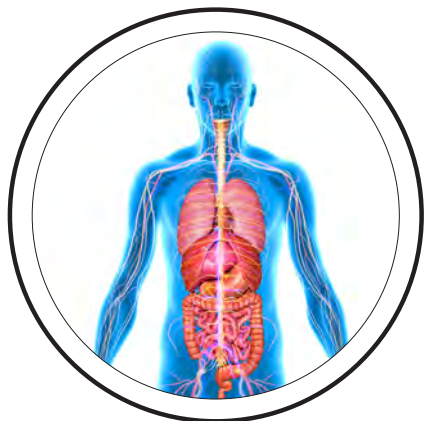
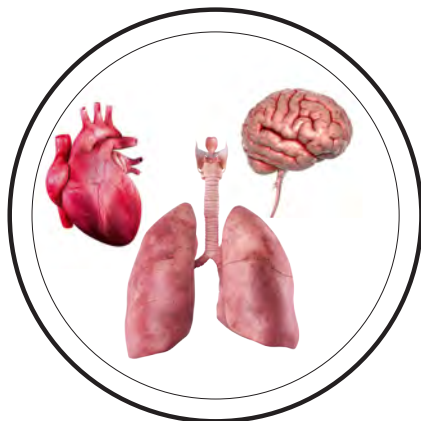


CORPS



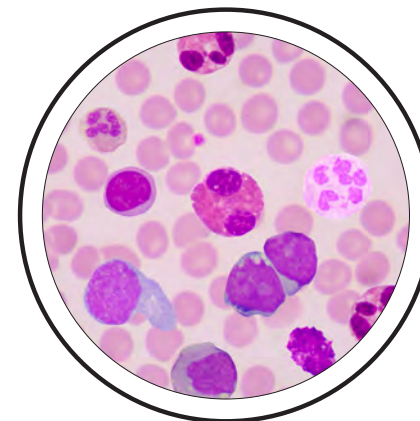
ORGANES



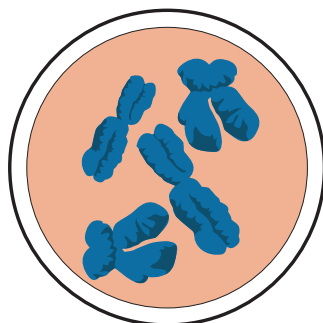
TISSU



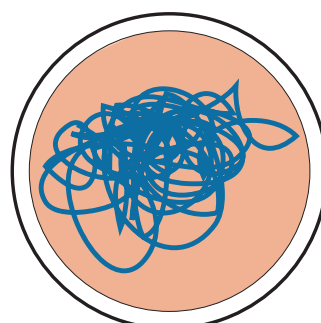
CELLULES



CHROMOSOME

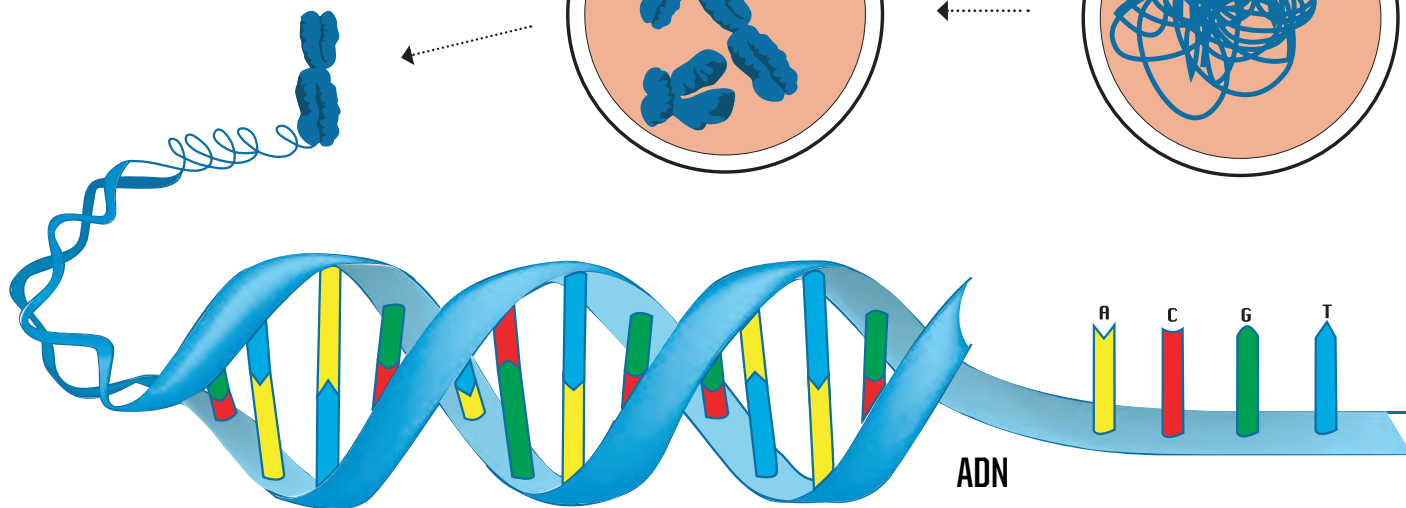
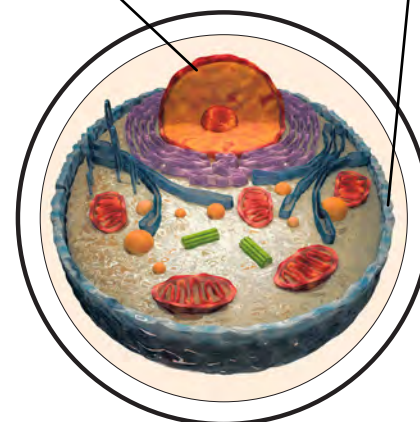


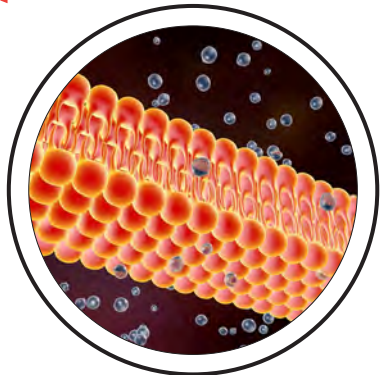
INFORMATION CELLULAIRE



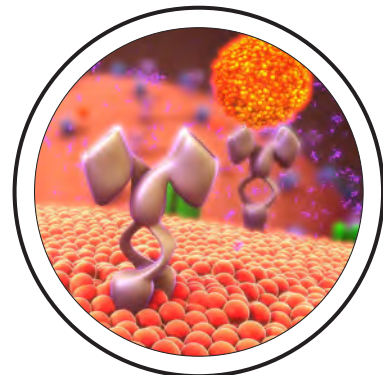
NOYAU CELLULAIRE

ENVELOPPE CELLULAIRE

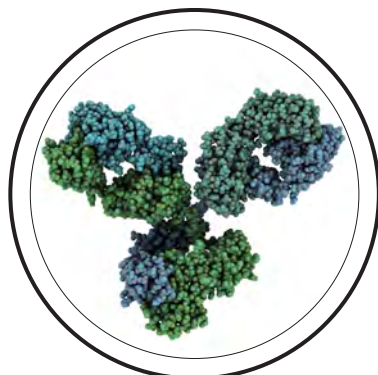




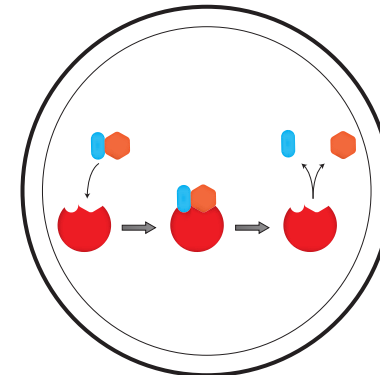
PROTÉINE STRUCTURALE :
Détermine la forme et confère la stabilité



