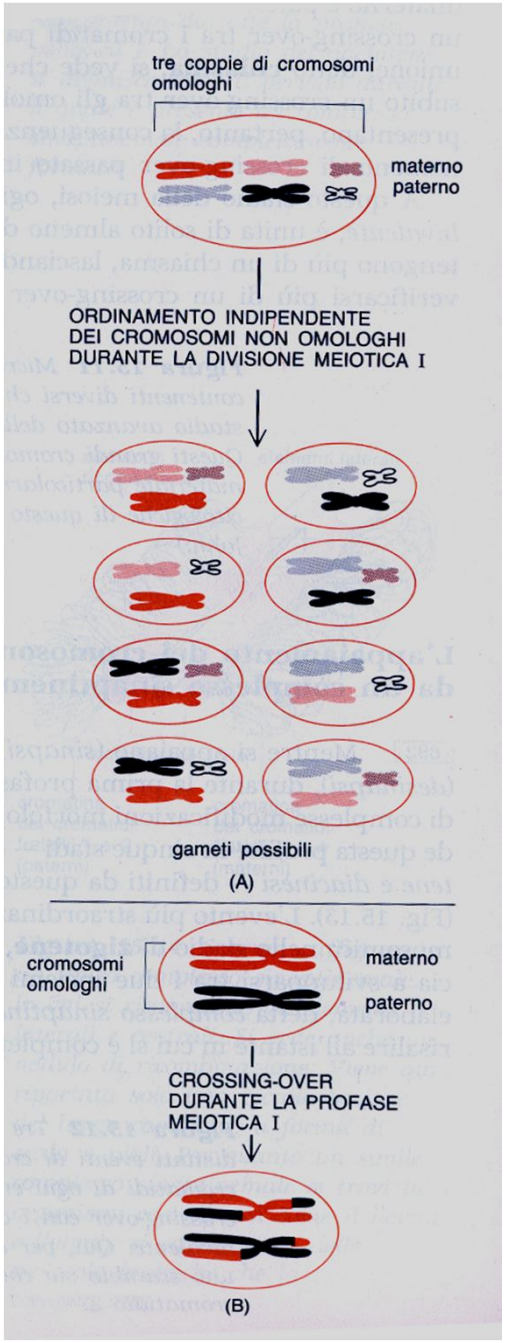
Crossing Ower


LEPTOTENE
PACHITENE
cromatidio 1
cromatidio 2
cromatidio 3
cromatidio 4
aggregazione dell'elemento centrale del complesso sinaptinemale
distacco dell'asse proteico
1
2
3
4
INTERFASE
ZIGOTENE
DIPLOTENE SEGUITO DA DIACINESI


chiasma
cromatidi fratelli
centromeri


metafase meiotica I
chiasma
i cinetocori fusi dei cromatidi fratelli funzionano come uno solo
I BRACCI DEI CROMATIDI FRATELLI SI DISTACCANO
anafase meiotica I
breve interfase seguita dallo stabilirsi di cinetocori distinti su ogni cromatidio fratello


Profase I
della meiosi
cromatidi
tetrade
Chiasma,
luogo del
crossing over
Metafase I
Metafase II
cellule figlie
cromosomi
ricombinati

