

Naji N. Abumrad, M.D.
Curriculum Vitae

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Education 1966: B.S. (Biology). American University of Beirut (AUB), Lebanon
1971: MD, including one-year internship in pediatrics. AUB, Lebanon

Professional Experience 1971-1972: Pediatric Resident, AUB, Lebanon
1972-1976: Surgery Resident, State University of New York (SUNY), Syracuse.
1976-1979: Assistant Professor of Surgery, SUNY, Syracuse, NY.
1979-1981: Research Assistant Professor of Surgery and Medicine, Vanderbilt University School of Medicine.
1981-1982: Assistant Professor of Surgery, Medicine and Physiology. Vanderbilt University School of Medicine
1982-1991: Director, S.R Light Laboratory, Vanderbilt University School of Medicine
1984-1992: Paul W. Sanger Professor of Surgery. Vanderbilt University School of Medicine
1985-1992: Associate Director, Clinical Research Center, Vanderbilt University School of Medicine
1983-1986: Associate Professor with tenure of Surgery and Medicine. Vanderbilt University Medical Center
1986-1992: Professor with tenure of Surgery, Medicine, and Molecular Physiology and Biophysics. Vanderbilt University Medical Center
1992-1994: Adjunct Professor of Surgery. Vanderbilt University Medical Center
1/92-2/96: Professor and Chairman, Department of Surgery and Professor - Molecular Physiology, SUNY/Stony Brook
2/94-2/96: Acting Dean, School of Medicine, SUNY at Stony Brook
2/96-10/2000: Chairman, Department of Surgery, North Shore University Medical Hospital, Manhasset, NY
2/96-10/2000: Co-Chairman and Professor, Department of Surgery, New York University Medical Center

Professional Experience	<p>2/96-10/2000: Adjunct Professor of Molecular Physiology – SUNY, Stony Brook</p> <p>2/96-10/2000: Adjunct Professor of Physiology, LSU, New Orleans, LA</p> <p>1/01-12/02: Director, Surgical Research, Sinai Hospital, Baltimore MD</p> <p>9/02-12/03: Chief, Surgical Services, Tennessee Valley Health System, and Professor of Surgery, Vanderbilt University Medical Center, Nashville, TN</p> <p>1/04- Present: Chairman, Department of Surgery, Vanderbilt University School of Medicine</p>
Awards	<p>1977: Best Teacher Award, SUNY, Syracuse, New York</p> <p>1979-1981: Clinical Associate Physician Award, NIH</p> <p>1983: Alpha Omega Alpha</p> <p>1984: Grant W. Liddle Award for Excellence in Teaching, Vanderbilt University Medical Center</p> <p>1986: Sigma Xi - The Scientific Research Society</p> <p>1991-1994: Member of Surgery, Anesthesia and Trauma (SAT) Study Section. NIH, Bethesda, MD</p> <p>1994: Member, Secretary Donna Shalala's Task Force on Breast Cancer</p> <p>7/94-6/99: Ad-Hoc Member of SAT Study Section, NIH</p> <p>3/99: Member of NIGMS Council</p> <p>4/99: Member of Advisory Committee to NIH Director for advice on how to manage the yearly 15-18% increase in NIH budget for the next five years.</p> <p>5/99: Chairman of an NIH nationally sponsored Consensus Conference on the Role of the Clinician Scientist</p> <p>10/98-2/2001: Ad hoc Member of Metabolism Study Section, NIH</p> <p>10/99–6/03: Permanent Member of GMA2 Study Section, NIH</p> <p>2/2004: Chairman, GMA2 Study Section, NIH</p> <p>May 2004: Ellis Island Medal of Honor, Ellis Island, NY</p>
Licensure	<p>New York State License</p> <p>Tennessee State License</p>
Board Certification	<p>American Board of Surgery, December, 1978 and re-certification, 1996</p>
Reviewer	<p>Journal of Clinical Investigation, American Journal of Physiology, Diabetes, Diabetes Care, Metabolism, Endocrinology, Science, Journal of Clinical Endocrinology and Metabolism. American Journal of Clinical Nutrition. Journal of Parenteral and Enteral Nutrition. New England Journal of Medicine, Proceedings of the National Academy of Science</p>