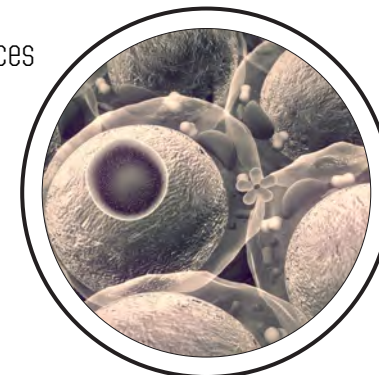
RÉCEPTEUR :
Capte les signaux



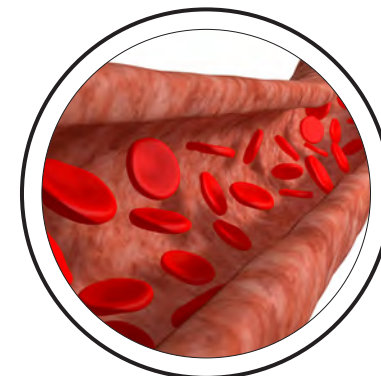
ANTICORPS :
Identifie les agents pathogènes et les substances étrangères



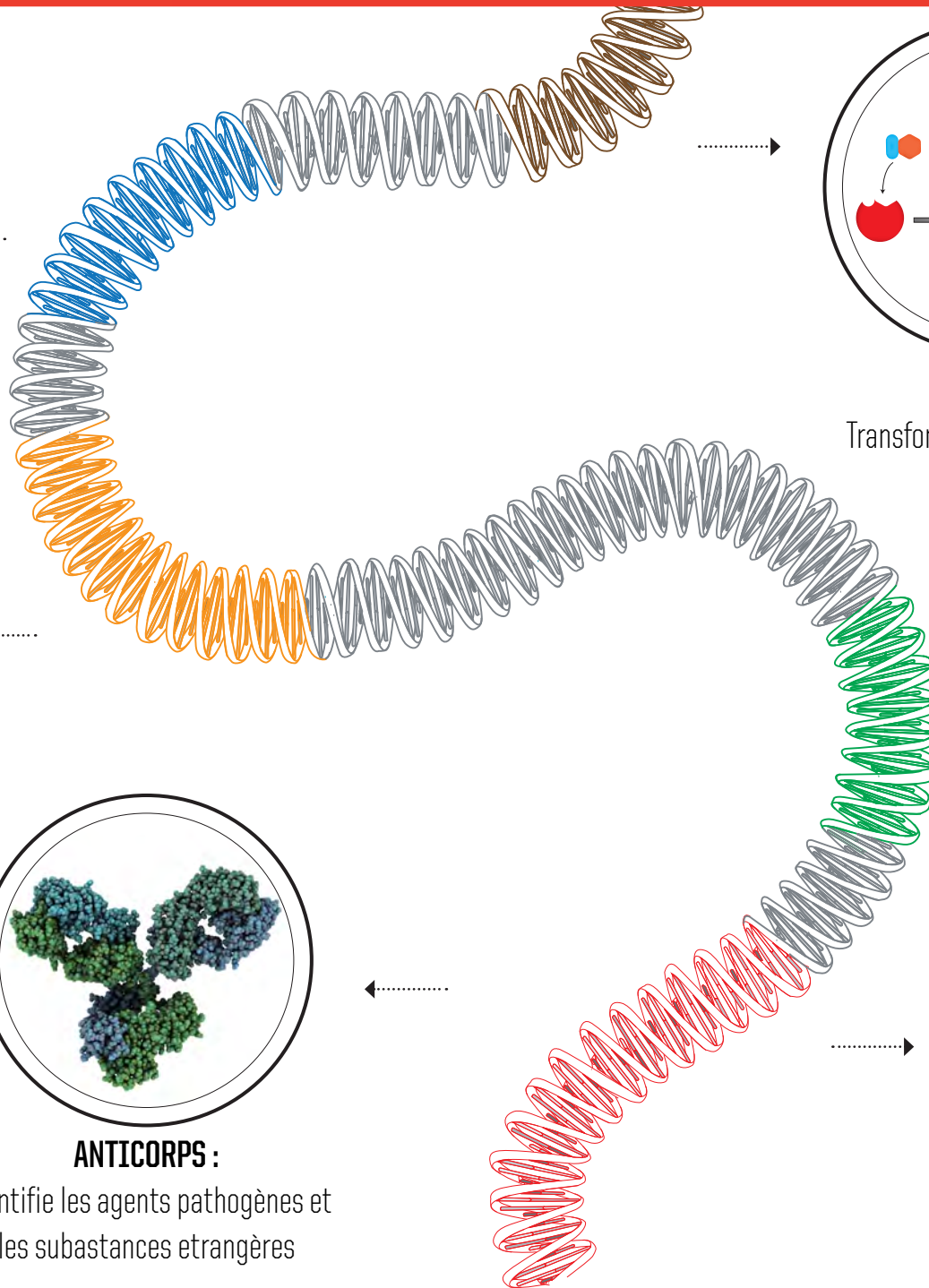
ENZYME :
Transforme les substances



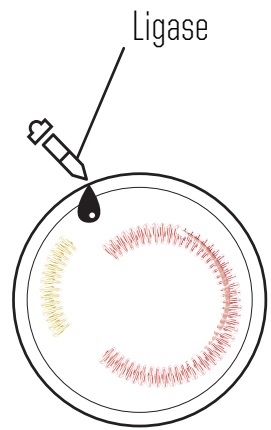
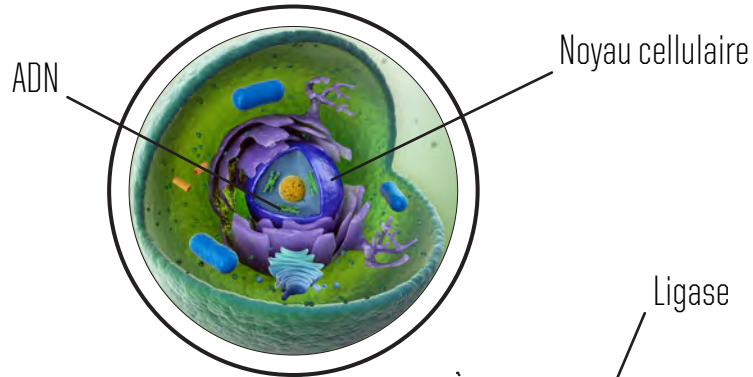
HORMONE :
Transmet les signaux



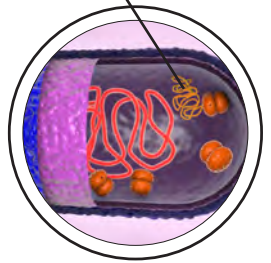
PROTÉINE DE TRANSPORT :
Transporte les substances



