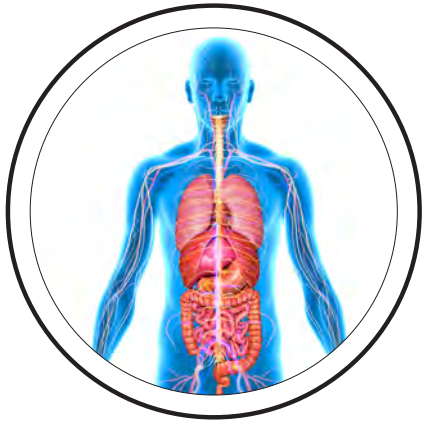


KÖRPER



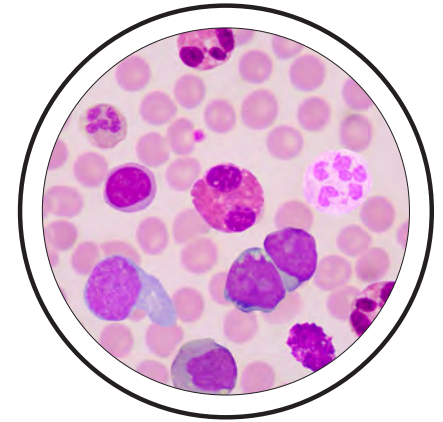
ORGANE



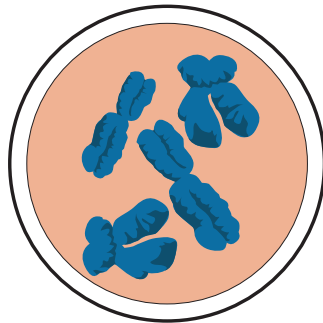
GEWEBE



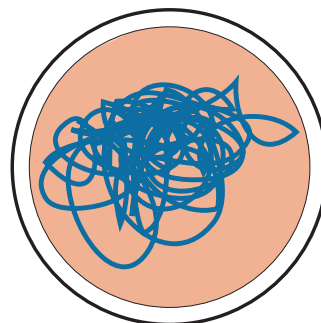
ZELLEN



CHROMOSOM

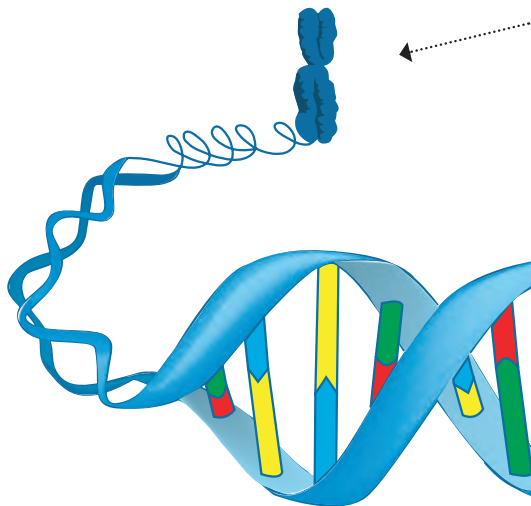
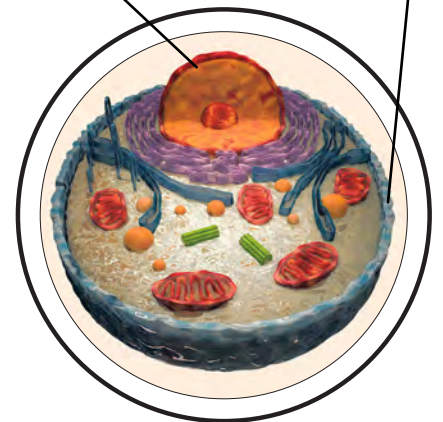


ERBINFORMATION

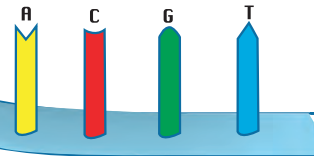


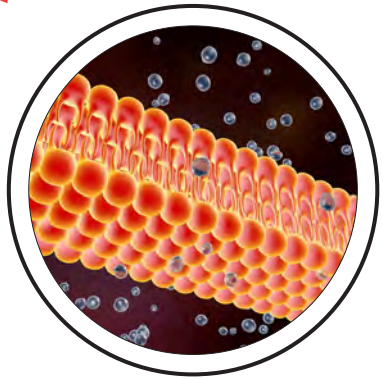
ZELLKERN

ZELLHÜLLE

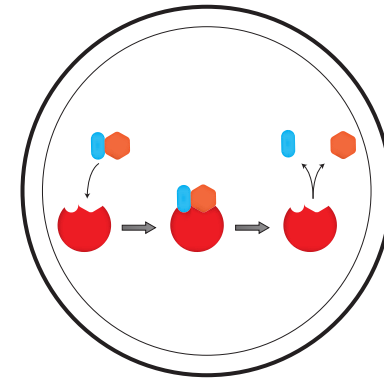


DNS

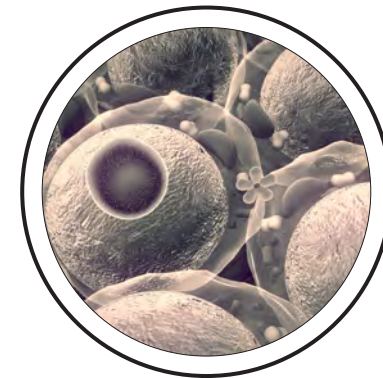




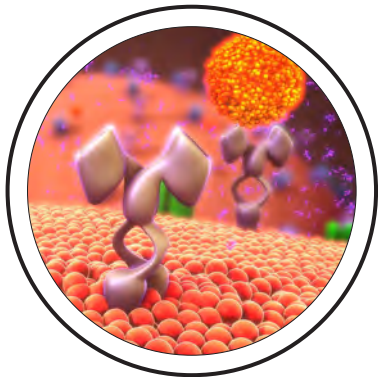
STRUKTUREIWEISS:
Form und Stabilität geben