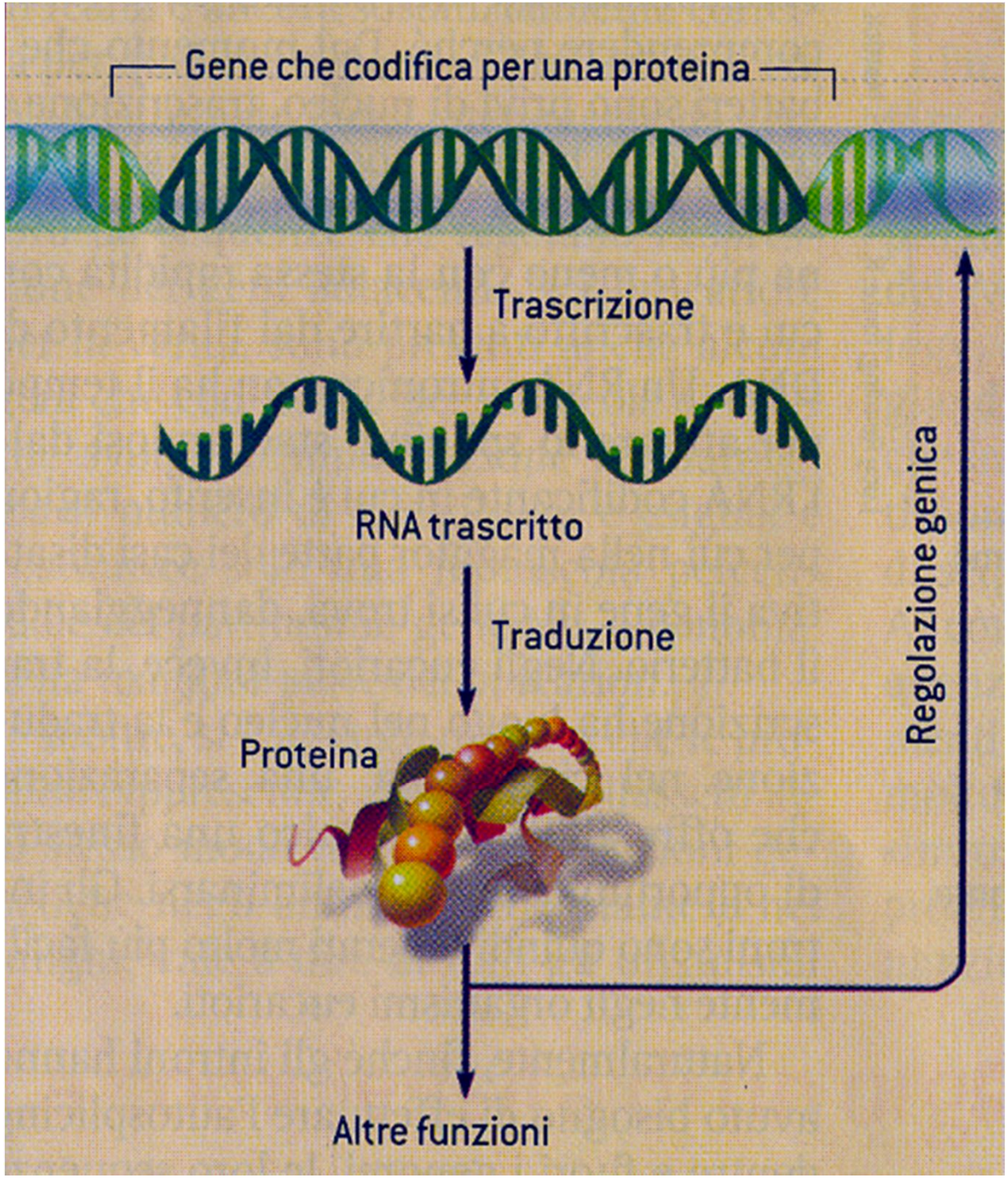


Gameti geneticamente diversi

2En

n= numero aploide dei cromosomi