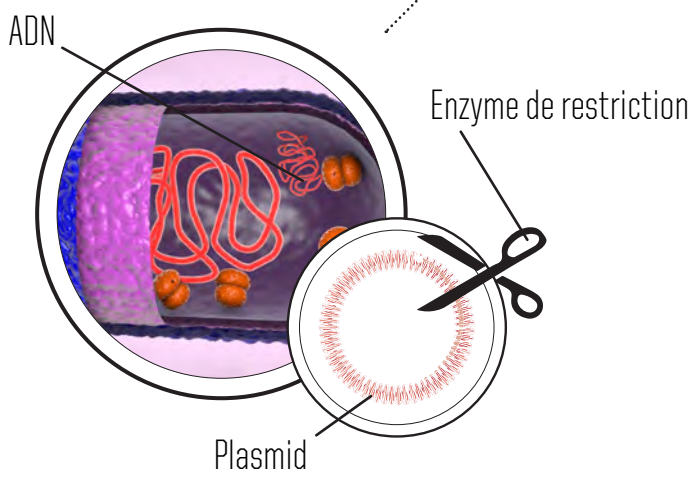
CELLULE HUMAINE

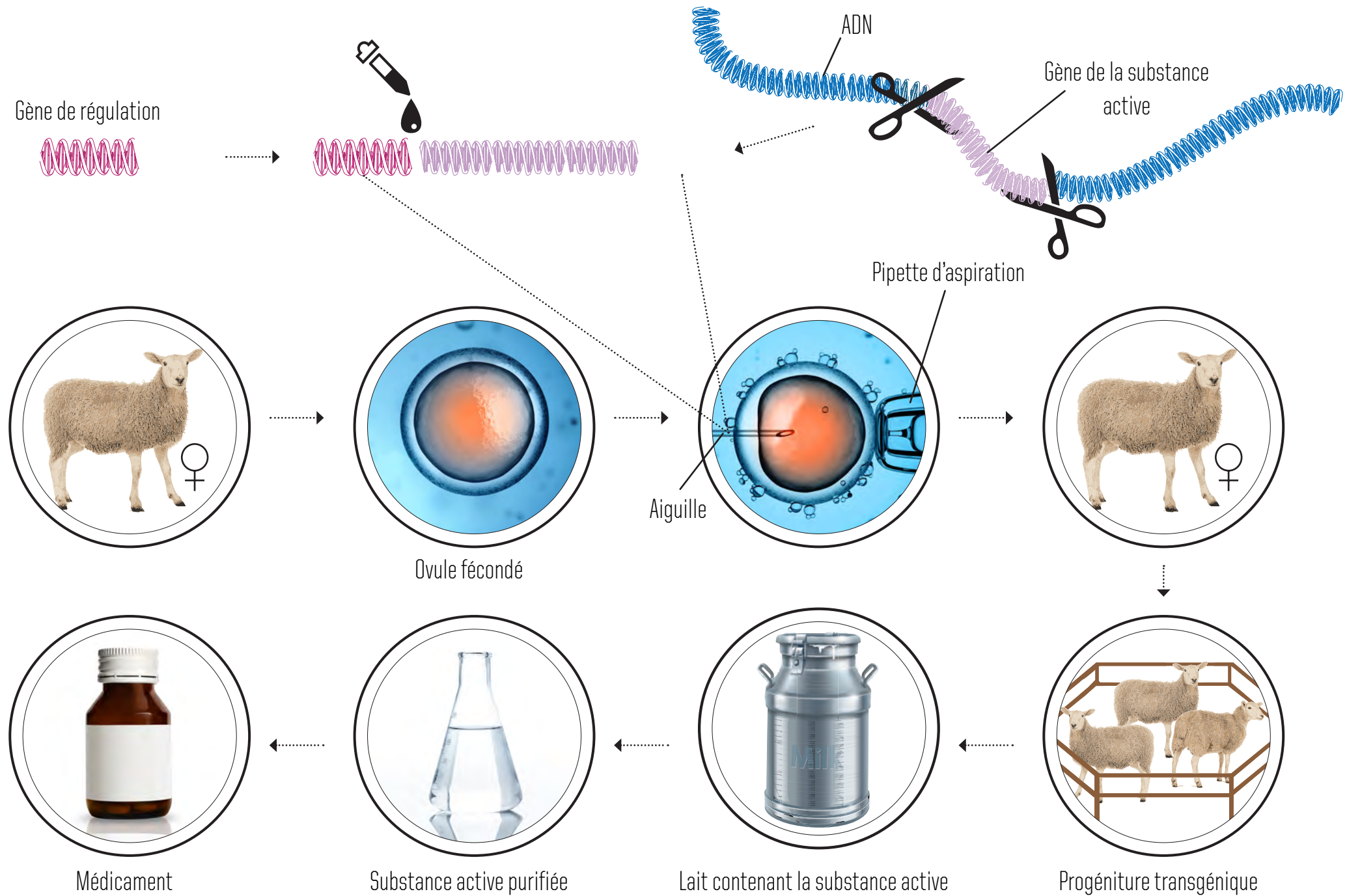


Bactérie génétiquement modifiée produisant de l'insuline

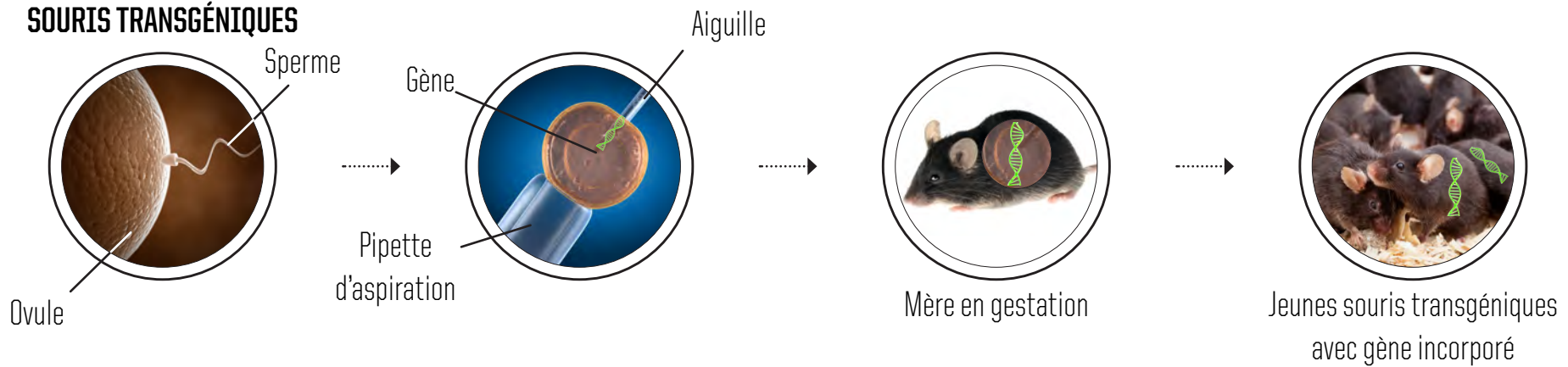


BACTÉRIE

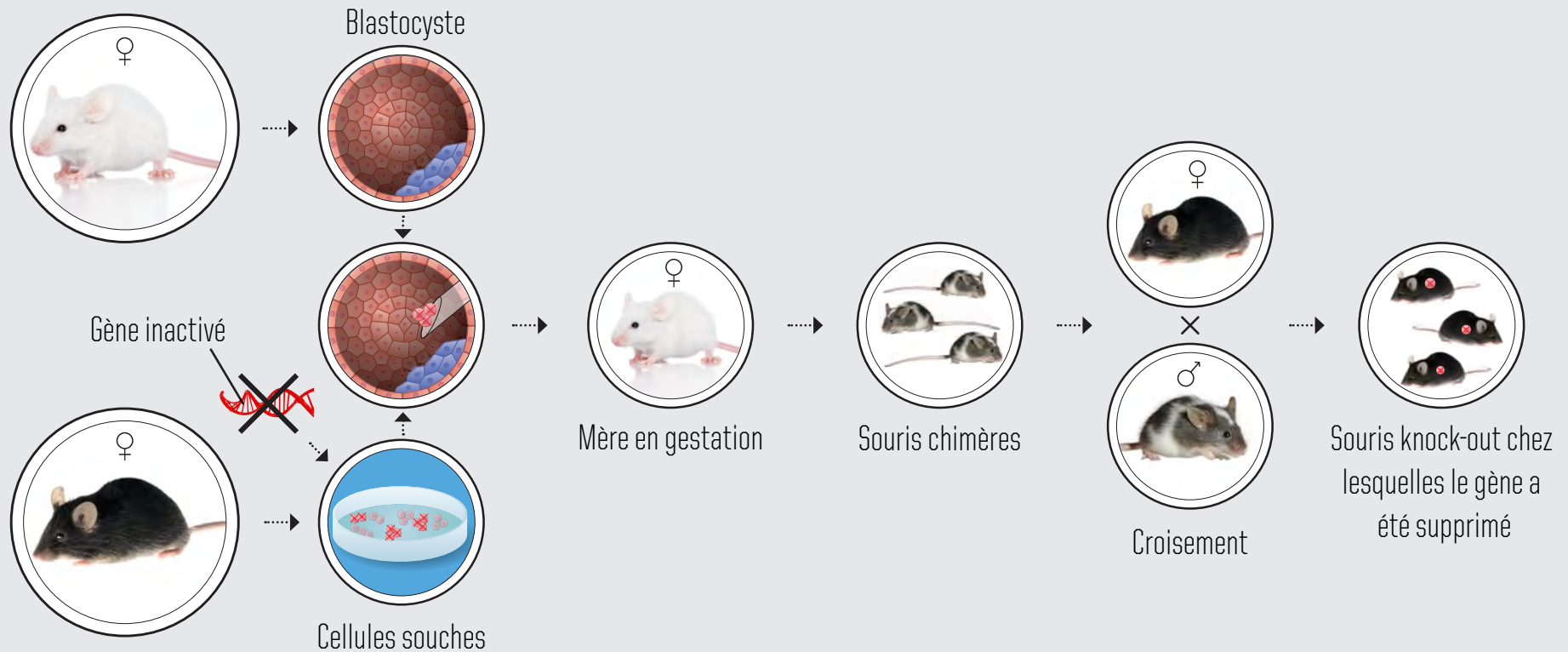




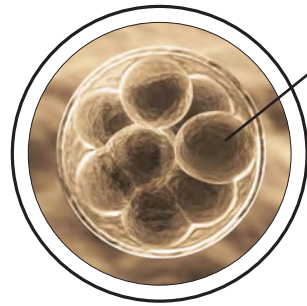
SOURIS TRANSGÉNIQUES



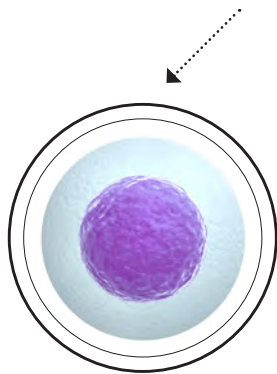
SOURIS KNOCK-OUT



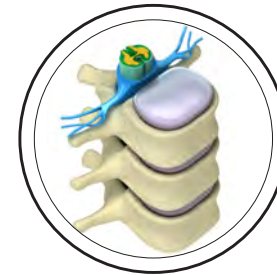
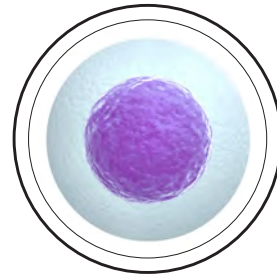
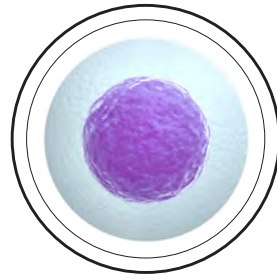
EMBRYON JUSTE APRÈS LA FÉCONDATION



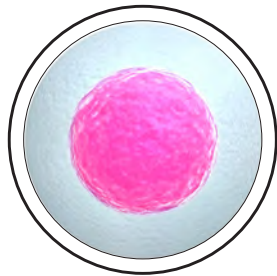
Cellules souches totipotentes



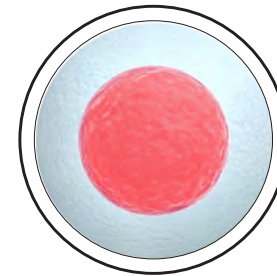
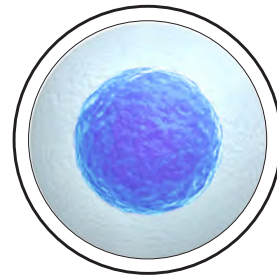
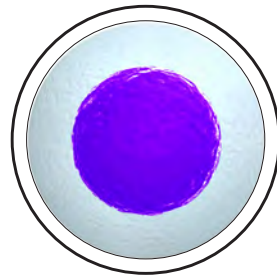