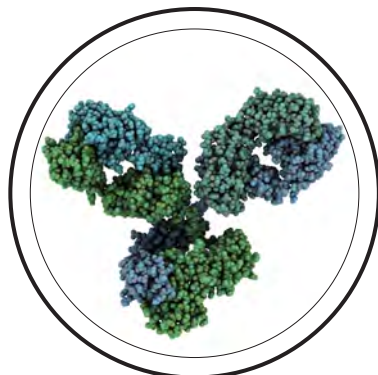
ENZYM:
Stoffe umwandeln



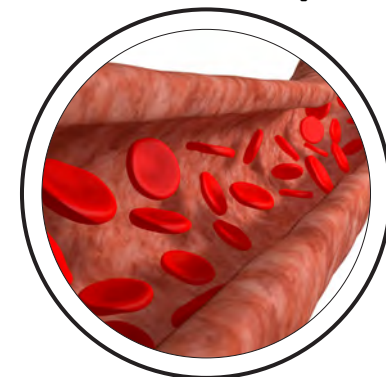
HORMON:
Signale übermitteln



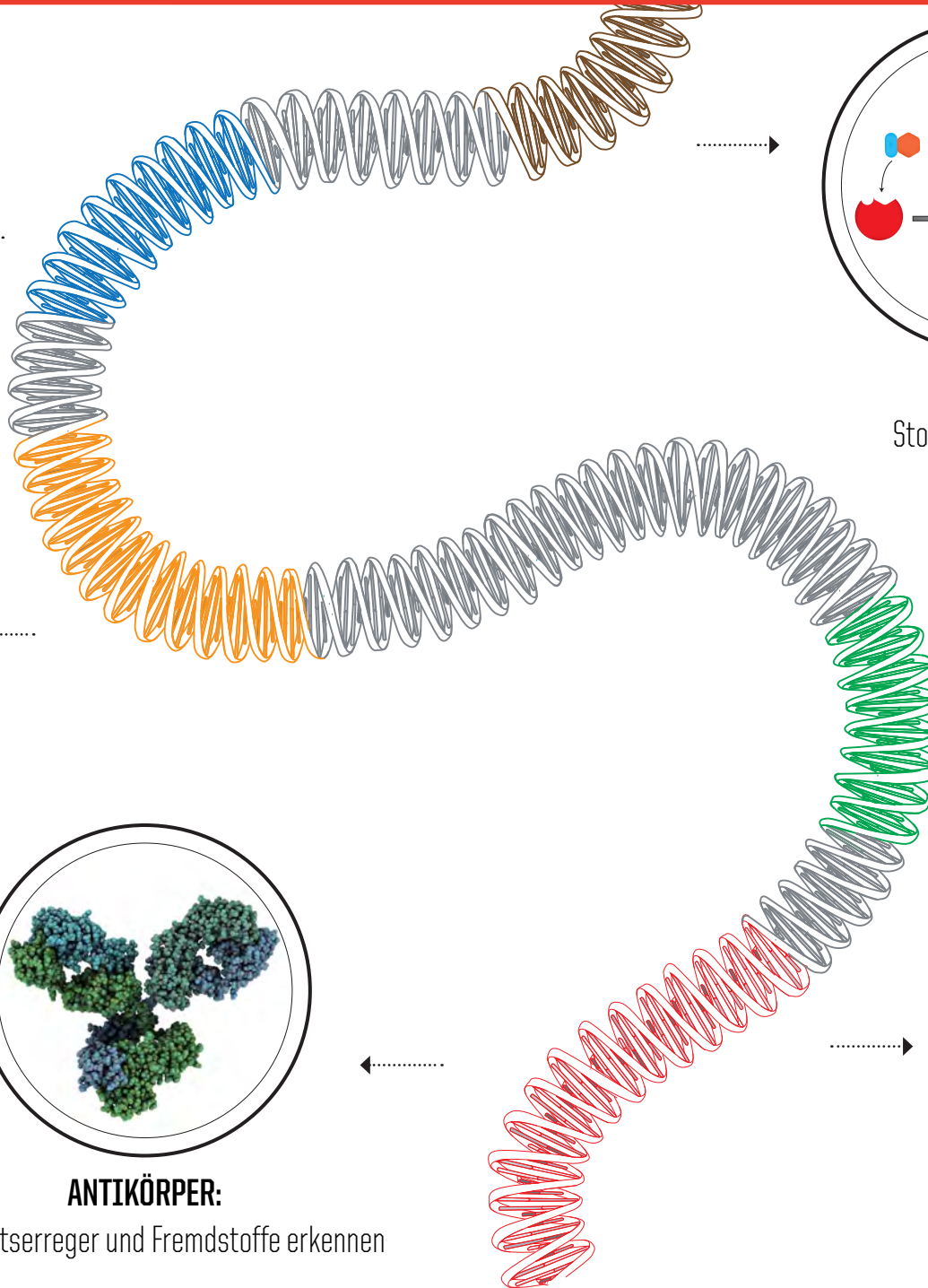
