



**Hépatologie
Faculté de Médecine
Inserm 1241**

Rennes

Métabolisme du fer et surcharges en fer

SFTS et SFVTT

Paris

18 Mai 2018



QUESTION N° 1

La production d'hépcidine, hormone de régulation systémique du fer, augmente suite à une augmentation physiologique de l'absorption digestive du fer

Réponse : OUI / NON / ?

QUESTION N° 2

La production d'hépcidine est augmentée en cas de surcharge en fer hémochromatosique

Réponse : OUI / NON / ?

QUESTION N° 3

La production d'hépcidine augmente suite à une surcharge en fer transfusionnelle

Réponse : OUI / NON / ?

Métabolisme du fer

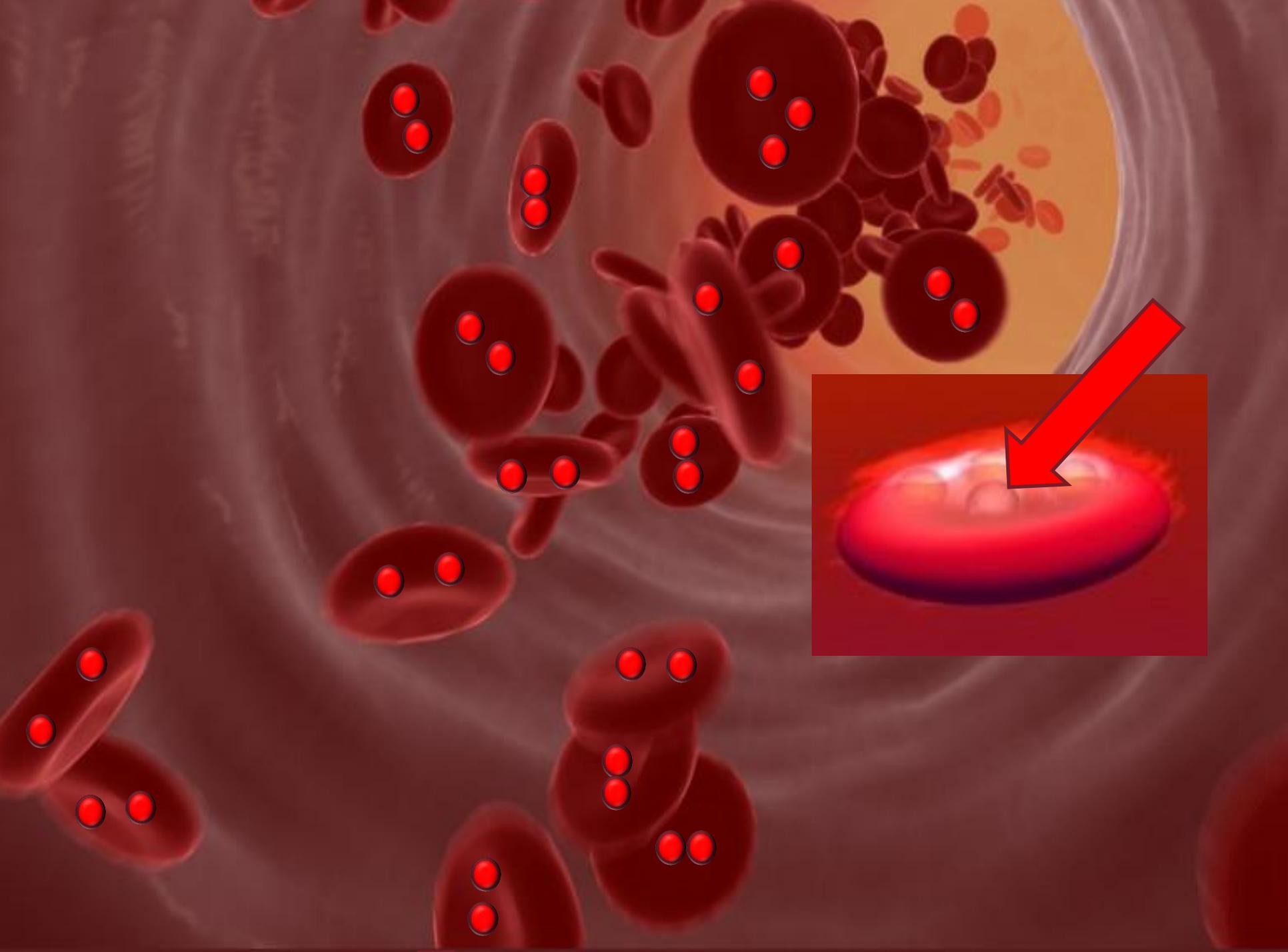
Données «classiques»

Données récentes

Surcharges en fer

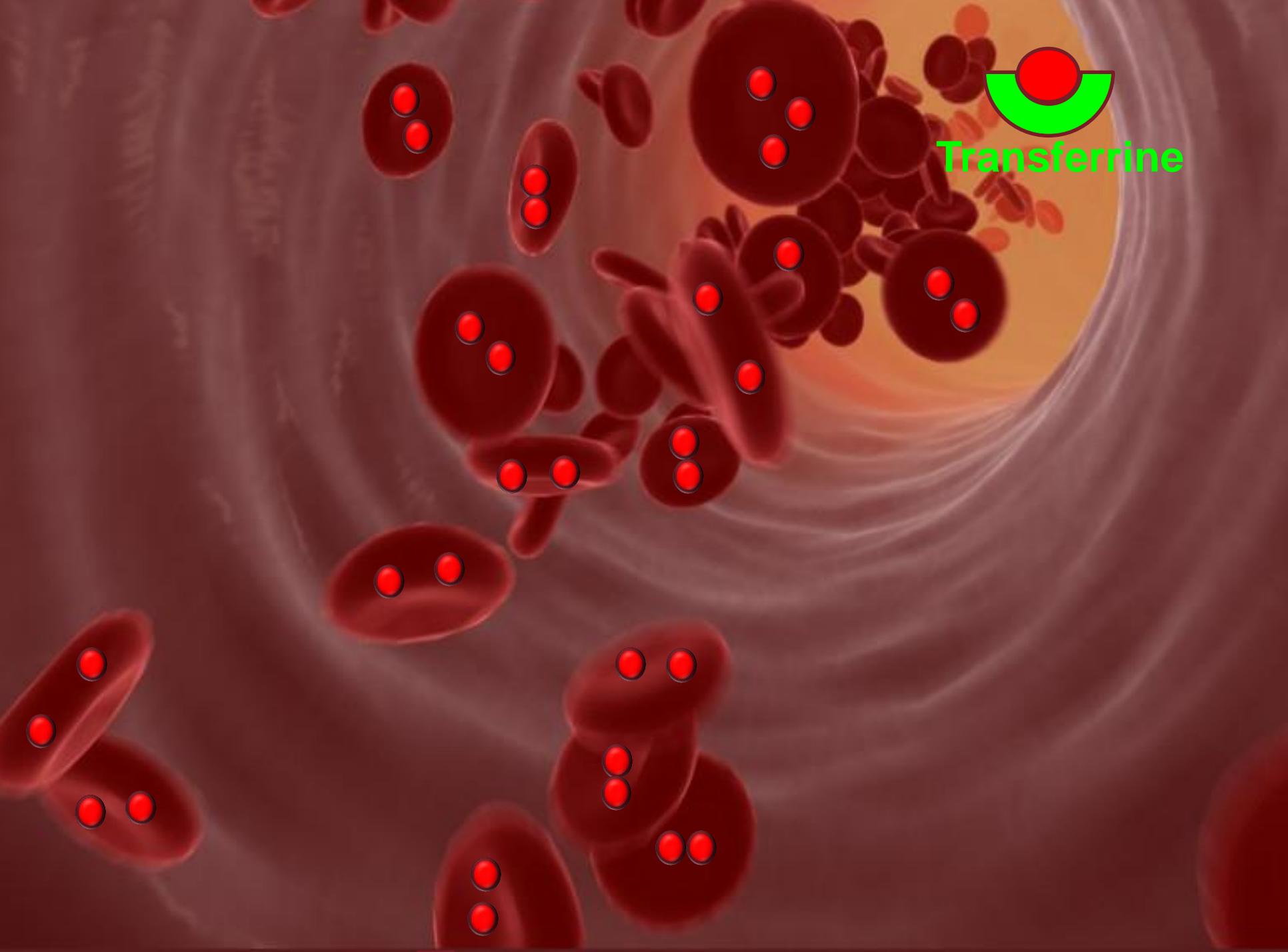
Pourquoi fréquentes ?

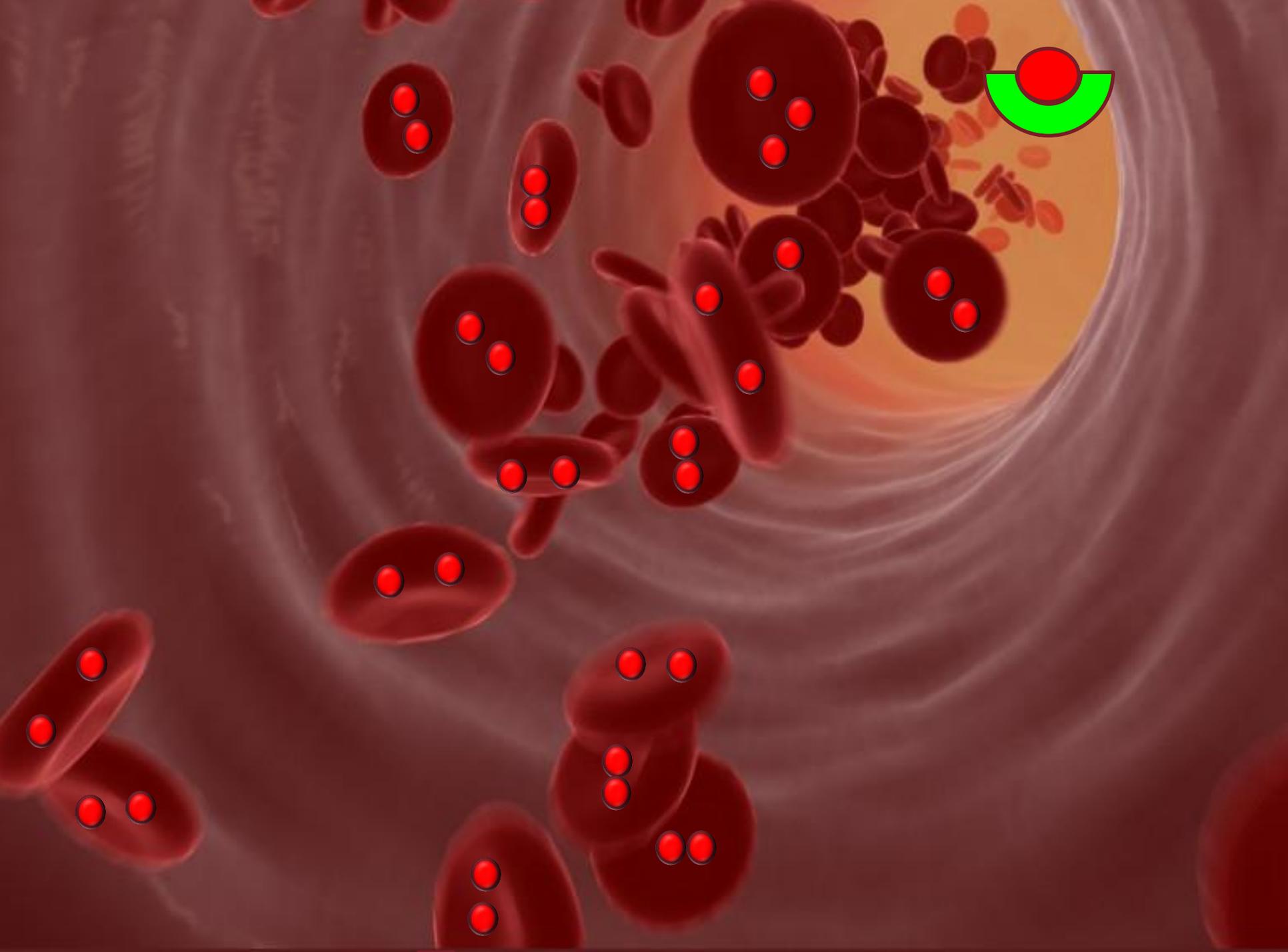
Quelles causes ?



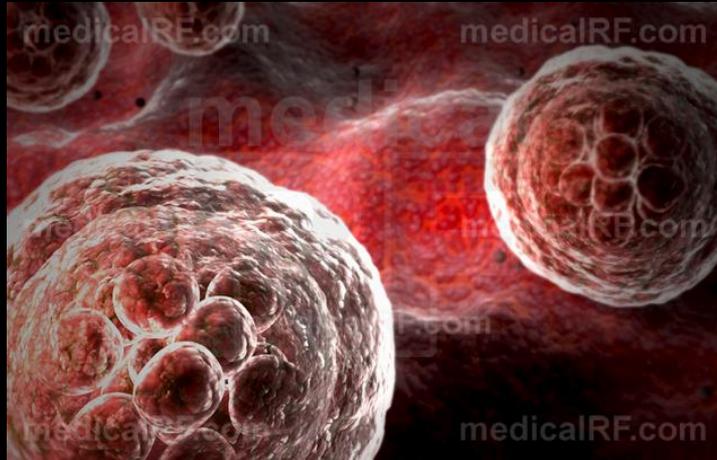
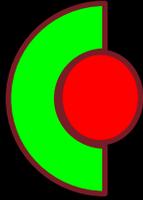


Transferrine

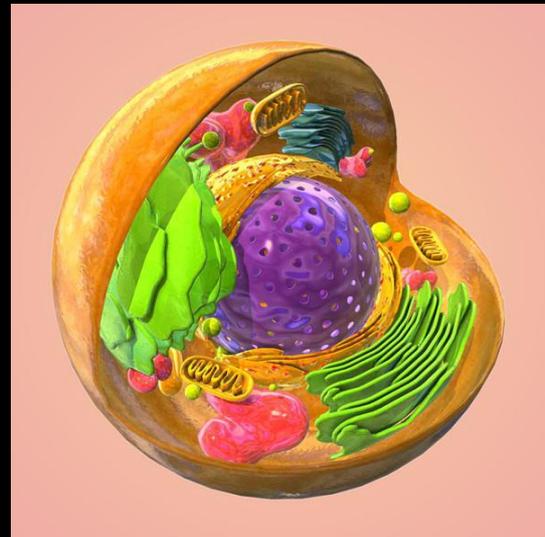


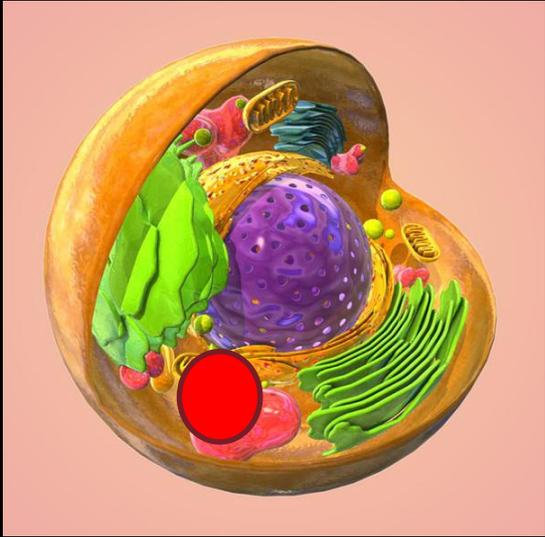


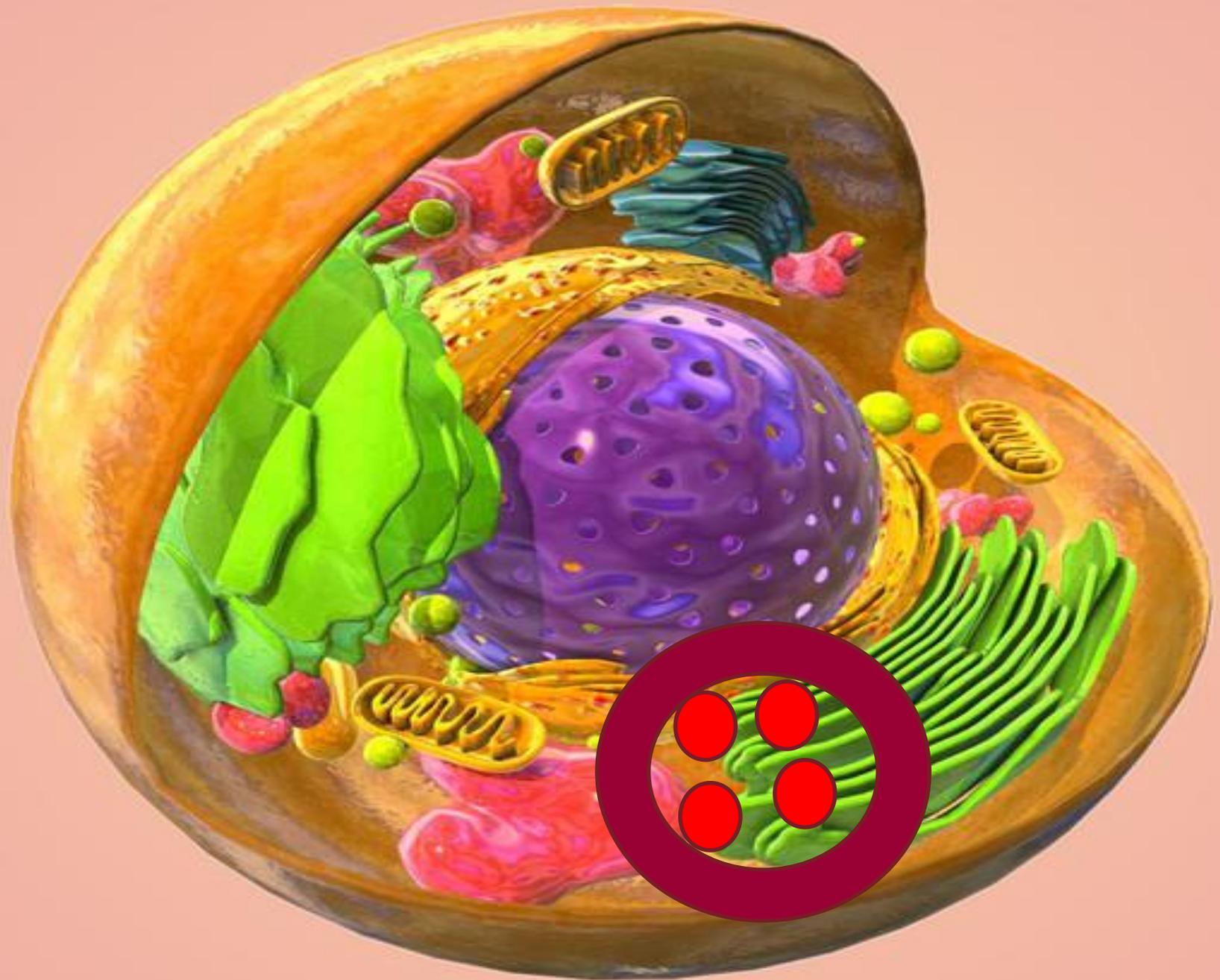






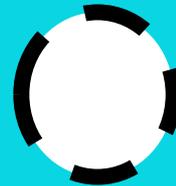
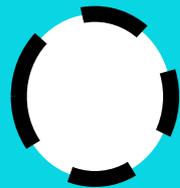