Cellules souches pluripotentes



Moelle osseuse d'un donneur sain



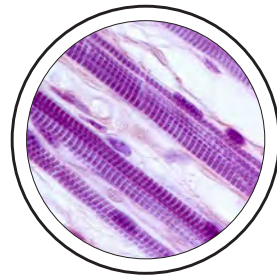
Cellules précurseurs spécifiques d'un type de tissu



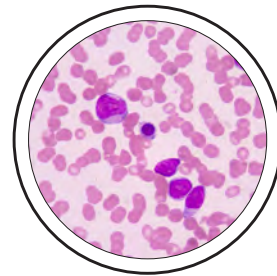
Cellule souche du sang



Cellules nerveuses



Cellules musculaires



Cellules du sang

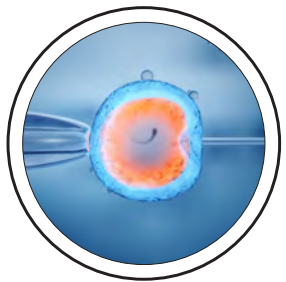


Culture cellulaire

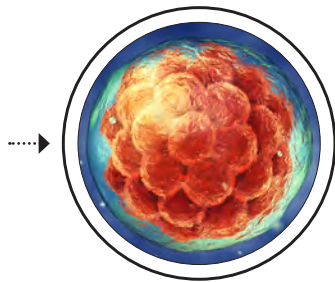


Traitement d'un cancer du sang avec des cellules souches

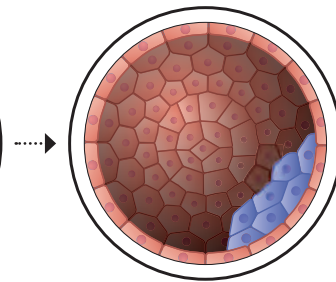
EMBRYONS FÉCONDÉS EN ÉPROUVETTE



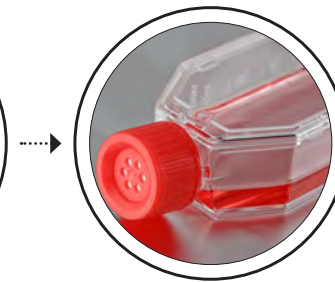
Fusion du spermatozoïde et de l'ovule



Ovule fécondé

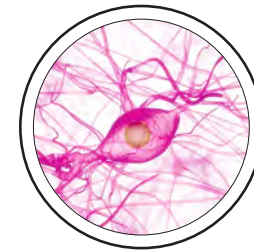


Blastocyste (embryon au stade des 100 cellules)

