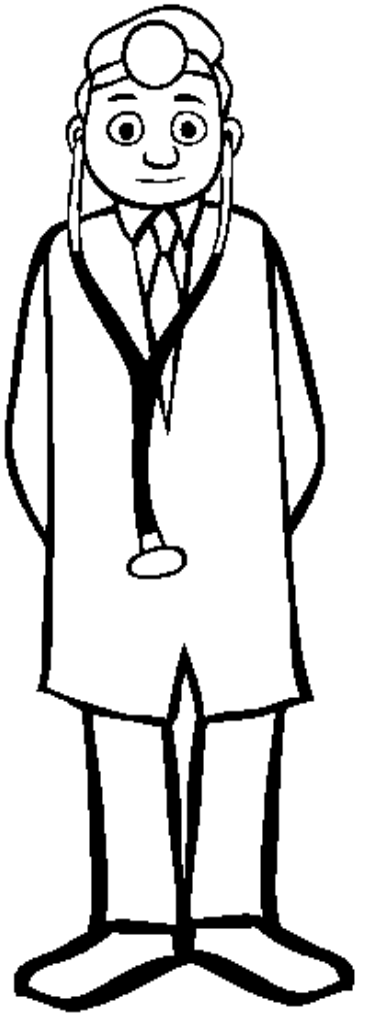
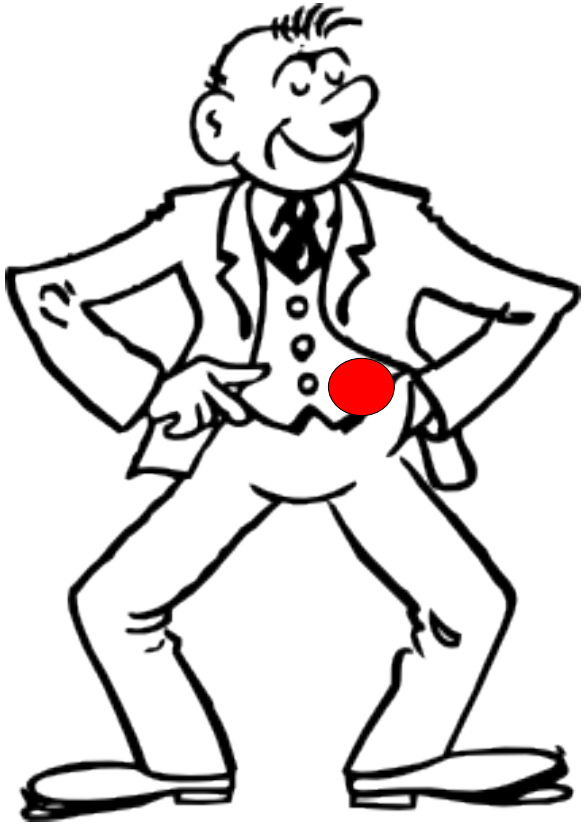
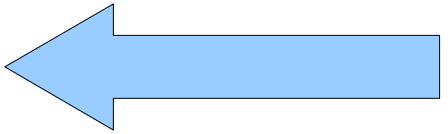
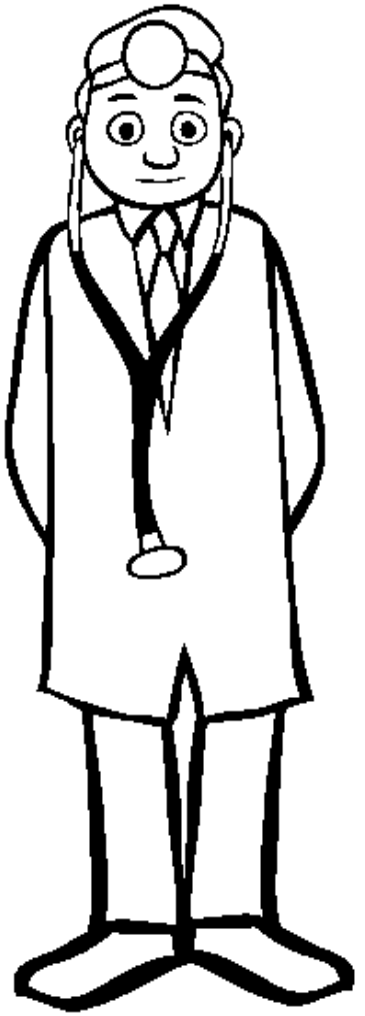
Mr. X