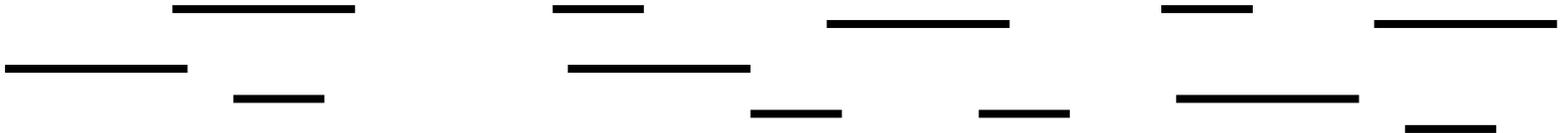
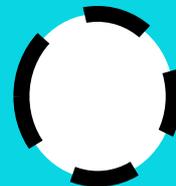
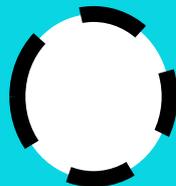


Ferritine

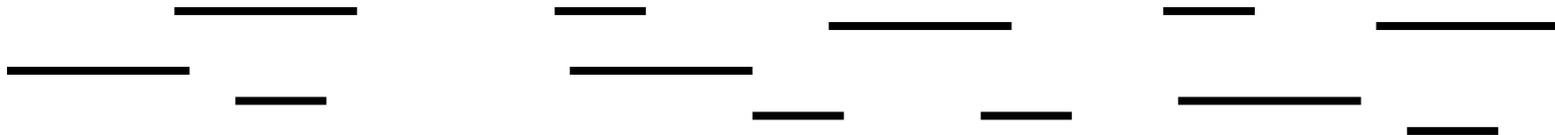
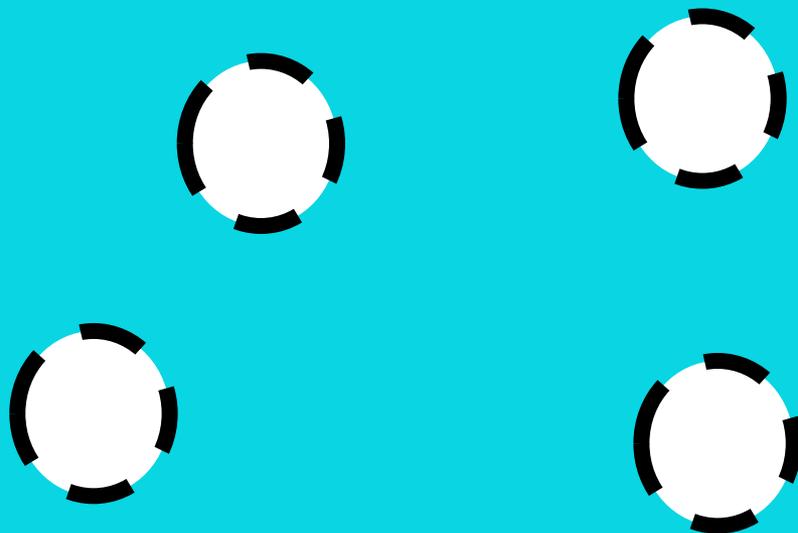
CELLULE

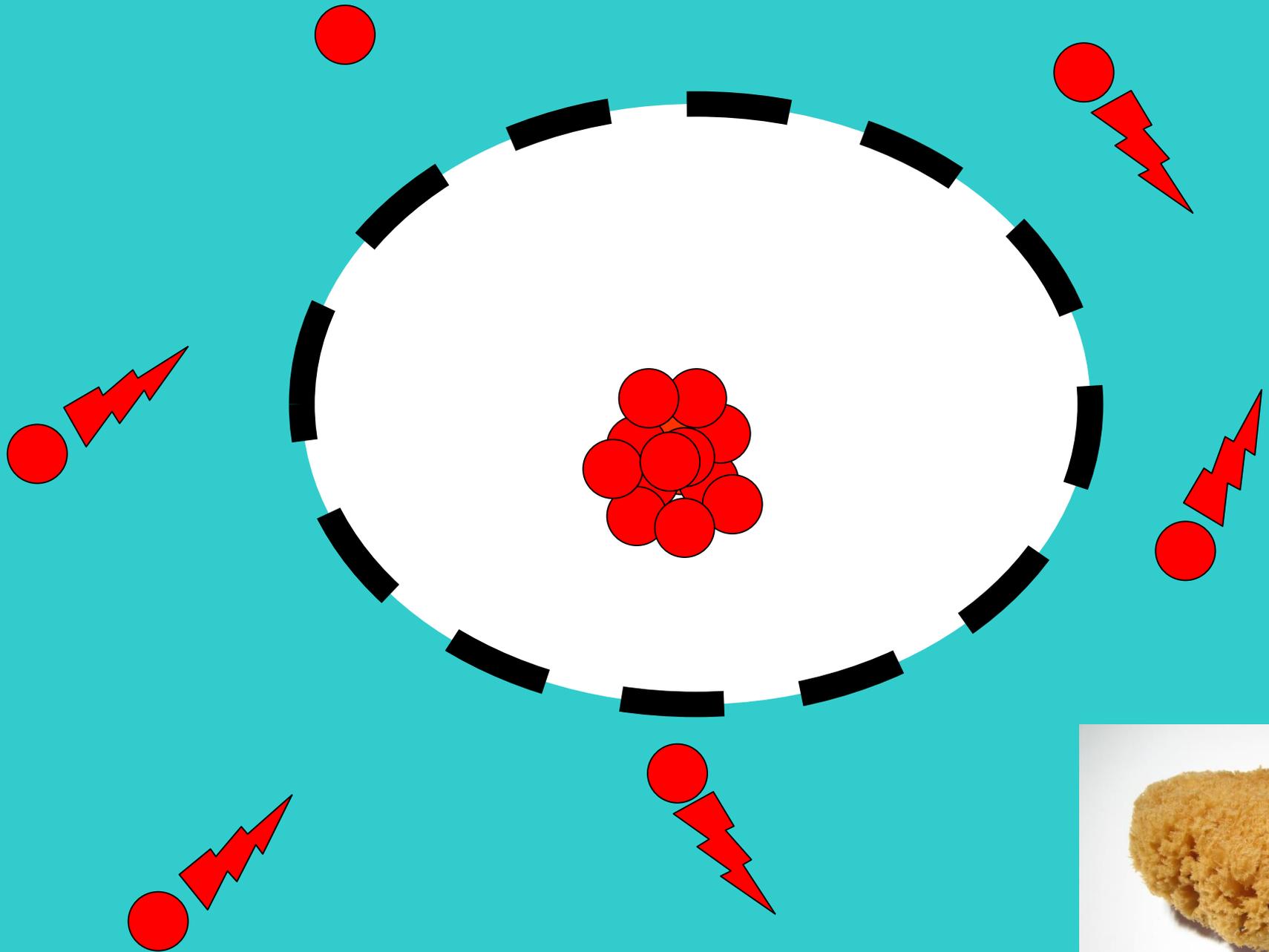


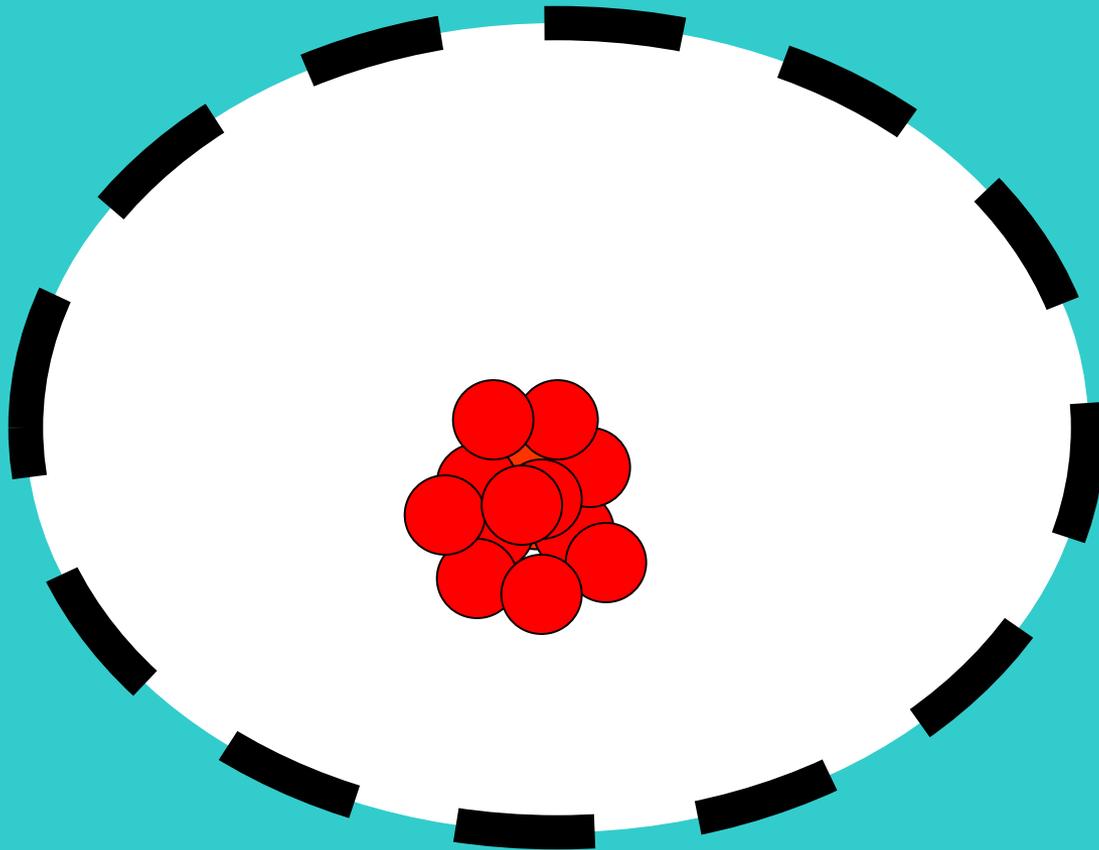
**Molécules de
ferritine**

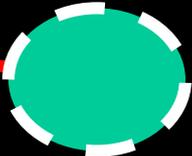
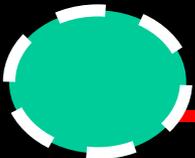
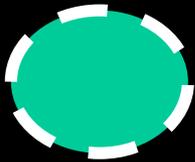


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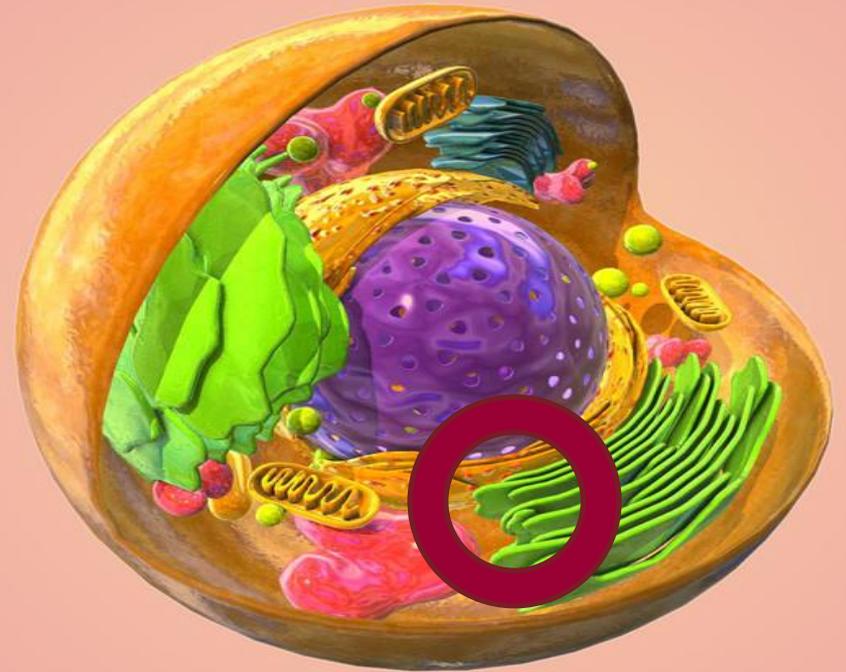








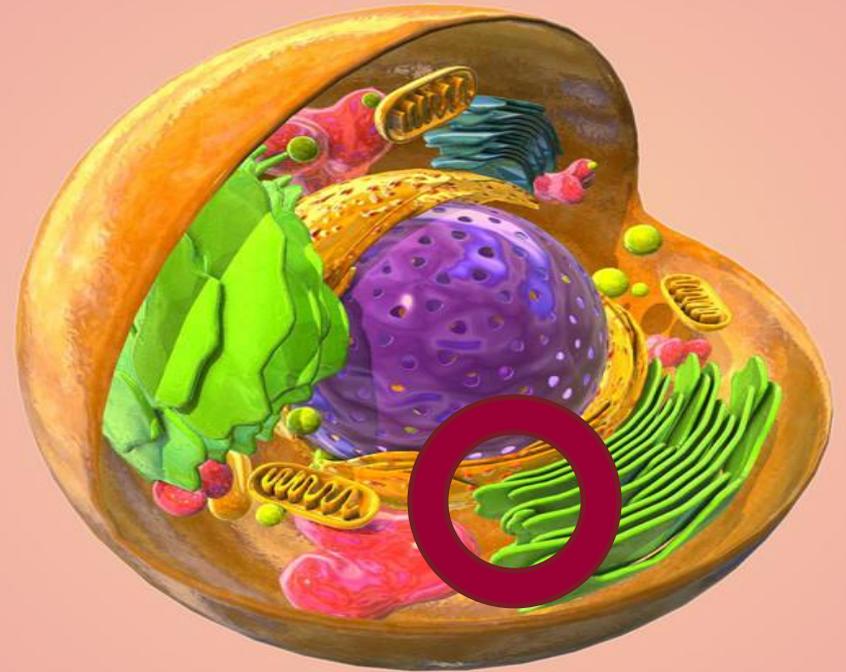
Transferrine



Ferritine



Transferrine



Ferritine

Métabolisme du fer

Données «classiques»