REZEPTOR:
Signale empfangen

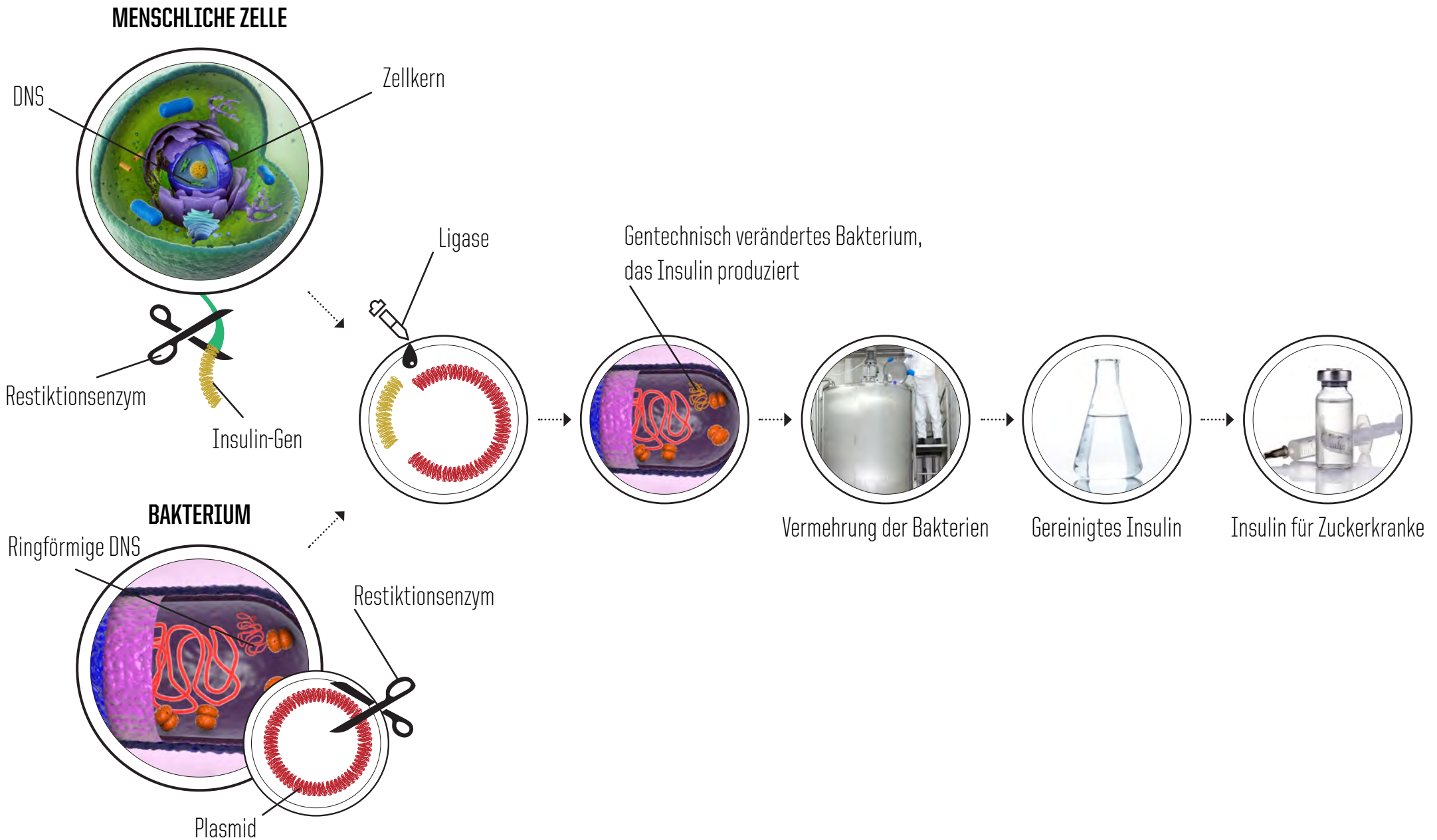


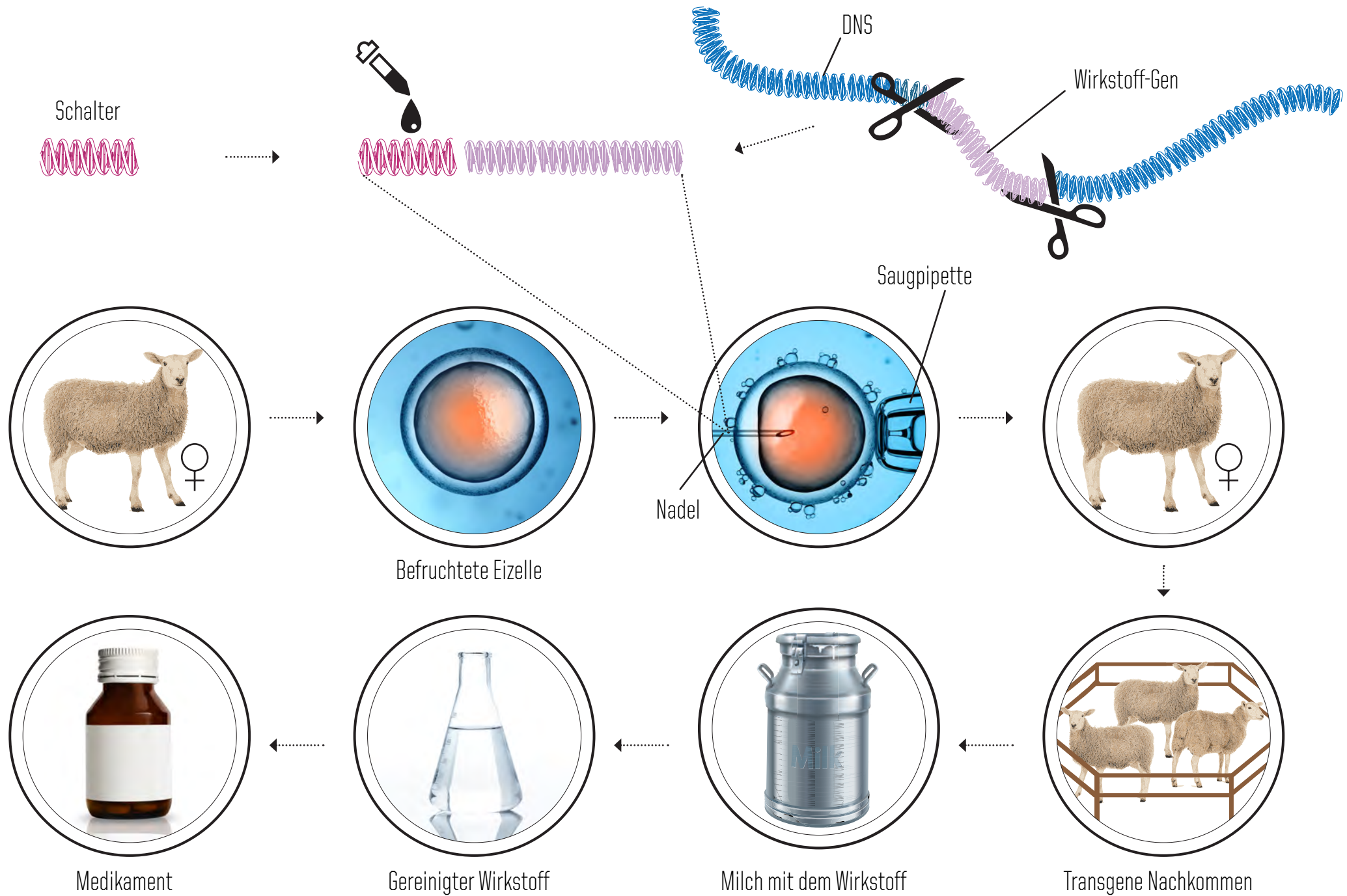
ANTIKÖRPER:
Krankheitserreger und Fremdstoffe erkennen