Krebs

Zwei Krebstypen

1

Typ 1: Mild

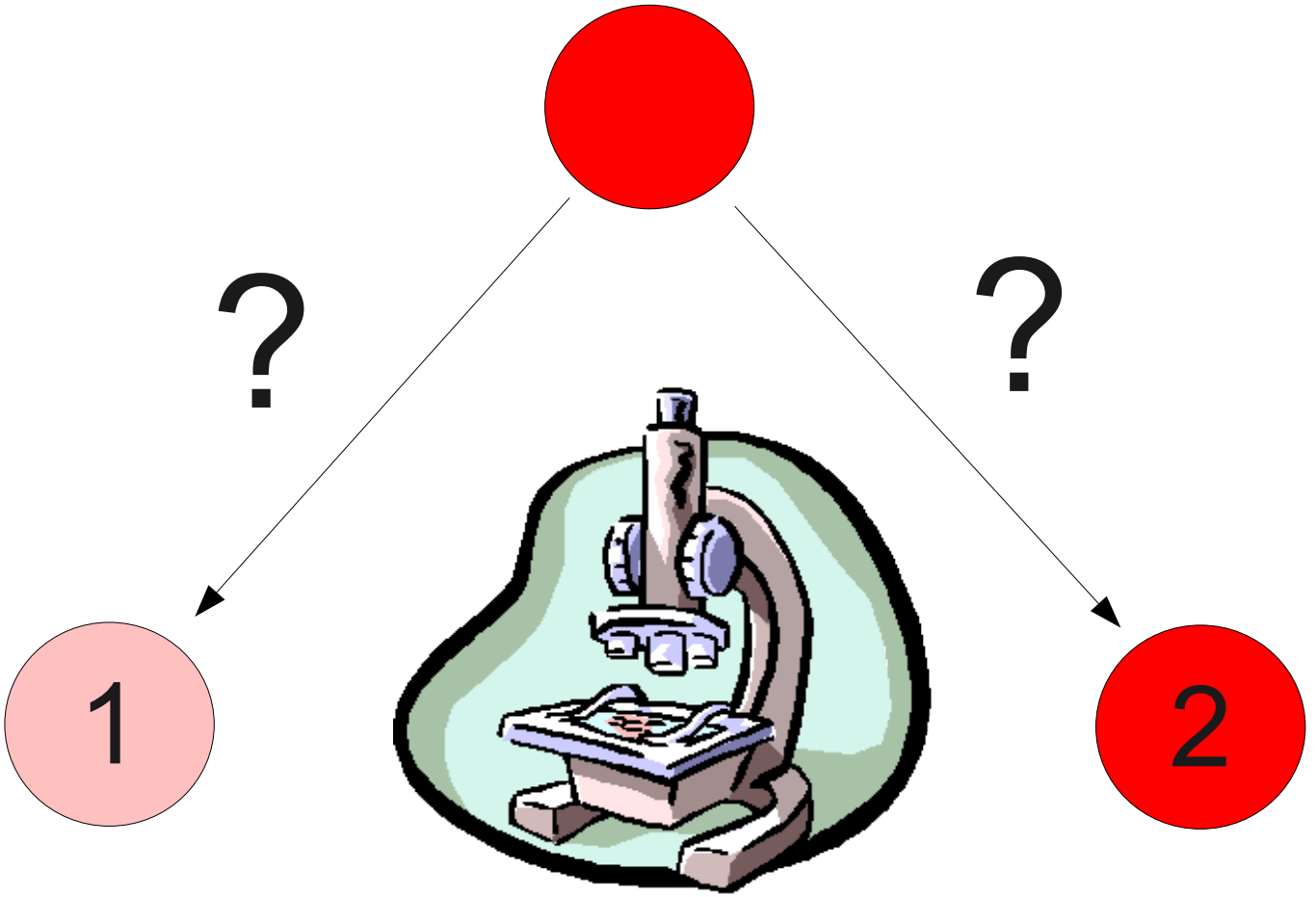
Chemotherapie nicht nötig

2

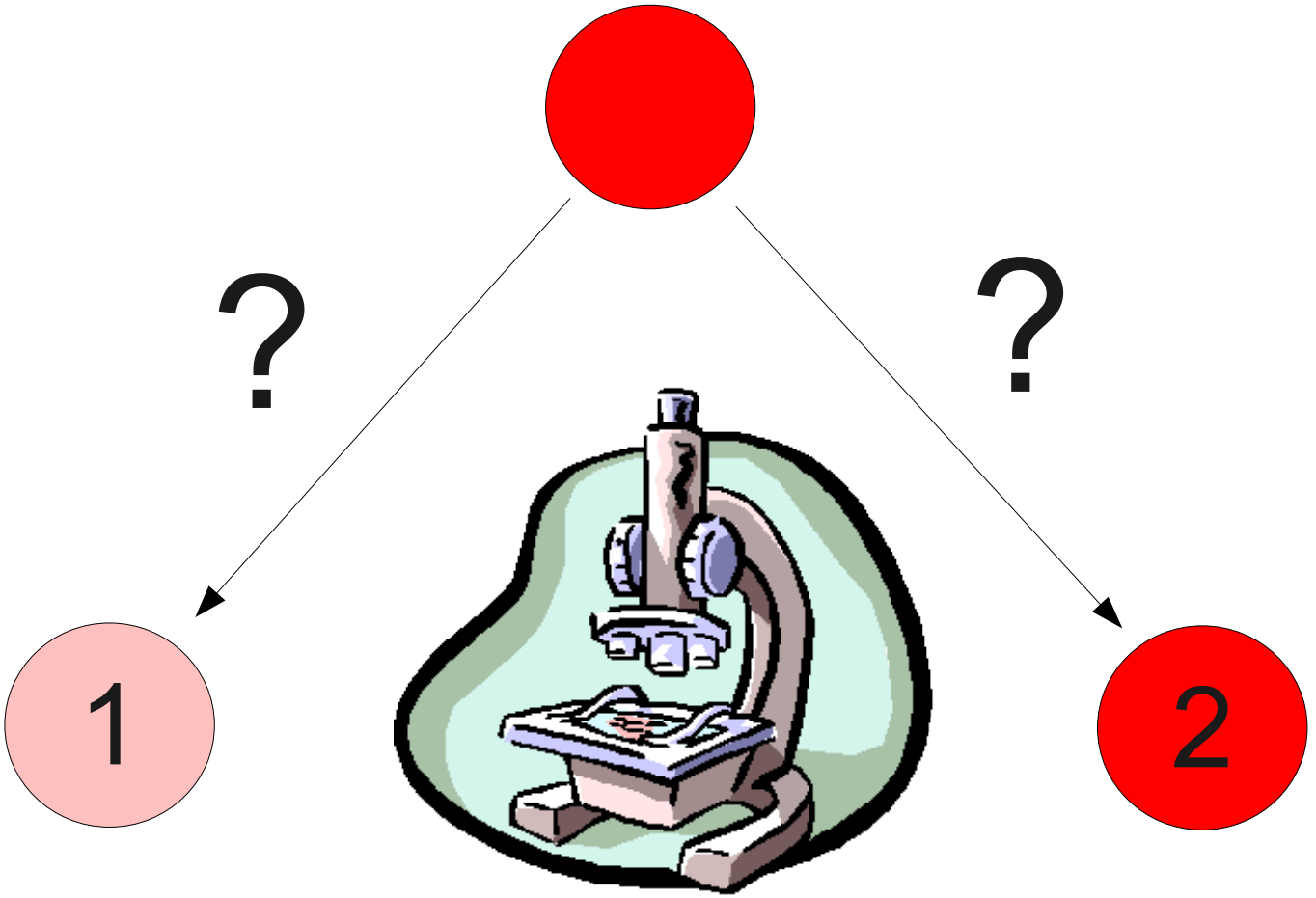
Typ 2: Schwer

Chemotherapie nötig

Problem:
Typ erst nach langer Zeit erkennbar



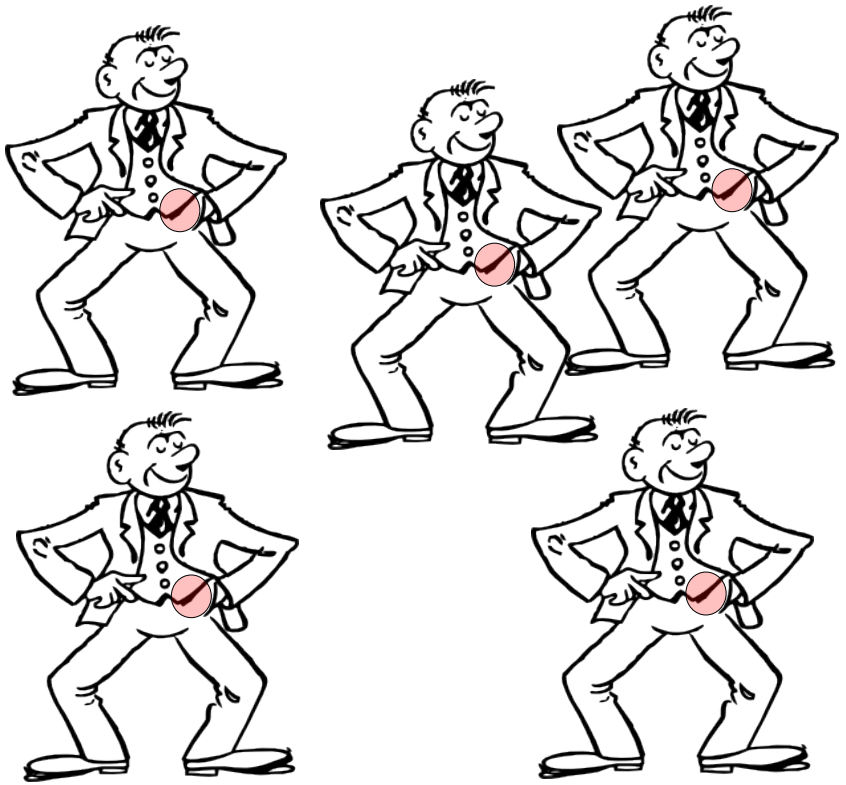
Problem:
Typ erst nach langer Zeit erkennbar



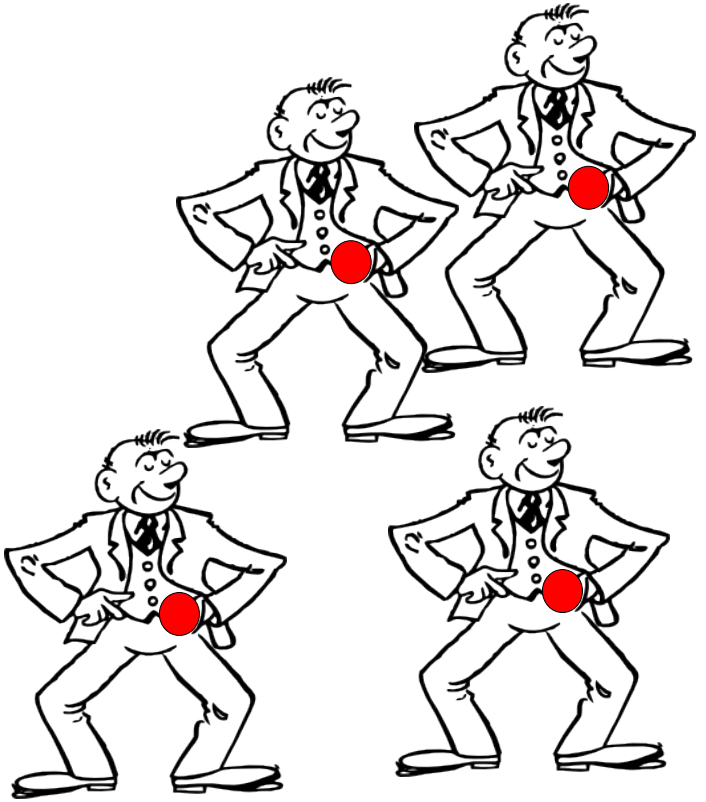
Jetzt **Chemotherapie** oder nicht?

Wie kann man verschiedene Arten von Krebs unterscheiden?