Données récentes

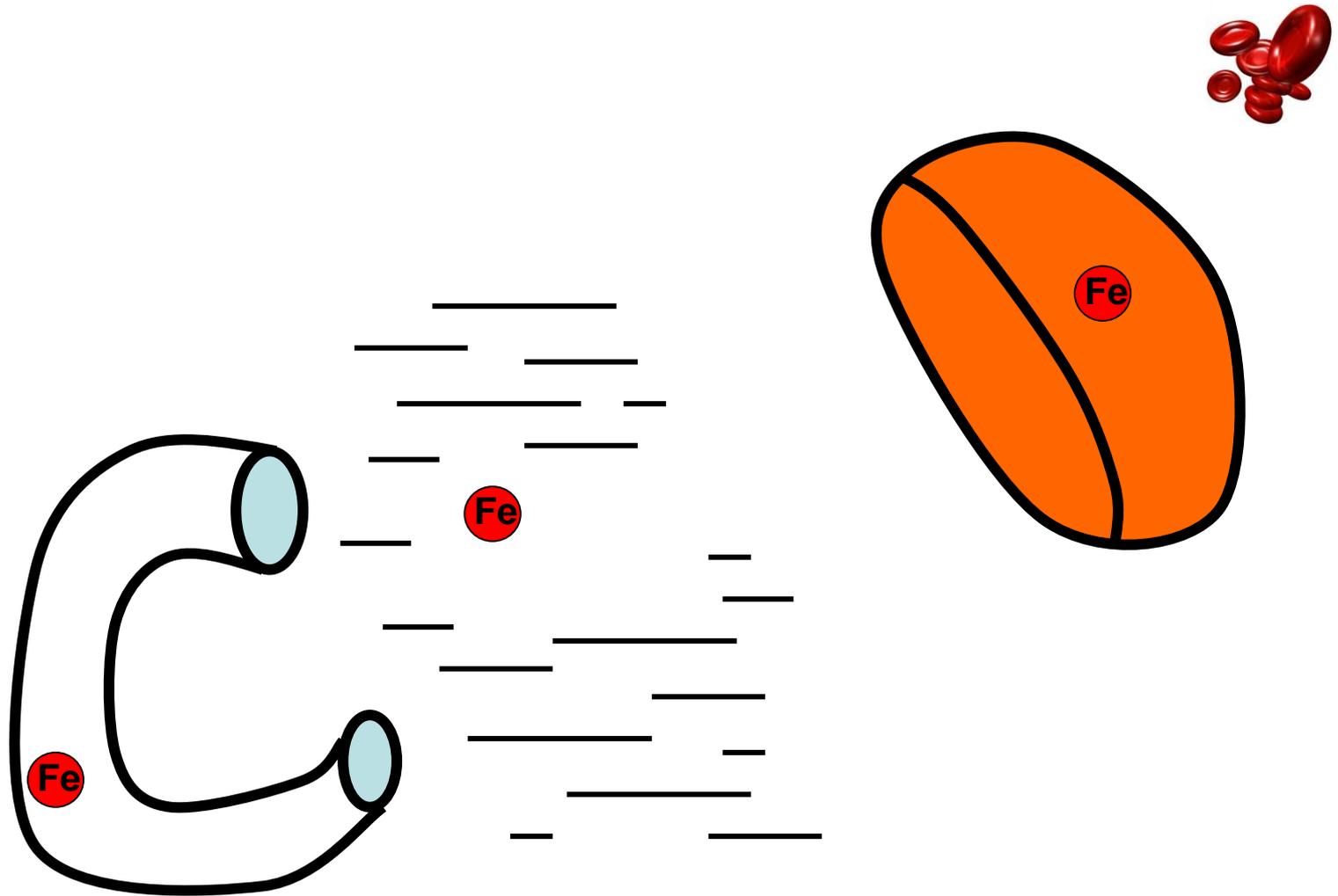
Régulation

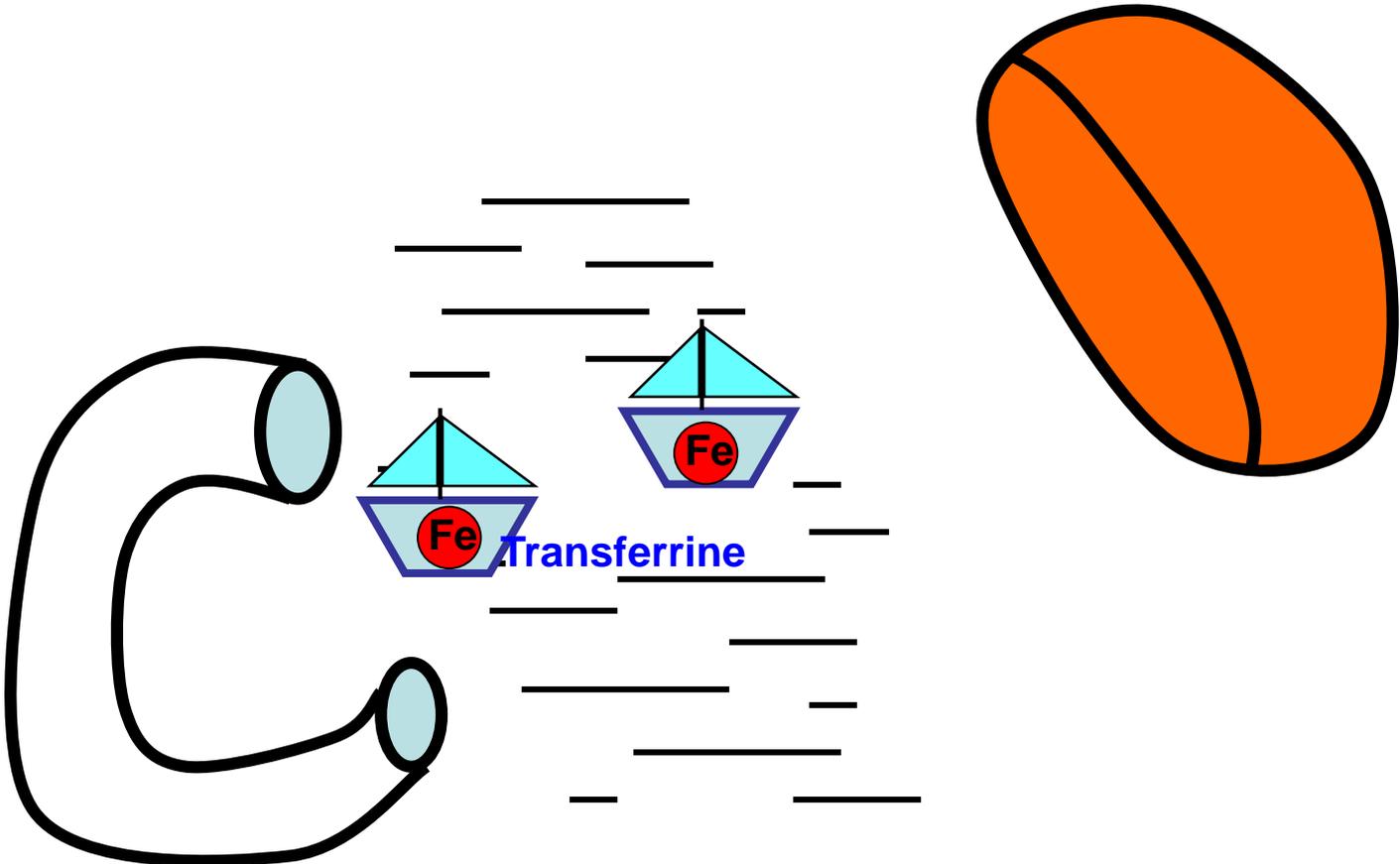
Toxicité

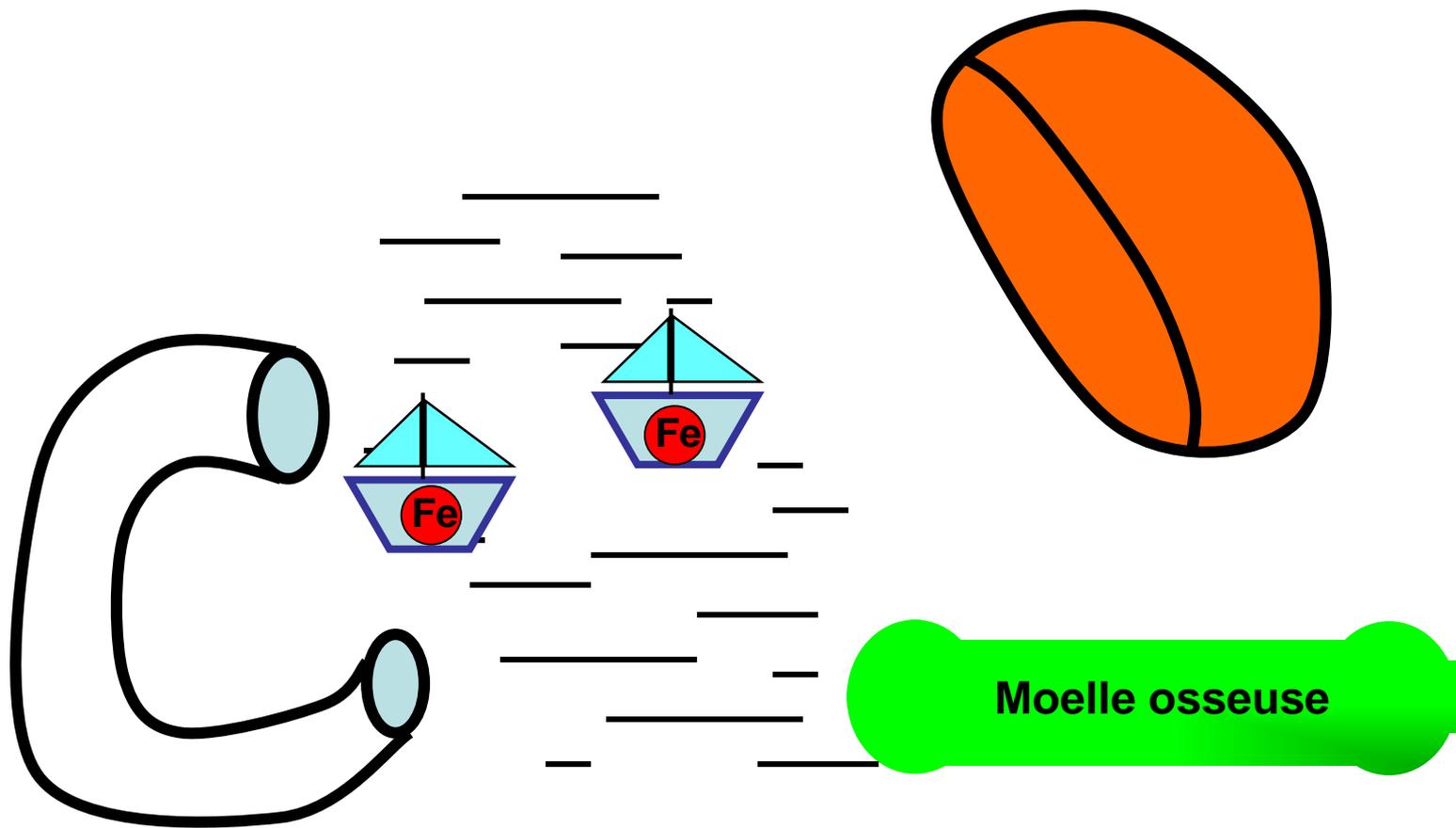
Surcharges en fer

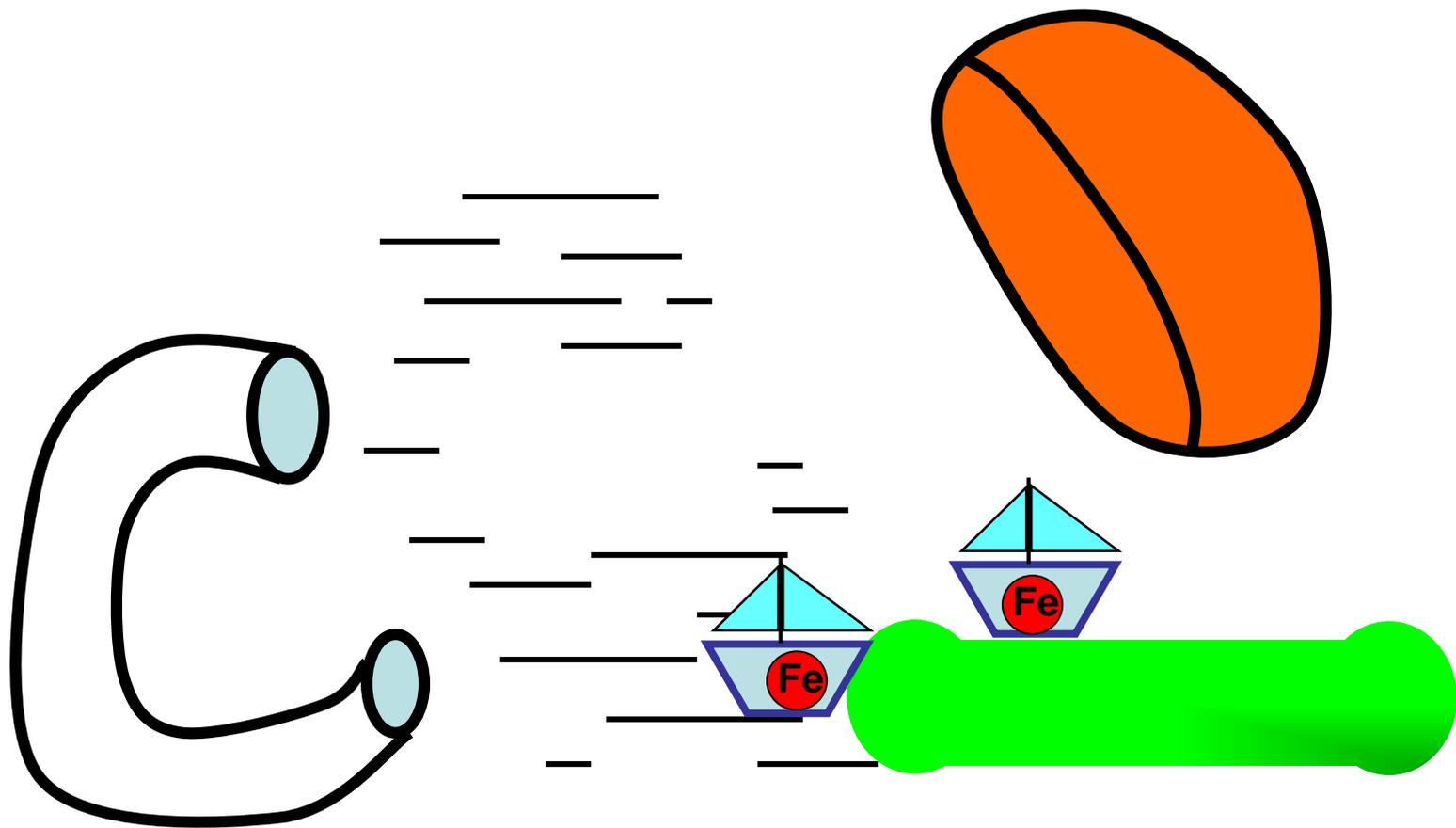
Pourquoi fréquentes ?

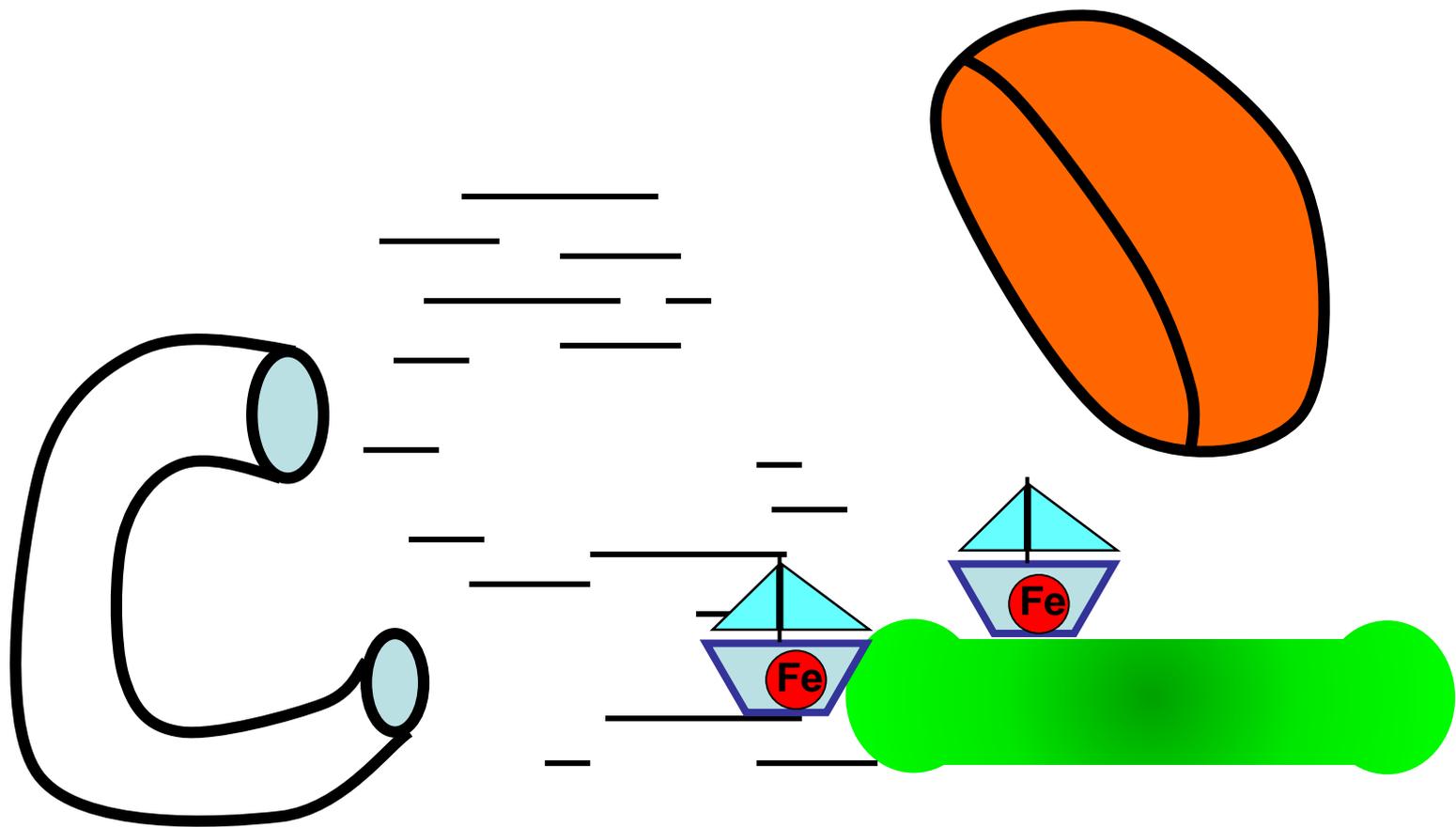
Quelles causes ?