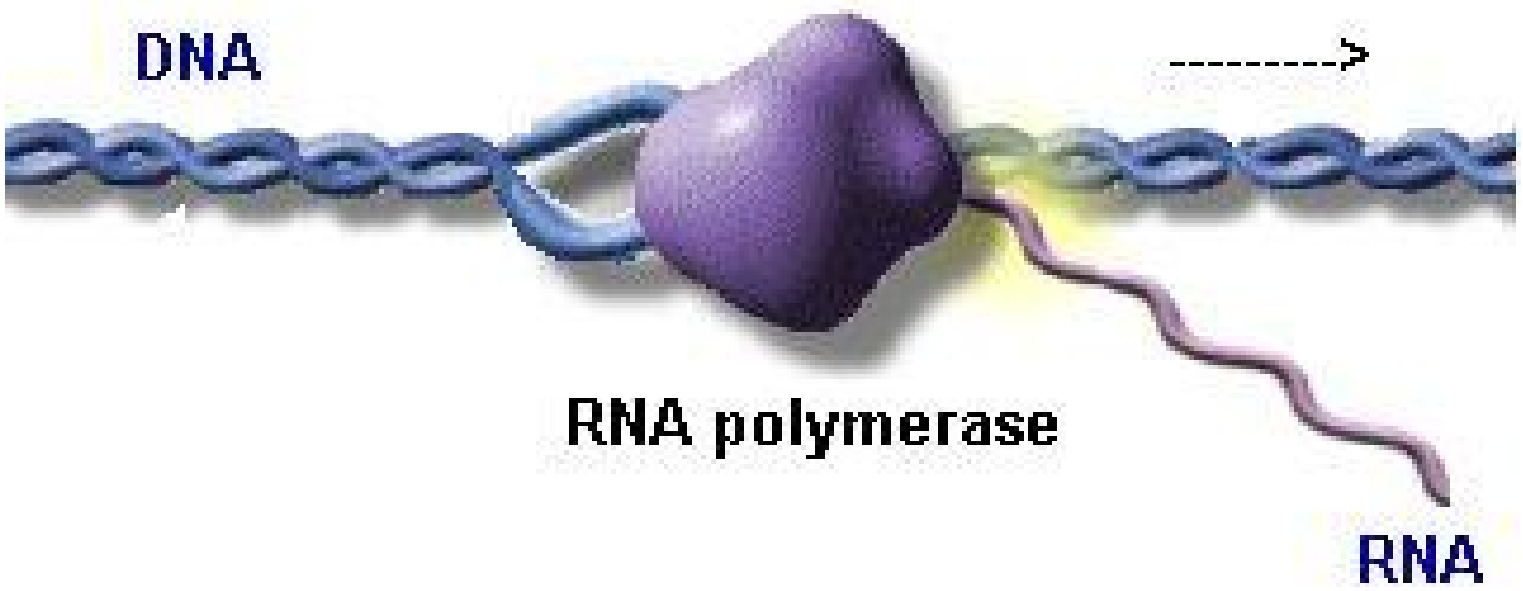
2E23 =8,6x 10E6

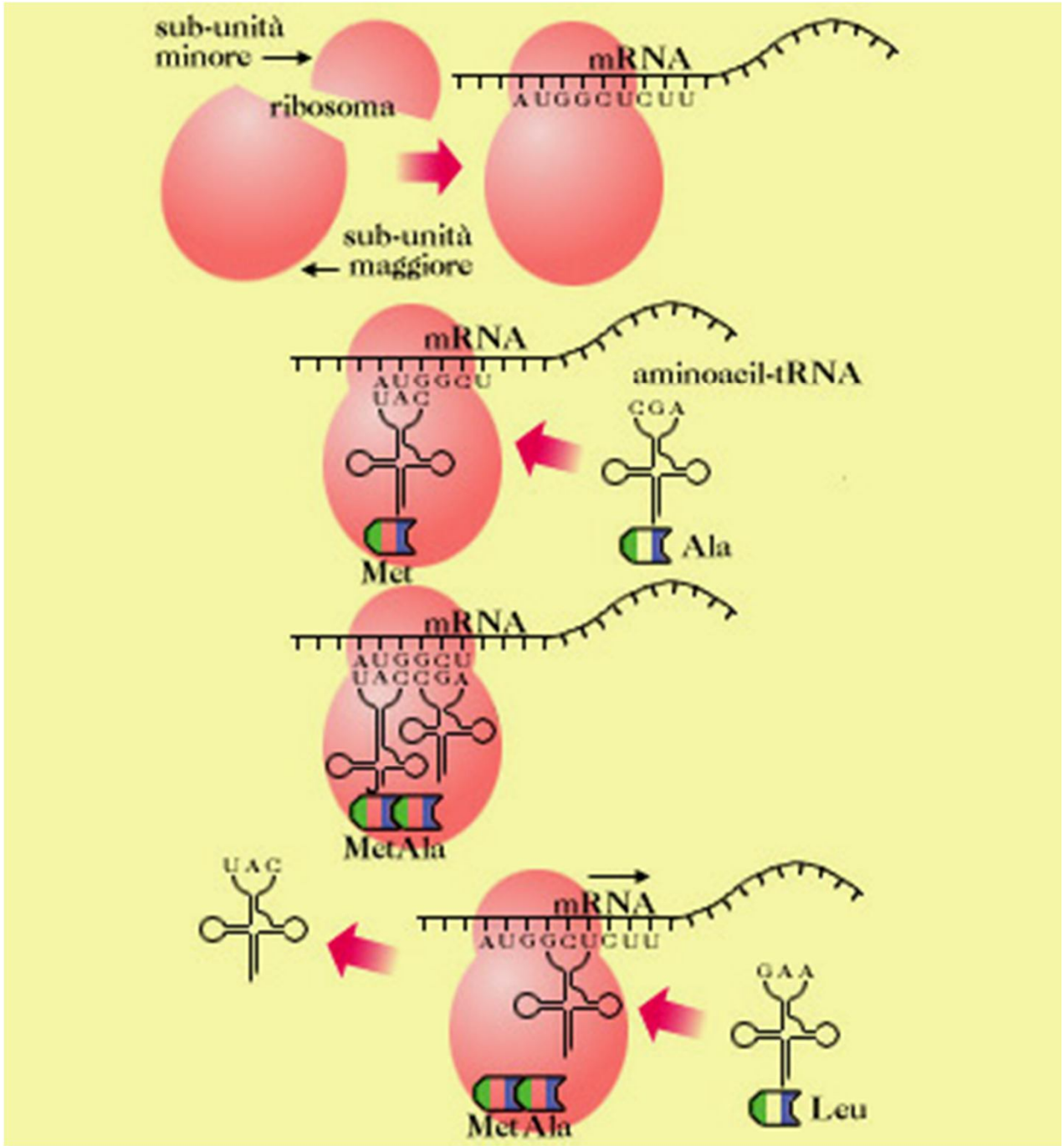