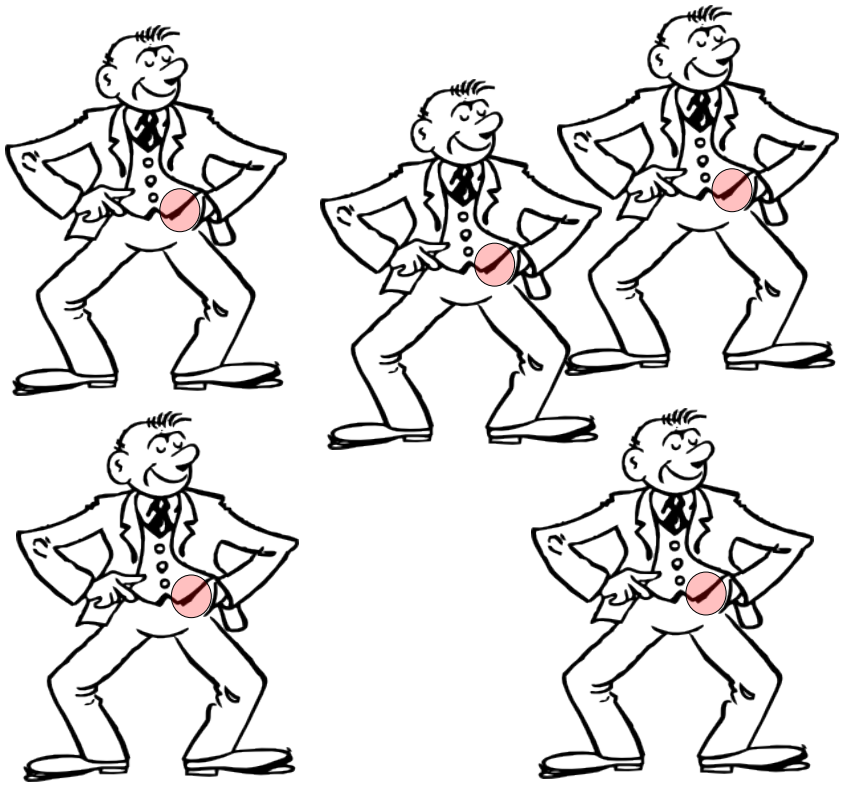
Typ 1



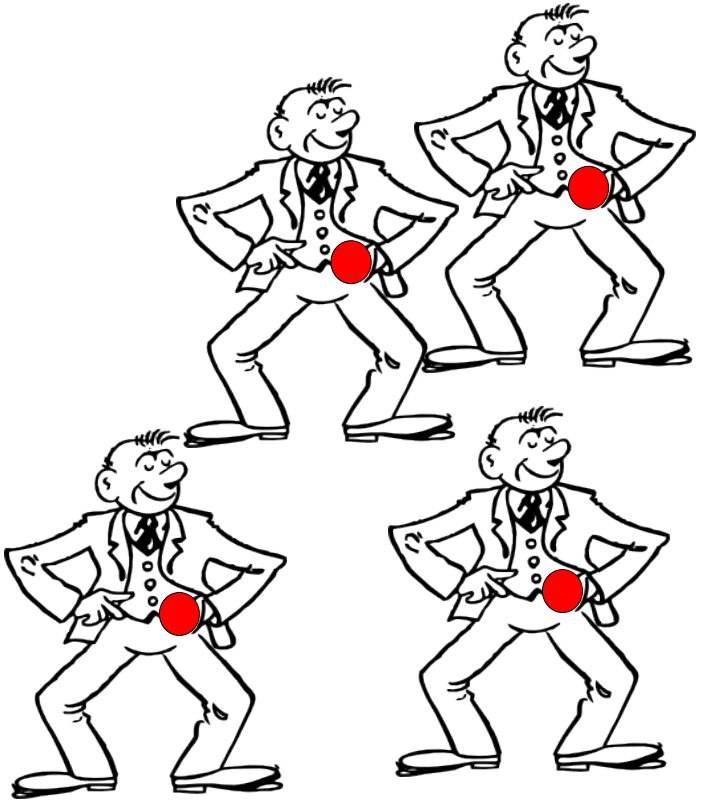
Typ 2



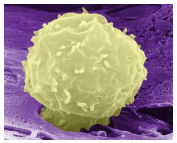
Typ 1

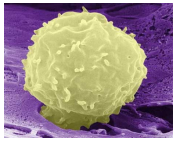


Typ 2



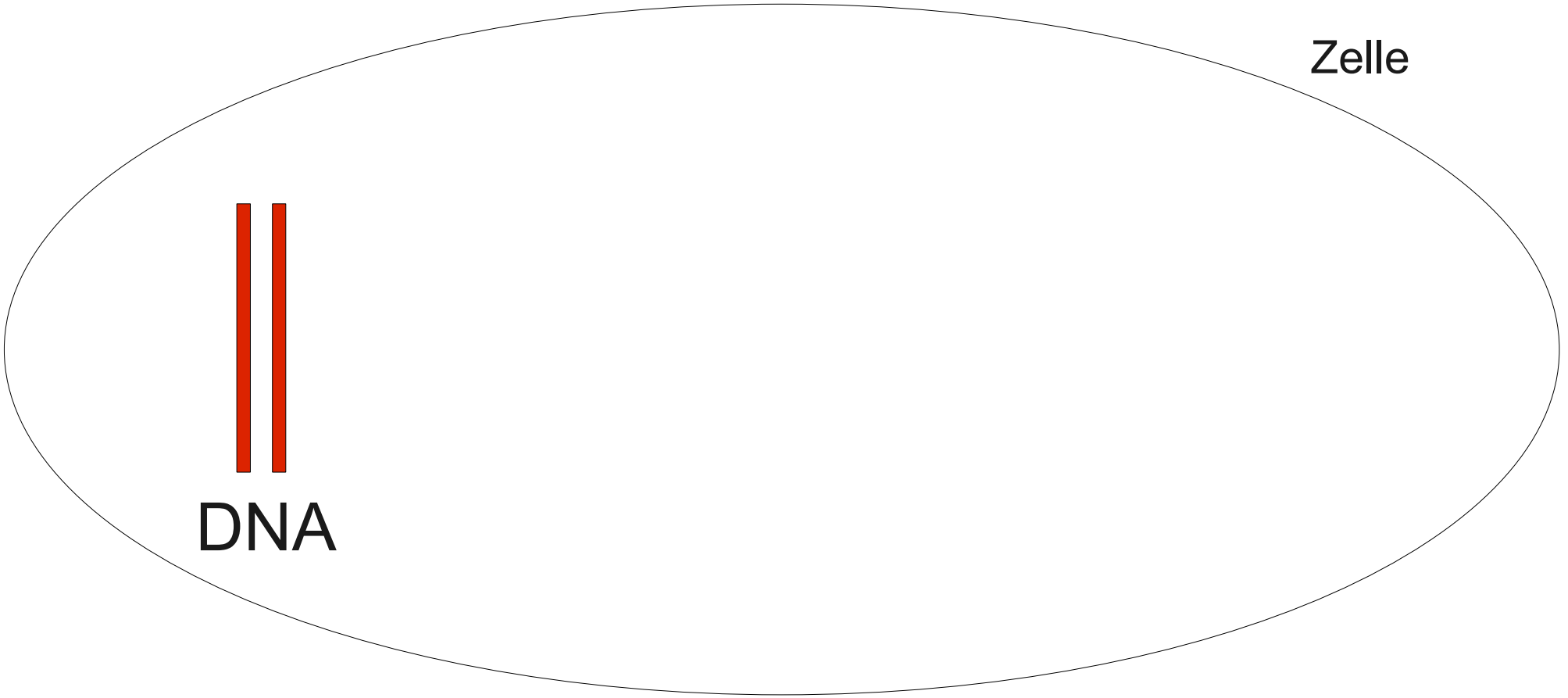
Vergleiche Krebszellen