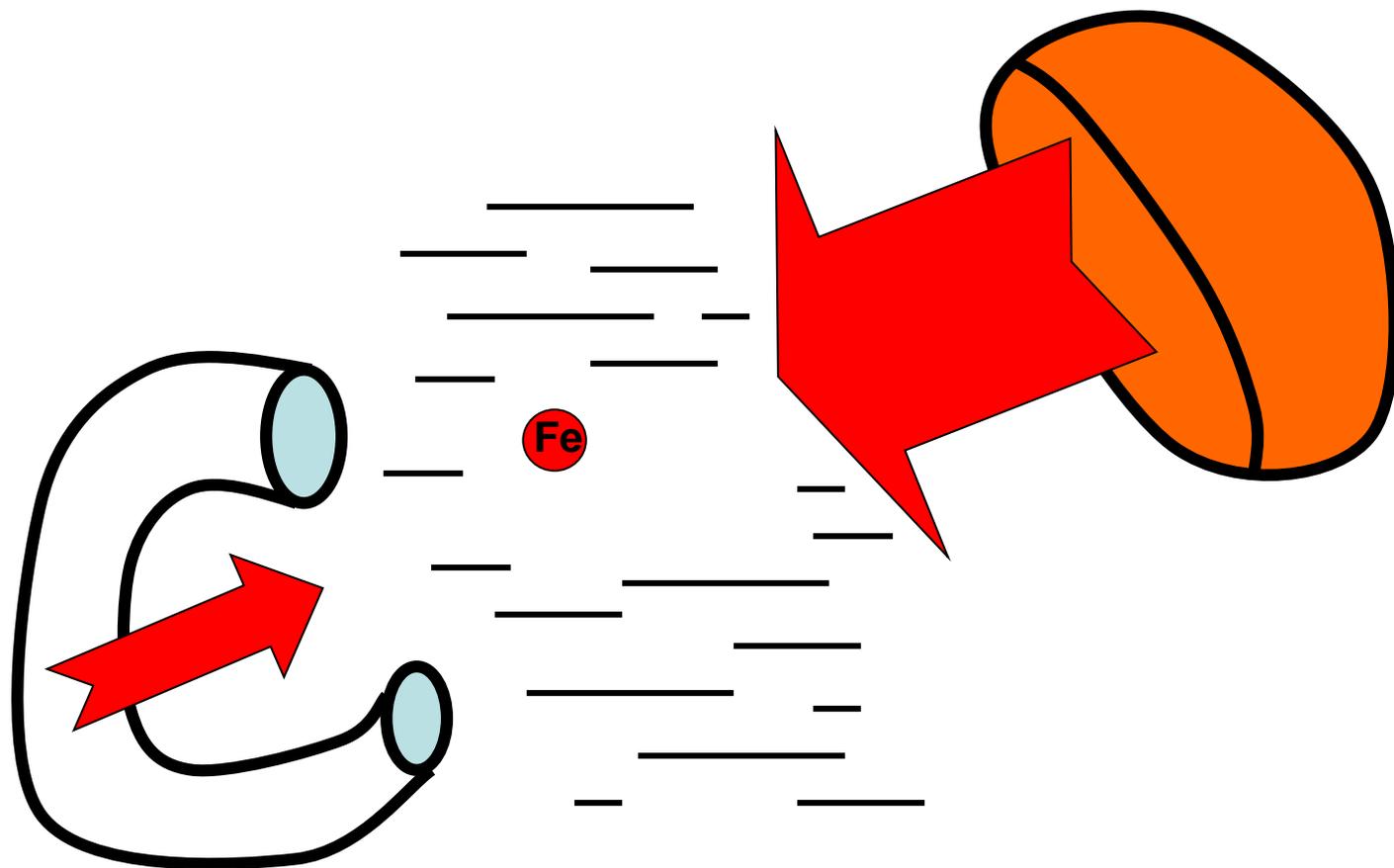


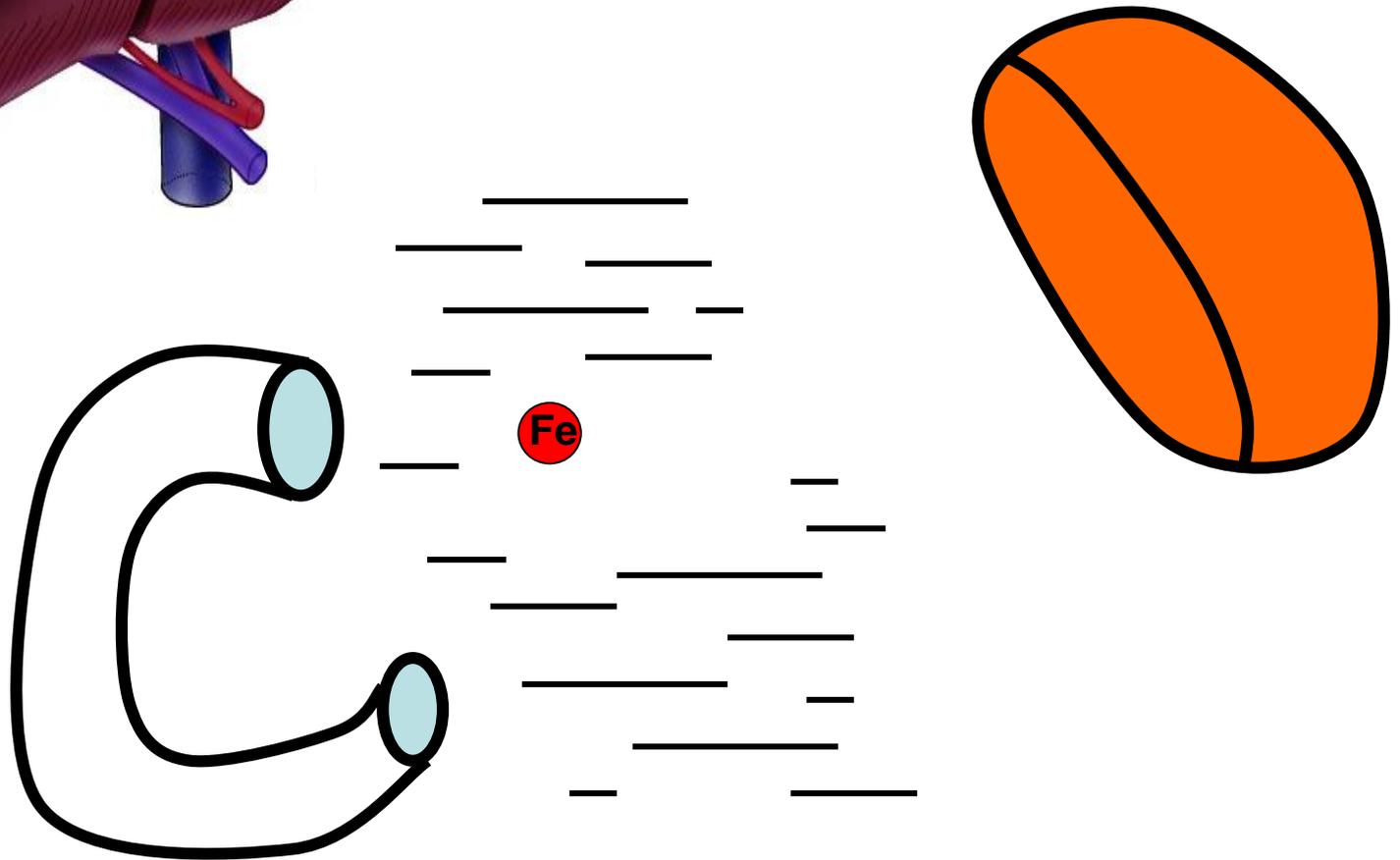


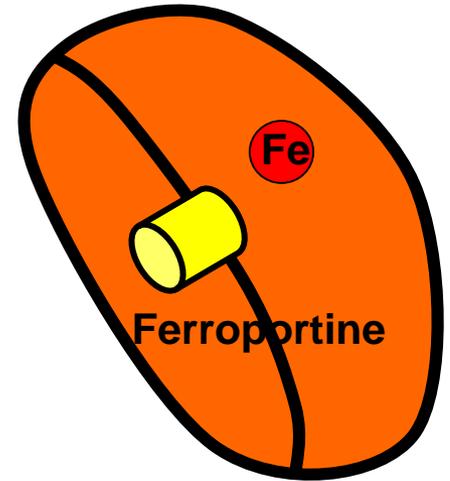
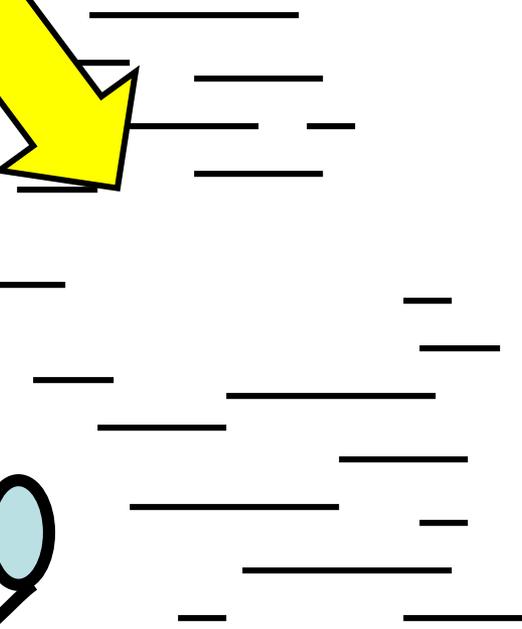
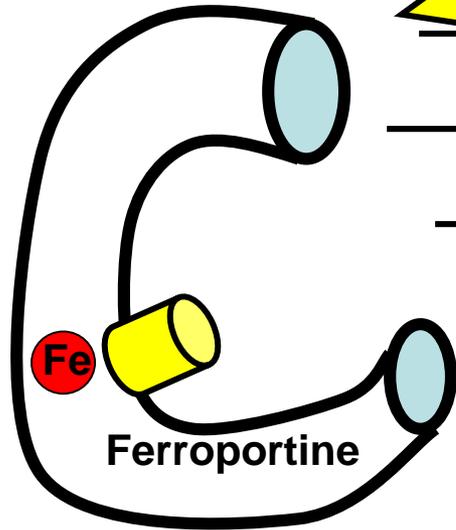
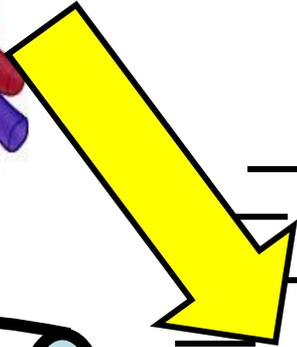


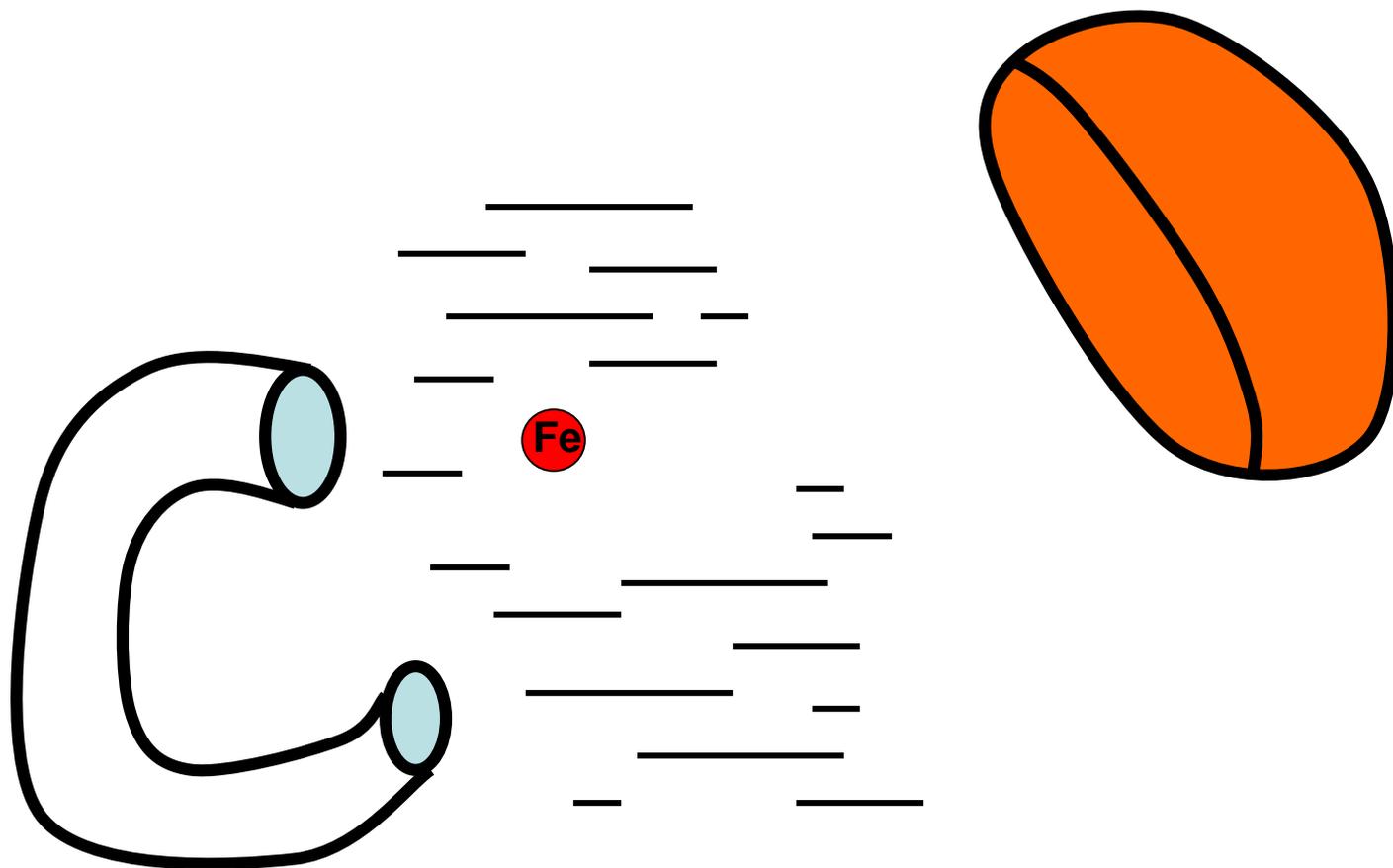


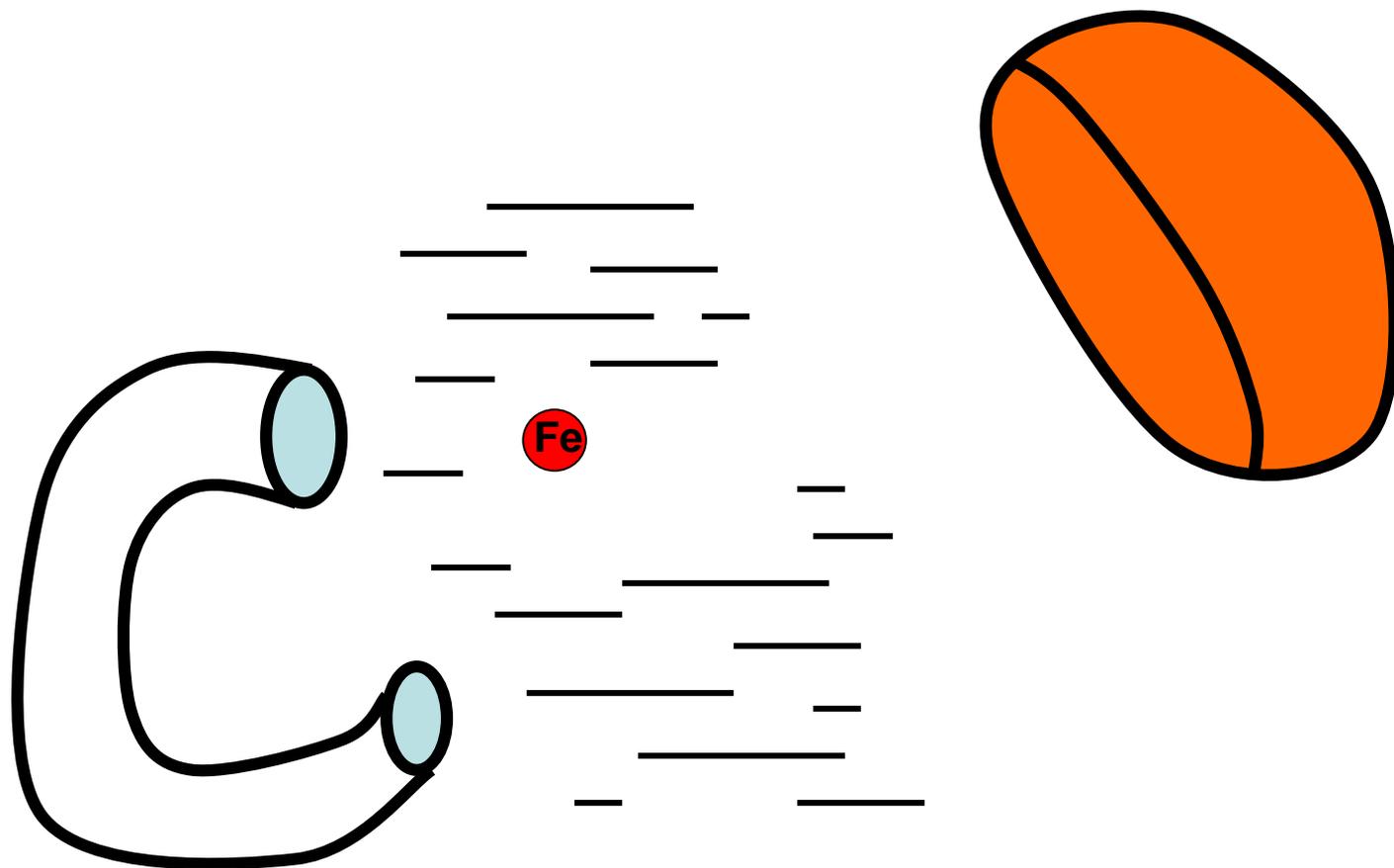


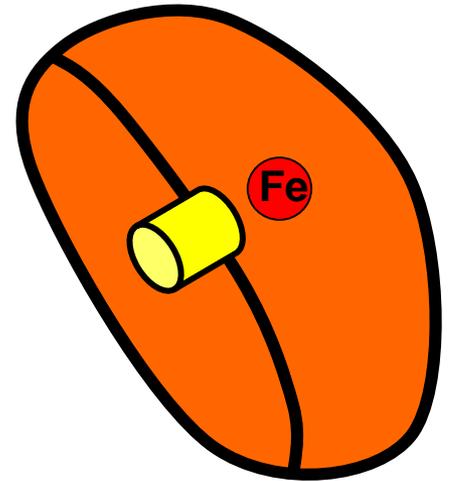
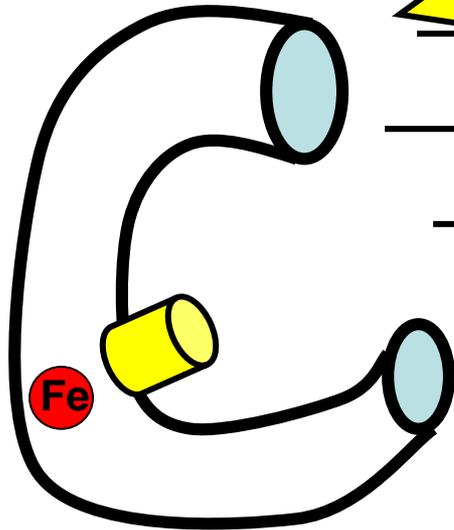
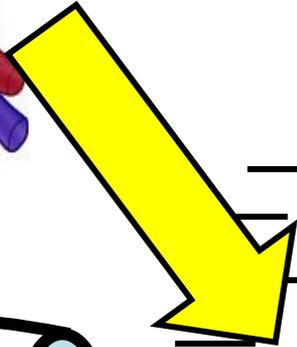
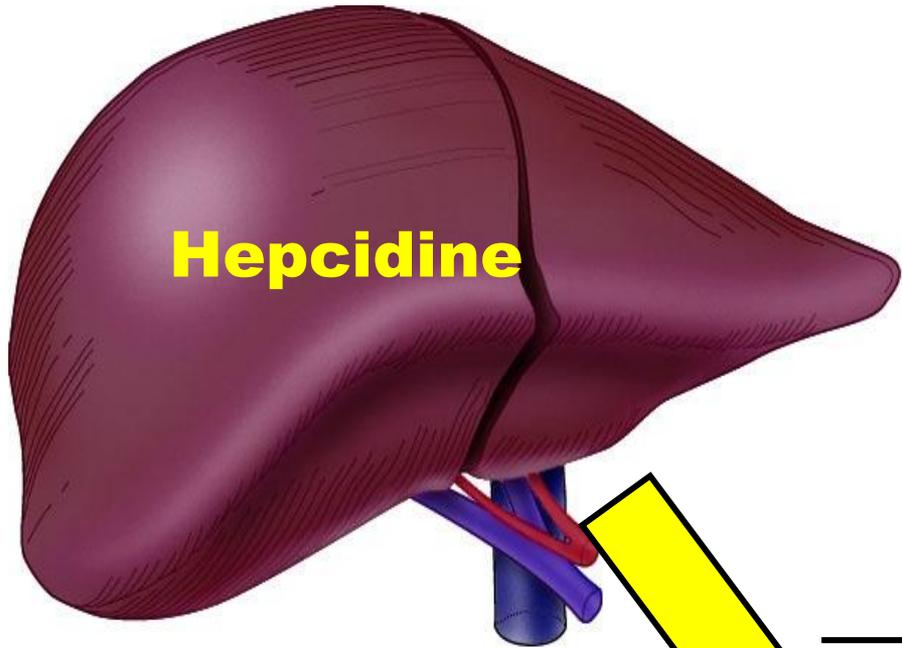