Gene che codifica per una proteina
Trascrizione
RNA trascritto
Traduzione
Proteina
Regolazione genica
Altre funzioni

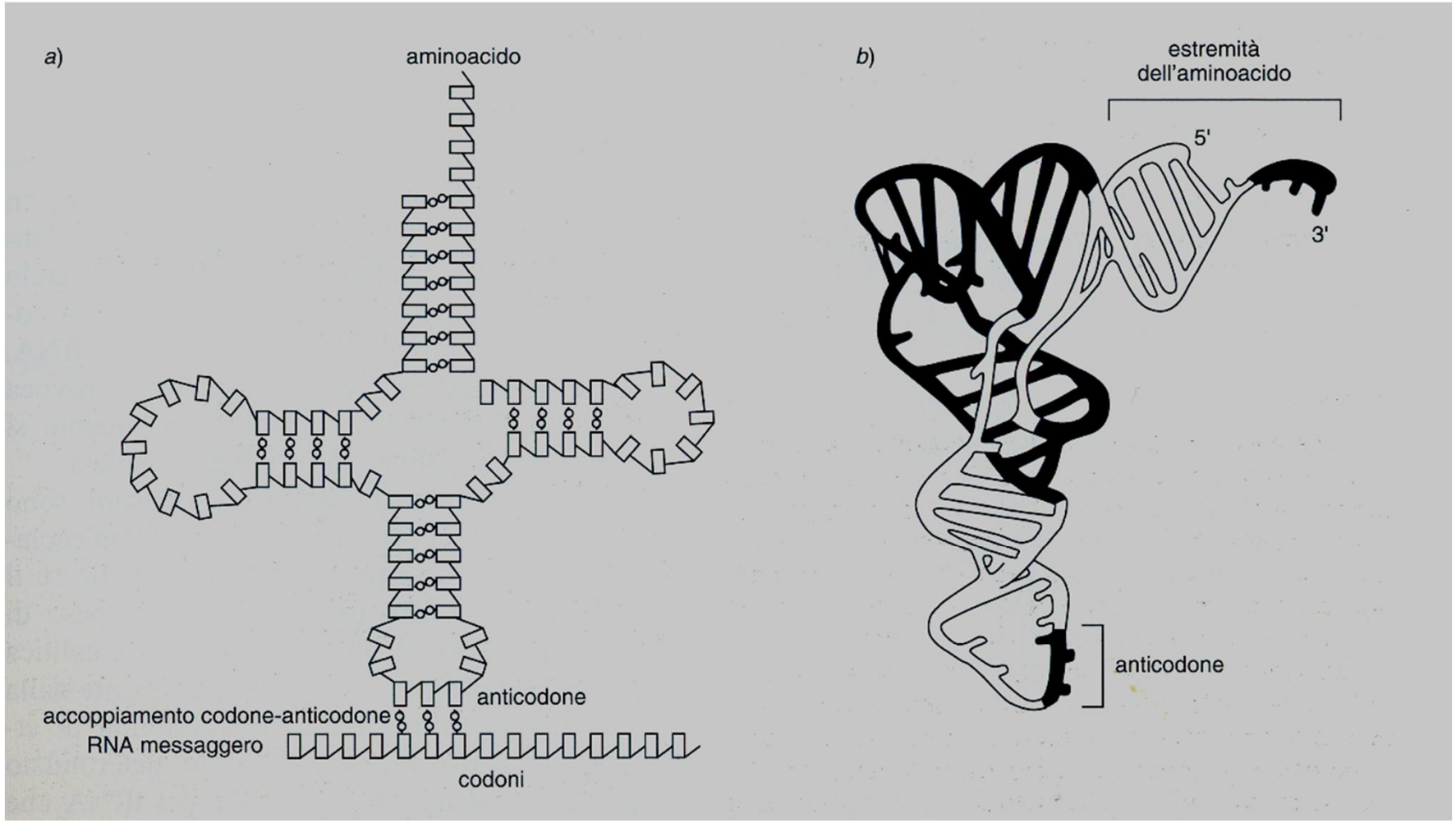
DNA: 3'-ACGCGCGCGATAATG-5'

