

Table of Contents

Definitions	III
Abbreviations	IV
Summary	1
Zusammenfassung	4
Introduction	8
Literature Review	11
1. Iron metabolism	11
1.1 Cellular iron metabolism	13
1.2 Systemic iron metabolism	16
1.3 Interplay of cellular and systemic iron metabolism	22
1.4 Therapeutic opportunities using hepcidin	23
2. Iron deficiency and iron deficiency anemia	25
2.1 Prevalence	25
2.2 Diagnosis	26
2.3 Etiology	27
2.4 Consequences	28
2.5 Approaches to prevent and treat ID and IDA	29
3. Inflammation and iron metabolism	31
3.1 Inflammation and hepcidin	31
3.2 Inflammation and erythrocyte production and turnover	32
3.3 Iron sequestration and infection	33
3.4 Non-transferrin bound iron	34
3.5 Anemia of Inflammation	35
4. Methods for hepcidin quantification	41
4.1 First successes in hepcidin measurement	41
4.2 Immunoassays	43
4.3 Mass spectrometry	45
4.4 Comparability of hepcidin values measured with different methods	46

5. Iron bioavailability	48
5.1 Subject factors influencing iron bioavailability	48
5.2 Dietary factors influencing iron bioavailability.....	49
5.3 Hepcidin as a predictor for iron bioavailability	51
6. Oral iron supplementation in ID and IDA	53
6.1 Current recommendations for oral iron supplementation	53
6.2 Improving iron supplementation dosing regimens	55
6.3 Iron compounds	59
6.4 Side effects and compliance.....	59
7. Techniques to measure iron bioavailability.....	62
7.1 Isotope techniques	62
7.2 Non isotopic techniques	65
8. References	66
Manuscript 1	88
Prediction of human iron bioavailability using rapid c-ELISAs for human plasma hepcidin	
Manuscript 2	102
Iron absorption from oral iron supplements given on consecutive versus alternate days and as single morning doses versus twice-daily split dosing in iron-depleted women: two open label, randomized controlled trials	
Manuscript 3	123
Iron absorption from supplements is greater with alternate day than with consecutive day dosing in iron-deficient anemic women	
Manuscript 4	140
The opposing effects of acute inflammation and iron deficiency anemia on serum hepcidin and iron absorption in young women	
General Discussion and Conclusion.....	159
CURRICULUM VITAE	170