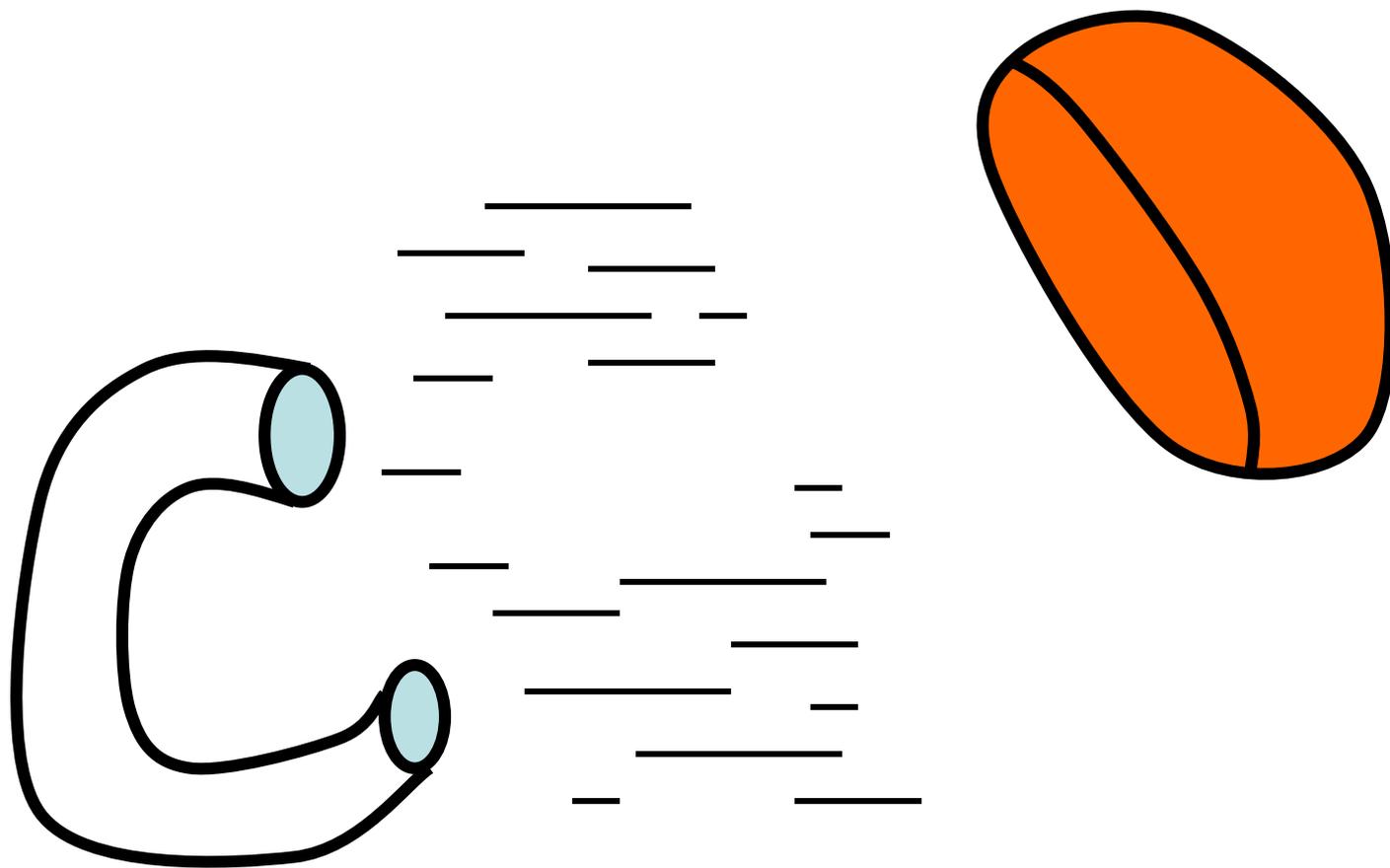


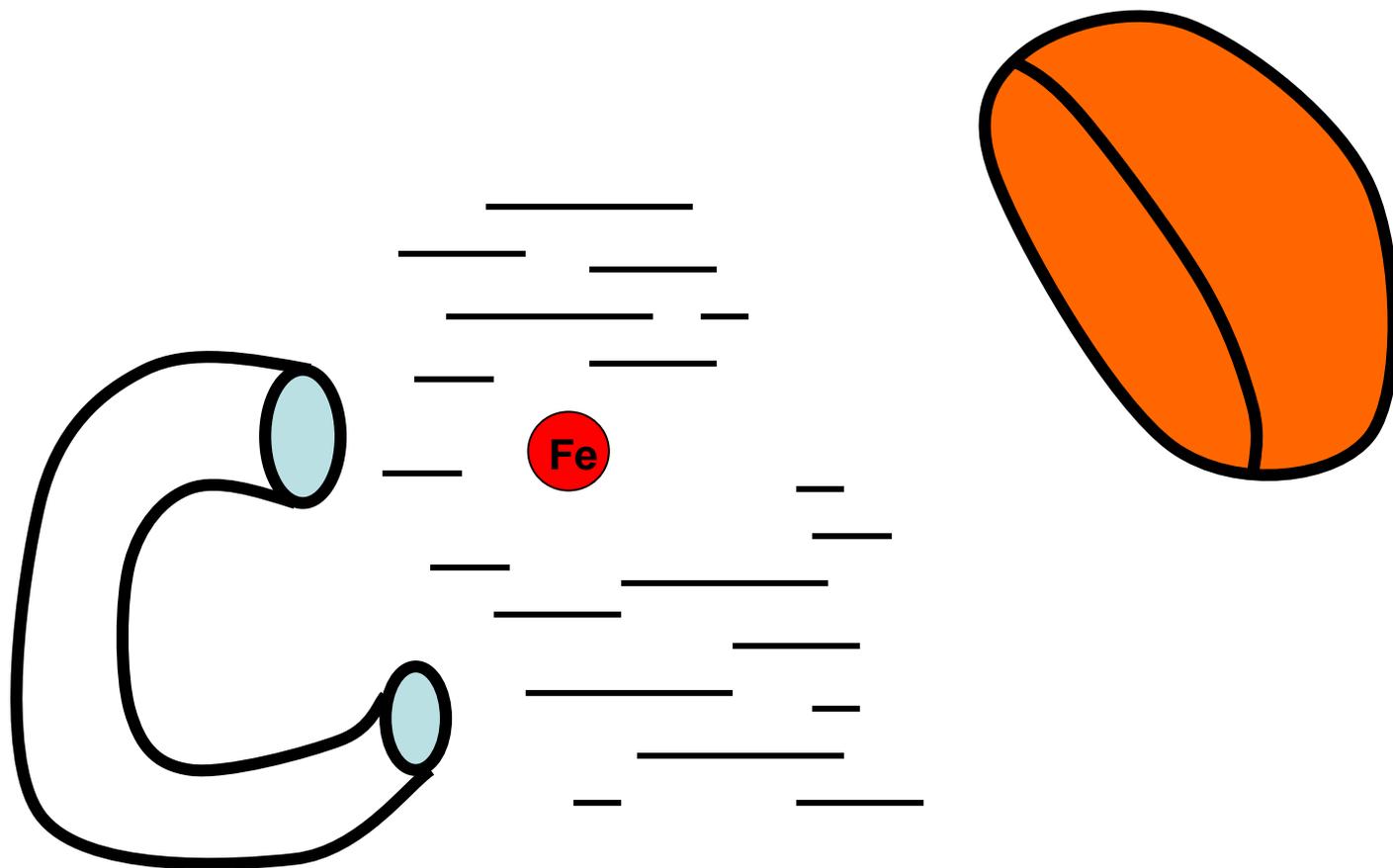




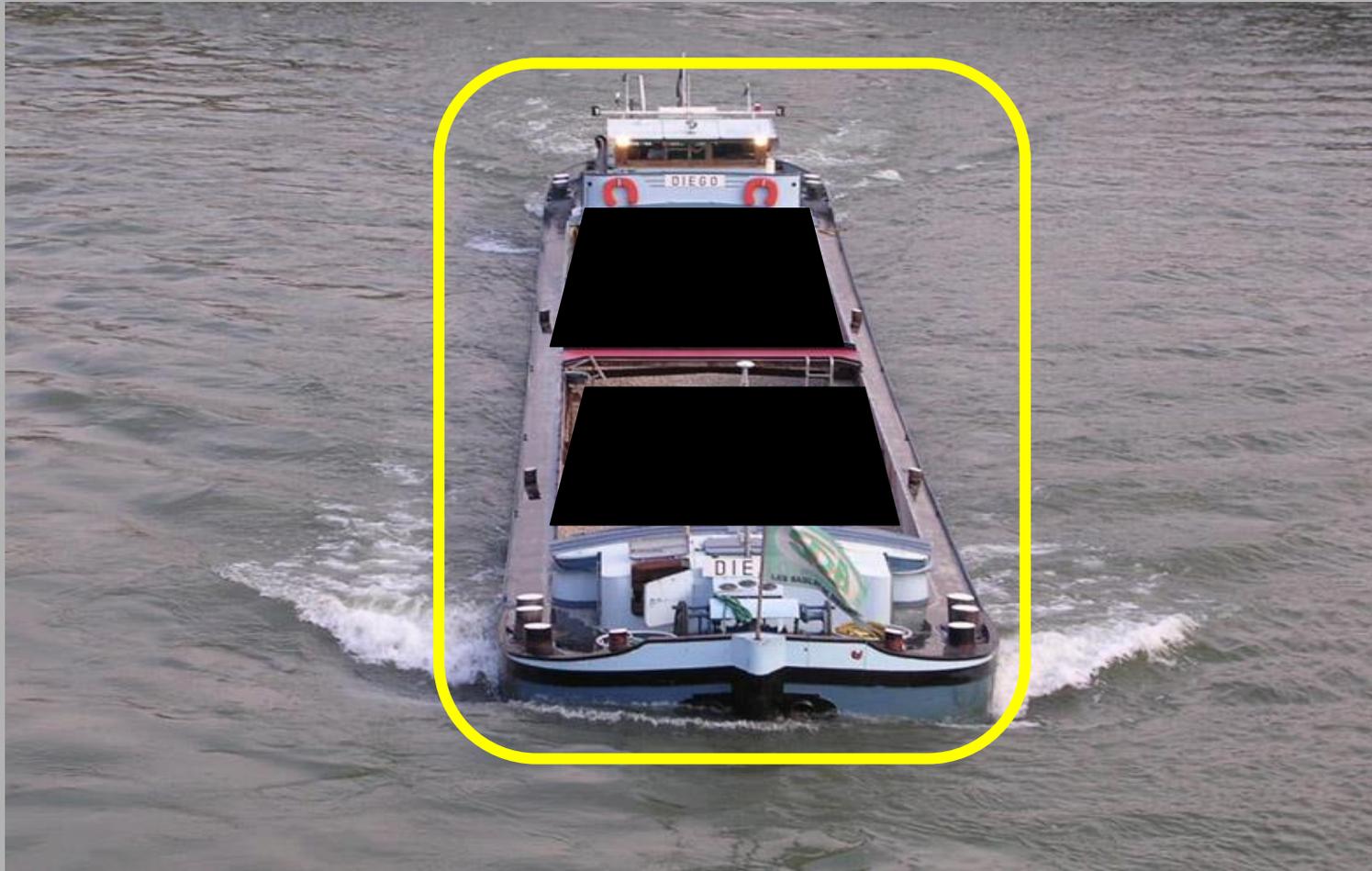








Transferrine





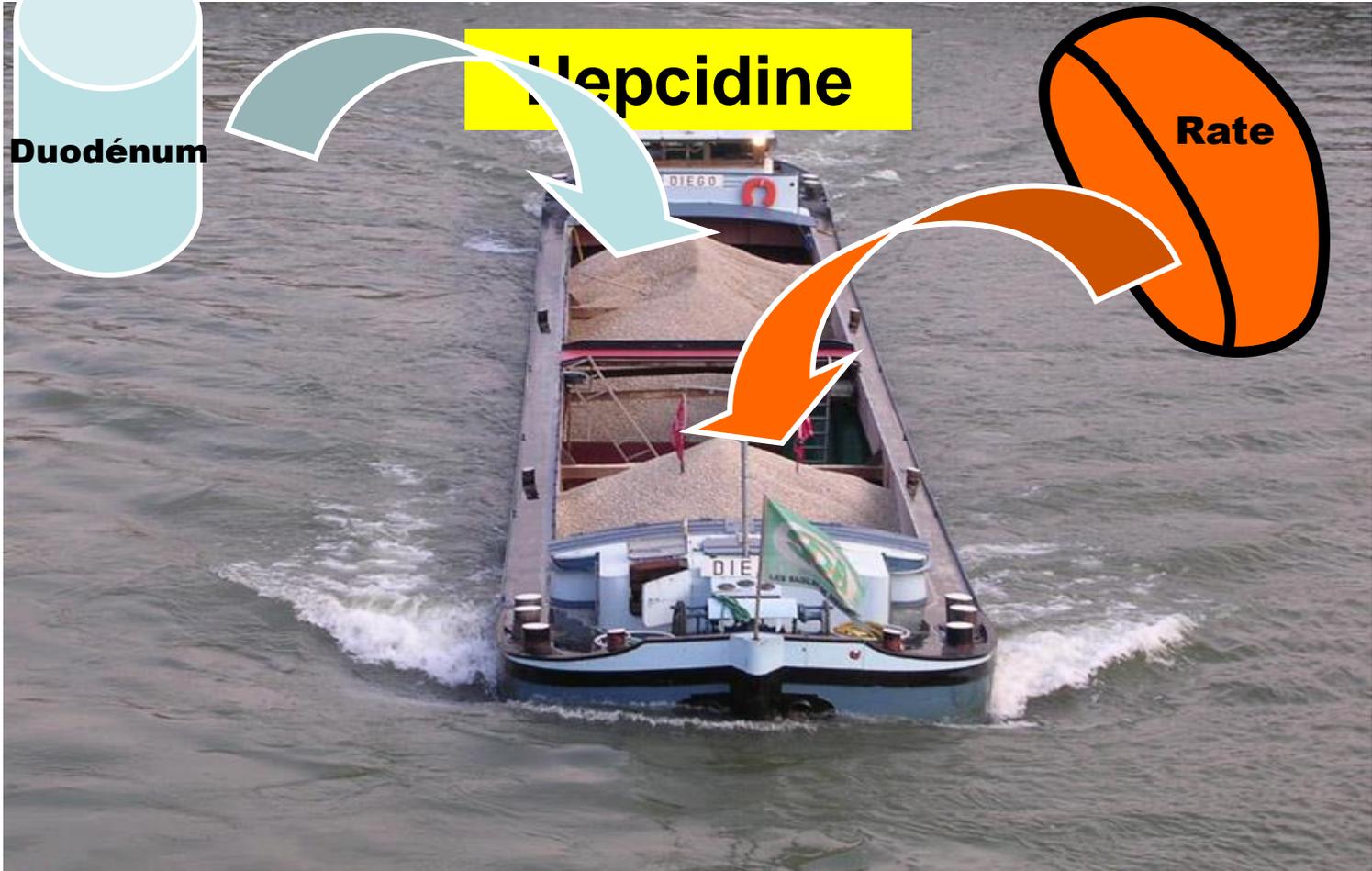
Saturation transferrine (%)