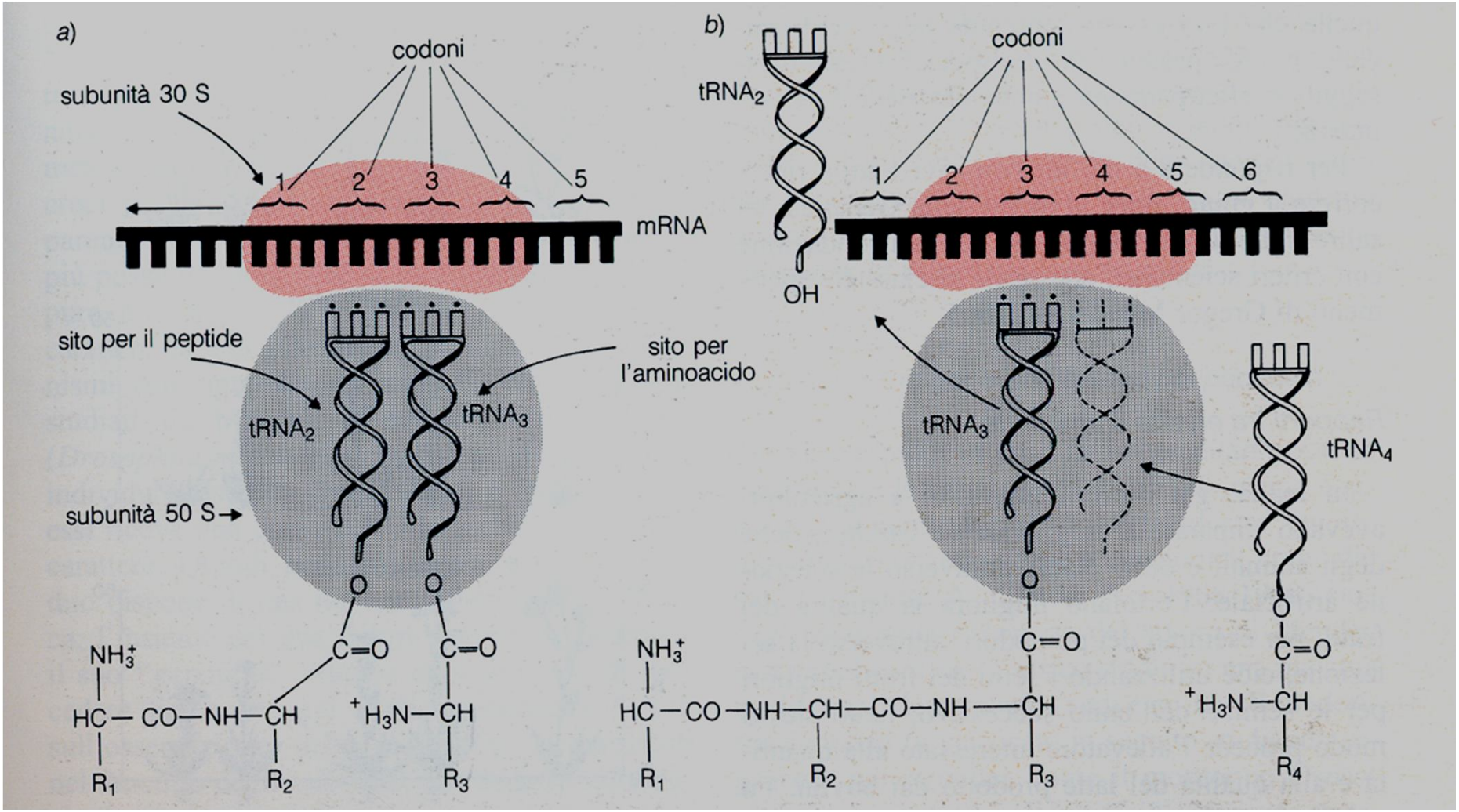
Transcription

RNA: 5'-UGCGCGCGCUAUUAC-3'