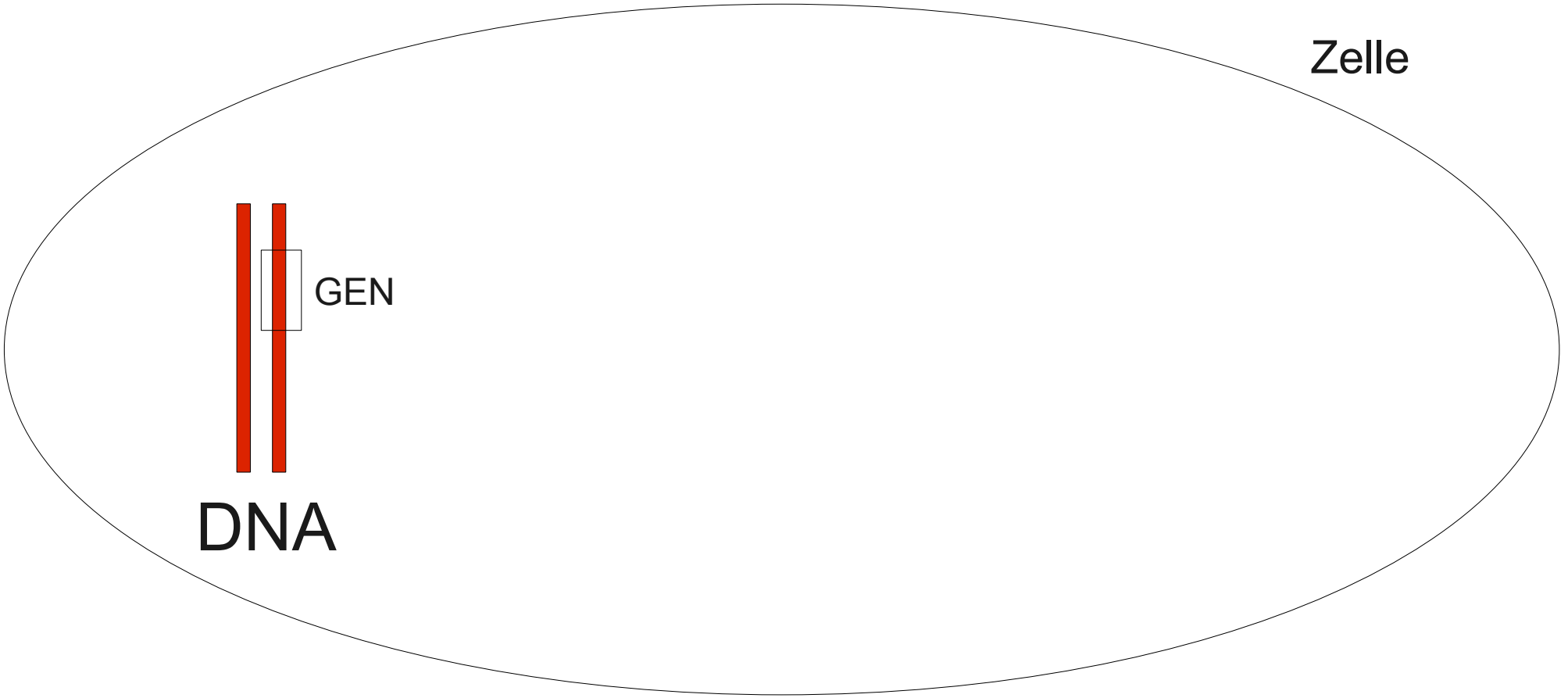


Idee:
Vergleiche Aktivität innerhalb der Zelle

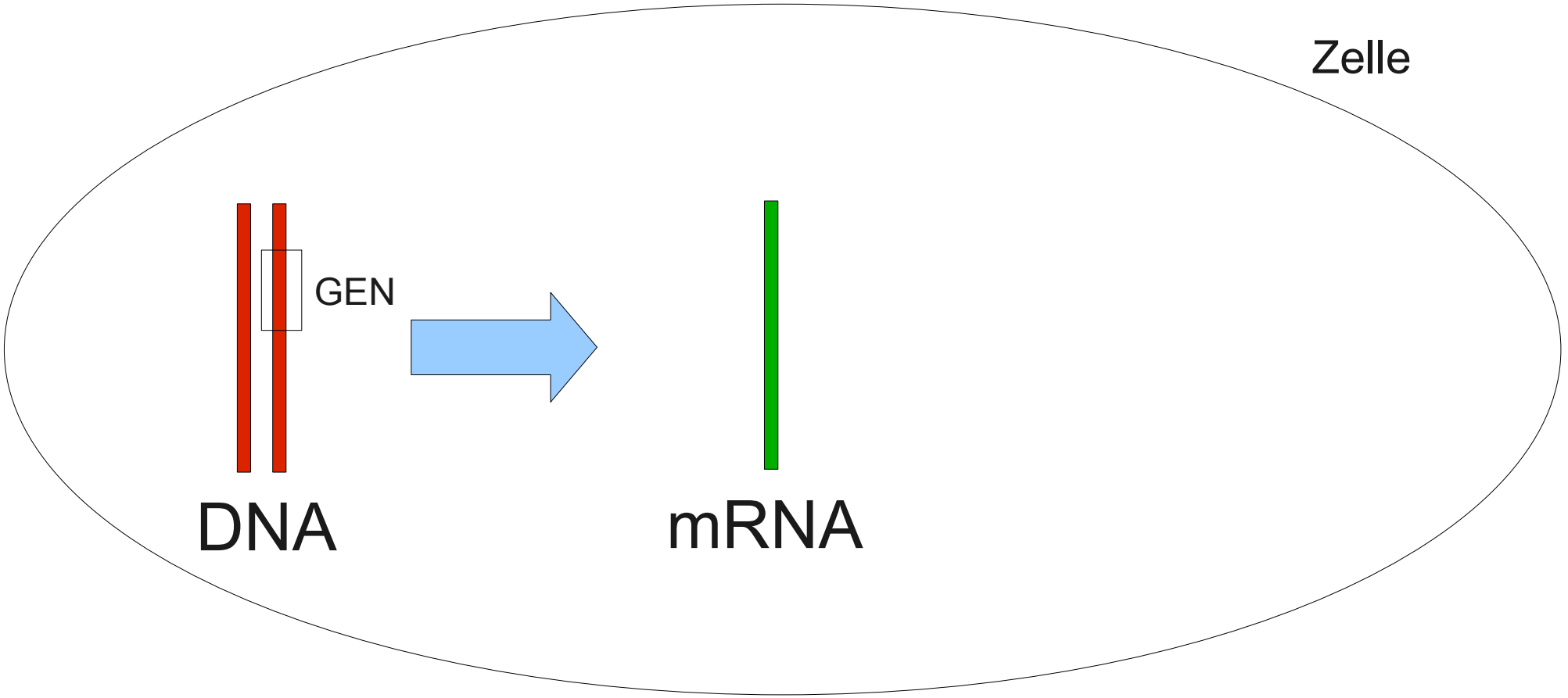
Zentrales Dogma der Molekularbiologie



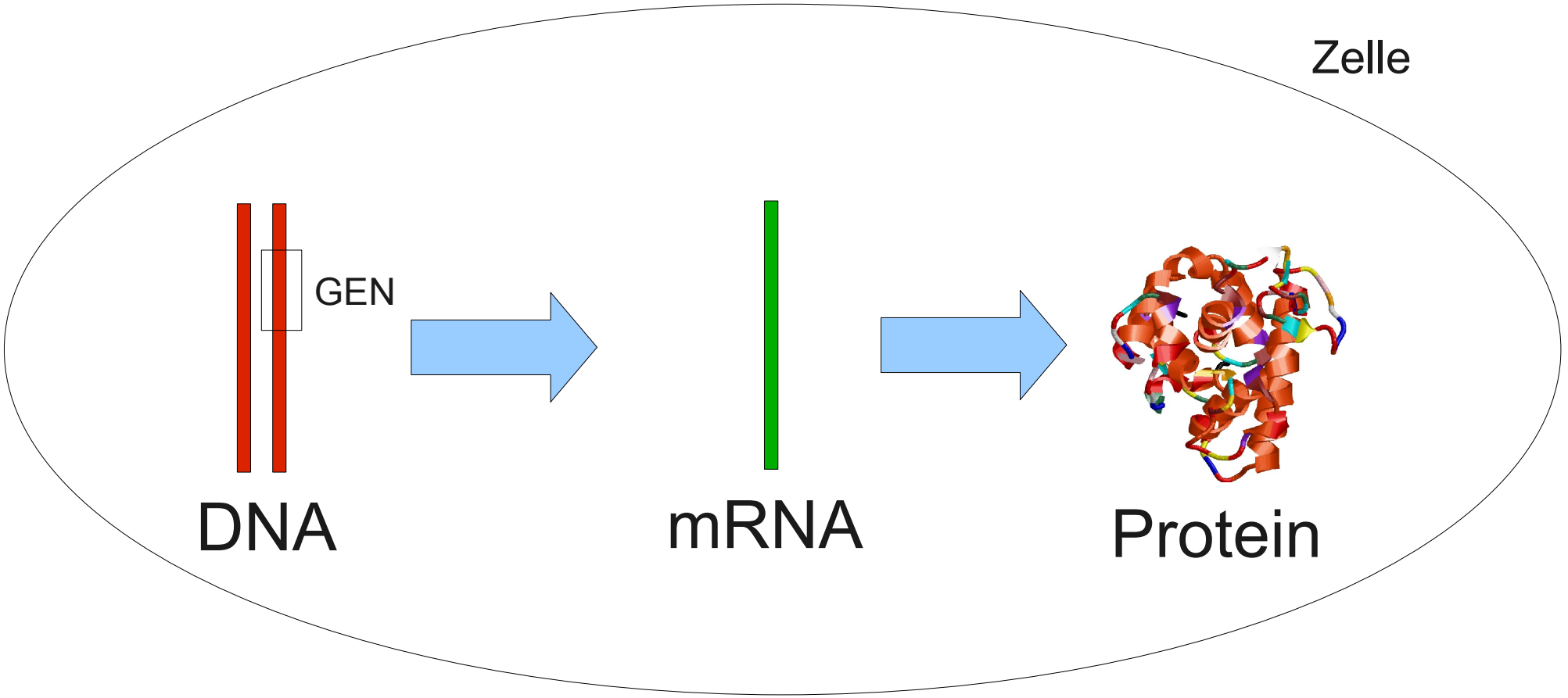
Zentrales Dogma der Molekularbiologie



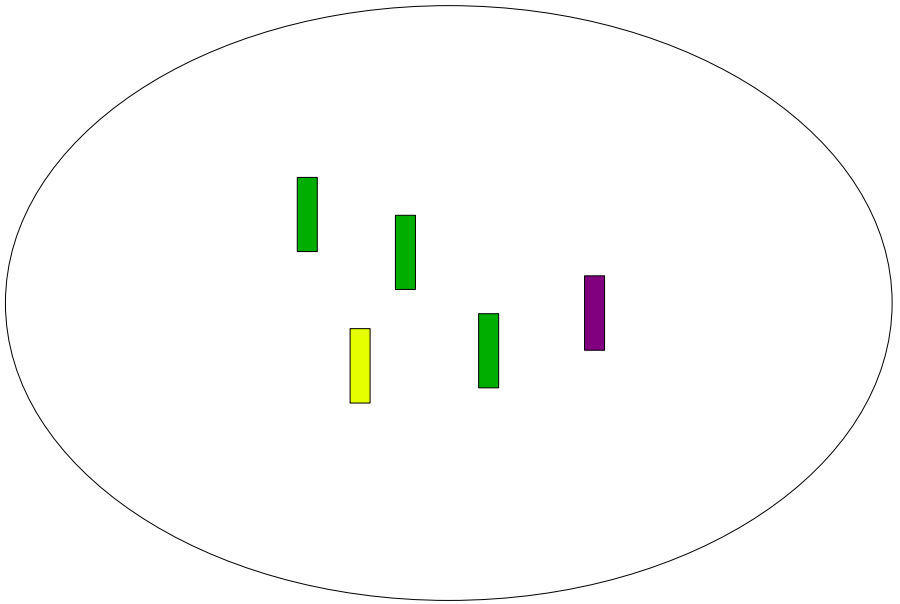