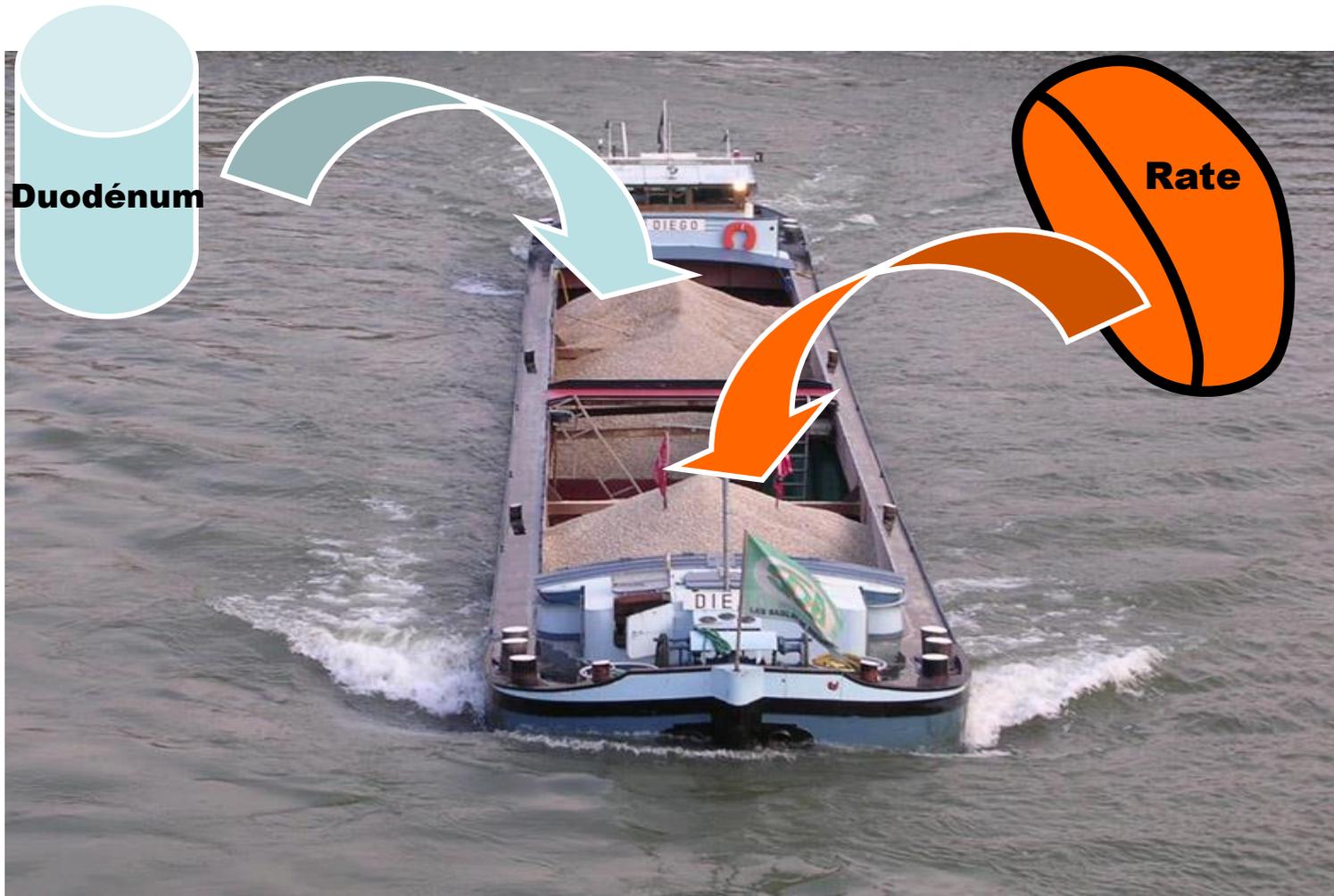
Saturation transferrine < 45%



Hepcidine



Saturation transferrine (%)

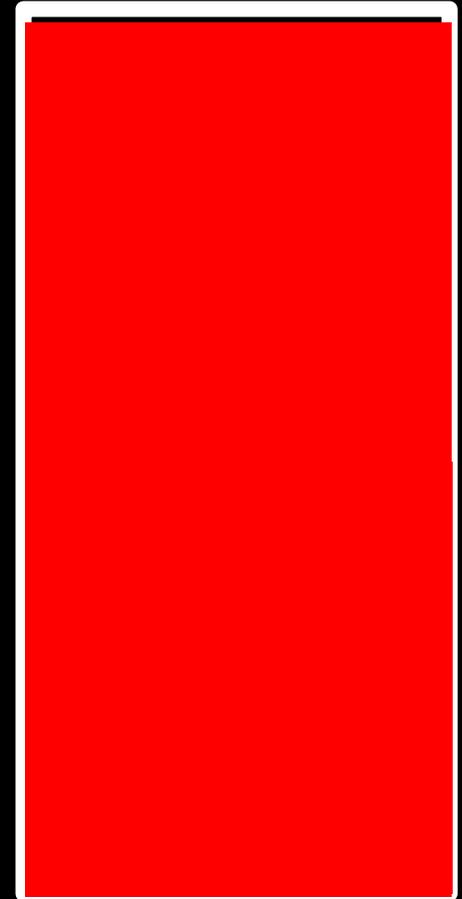
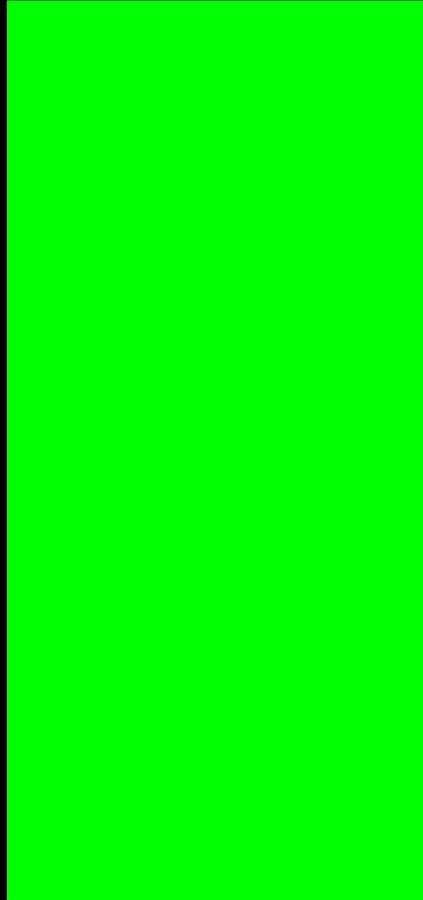
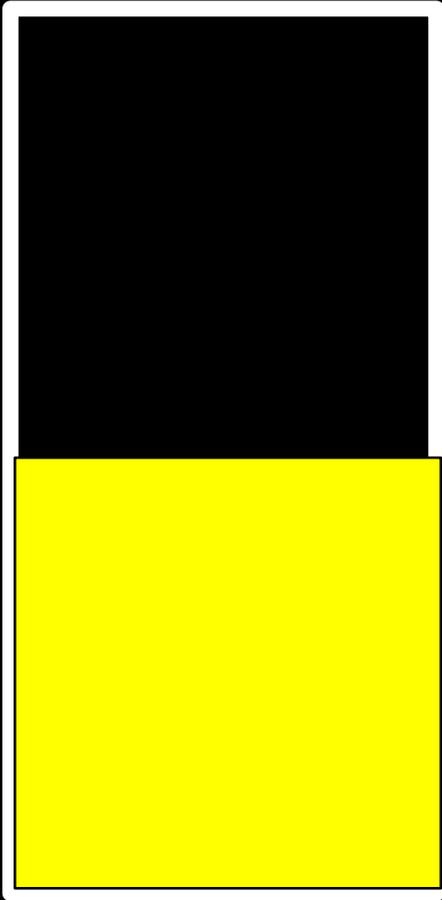


Saturation transferrine (%)

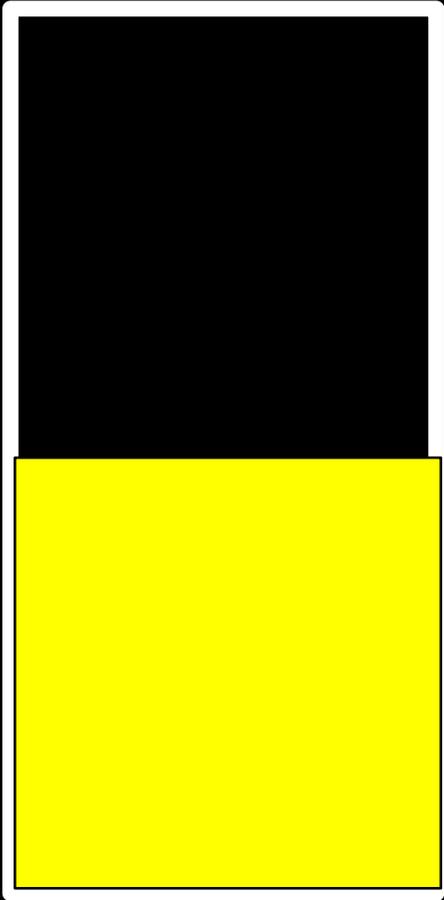
HEPCIDINE

FERROPORTINE

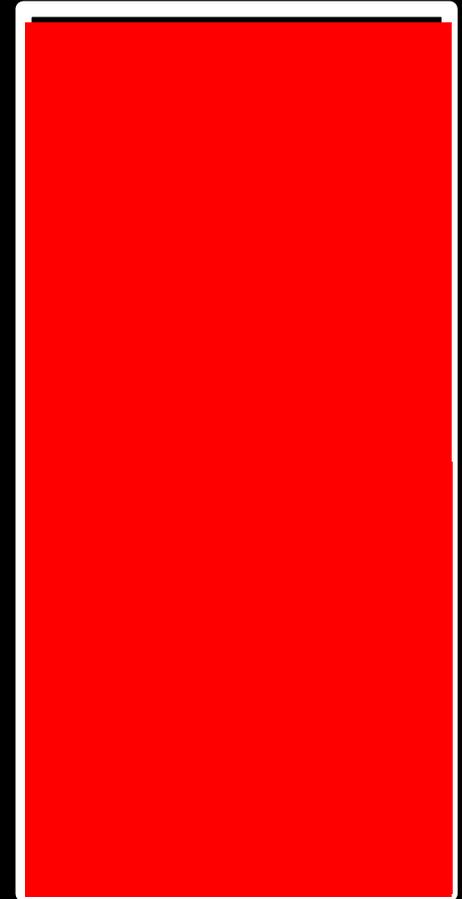
FER



INSULINE



GLUCOSE



Métabolisme du fer

Données «classiques»

Données récentes

Régulation

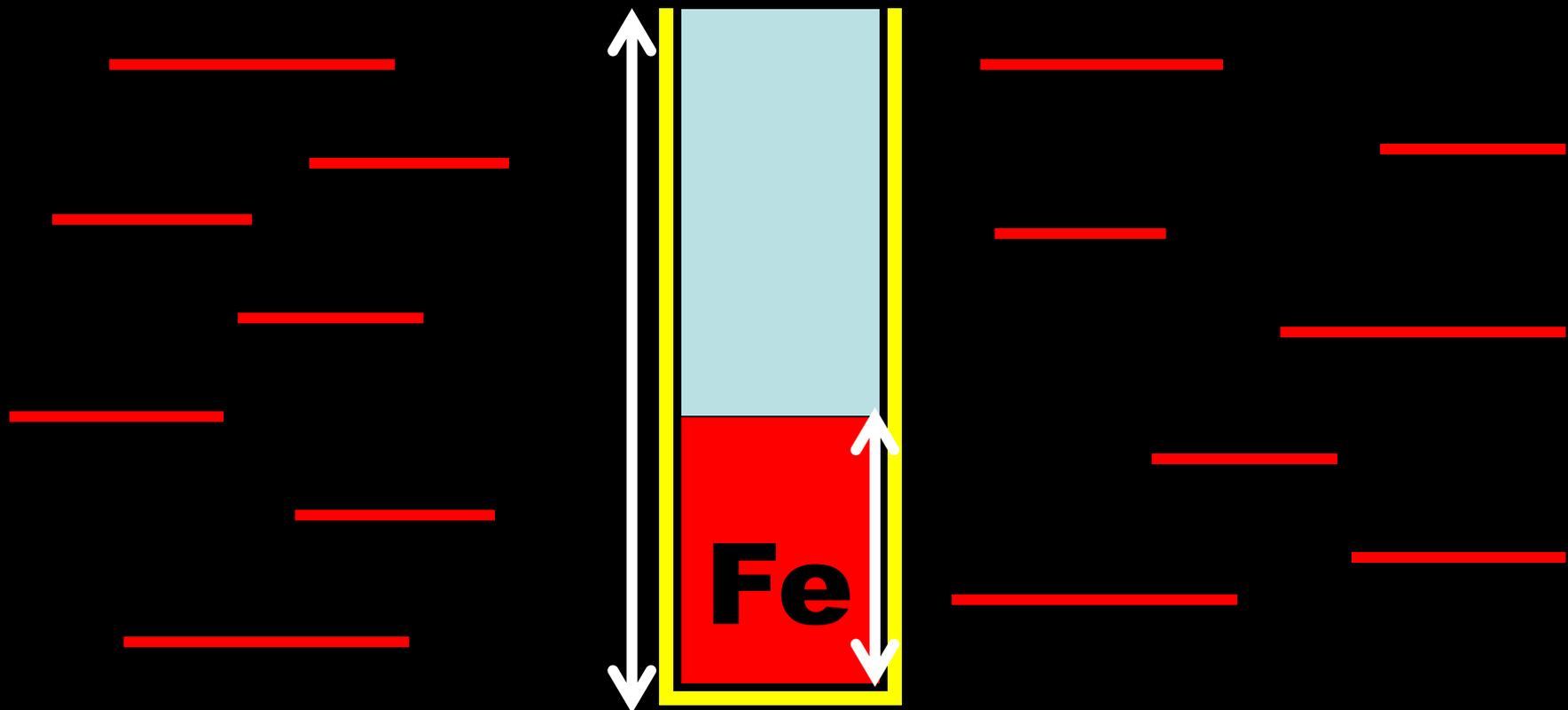
Toxicité

Surcharges en fer

Pourquoi fréquentes ?

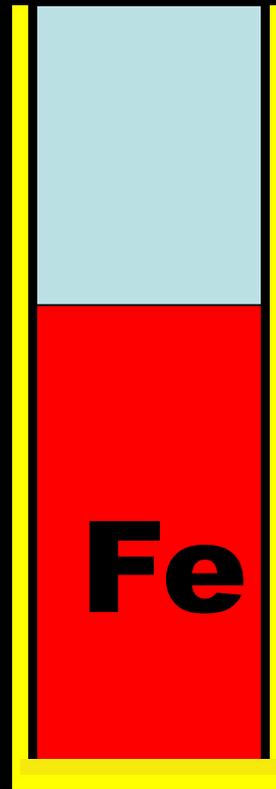
Quelles causes ?

FER NON LIE A LA TRANSFERRINE (FNLT)

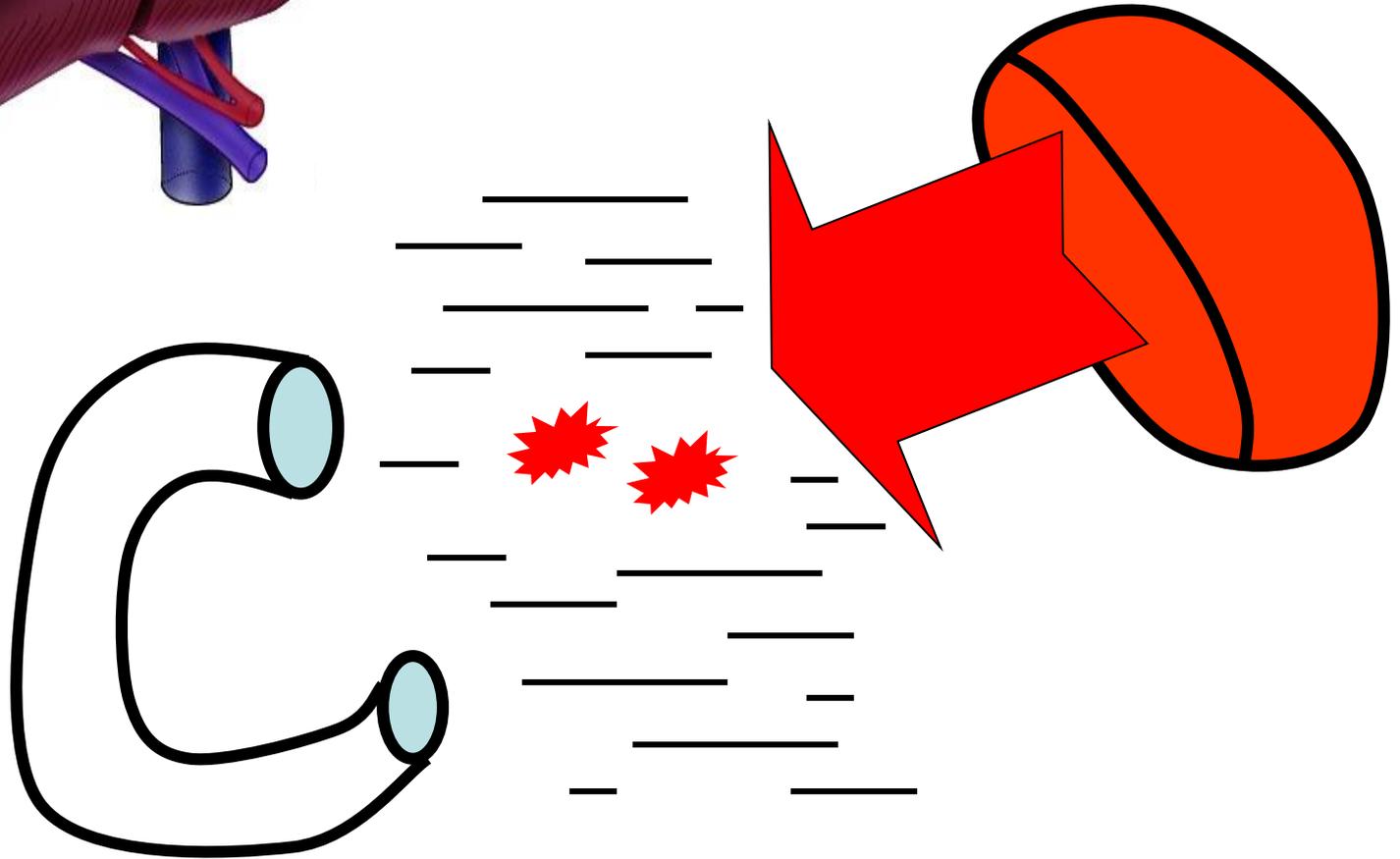
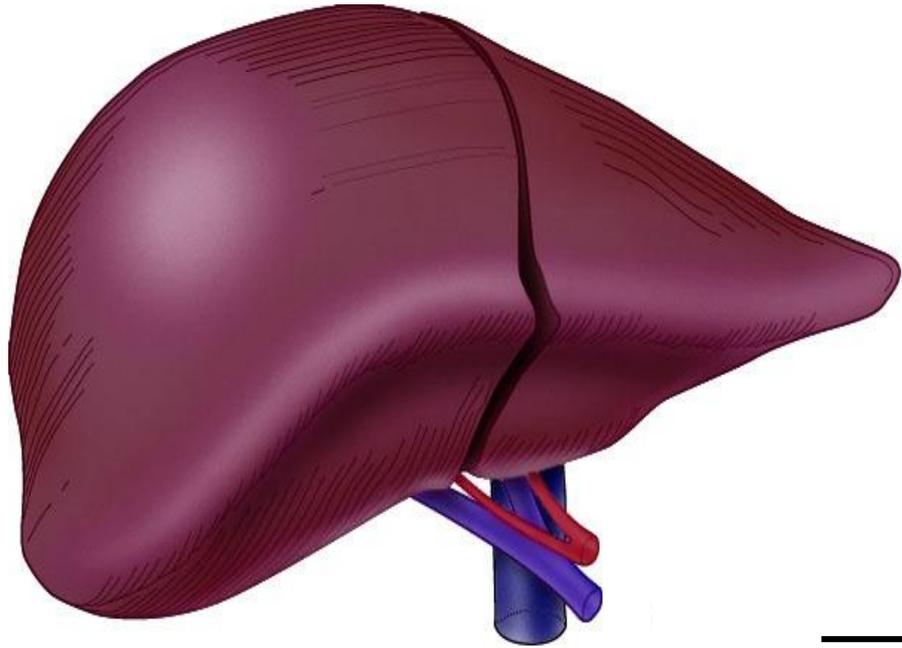