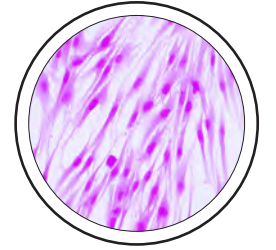


Culture de cellules souches

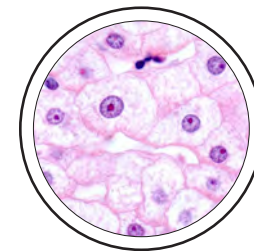
TYPES DE CELLULES SPÉCIFIQUES D'UN TISSU



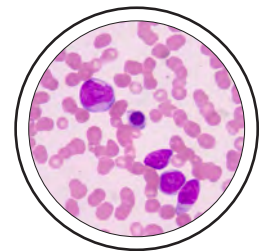
Cellule nerveuse



Cellule du foie



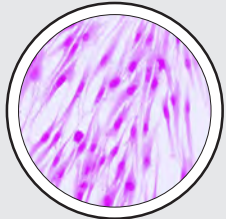
Cellule de la peau



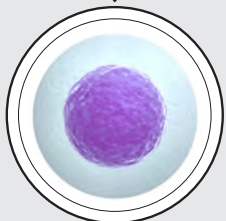
Cellules du sang

REPROGRAMMATION DES CELLULES

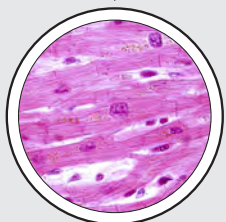
Reprogrammation indirecte



Cellules de la peau



Cellules souches plénipotentes induites

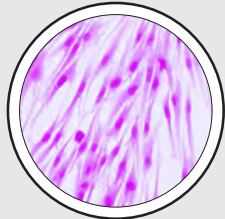


Cellules musculaires cardiaques

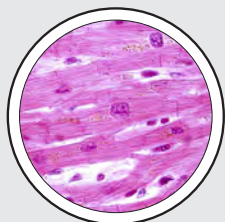


Disease modelling

Reprogrammation directe



Cellules de la peau



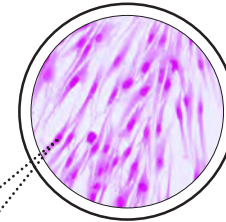
Cellules musculaires cardiaques



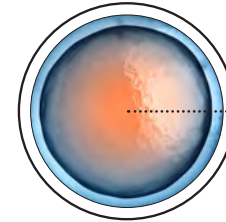
Test d'efficacité

CLONER

Noyau cellulaire somatique

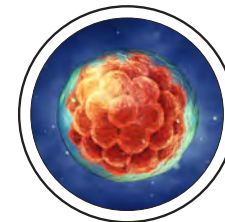


Cellules de la peau



Noyau d'un ovule

Transfert de noyau somatique

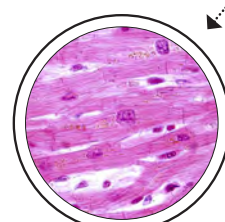


Cellules clones

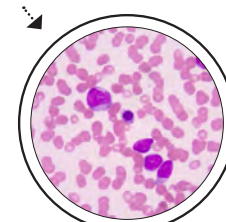
CLONAGE DE RECHERCHE



culture de cellules souches



Cellules musculaires cardiaques



Cellules sanguines

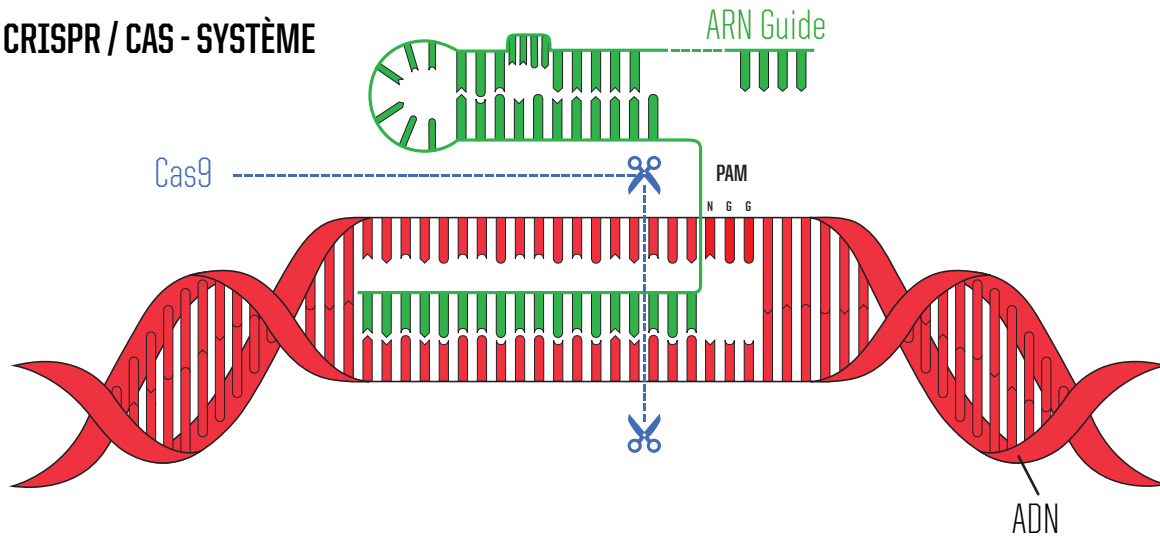
CLONAGE REPRODUCTIF

transfert dans l'utérus d'une mère porteuse

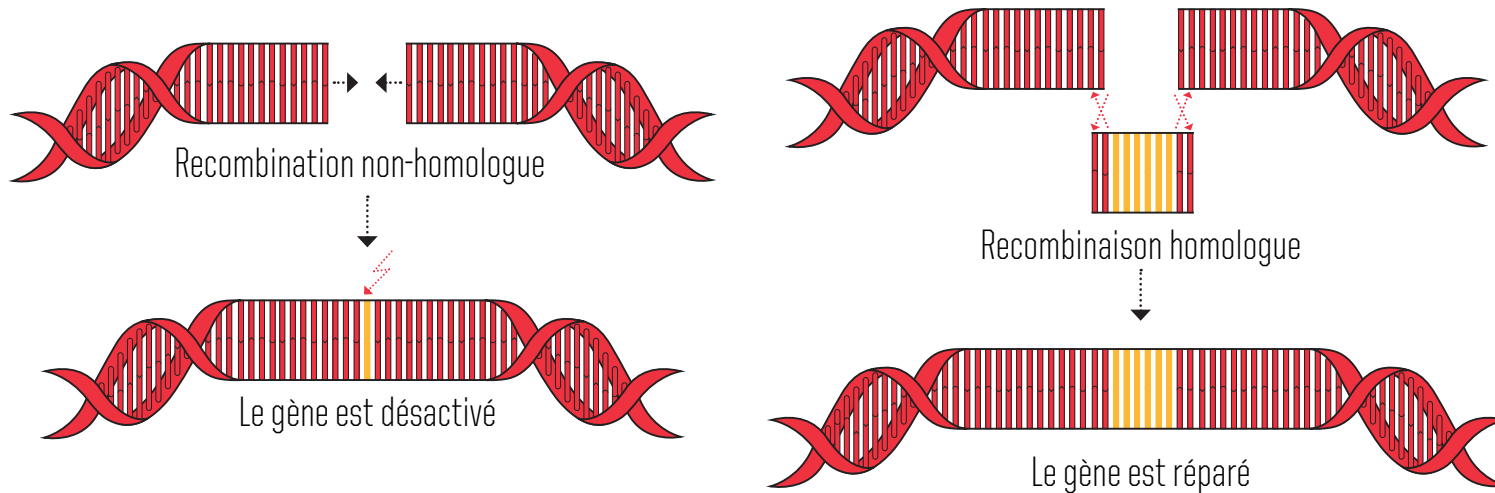


Mouton cloné

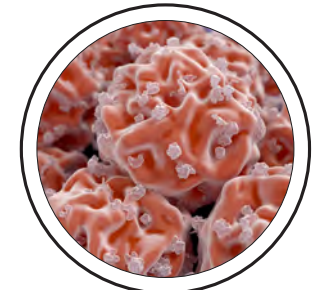
