

(様式1)

公益社団法人日本栄養・食糧学会研究業績

<学 会 賞>

1. 候補者

研究題目:(和)	マグネシウムを中心としたミネラル栄養に関する基礎的研究		
(英)	Basic studies on nutrition of minerals centered on magnesium		
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所属機関:(和)	京都大学大学院農学研究科応用生物科学専攻、教授		
(英)	Division of Applied Biosciences Graduate School of Agriculture, Kyoto University, Professor		
学 位:	博士(農学)	最終学歴:	昭和 60 年 3 月、京都大学農学研究科畜産学専攻博士課程修了
専門分野	①栄養生理学、②栄養生化学、③分子栄養学、④公衆栄養学、⑤臨床・病態栄養学、⑥食生態学、⑦調理科学、⑧食品化学・食品分析学、⑨食品機能学、⑩食品工学、⑪食品加工・流通・貯蔵学、⑫食品衛生・安全学、⑬生理学、⑭生化学、⑮分子生物学、⑯臨床医学(内科系)、⑰臨床医学(外科系) ⑱その他		
履 歴	昭和 60 年 4 月 島根大学農学部助手 昭和 60 年 9 月～昭和 60 年 8 月 アメリカ合衆国ケンタッキー大学農学部博士研究員 平成 4 年 8 月 京都大学農学部助教授 平成 19 年 5 月 京都大学大学院農学研究科教授 現在に至る。		
会員番号:		入会年度:	平成5年

2. 研究業績要旨(1,000 字以内)

候補者は、日本人において不足しがちなマグネシウム (Mg) 栄養に関する基礎的研究や炎症性貧血発症解明の基盤となるヘプシジン発現調節に関する研究を実験動物と培養細胞を用いて行ってきた。

海藻類に含まれる Mg の生体利用性の差は溶解性のみでは説明できず、消化管内容物中溶解性画分における形態にも依存することを示唆した (8)。安定同位体 Mg をトレーサーとして用い、飲水中 Mg の吸収性は一回あたりの摂取量や飲水中 Mg 濃度の影響を受けることから、Mg の消化管内通過速度がその吸収に影響を及ぼすことを示した (7)。また、低 Mg 飼料給与時には脂肪およびスクロースの過剰摂取が Mg 欠乏を増悪させることを明らかにした (2)。

候補者は Mg 欠乏によって生じる未知の異常を見出すための検討も行っており、Mg 欠乏は肝臓中マスト細胞数を増加させることを明らかにし、これが脂肪性肝疾患発症につながる可能性を示した (5)。肝臓および肝臓を構成する細胞のモデル培養系を用い、代謝産物の網羅的解析によって Mg 欠乏の影響を検討し、Mg 欠乏時に肝臓で生じるハイポタウリン濃度上昇は肝細胞でも認められること、肝臓で生じるプトレッシン濃度低下は肝細胞では認められないが、マクロファージ系細胞で生じていることなどを明らかにした (1, 4)。ミネラル代謝間相互作用のため、あるミネラルの不足は他のミネラルの過不足を二次的に促進することがある。候補者は Mg 欠乏時の肝臓中金属元素の網羅的解析を行い、モリブデンなど9つの金属元素濃度が変動することを見出すとともに (9)、Mg 欠乏時にはモリブデントランスポーター2 (Mot2) の遺伝子発現が低下することを示した (18)。カルシウム欠乏は Mg 欠乏と協調し肝臓中亜鉛濃度を上昇させるが、Mg 欠乏による肝臓中亜鉛トランスポーター (Zip14) の発現増加、カルシウム欠乏による骨からの亜鉛放出促進が肝臓中亜鉛濃度を上昇させることを明らかにした (6)。Mg 欠乏時の肝臓中铁含量増加に応答し BMP6 遺伝子発現が増加するにもかかわらず、その下流の鉄吸収抑制ホルモンであるヘプシジン遺伝子発現は増加しないことから、Mg 欠乏はヘプシジン発現応答を抑制することによって鉄代謝を乱すことを示した (10)。

この研究以降、炎症性貧血発症解明の基盤となるヘプシジン転写調節機構に研究を展開し、炎症性サイトカインであるアクチビン B や IL-1 β がヘプシジン発現を亢進する機構を明らかにしてきた (3,11,13)。

3. 報文等リスト

(1) この研究に直接関連するもの(10 編以内)

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(2) その他の論文(編数制限なし)

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- その他の原著論文
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(3) 過去 5 年間の本学会での活動状況

1) 理事

平成 28 年度～平成 29 年度 業務執行理事 (編集担当)

2) 委員会・その他

平成 26 年度～ 代議員

平成 26 年度～ 利益相反委員会委員

平成 26 年度～平成 27 年度 学会誌編集委員会副委員長

平成 26 年度～平成 27 年度 ありかた検討委員会

平成 26 年度～平成 29 年度 用語委員会委員長

平成 26 年 1 月～平成 28 年 12 月 Journal of Nutritional Science and Vitaminology 編集委員会副委員長

平成 27 年度～ 日本医学会分科会用語委員会委員 (本学会選出)

平成 28 年度～平成 29 年度 学会誌編集委員会委員長

平成 28 年度～平成 29 年度 将来構想委員会委員

平成 29 年 1 月～平成 29 年 12 月 Journal of Nutritional Science and Vitaminology 編集委員会委員

平成 30 年度～ 用語委員会副委員長

平成 30 年度～ 中央選挙管理委員会委員長

3) 大会での座長

平成 30 年度 第 72 回大会教育講演・一般講演座長

平成 29 年度 第 71 回大会技術賞受賞講演座長

平成 28 年度 第 70 回大会教育講演座長

(4) 特記事項

Asian-Australasian Association of Animal Production Societies, 2010 年, The Woogene B & G Award, Outstanding contribution to animal nutraceutical biotechnology which is of international significance.