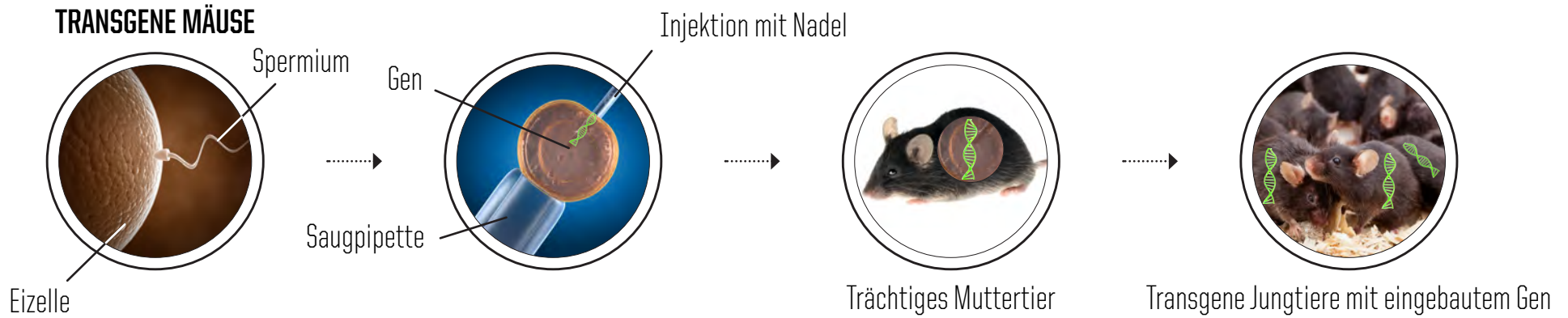
TRANSPORTEIWEISS:
Stoffe transportieren



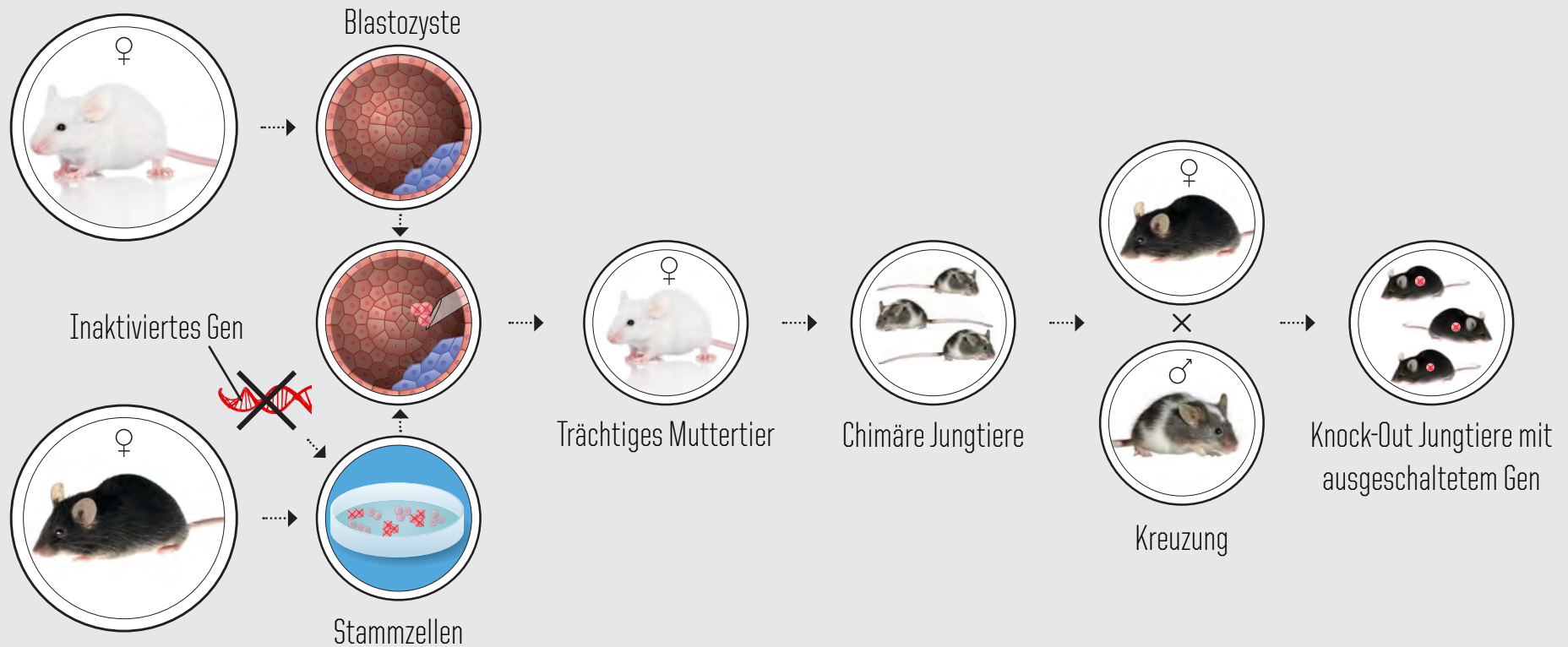




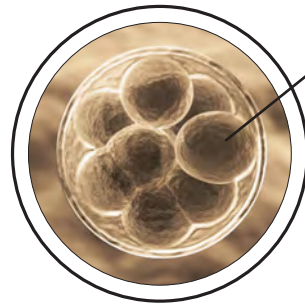
TRANSGENE MÄUSE



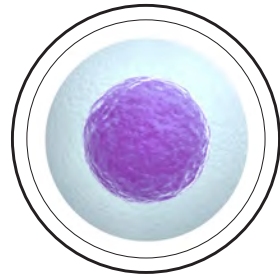
KNOCK-OUT-MÄUSE



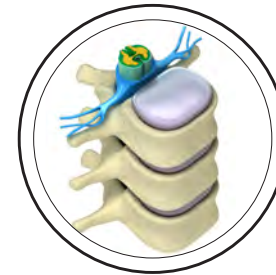
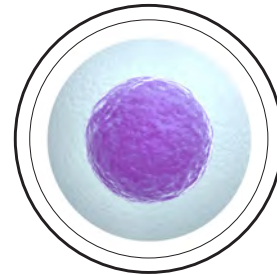
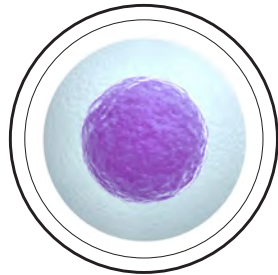
EMBRYO KURZ NACH DER BEFRUCHTUNG



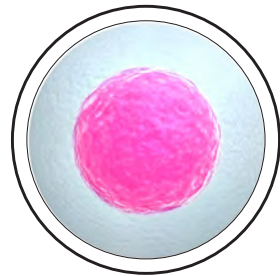
Totipotente Stammzellen



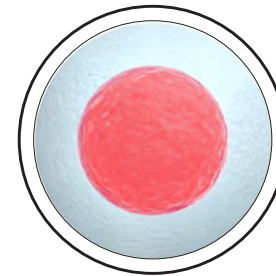
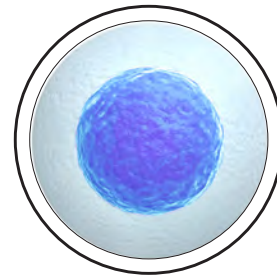
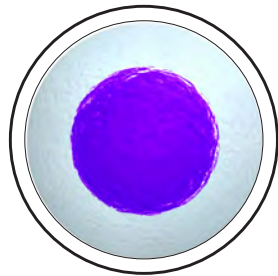
Pluripotente Stammzellen



Knochenmark eines gesunden Spenders



Multipotente Stammzellen



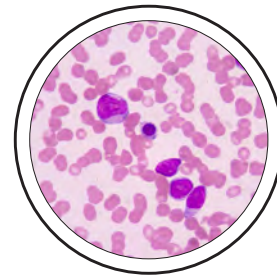
Blutstammzellen



Nervenzellen



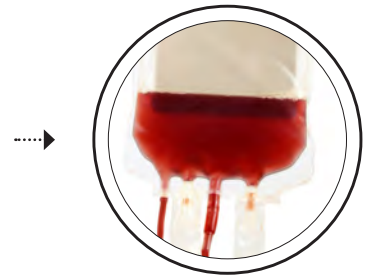
Muskelzellen



Blutzellen

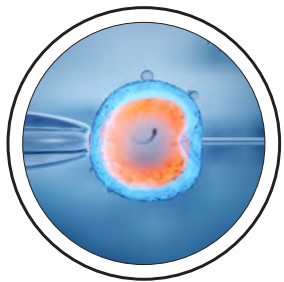


Zellkultur

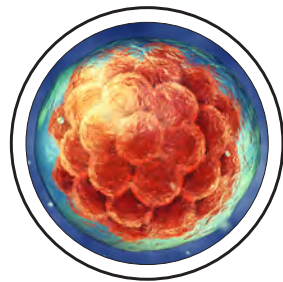


Behandlung von Blutkrebs mit Stammzellen

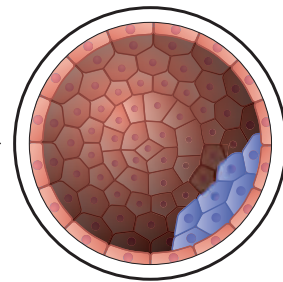
EMBRYONEN AUS REAGENZGLASBEFRUCHTUNG



Verschmelzung von Samen und Eizelle



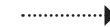
Befruchtete Eizelle



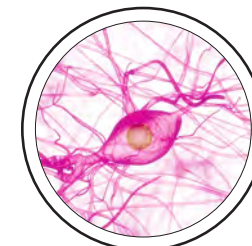
Blastozyste (Embryo im 100-Zellen-Stadium)