CRISPR / CAS - SYSTÈME



RÉPARATION DES CASSURES DOUBLE BRIN



MANIPULATIONS GÉNÉTIQUES CIBLÉES



Recherche



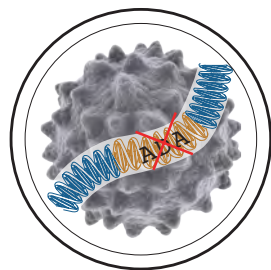
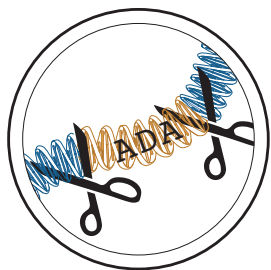
Plantes à cultiver



Etudes cliniques

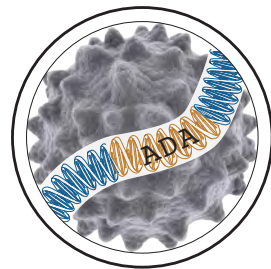
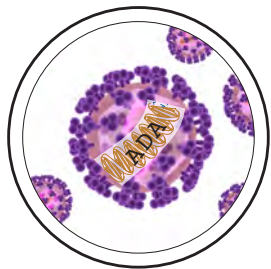
DONNEUR SAIN

ENFANT ATTEINT D'UNE DÉFICIENCE
IMMUNITAIRE GRAVE



Gène ADA sain

Globule blanc porteur d'un
gène ADA défectueux



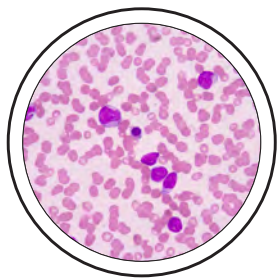
Virus non infectieux jouant
le rôle de taxi génique

Globule blanc avec
gène ADA sain

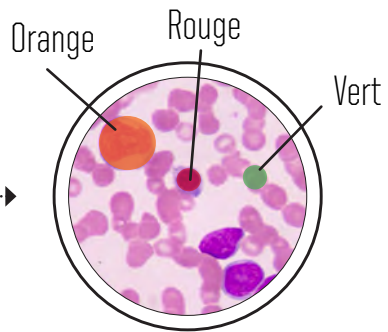
Culture cellulaire

Transfusion
sanguine

ACTIVITÉ GÉNÉTIQUE



Différents types de globules rouges



Destin cellulaire



Gène actif

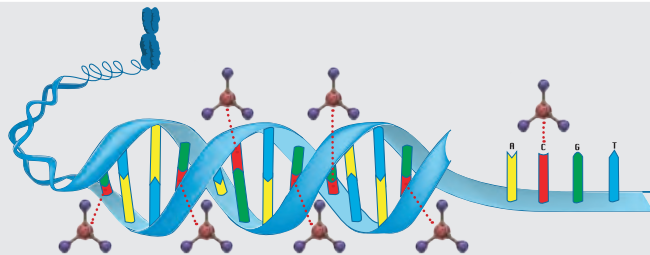
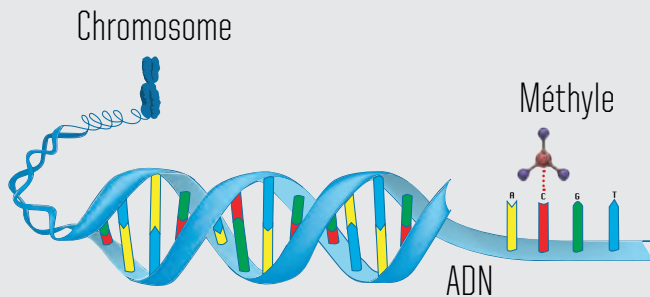


Gène limité dans sa fonction

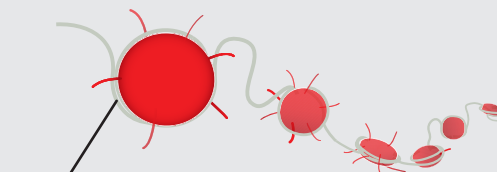


Gène inactif

EPIGÉNÉTIQUE

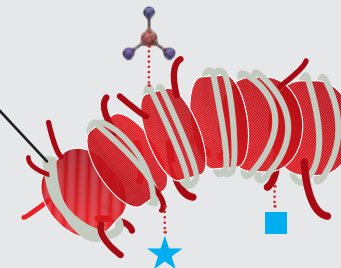


Protéine d'emballage



Euchromatine

DNS

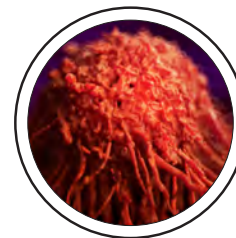


Hétérochromatine

CONTRÔLE EPIGÉNÉTIQUE



Marqueurs biologiques



Maladies



Hérédité



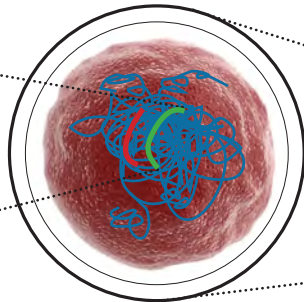
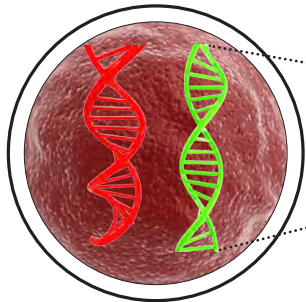
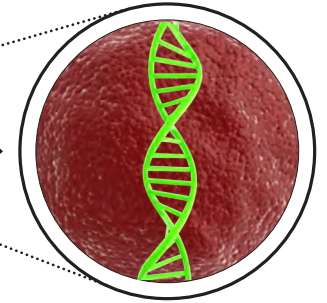
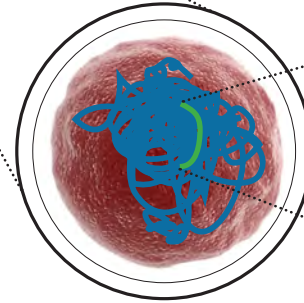
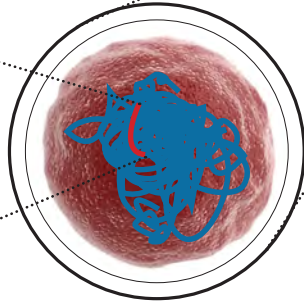
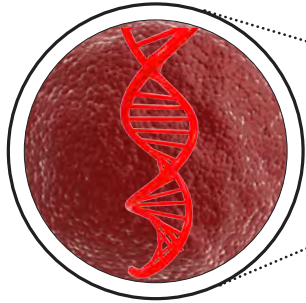
Ovule