Saturation transferrine = $Fe/Tf < 45\%$

FNLT (Fer Non Lié à la Transferrine)



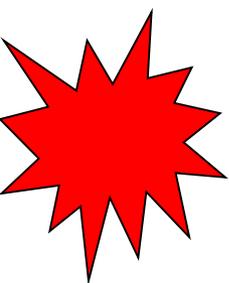
Saturation Transferrine > 45%



FPR (Fer Plasmatique Réactif)



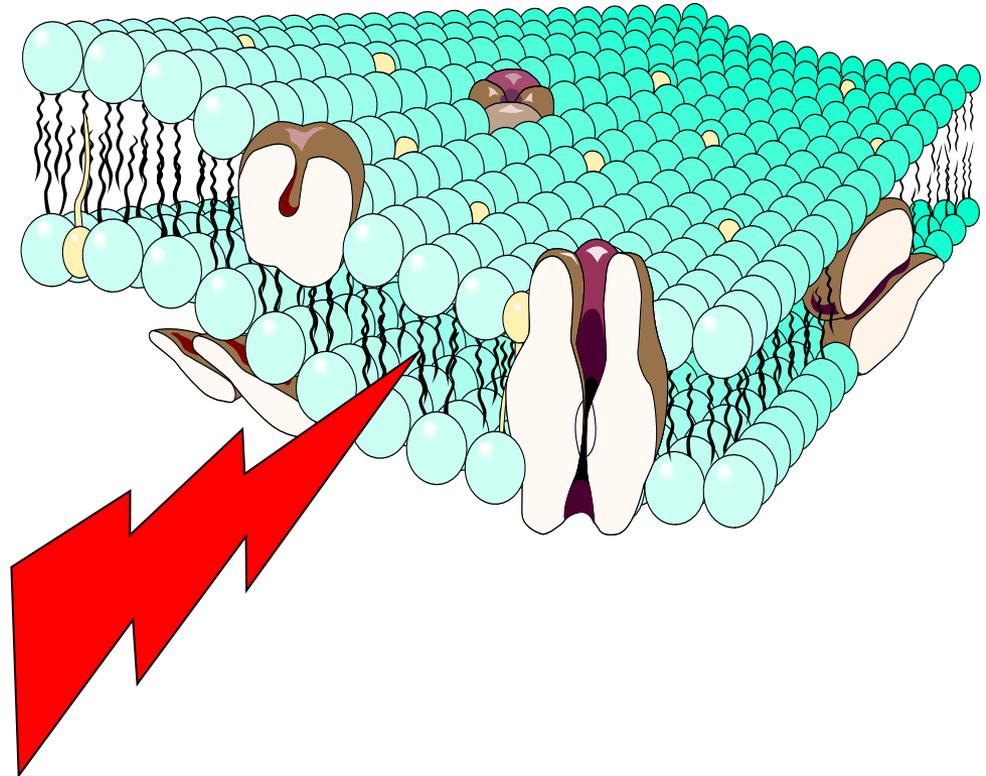
Saturation Transferrine > 75%

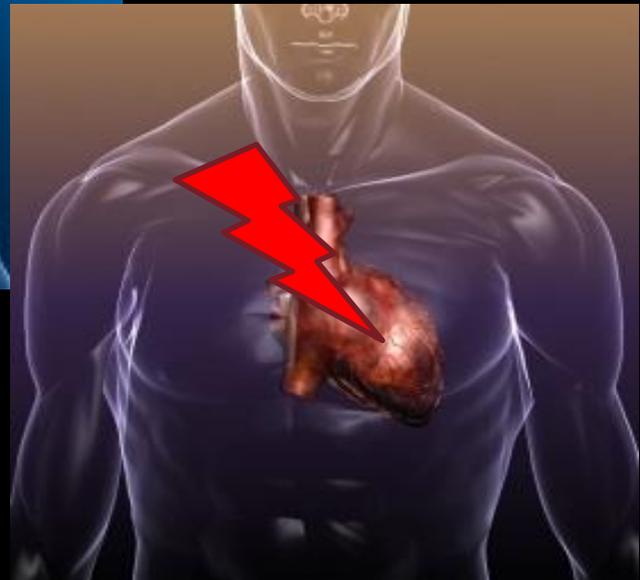
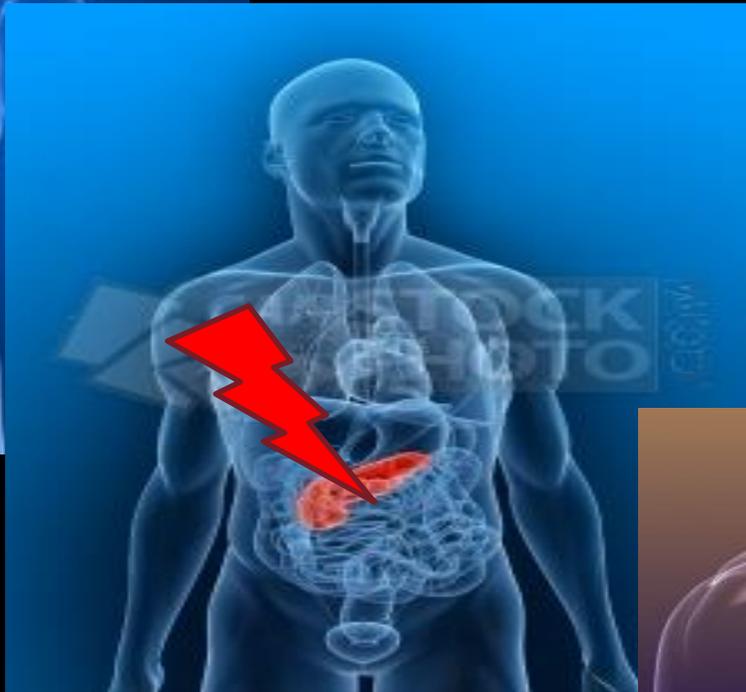
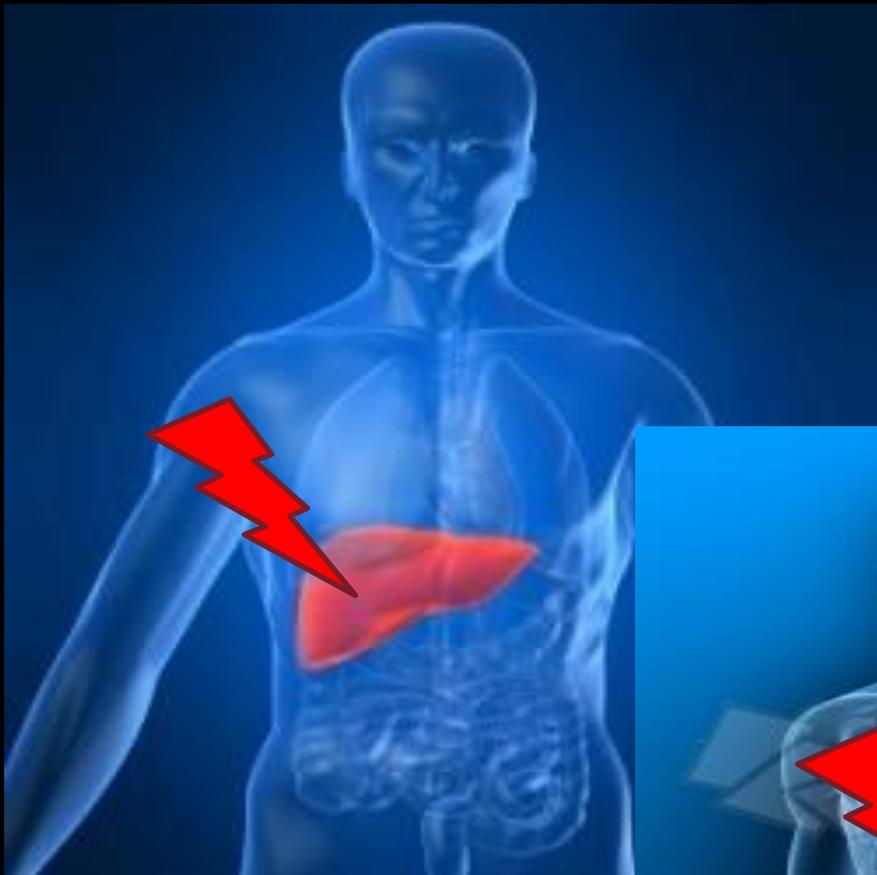


FPR



**Espèces
Radicalaires
Oxygénées**





Métabolisme du fer

Données «classiques»

Données récentes

Régulation

Toxicité

Surcharges en fer

Pourquoi fréquentes ?

Quelles causes ?

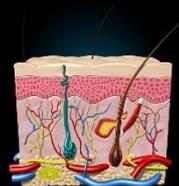
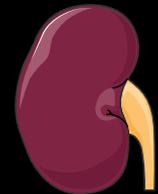
**L'organisme humain est très peu armé
pour excréter le fer**



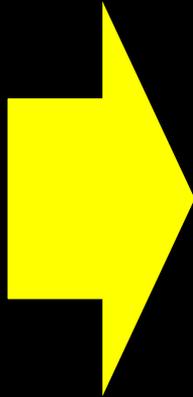
Entrées



Sorties



Entrées



Sorties

Métabolisme du fer

Données «classiques»

Données récentes

Régulation

Toxicité

Surcharges en fer

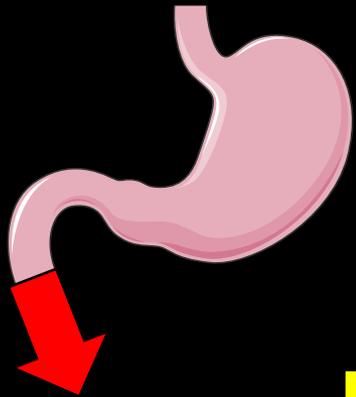
Pourquoi fréquentes ?

Quelles causes ?