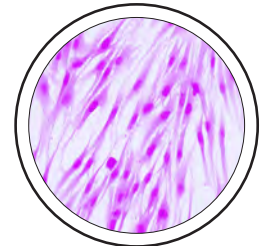
Stammzellkultur



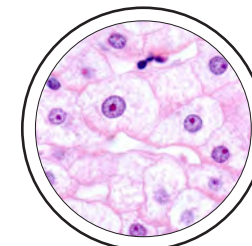
GEWEBESPEZIFISCHE ZELLTYPEN



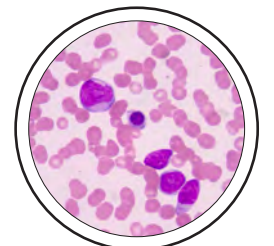
Nervenzellen



Hautzellen

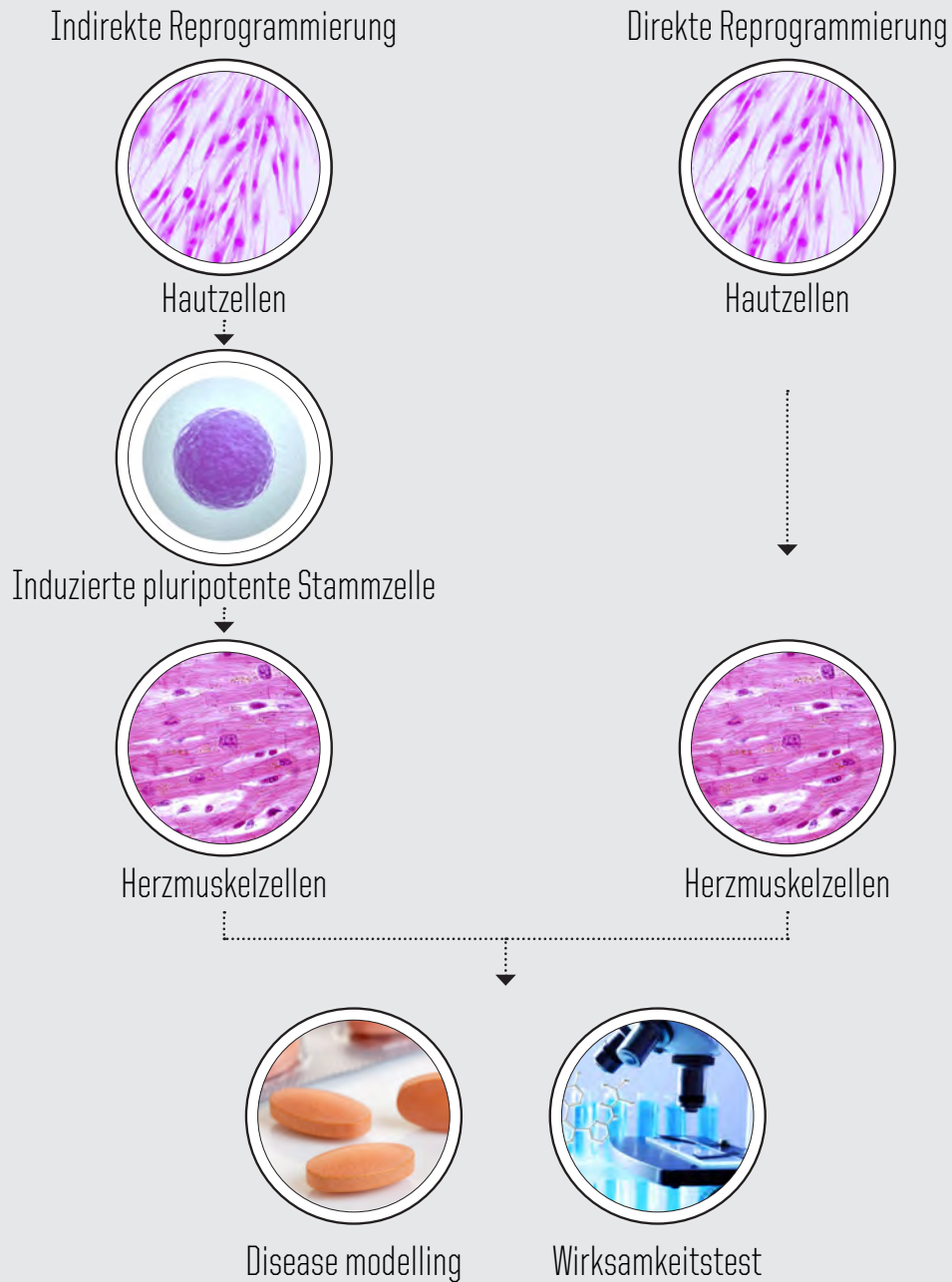


Leberzellen

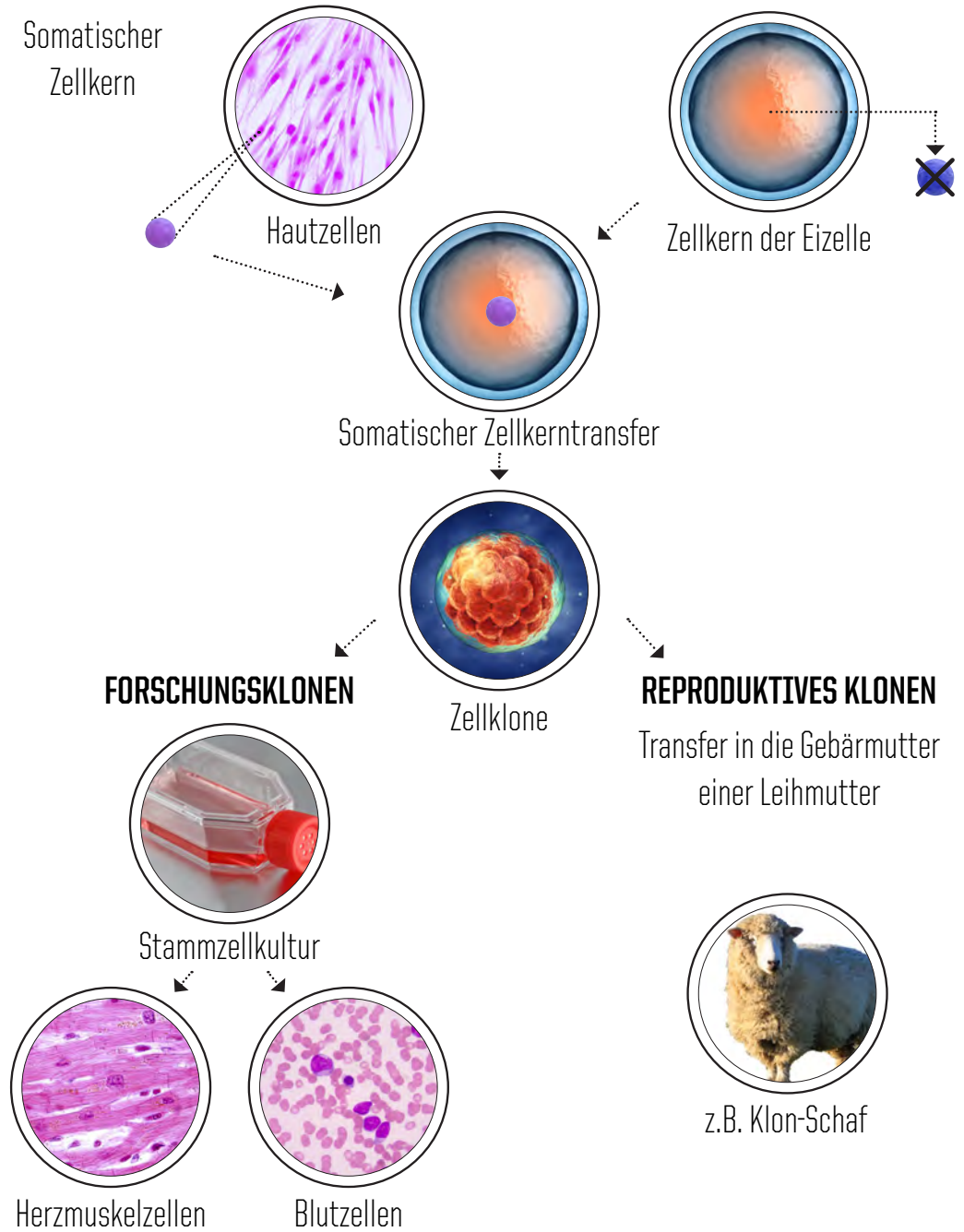


Blutzellen

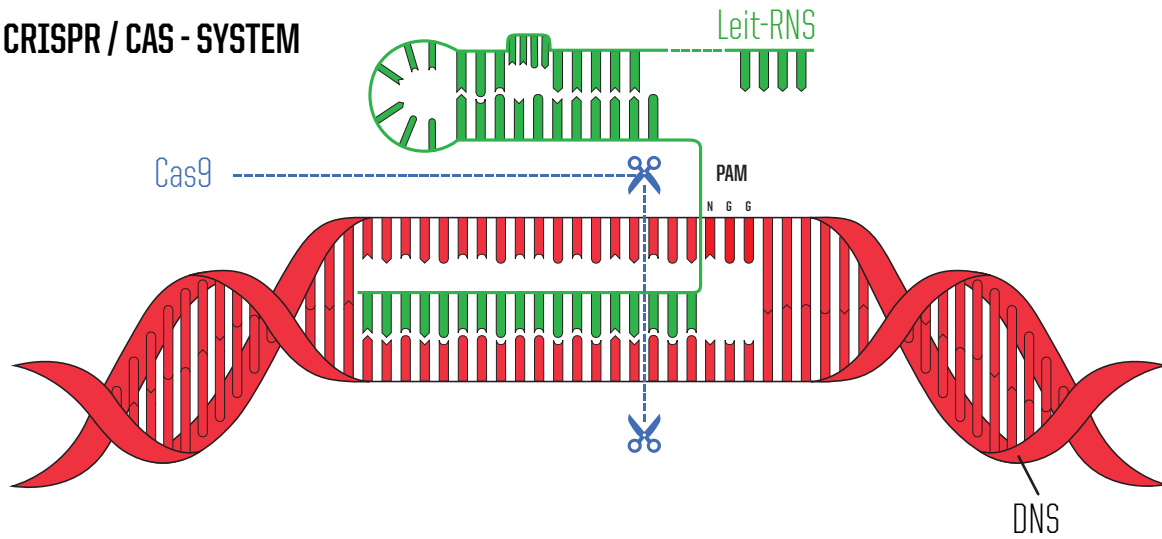
REPROGRAMMIERUNG VON ZELLEN



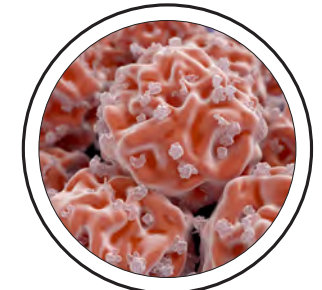