Spermatozoïde

CELLULES GERMINALES

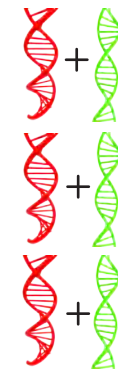


CELLULE DU CORPS

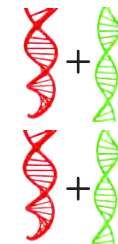


Information héréditaire (génotype)

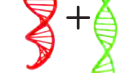
Apparence (phénotype)



Rouge = dominant
Vert = récessif



Rouge = récessif
Vert = dominant



Vert + Rouge = codominant

Gène responsable d'une caractéristique particulière (1 copie)

Noyau cellulaire

Noyau cellulaire

Gène responsable d'une caractéristique particulière (1 copie)

Gène responsable d'une caractéristique particulière (1 copie)

Noyau cellulaire

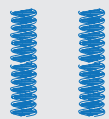
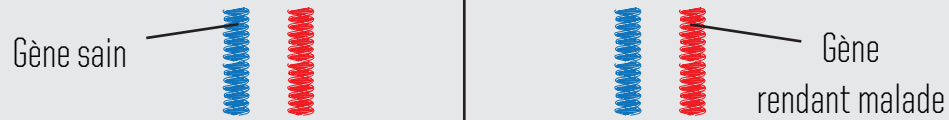
TRANSMISSION RÉCESSIVE

p.ex. mucoviscidose

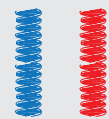


Porteur sain

Porteuse saine



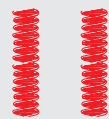
Sain



Porteur sain



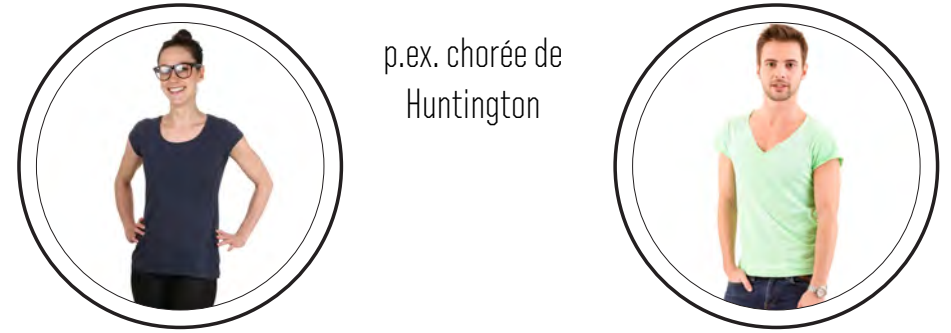
Porteur sain



Malade

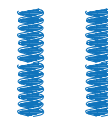
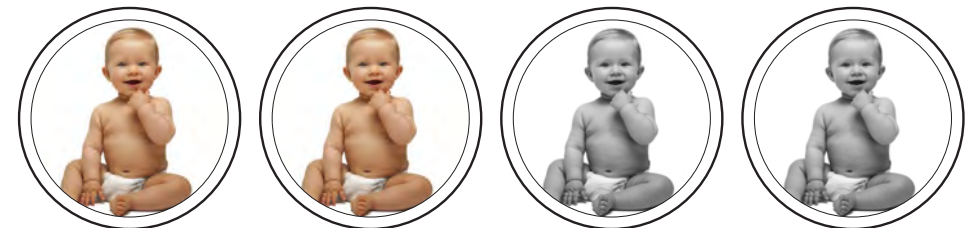
TRANSMISSION DOMINANTE