Zentrales Dogma der Molekularbiologie



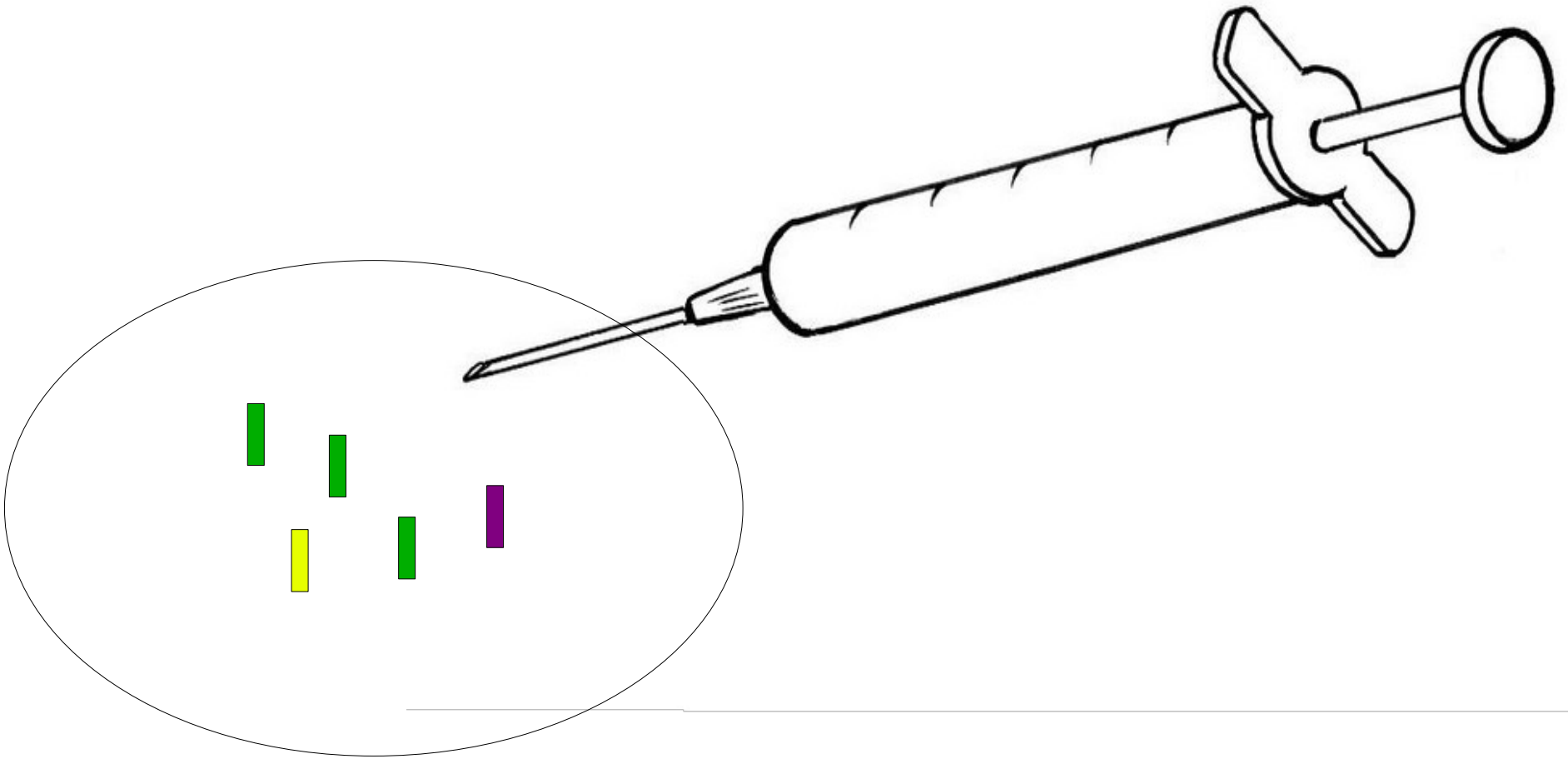
Zentrales Dogma der Molekularbiologie



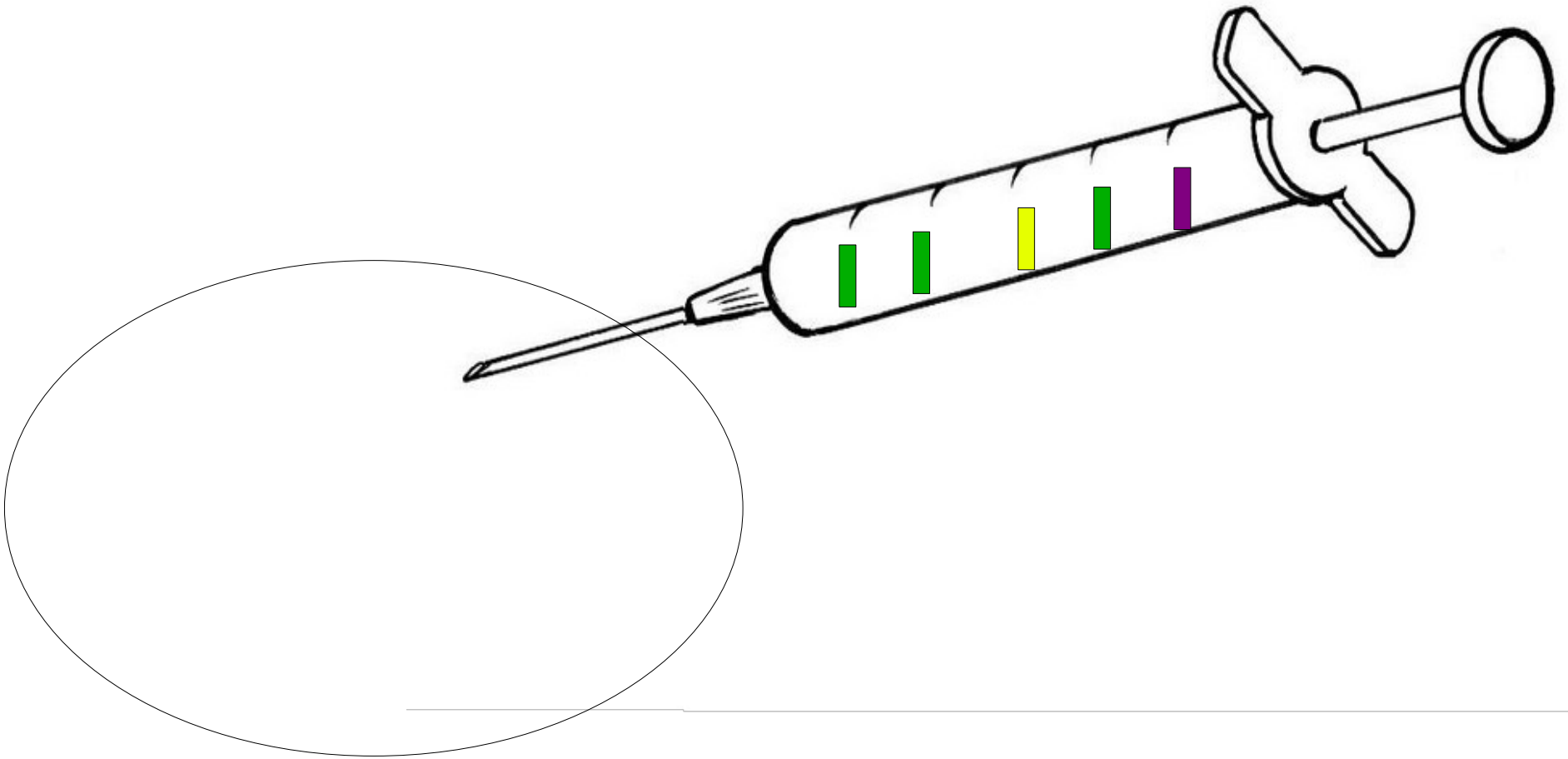
Momentaufnahme: mRNA



Entnehme mRNA

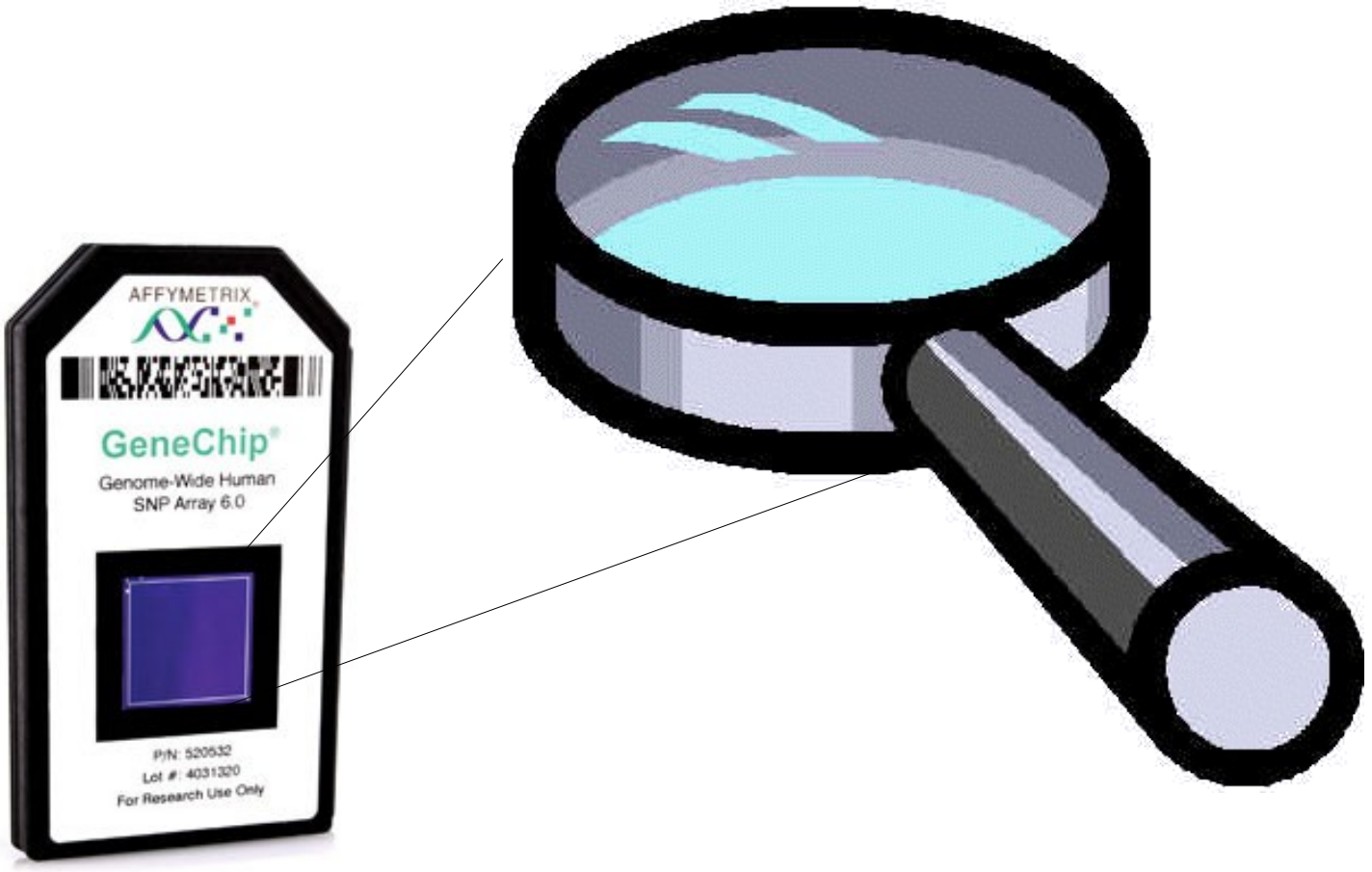


Entnehme mRNA

