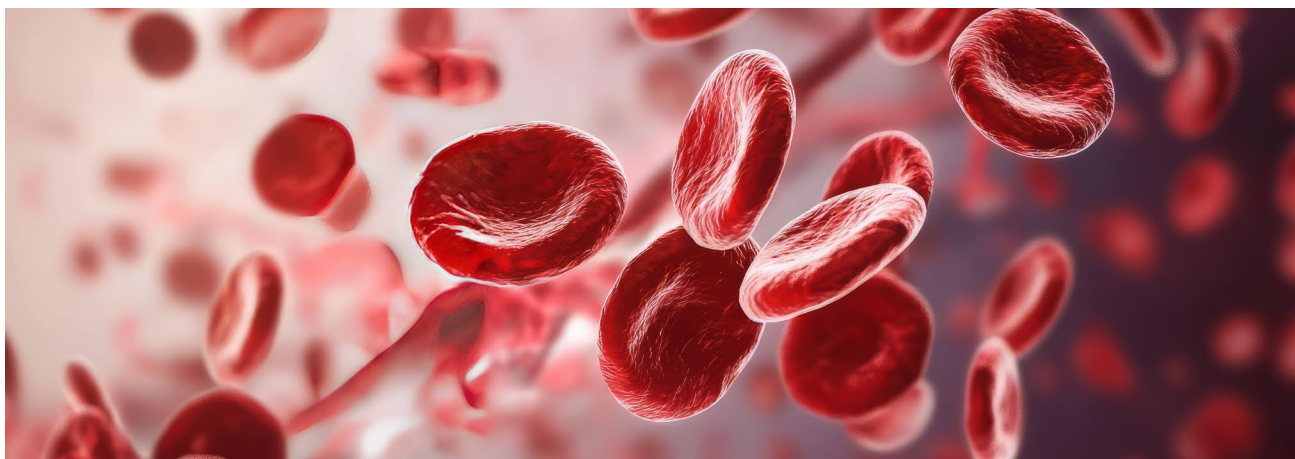


## Licensing Opportunity

# Next generation of iron supplementation addressing iron deficiency and anaemia



### Application

This invention bears the potential to become the next generation of iron supplementation, addressing the global challenge of iron deficiency. Novel Fe(II)-fortified dietary supplements efficiently deliver iron in the optimal bioavailable form to the body. By blending into various foods and drinks without affecting taste or aroma, they are also very well suited for vegetarian and vegan diets.

### Features & Benefits

- high iron uptake demonstrated in Human Studies
- superior sensory performance
- available in powder and liquid forms
- extended shelf-life and low costs
- vegan product

### Publication

- *Nature Nanotechnology*, **12**, 642-647 (2017)  
<https://doi.org/10.1038/nnano.2017.58>
- *Preprint* "Oat protein nanofibril-iron hybrids ..."  
<https://doi.org/10.1101/2025.01.24.25321072>
- Patent granted EP, US, [WO2018166947](https://patents.google.com/patent/WO2018166947)

### Background

Iron deficiency anaemia (IDA) is a global public health problem. A cost-effective strategy to reduce IDA is iron fortification of foods. Ideally Fe(II) nanoparticles are added to the food as it is the most bioavailable state of iron. In aqueous drinks and food, however, Fe(II) nanoparticles rapidly aggregate because of their limited colloidal stability. Moreover, dry powder of Fe(II) nanoparticles easily oxidizes due to the large surface area.

### Invention

Amyloid fibrils serve as excellent carriers for Fe(II) nanoparticles, forming a stable hybrid material. In the stomach, gastric acid rapidly dissolves Fe(II), while the fibrils undergo slow enzymatic hydrolysis, ensuring efficient iron delivery and preventing particle aggregation. The final product can be freeze-dried for easy storage and transportation. The amyloid fibrils may originate from various protein sources, such as high-quality oat flake powder, leading to an improved and environmentally sustainable nutrition.

These iron supplements have been rigorously tested in mouse models, demonstrating safe and effective iron delivery with no abnormal accumulation in any organ.

Human clinical studies (ID N° NCT05826899) successfully validated the use of the iron supplements, showing outstanding Fe(II) bioavailability: In iron-deficient women, absorption is found to be 66-76% higher than the reference compound and gold standard FeSO<sub>4</sub>. Besides, it causes minimal sensory alterations, unlike FeSO<sub>4</sub> that induces unpleasant changes in foods.



### ETH transfer

transfer@sl.ethz.ch  
[www.ethz.ch/transfer](http://www.ethz.ch/transfer)  
Reference 2017-009

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### Technology Readiness Level