p.ex. chorée de Huntington

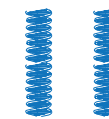


Mère saine

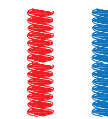
Père malade



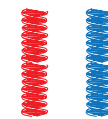
Sain



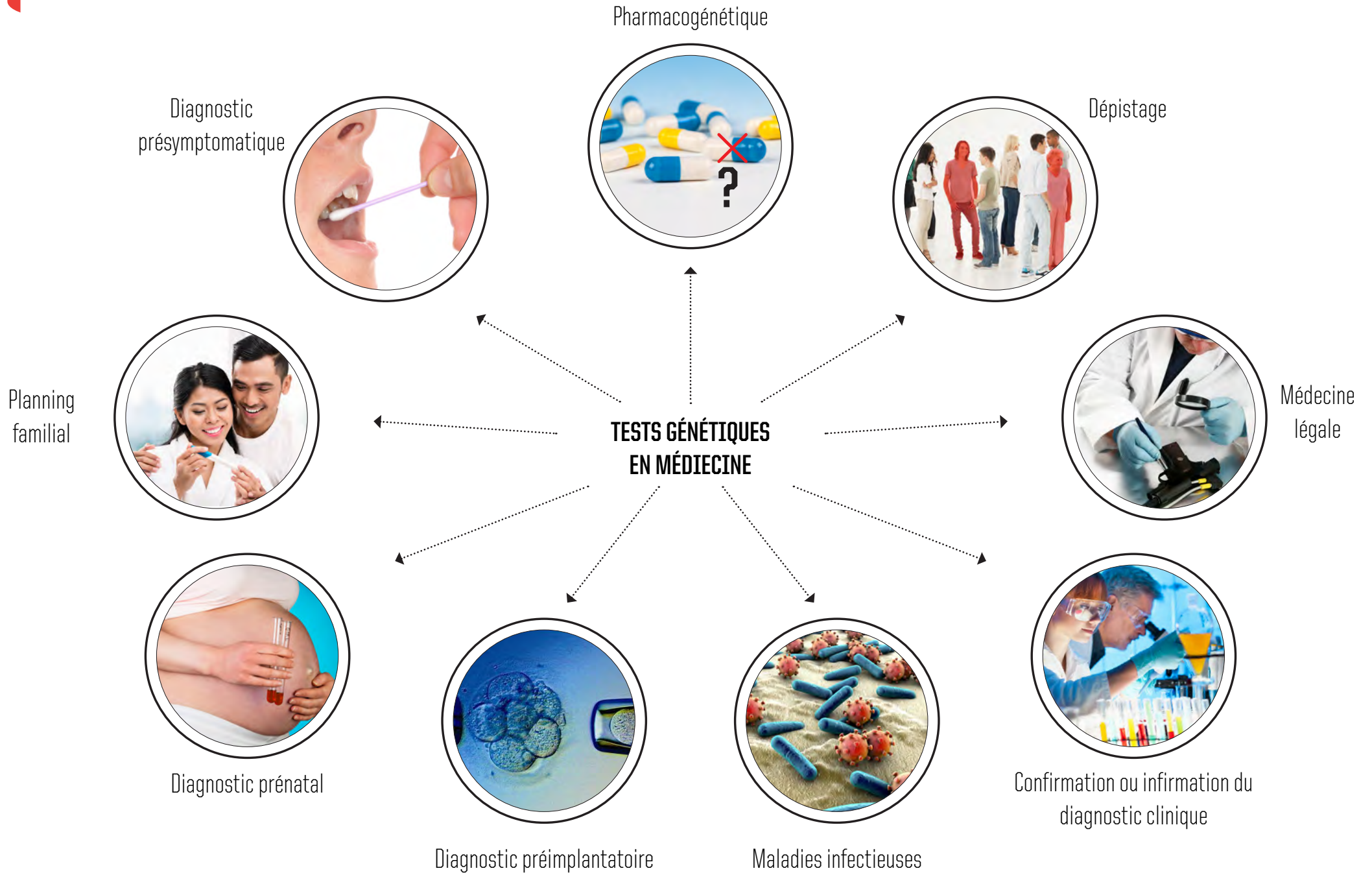
Sain



Malade



Malade

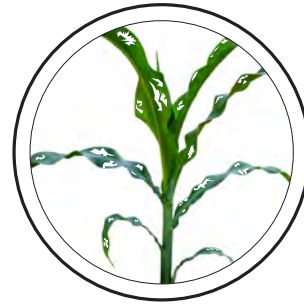




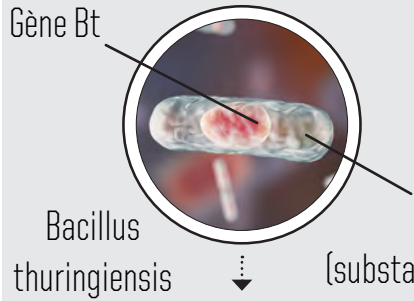
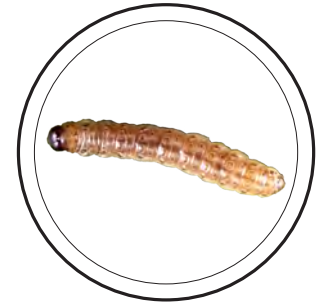
Plant de maïs



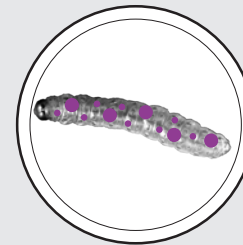
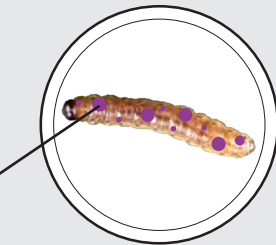
Larve de la pyrale



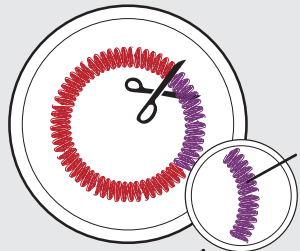
plant de maïs endommagé



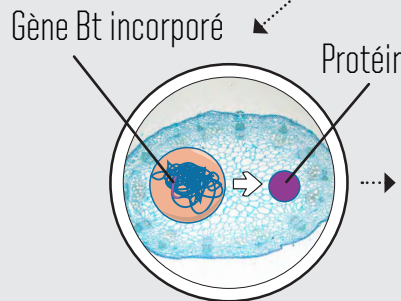
Protéine Bt
(substance active insecticide)



Pyrale du maïs morte

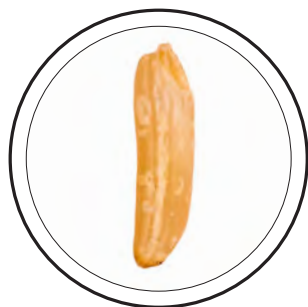
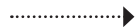


Gène Bt isolé

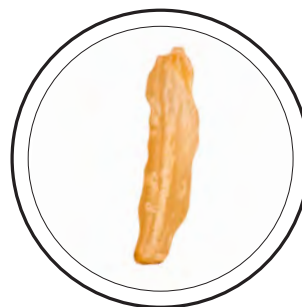
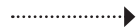


Cellule de la plante de maïs
produisant la protéine Bt





Grain de riz non décortiqué



Riz ranci après stockage

Enveloppe de riz riche en provitamine A et en acides gras



Grain de riz décortiqué



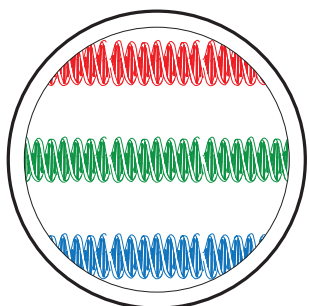
Riz propre au stockage



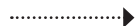
Carence en vitamine A

Pas de provitamine A

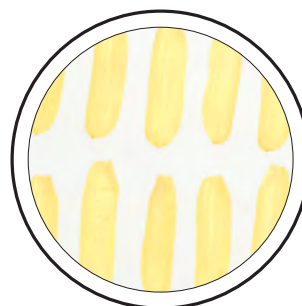
Cécité
Prédisposition aux infections



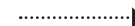
Gènes destinés à la production de provitamine A



Provitamine A



«Riz doré»



Contribution à l'éradication de l'avitaminose A

ENZYMES DE PRODUITS DE LESSIVE

Lipases : graisses
 Protéases : protéines
 Amylases : amidon
 Cellulases : matière végétale



Réduit la température de lavage de 95° à 40°

PROCÉDÉS DE FABRICATION PLUS ÉCOLOGIQUES



Production traditionnelle



Utilisation des ressources



Quantité de déchets



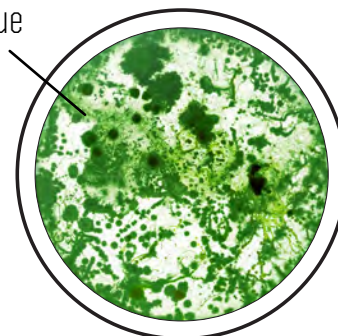
Production biotechnologique

MATIÈRES SYNTHÉTIQUES BIOLOGIQUEMENT DÉGRADABLES

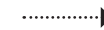


Plant de colza

Bioplastique



Bactérie du sol



Emballages en plastique biodégradables

AGRICULTURE PLUS RESPECTUEUSE DE L'ENVIRONNEMENT



Agriculture intensive pratiquée jusqu'à présent



Agriculture extensive pratiquée jusqu'à présent



Agriculture nouvelle pratiquée avec des plantes cultivées transgéniques

ASSAINISSEMENT BIOLOGIQUE

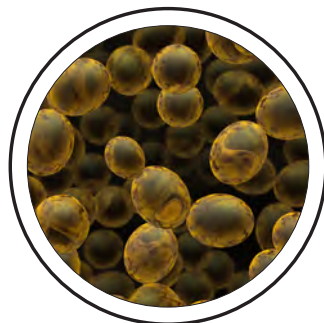


Sol pollué



Sol purifié

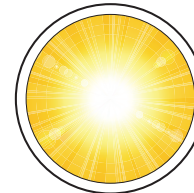
MISE EN ÉVIDENCE DE POLLUANTS TOXIQUES



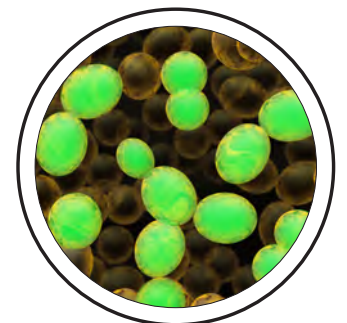
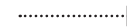
Levure génétiquement modifiée



Substance toxique



Rayons UV



Cellules de levure fluorescentes