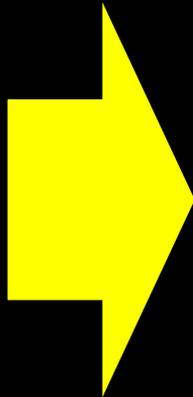
Entrées

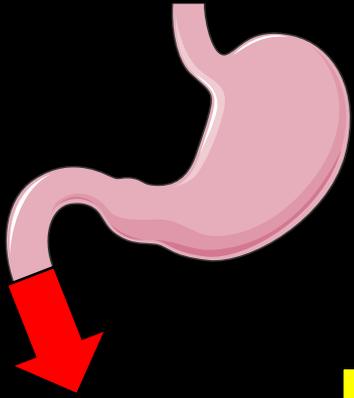


Sorties

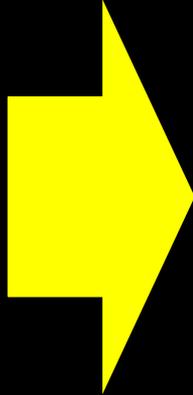


Entrées





Entrées

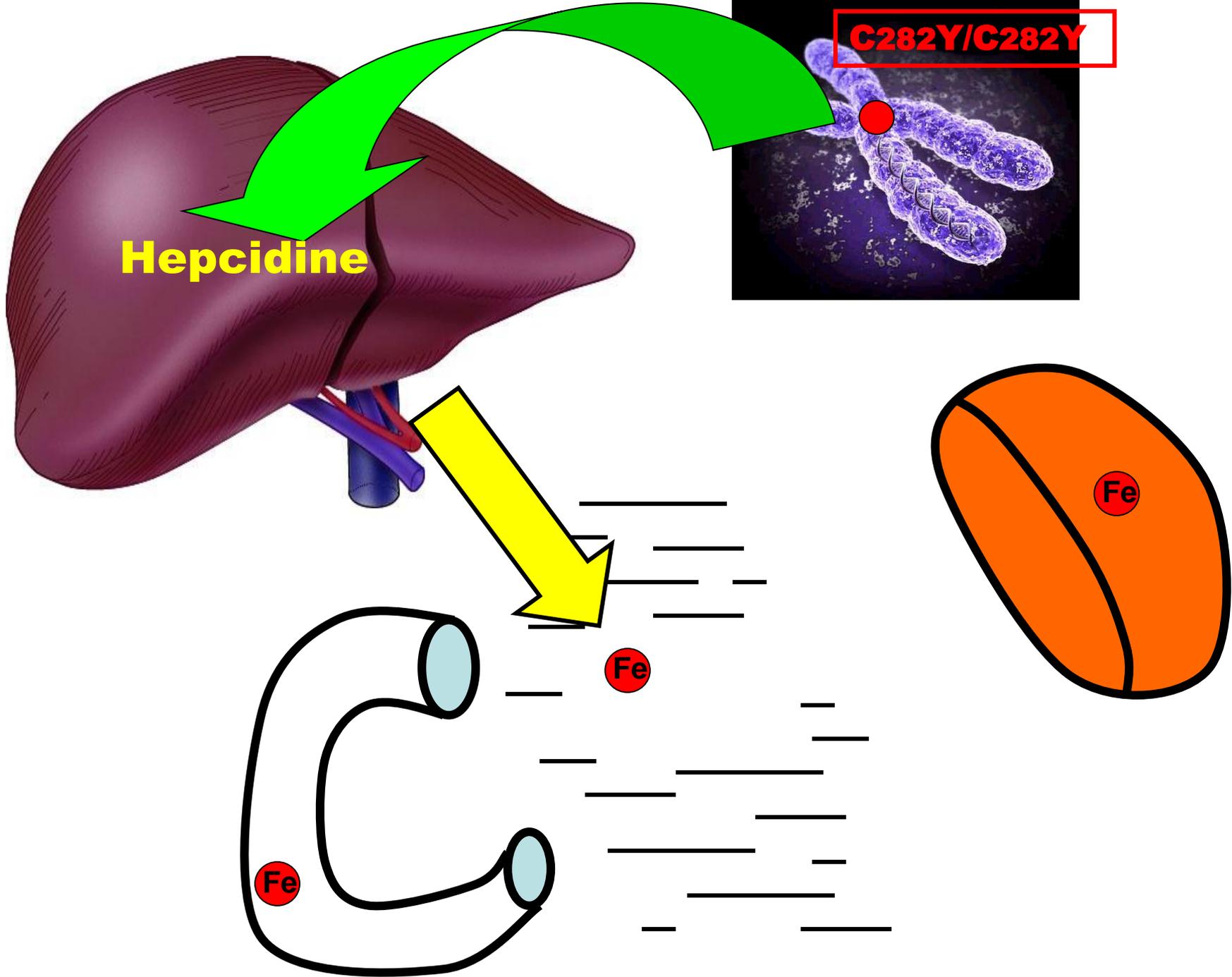


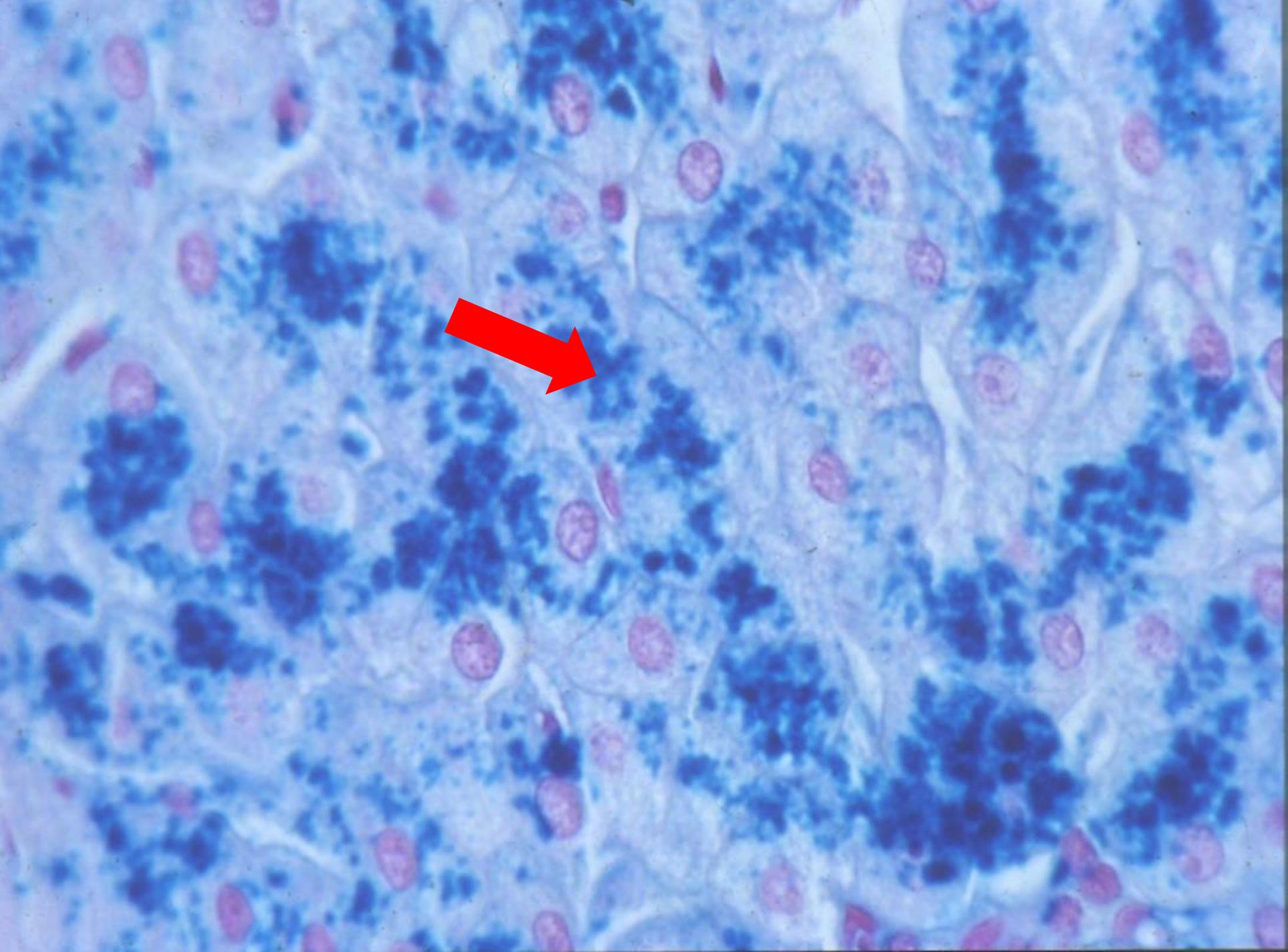
GENETIQUES

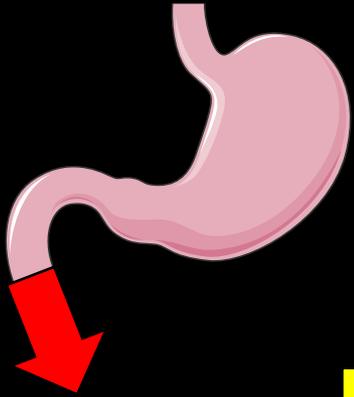
FER

ACQUISES

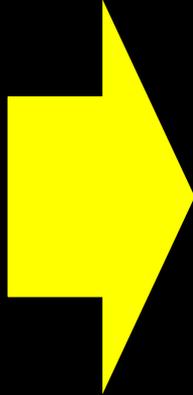
Hémochromatose







Entrées



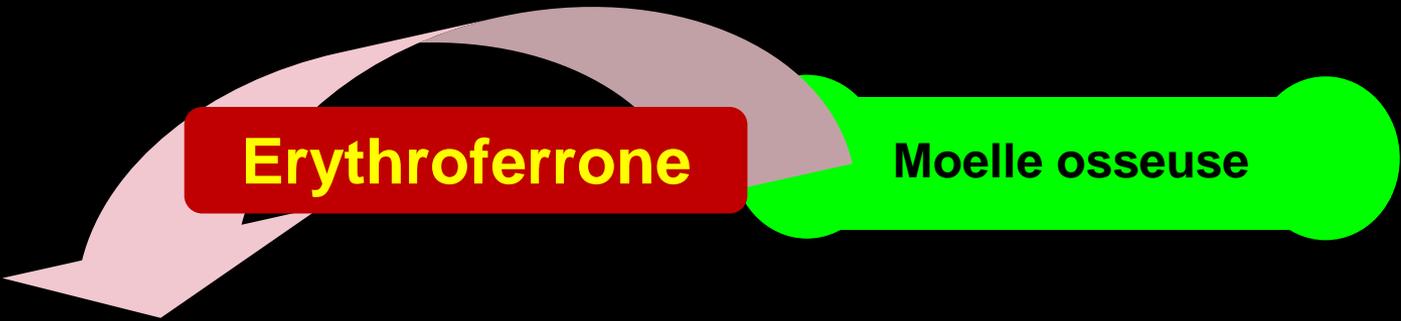
GENETIQUES

FER

ACQUISES

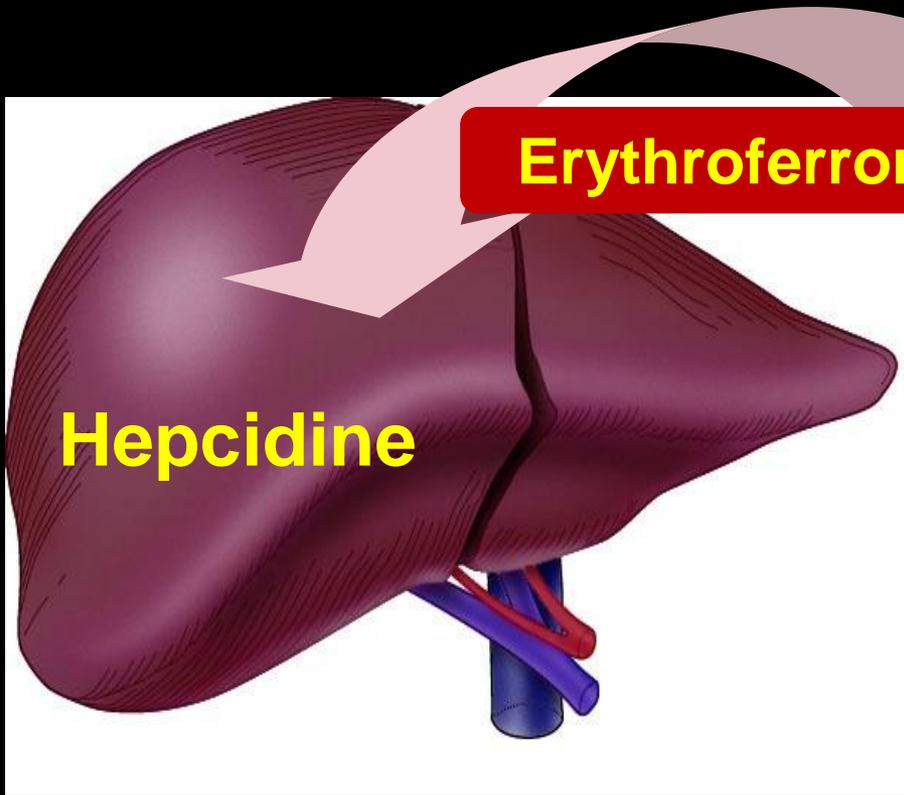
Hémochromatose

Dysérythropoïèse



Erythroferrone

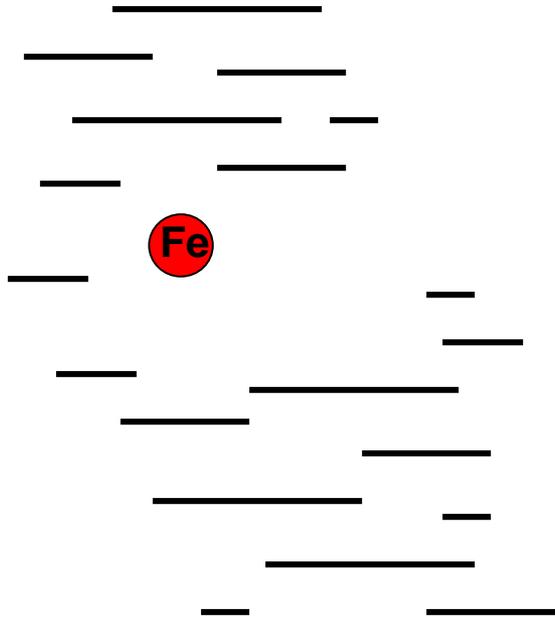
Moelle osseuse

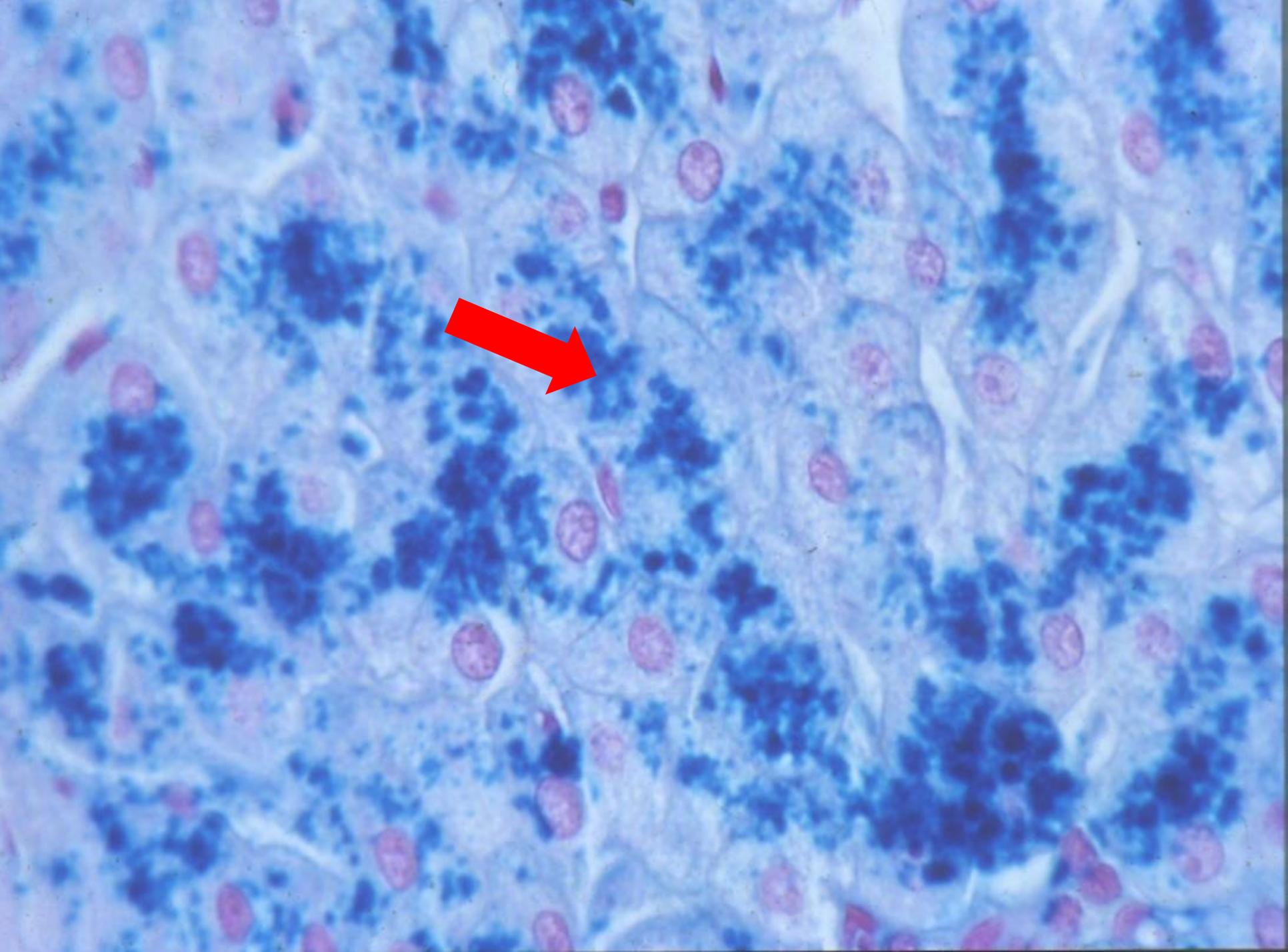


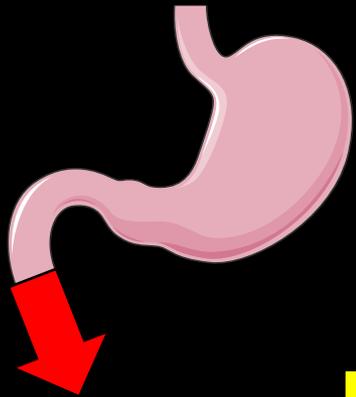
Erythroferrone

Hepcidine

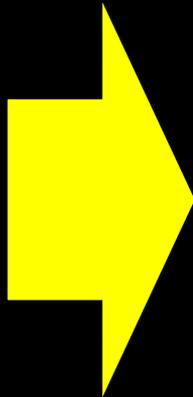
Erythropoïèse inefficace



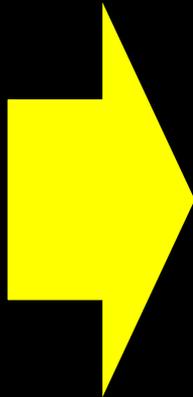
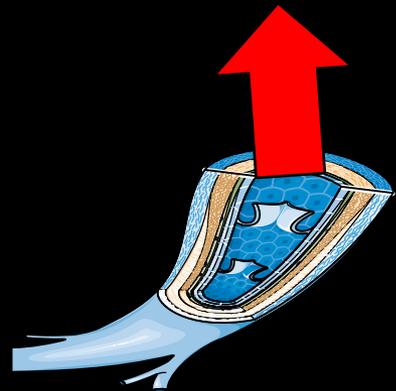




Entrées



Entrées



**ACQUISES
«iatrogènes»**

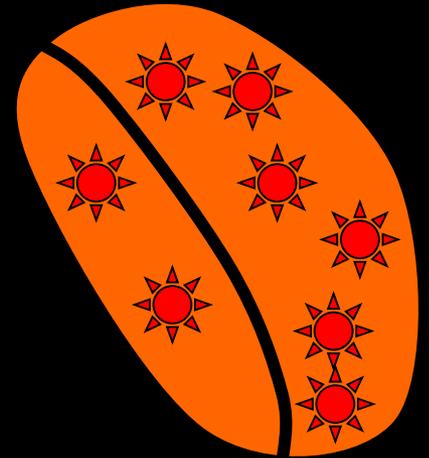
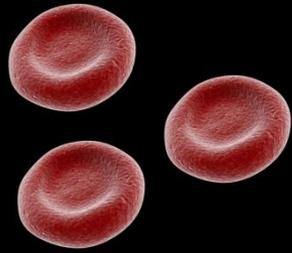


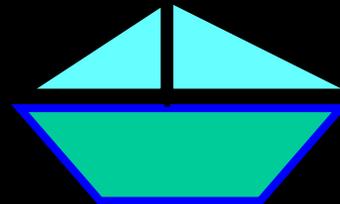
Fer injectable



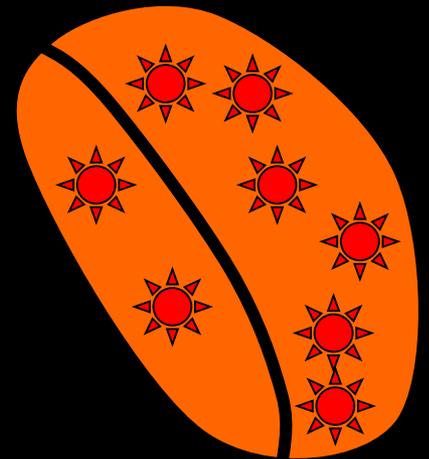
Transfusions

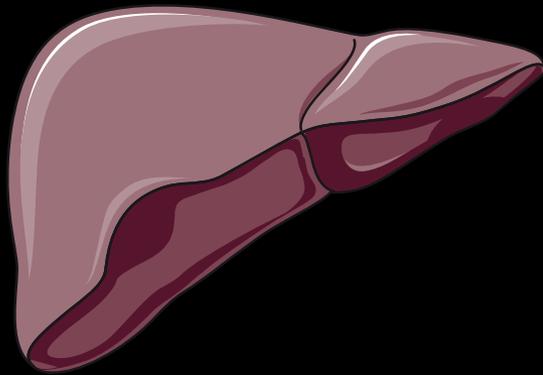




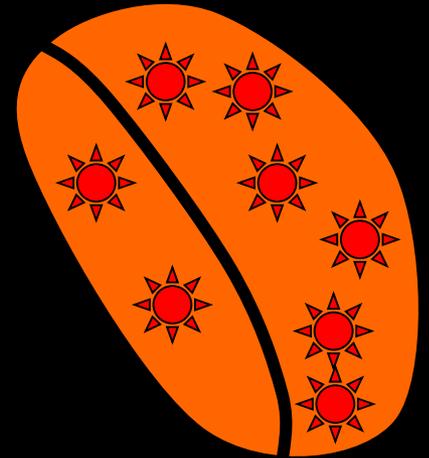
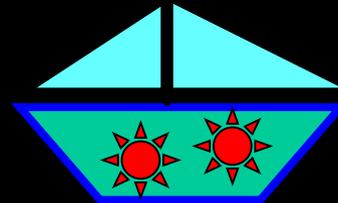


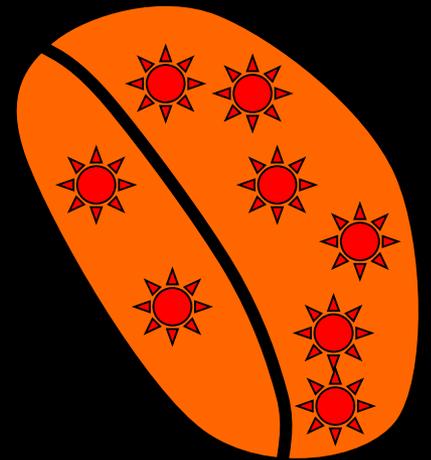
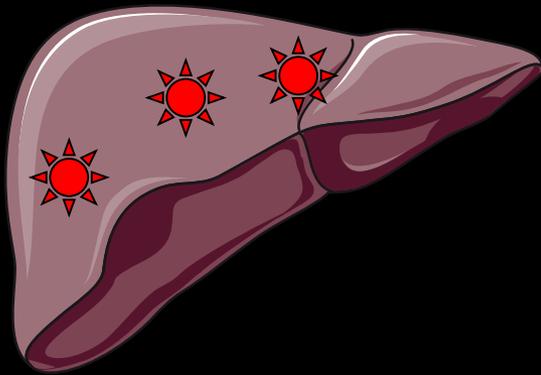
FNLT





FNLT





Résumé (1)

- **Transferrine (transport), ferritine (stockage), hepcidine (régulation), ferroportine (export) sont les 4 grandes protéines du métabolisme du fer**
- **La forte propension à la surcharge en fer s'explique par le peu d'adaptabilité de l'excrétion du fer**
- **L'hypohepcidinémie est responsable de la surcharge en fer dans l'hémochromatose et dans la dysérythropoïèse**

Résumé (2)

- L'hypohepcidinémie, par le biais du FNLT, est responsable d'une surcharge en fer avant tout parenchymateuse (hépatocytaire)
- Le FNLT est la forme circulante potentiellement toxique du fer
- La surcharge transfusionnelle est responsable d'abord d'une surcharge en fer macrophagique (splénique) puis d'une surcharge parenchymateuse (via le FNLT)

Conclusion

Une bonne connaissance de la physiopathologie du fer est importante pour une prise en charge optimale des patients transfusés

QUESTION N° 1

La production d'hépcidine, hormone de régulation systémique du fer, augmente suite à une augmentation physiologique de l'absorption digestive du fer

Réponse : OUI

QUESTION N° 2

La production d'hepcidine est augmentée en cas de surcharge en fer hémochromatosique

Réponse : NON

QUESTION N° 3

La production d'hépcidine augmente suite à une surcharge en fer transfusionnelle

Réponse : OUI