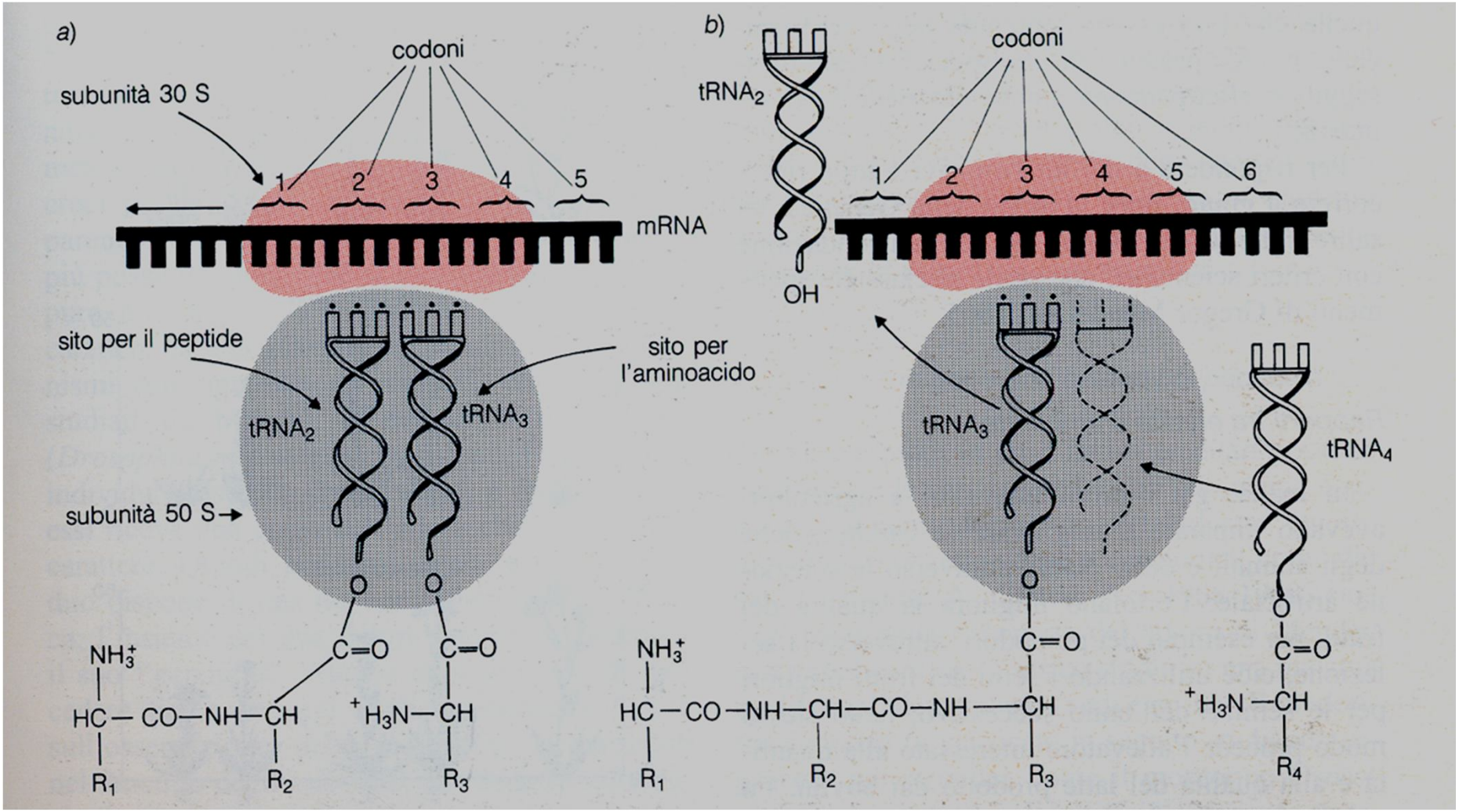



sub-unità
minore
ribosoma
mRNA
AUGGCUCUU
sub-unità
maggiore
mRNA
AUGGCU
UAC
aminoacil-tRNA
CGA
Met
Ala
mRNA
AUGGCU
UACCGA
MetAla
UAC
mRNA
AUGGCUCUU
GAA
MetAla
Leu


a)
aminoacido
anticodone
accoppiamento codone-anticodone
RNA messaggero
codoni
b)
estremità
dell'aminoacido
5'
3'
anticodone


a)
codoni
subunità 30 S
1
2
3
4
5
mRNA
sito per il peptide
sito per l'aminoacido
tRNA2
tRNA3
subunità 50 S
O
O
C=O
C=O
NH3+
HC — CO—NH—CH
+H3N—CH
R1
R2
R3
b)
tRNA2
OH
codoni
1
2
3
4
5
6
tRNA3
tRNA4
O
C=O
NH3+
HC — CO—NH—CH—CO—NH—CH
+H3N—CH
R1
R2
R3
R4

prima base	seconda base: U	seconda base: C	seconda base: A	seconda base: G
U	UUU Phe (F) UUC UUA Leu (L) UUG	UCU Ser (S) UCC UCA UCG	UAU Tyr (Y) UAC UAA STOP UAG	UGU Cys (C) UGC UGA STOP UGG Trp (W)
C	CUU Leu (L) CUC CUA CUG	CCU Pro (P) CCC CCA CCG	CAU His (H) CAC CAA Gin (Q) CAG	CGU Arg (R) CGC CGA CGG
A	AUU Ile (I) AUC AUA AUG Met (M)	ACU Thr (T) ACC ACA ACG	AAU Asn (N) AAC AAA Lys (K) AAG	AGU Ser (S) AGC AGA Arg (R) AGG
G	GUU Val (V) GUC GUA GUG	GCU Ala (A) GCC GCA GCG	GAU Asp (D) GAC GAA Glu (E) GAG	GGU Gly (G) GGC GGA GGG


a)
codoni
subunità 30 S
1
2
3
4
5
mRNA
sito per il peptide
sito per l'aminoacido
tRNA2
tRNA3
subunità 50 S
O
O
C=O
C=O
NH3+
HC — CO—NH—CH
+H3N—CH
R1
R2
R3
b)
tRNA2
OH
codoni
1
2
3
4
5
6
tRNA3
tRNA4
O
C=O
NH3+
HC — CO—NH—CH—CO—NH—CH
+H3N—CH
R1
R2
R3
R4