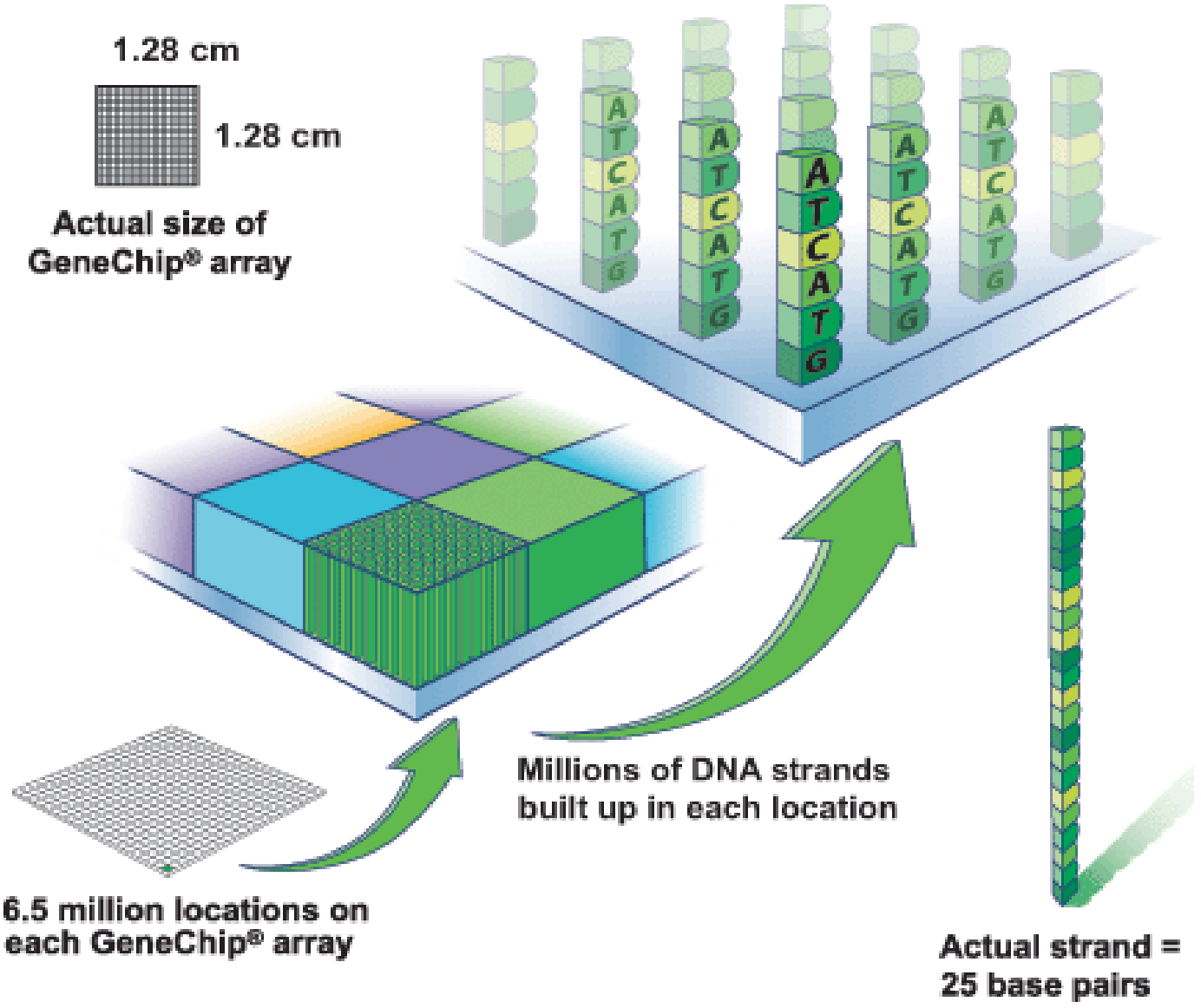


Nehme einen Microarray

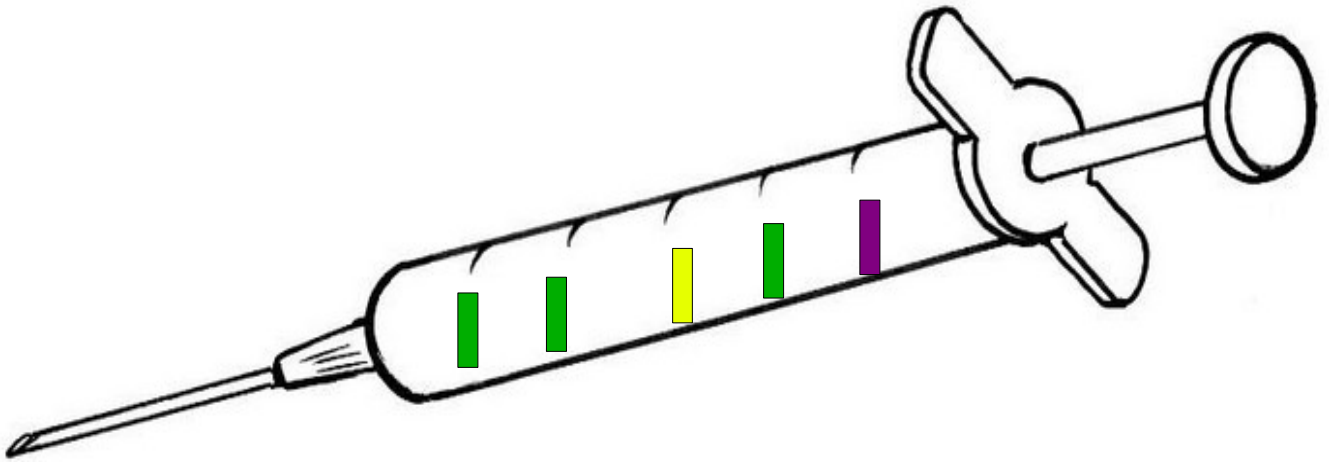
Nehme einen Microarray



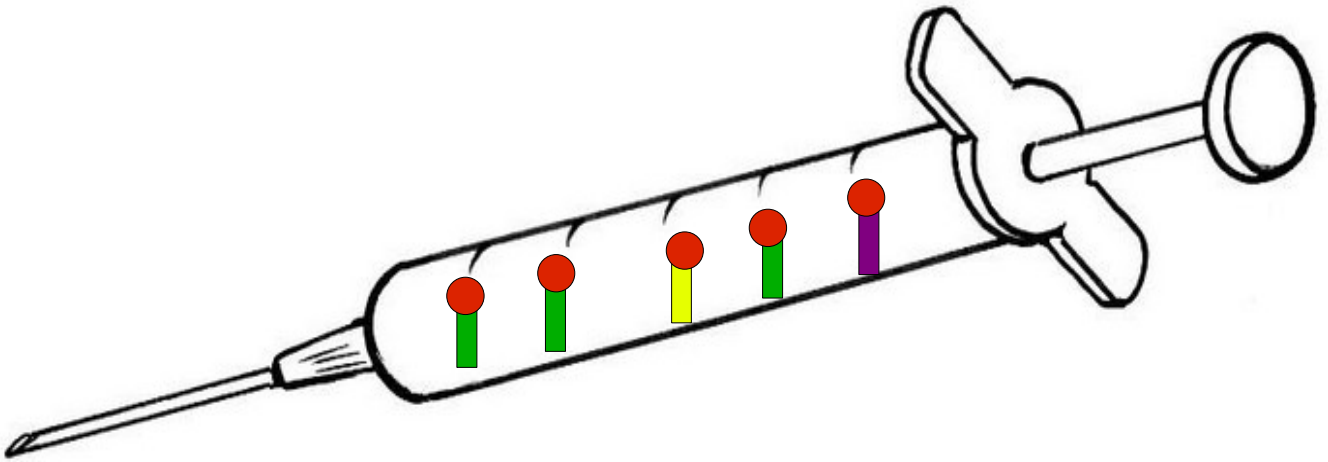
Microarray: Zoom In



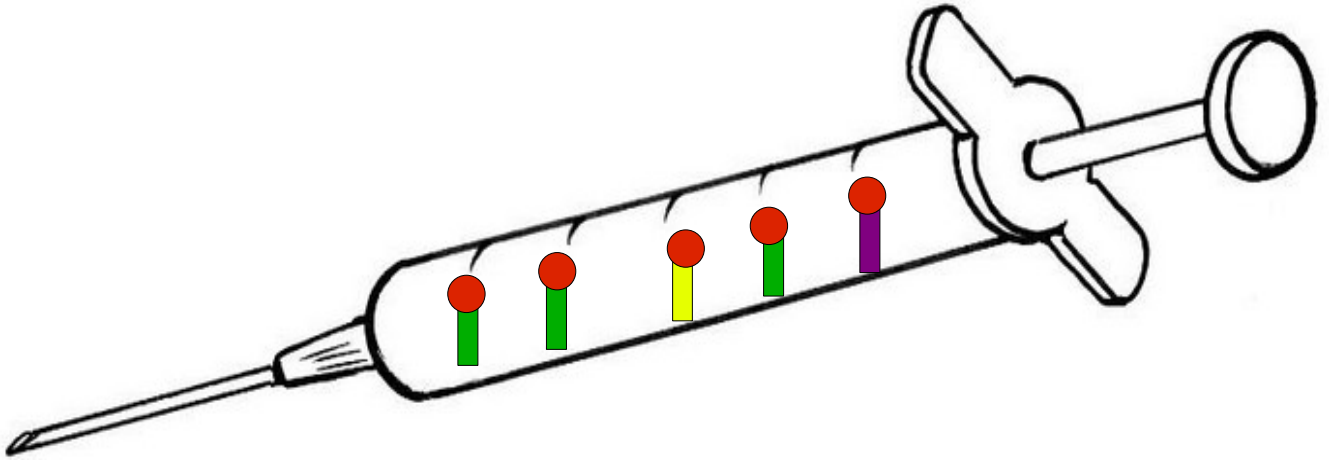
Entnehme mRNA



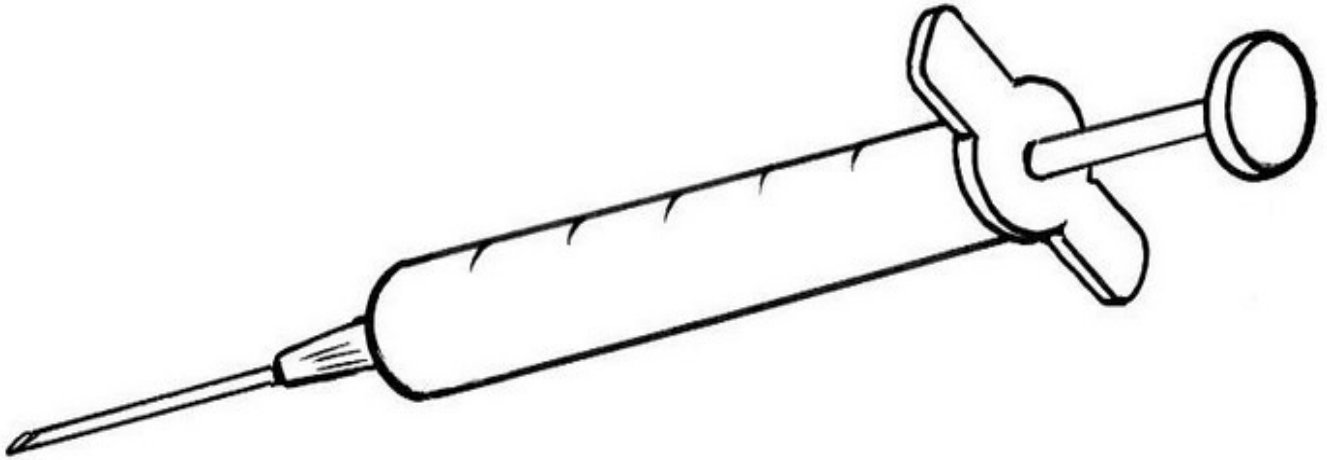