KLONEN



CRISPR / CAS - SYSTEM



ZIELGERICHTETE GENMANIPULATION



Forschung

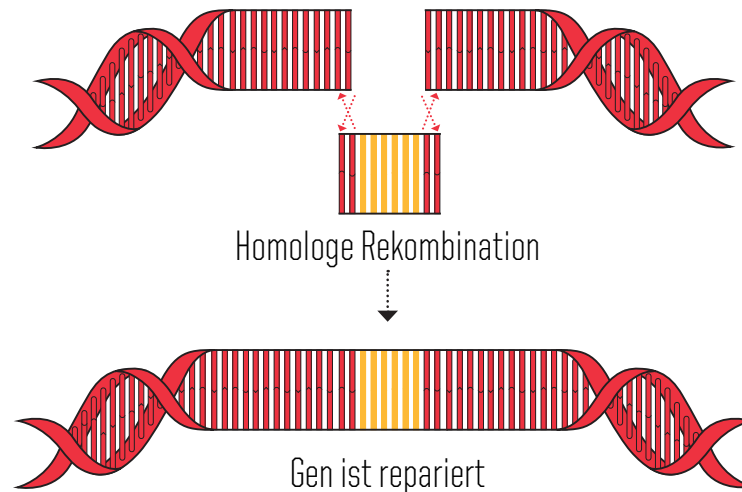
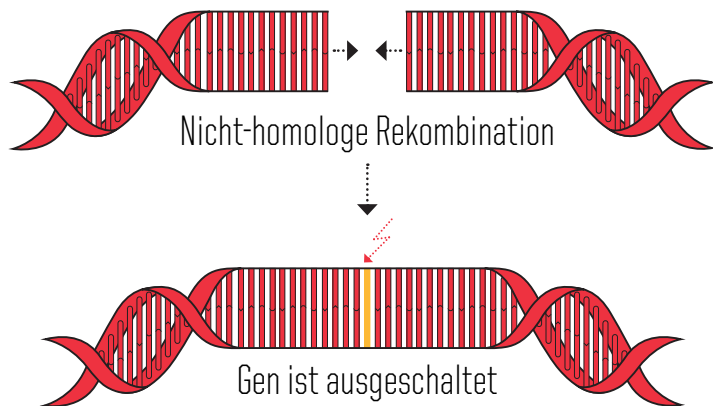


Pflanzenzüchtung



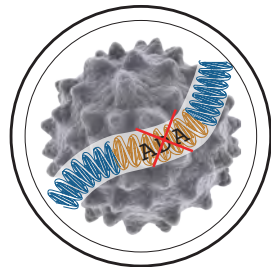
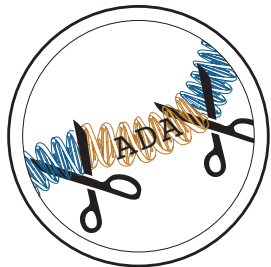
Klinische Studien

REPARATUR DES DOPPELSTANGBRUCHS



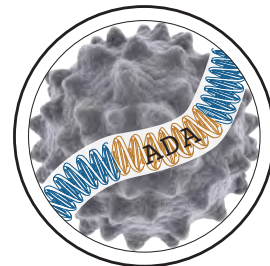
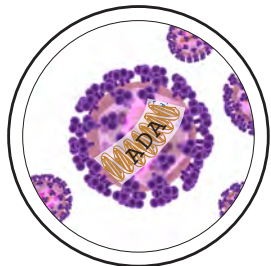
GESUNDER SPENDER

