

Natural history of an Iron atom

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(365 words)

This story is quite elementary,
For iron is most necessary,
By this atom though small in size,
Life in fact is catalysed

Consumption of a ferric source,
(Beans or steak for your main course),
Sends iron on its merry way,
To help you live another day

Inside your duodenal intestine,
Iron uptake by absorption,
Moves this elemental species,
Into you and not your faeces,
Once inside an Enterocyte,
Iron pauses or takes flight,
Ferroportin mediated,
To serum, iron is liberated

Another quarry to be mined,
Are Red blood cells that have died,
These rotund red corpuscles,
Parcels packed with rusty metals,
Swallowed whole by Macrophages,
Releasing iron from Heme cages,
Thence once again, through Ferroportin,
Iron to blood, is transported

From blood, Transferrin tries to chelate,
Iron from its sanguineous state,
This union is most essential,

For free iron is detrimental,
Since microbes of many a kind,
Like us, for ferric ions pine,
From bids to steal the host supply,
Transferrin acts to fortify

When pathogens do invade,
And undertake an iron raid,
Another mode of self-defence,
In the liver does commence,
Hepatic HEPcidin is produced,
To keep serum iron running loose,
To Ferroportin it does bind,
Blocks iron export, locks ions inside

Transferrin with its iron crown,
Will quick become receptor bound,
Intake via endosome,
Brings iron to its brand new home,
Surplus stored in Ferritin vaults,
In case external supply ever halts,
The rest dependant on each cell's needs,
To different pathways it does feed,

For what is iron used, you ask?
Well, it's put to work at many a task,
Red cell Hemoglobin claims two thirds,
And like a shepherd tries to herd,
Oxygen with all its might,
Through blood to every tissue site,
The rest is used by other cells,
In both cytosol and organelles

ONE – In DNA synthesis it plays a role,
In Primases and DNA pols,
TWO – Mitochondrial metabolism,
(But try to avoid toxic oxygen radicalism),
THREE – epigenetic regulation,
For Histone and DNA demethylation,
FOUR – other roles are rather muddy,
And definitely warrants further study

In short, I hope you've come to see,
Via this peculiar poetry,
The importance of this element,
Deems work on it, time well spent