Markiere mRNA mit Farbstoff



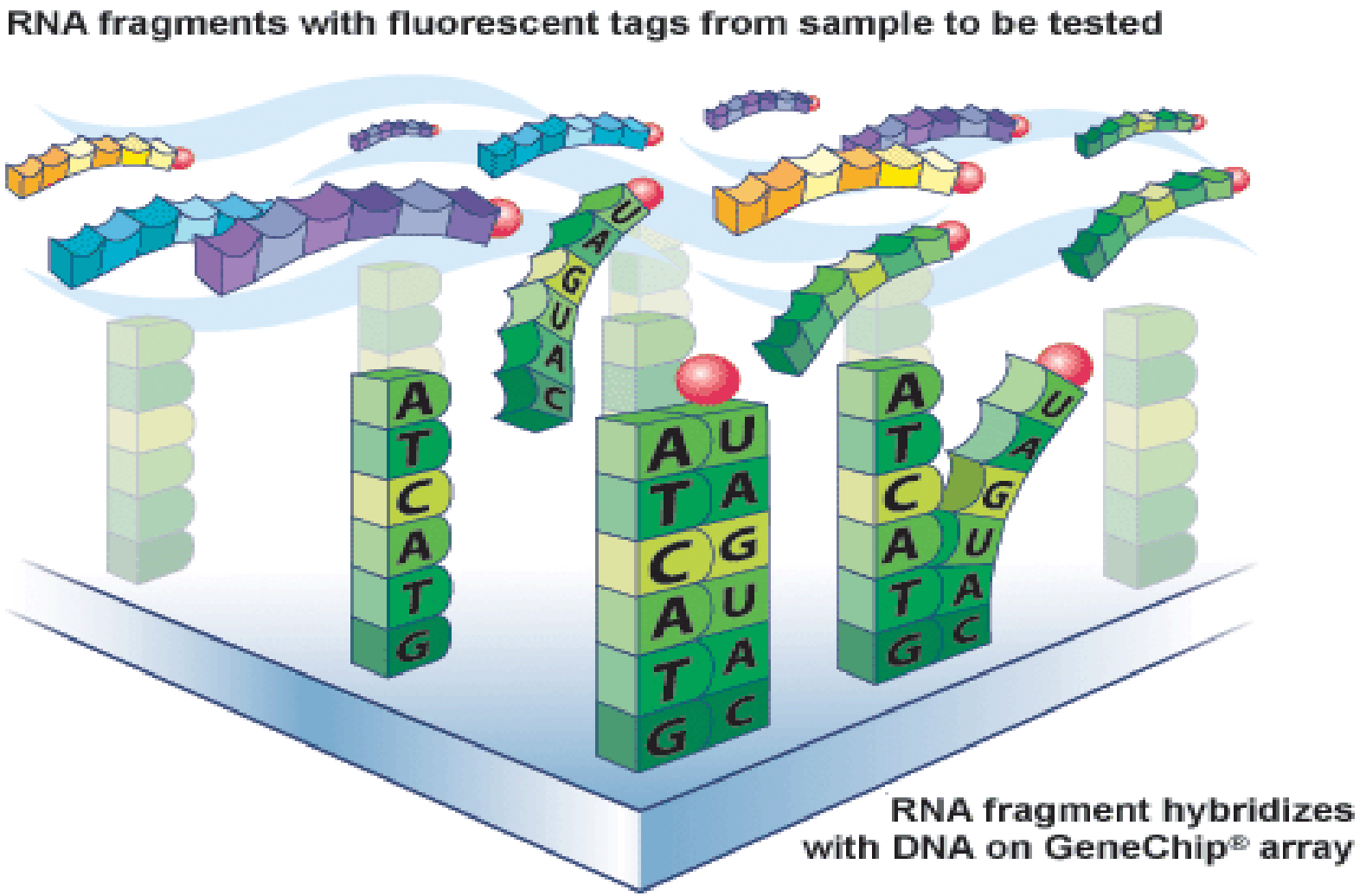
mRNA auf Microarray



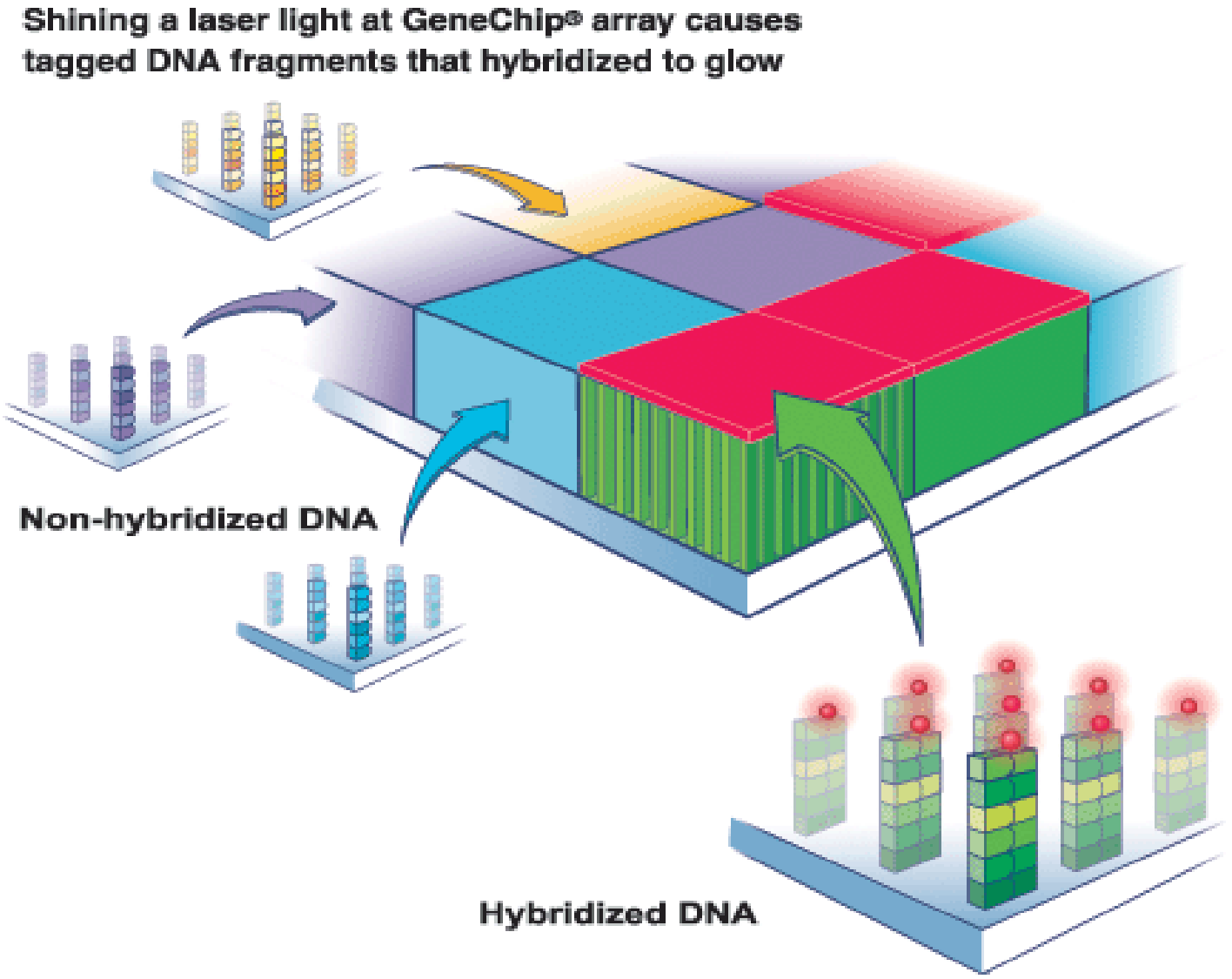
mRNA auf Microarray



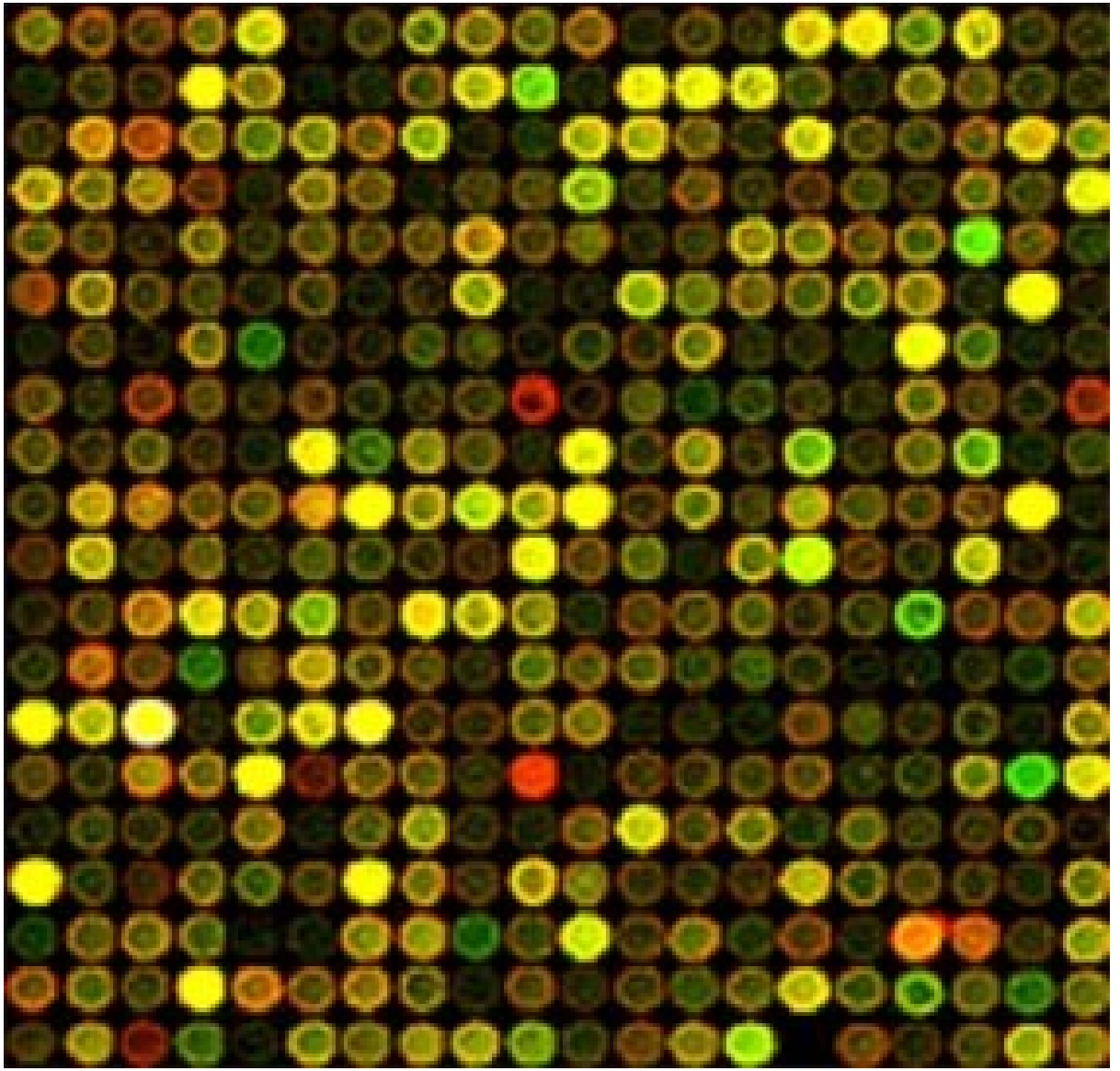
Auf dem Microarray



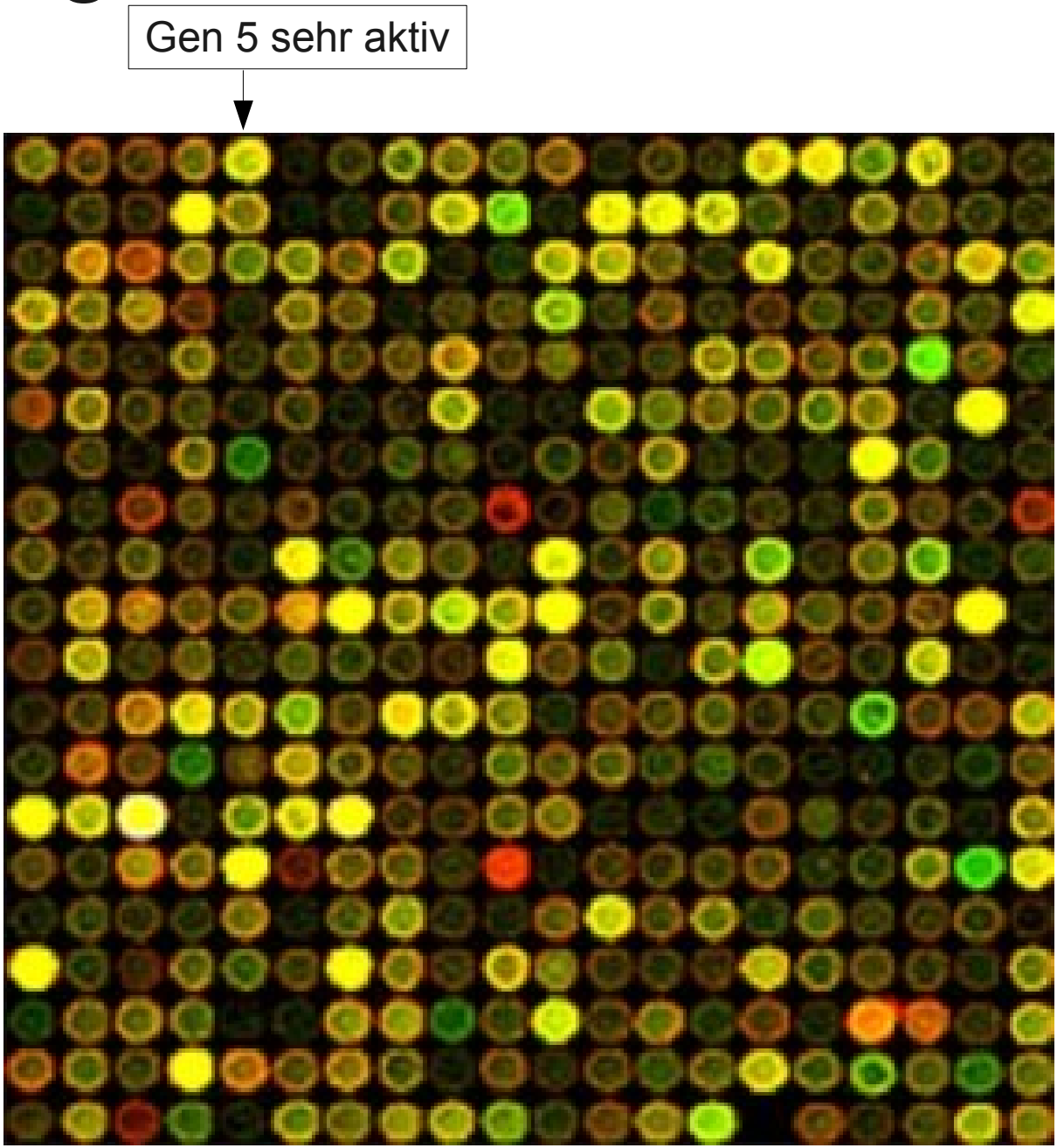
Voila: Ein Feuerwerk!