KIND MIT SCHWERER IMMUNSCHWÄCHE



Gesundes ADA-Gen

Defektes ADA-Gen



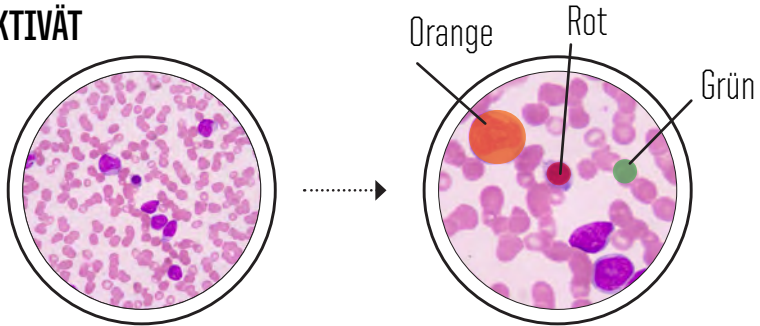
Nicht-infektiöses Virus als Gen-Taxi

Weisses Blutkörperchen mit gesundem ADA-Gen

Zellkultur

Bluttransfusion

GENAKTIVÄT



Unterschiedliche Blutzelltypen

Zellschicksal



Gen aktiv

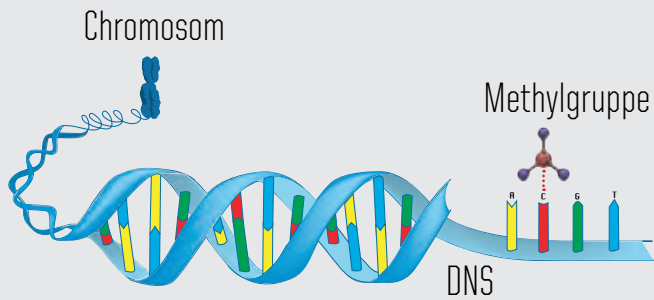


Gen in seiner Funktion eingeschränkt

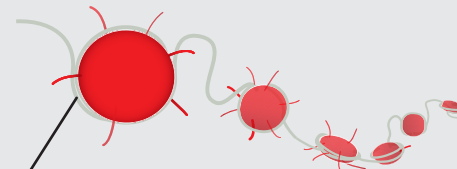


Gen inaktiv

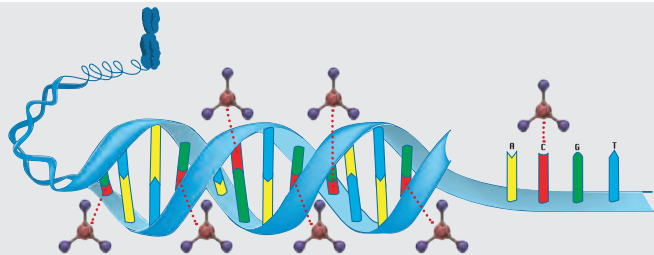
EPIGENETIK



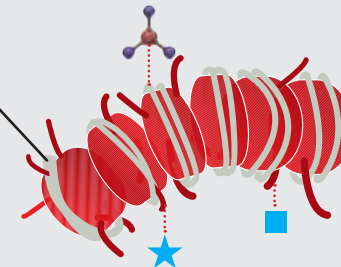
Verpackungsprotein



Euchromatin



DNS

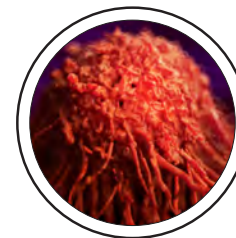


Heterochromatin

EPIGENETISCHE STEUERUNG



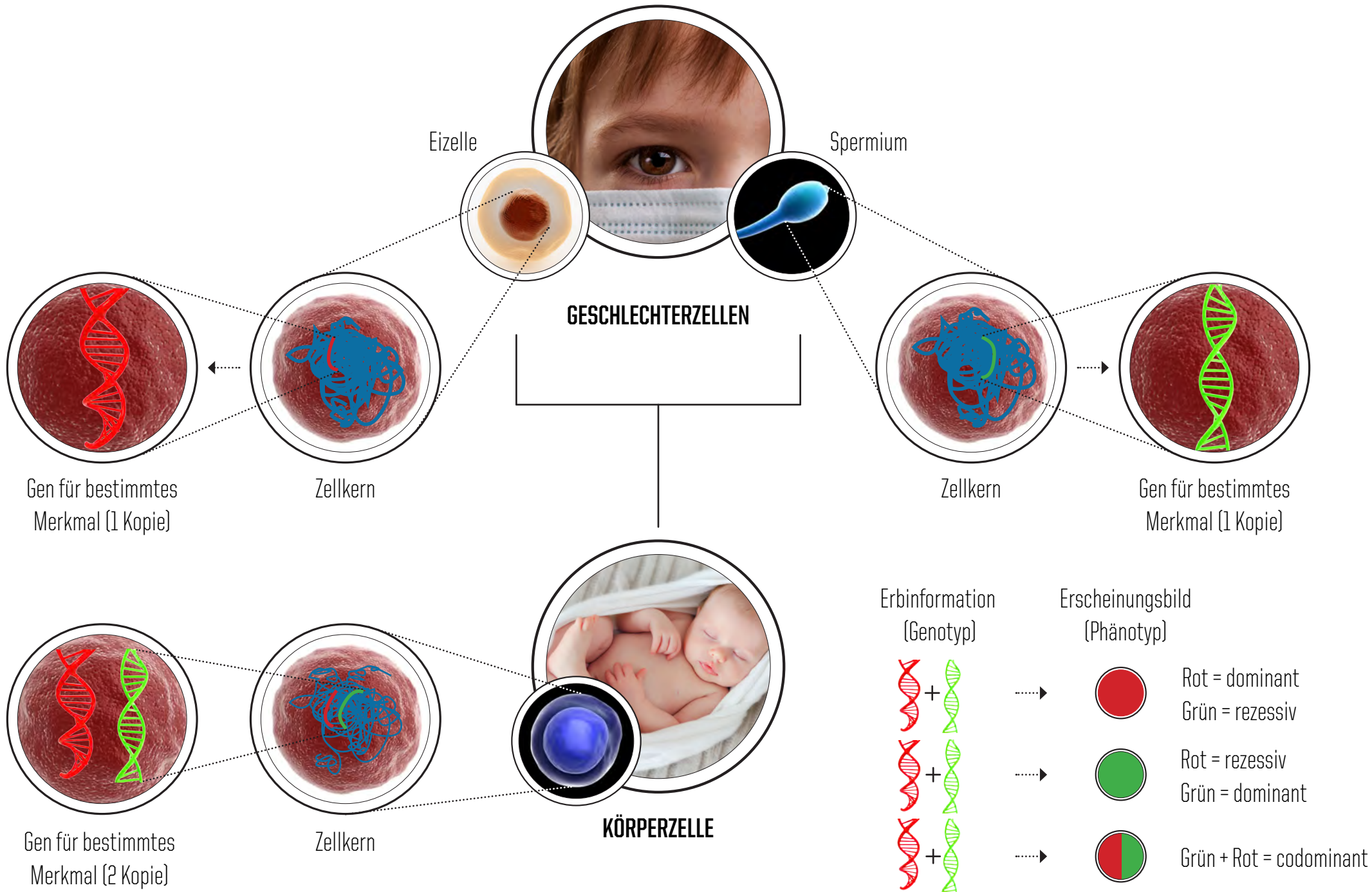
Biologische Merkmale



Krankheiten



Vererbung



REZESSIVER ERBGANG

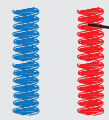
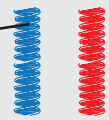
z.B. Cystische Fibrose



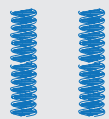
Gesunder Träger

Gesunde Trägerin

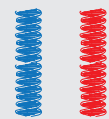
Gesundes Gen



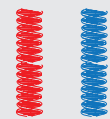
Krank machendes Gen



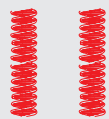
Gesund



Gesunder Träger



Gesunder Träger



Krank

DOMINANTER ERBGANG

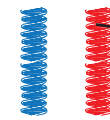
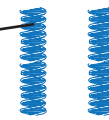
z.B. Chorea Huntington



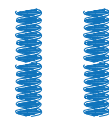
Gesunde Mutter

Kranker Vater

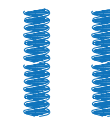
Gesundes Gen



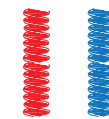
Krank machendes Gen



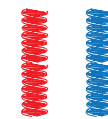
Gesund



Gesund



Krank



Krank

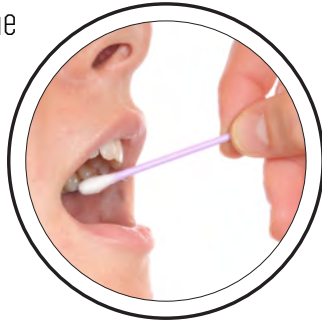
Pharmakogenetik



Screening



Präsymptomatische Diagnostik



Gerichtsmedizin



GENTESTS IN DER MEDIZIN

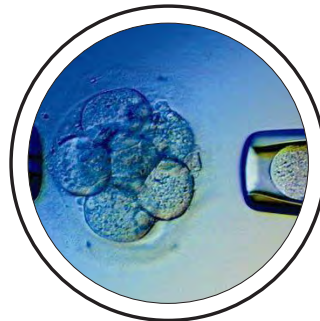
Bestätigung oder Abschluss klinischer Diagnosen