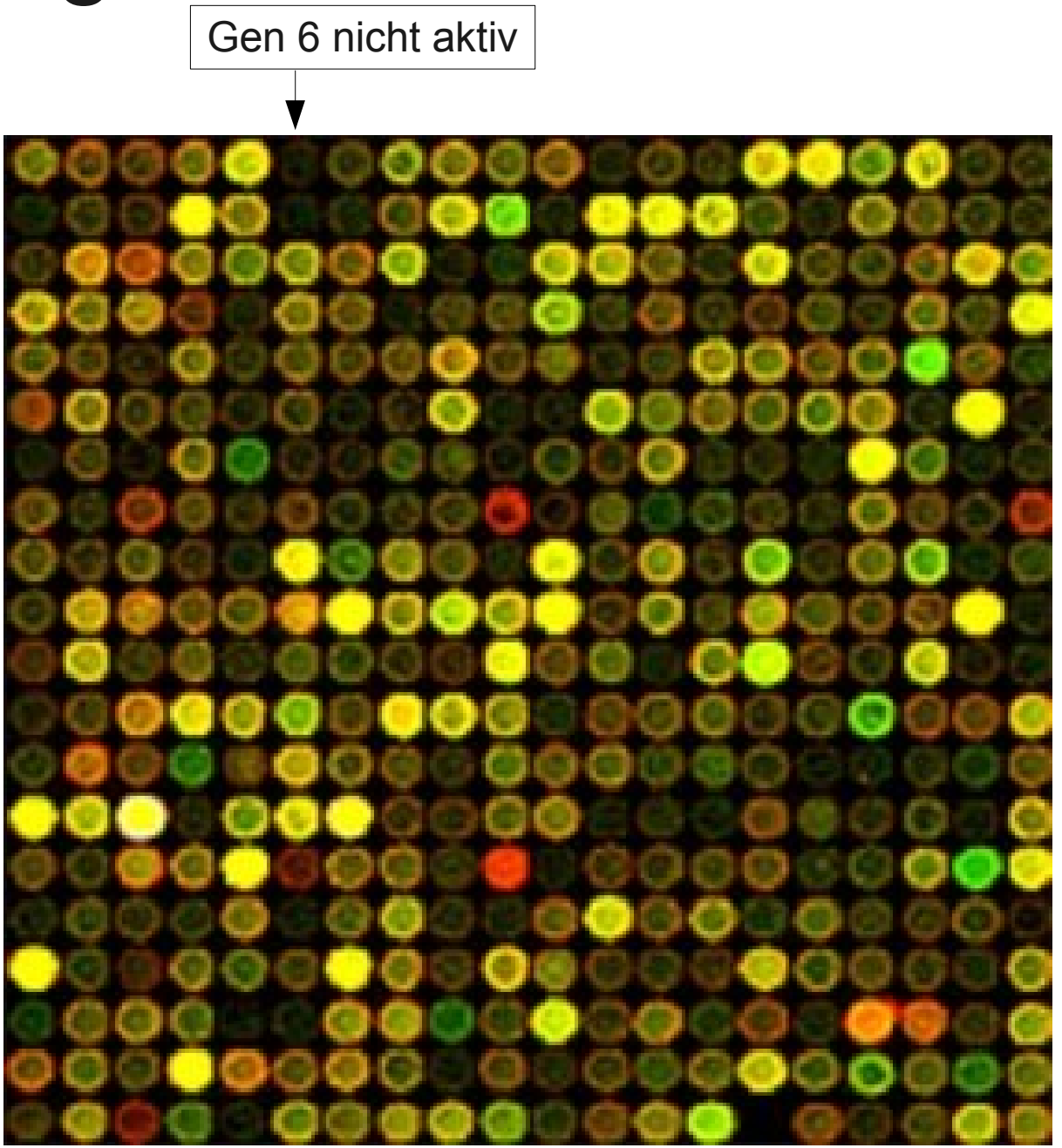
Helligkeit = Aktivität des Gens



Helligkeit = Aktivität des Gens

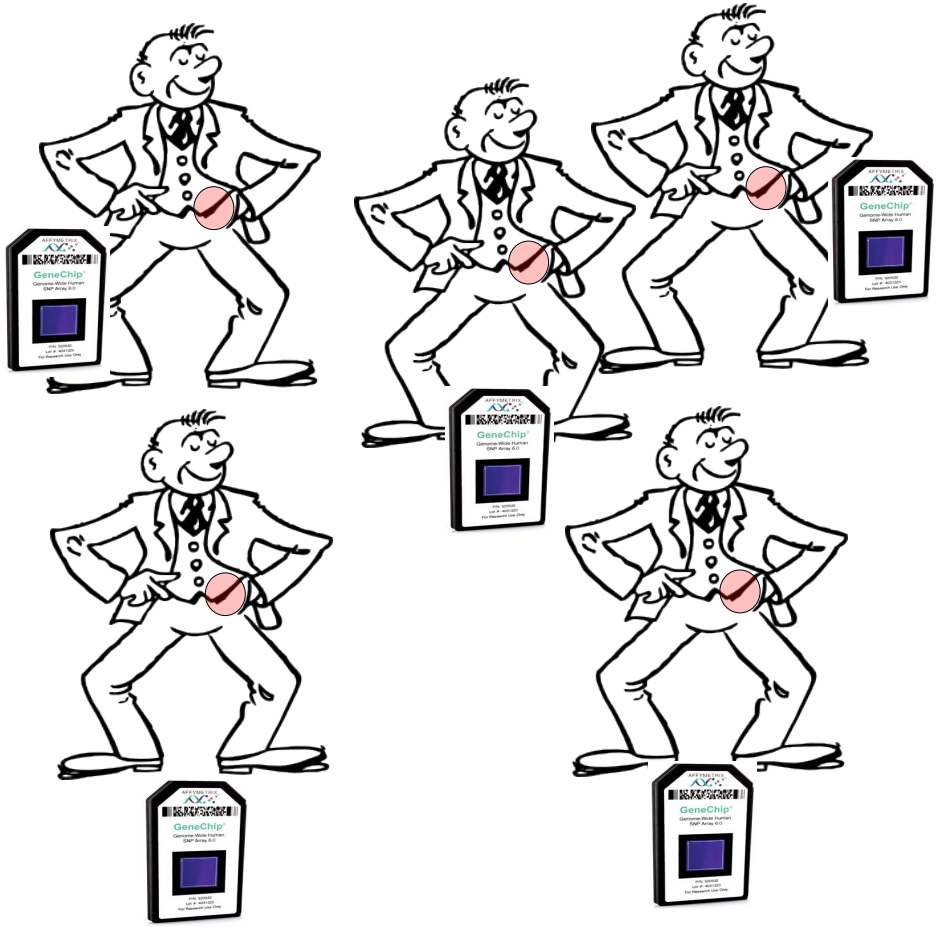


Helligkeit = Aktivität des Gens

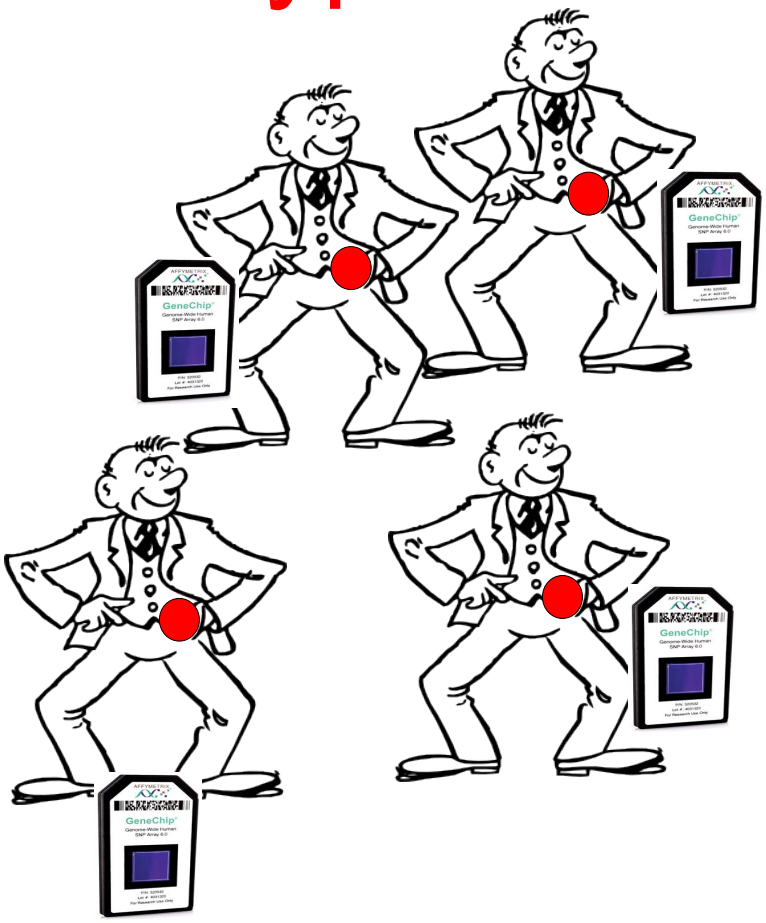


Für jeden Patienten ein Microarray

Typ 1



Typ 2



Microarray:
Aktivität aller Gene in der Zelle

Typ 1

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4	Pat. 5
1	2.1	1.3	1.9	1.2	1.4
2	2.4	2.3	2.5	2.1	2.0
...					
50000					

Typ 2

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4
1	1.9	2.5	2.4	2.9
2	2.3	2.2	2.4	2.1
...				
50000				

Microarray:
Aktivität aller Gene in der Zelle

Typ 1

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4	Pat. 5
1	**2.1**	**1.3**	**1.9**	**1.2**	**1.4**
2	2.4	2.3	2.5	2.1	2.0
...					
50000					

Typ 2

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4
1	**1.9**	**2.5**	**2.4**	**2.9**
2	2.3	2.2	2.4	2.1
...				
50000				

Microarray:
Aktivität aller Gene in der Zelle

Typ 1

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4	Pat. 5
1	**2.1**	**1.3**	**1.9**	**1.2**	**1.4**
2	**2.4**	**2.3**	**2.5**	**2.1**	**2.0**
...					
50000					

Typ 2

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4
1	**1.9**	**2.5**	**2.4**	**2.9**
2	**2.3**	**2.2**	**2.4**	**2.1**
...				
50000				

Microarray: Aktivität aller Gene in der Zelle

Typ 1

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4	Pat. 5
1	**2.1**	**1.3**	**1.9**	**1.2**	**1.4**
2	**2.4**	**2.3**	**2.5**	**2.1**	**2.0**
...					
50000					

Typ 2

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4
1	**1.9**	**2.5**	**2.4**	**2.9**
2	**2.3**	**2.2**	**2.4**	**2.1**
...				
50000				

Ist Gen 1 bei Typ 2-Tumorzellen signifikant aktiver?

Microarray:
Aktivität aller Gene in der Zelle

Typ 1

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4	Pat. 5
1	**2.1**	**1.3**	**1.9**	**1.2**	**1.4**
2	**2.4**	**2.3**	**2.5**	**2.1**	**2.0**
...					
50000					

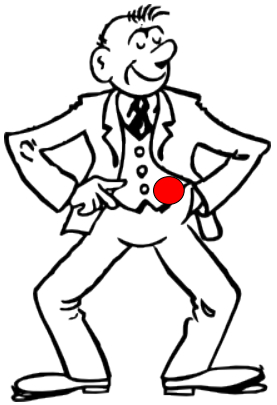
Typ 2

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4
1	**1.9**	**2.5**	**2.4**	**2.9**
2	**2.3**	**2.2**	**2.4**	**2.1**
...				
50000				

Ist Gen 1 bei Typ 2-Tumorzellen signifikant aktiver?

Falls ja: Gen 1 kann Typ1-Tumor und Typ-2 Tumor unterscheiden!

Falls ja:



Gen 1 nicht aktiv

Gen 1 aktiv

Typ 1

Typ 2

~~Chemotherapie~~

Chemotherapie

Microarray: Aktivität aller Gene in der Zelle

Typ 1

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4	Pat. 5
1	**2.1**	**1.3**	**1.9**	**1.2**	**1.4**
2	**2.4**	**2.3**	**2.5**	**2.1**	**2.0**
...					
50000					

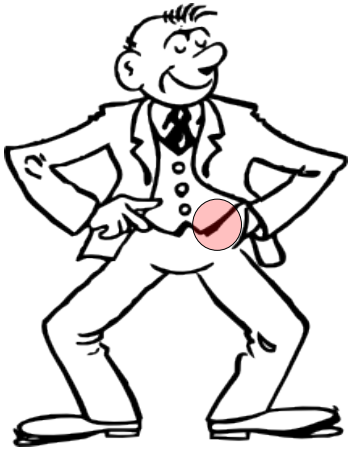
Typ 2

Gen	Pat. 1	Pat. 2	Pat. 3	Pat. 4
1	**1.9**	**2.5**	**2.4**	**2.9**
2	**2.3**	**2.2**	**2.4**	**2.1**
...				
50000				

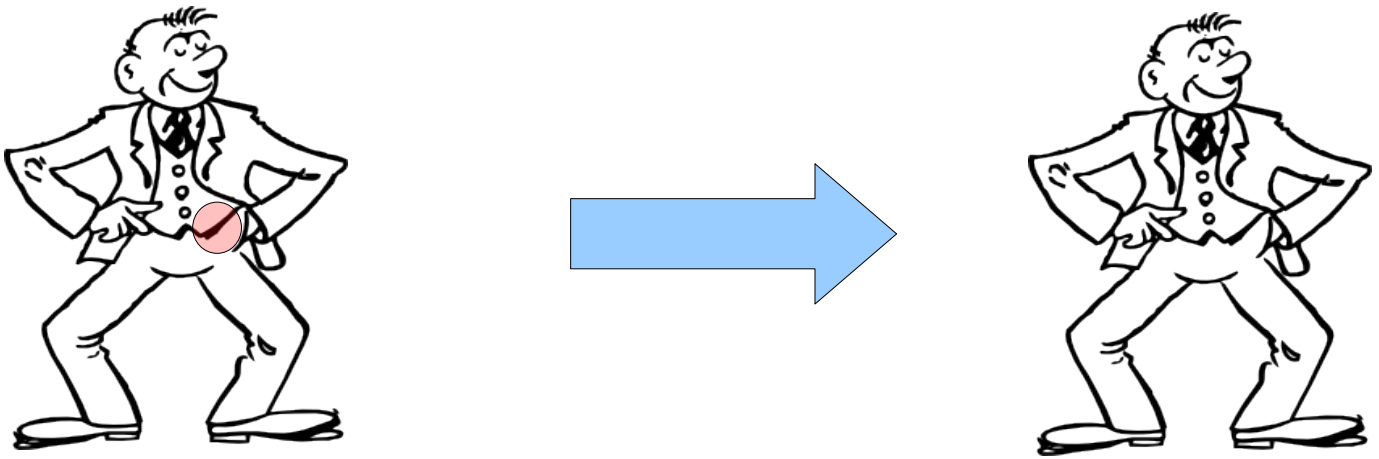
Ist Gen X bei Typ 2-Tumorzellen signifikant aktiver?

Ungepaarter t-Test

Happy End !



Happy End !



Happy End !