Infektionskrankheiten



Präimplantationsdiagnostik



Pränataldiagnostik

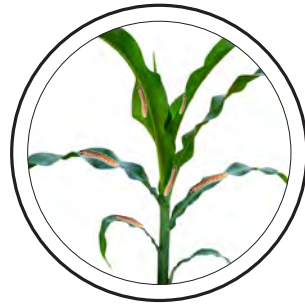


Familienplanung

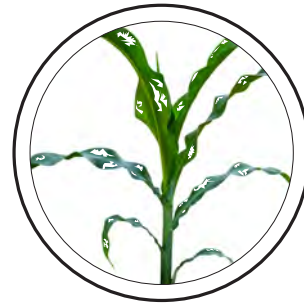




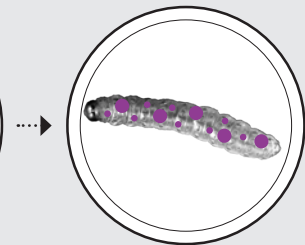
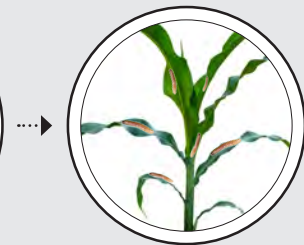
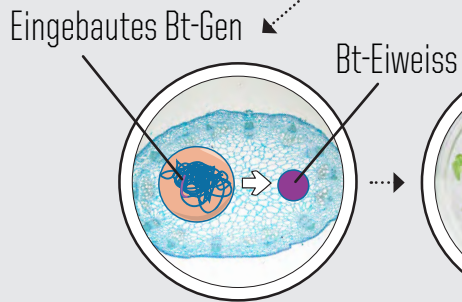
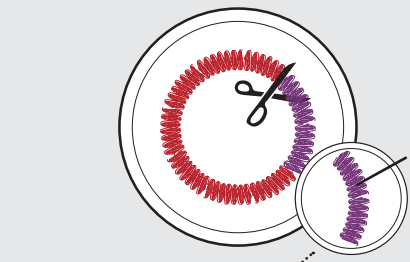
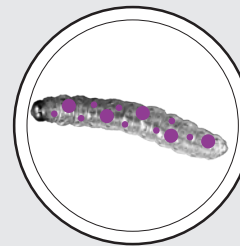
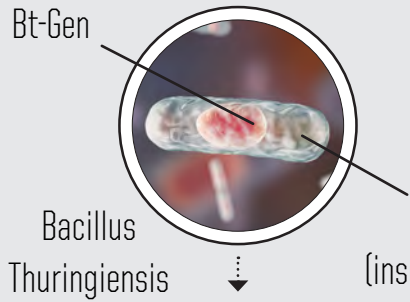
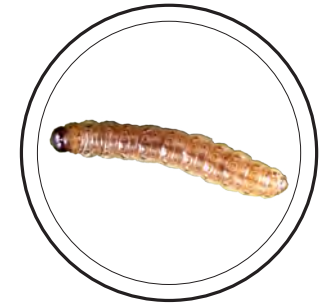
Maispflanze

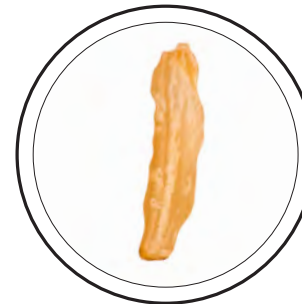
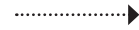
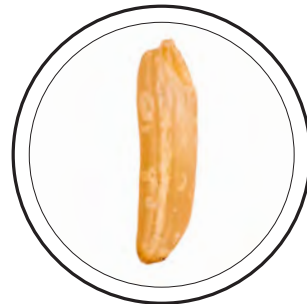
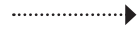


Maispflanze mit Maiszünslerlarve



Schaden an der Maispflanze

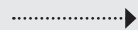




Reishülle mit Provitamin A
und Fettsäuren

Ungeschältes Reiskorn

Ranziger Reis nach Lagerung



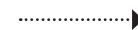
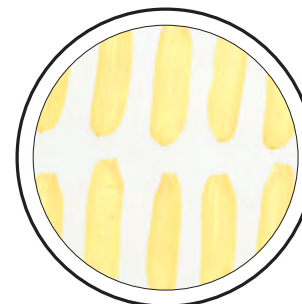
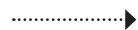
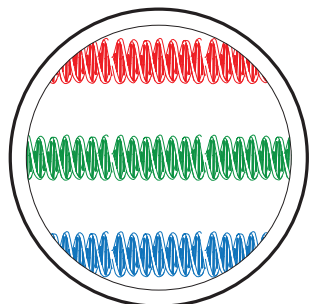
Infektanfälligkeit
Erblindung

Kein Provitamin A

Geschältes Reiskorn

Lagerungsfähiger Reis

Vitamin-A-Mangel



Gene zur Provitamin-A-Herstellung

Provitamin A

«Goldener Reis»

Beitrag zur Reduktion des
Vitamin-A-Mangels

WASCHMITTELENZYME

Lipasen: Fette
 Proteasen: Eiweisse
 Amylasen: Stärke
 Zellulasen: Pflanzenmaterial

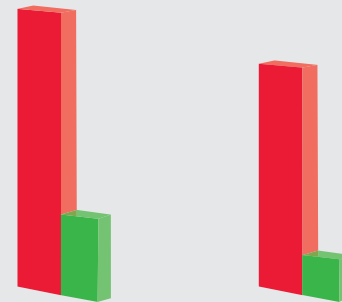
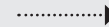


Reduziert die Waschtemperatur von 95° auf 40°

UMWELTSCHONENDERE
HERSTELLUNGSVERFAHREN



Herkömmliche Produktion



Ressourcenverbrauch

Abfallmenge



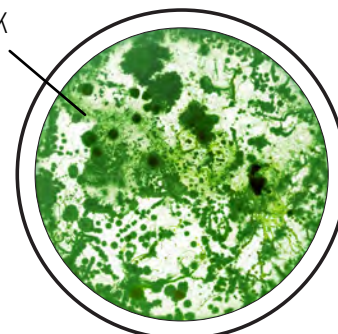
Biotechnische Produktion

BIOLOGISCH ABBAUBARE
KUNSTSTOFFE

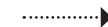


Rapspflanze

Bioplastik



Bodenbakterien



Kompostierbare Plastikprodukte

UMWELTSCHONENDERE
LANDWIRTSCHAFT



Bisherige intensive Landwirtschaft



Bisherige extensive Landwirtschaft



Neuartige Landwirtschaft mit
transgenen Kulturpflanzen

BIOLOGISCHE
SANIERUNG

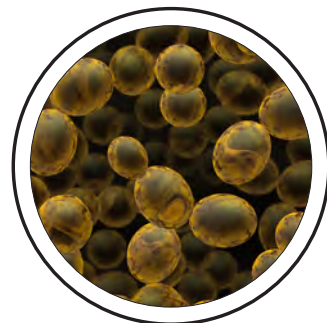


Schadstoffhaltiger Boden

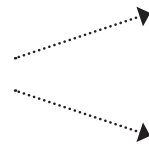


Gereinigter Boden

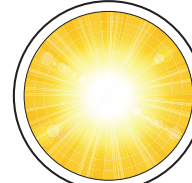
NACHWEIS VON
UMWELTGIFTEN



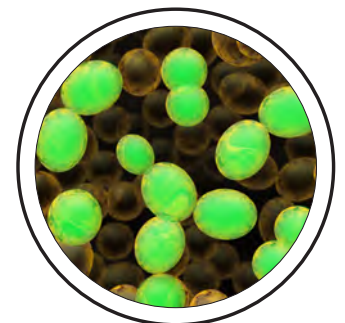
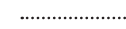
Gentechnisch veränderte Hefe



Giftstoff



UV- Strahlen



Fluoreszierende Hefezellen