- Research Funding:** R01 DK070860-01 (PI: Najj N. Abumrad): 01/01/2005 – 12/31/2010. Role of the Omentum in the treatment of morbid obesity. The grant proposal was reviewed in the October 2004 CIGP study section and received a priority score of 131 and a percentile score of 0.4. (Direct costs: \$ 475,000/year)
- Professional Organizations:** American College of Surgeons (Board of Governors); American Surgical Association. Association of Academic Surgery; Society for University Surgeons; American Diabetes Association; American Society for Clinical Nutrition; The Endocrine Society, Long Island Chapter of the American College of Surgeons; NY State Surgical Society. Nashville Surgical Society TN Academy of Medicine.
- Fellowships:** 1978: American College of Nutrition
1982: American College of Surgeons

Peer-reviewed Publications

1. Ackerman N and N **Abou-Mourad**. Obstructive, pseudo-obstructive and enteropathic syndromes after jejunioileal bypass. *Surgery, Gynecology & Obstetrics* **148:168-174, 1979**
2. **Abou-Mourad NN**, Ackerman NB, and B Chamberlain. Poor prognosis of patients with intra-abdominal sepsis and hypouricemia. *Surgery, Gynecology & Obstetrics* **148:58-360, 1979**
3. **Abou-Mourad NN**, Farah FS, and D Steel. Dermopathic changes in hypozincemia. *Archives of Dermatology* **115:956-958, 1979**
4. **Abou-Mourad NN**, and LS Rogers. Extra hepatic biliary steering-wheel trauma simulating pancreatic carcinoma, a dilemma in management. *J Trauma* **20:180-182, 1980**
5. **Abumrad NN, Schneider AJ, Steel D, and LS Rogers**. Amino acid intolerance during prolonged parenteral nutrition reversed by molybdate therapy. *American J. Clin Nutrition* **34:2551-2559, 1981**
6. **Abumrad NN**, Wise KL, Rabin D, and WW Lacy. The disposal of an intravenously administered amino acid load across the human forearm. *Metabolism* **31:463-470, 1982**
7. Patwardhan RV, Schenker S, Henderson GI, **Abou-Mourad N**, and AM Hoyumpa Jr. Short term and long term ethanol administration inhibits the placental uptake and transport of valine in rats. *J Lab Clin Med* **98:251-262, 1981**
8. **Abumrad NN**, Williams PE, Cherrington AD, Rabin D, and WW Lacy. Absorption and disposition of a glucose load in the conscious dog. *Am J Physiology* **242:E398-E406, 1982**
9. **Abumrad NN**, Rabin D, Diamond M, and WW Lacy. Use of a heated superficial hand vein as an alternative site for the measurement of amino acid concentrations and for the study of glucose and alanine kinetics in man. *Metabolism* **30:936-940, 1981**
10. **Abumrad NN**, Patrick L, Rannels SL, and WW Lacy. Branched chain amino acids and - ketoisocaproate balance across human forearm muscle. In: Walser M, Williamson J, Ed. **Proceedings of the First International Symposium on Branched Chain Amino Acid and Keto Acid.** New York: Elsevier North Holland, 1981:317-322

11. **Abumrad NN**, Wise K, Lacy DB, and WW Lacy. The effect of starvation on leucine kinetics in the conscious dog. **Proceedings of the First International Symposium on Branched Chain Amino Acid and Keto Acid**. New York: Elsevier North Holland, 1981:355-360
12. **Abumrad NN**, Wise KL, Rabin D, and WW Lacy. The disposal of an intravenously administered amino acid load across the human forearm. *Metabolism* **31:463-470, 1982**
13. Cherrington AD, Williams PE, **Abou-Mourad NN**, Lacy WW, and JE Liljenquist. Insulin as a mediator of hepatic glucose uptake in the conscious dog. *Am J Physiology* **242:E97-E101, 1982**
14. **Abumrad NN**, Wise KL, Williams PE, Abumrad NA, and WW Lacy. Disposal of alpha ketoisocaproate: roles of the liver, gut and kidney. *Am J Physiology* **243:E123-E131, 1982**
15. **Abumrad NN**, Jefferson LS, Rannels SR, Williams PE, Cherrington AD, and WW Lacy. Role of insulin in the regulation of leucine kinetics in the conscious dog. *J Clinical Investigation* **70:1031-1041, 1982**
16. **Abumrad N**, Robinson R, Gooch B, and WW Lacy. The effect of leucine infusion on substrate flux across the human forearm. *J Surgical Research* **32:453-464, 1982**
17. Miller B and **NN Abumrad**. Disparate effects of insulin on protein turnover in the conscious dog. *Surg Forum* **33:87-90, 1982**
18. Powell S and **NN Abumrad**. Effect of basal insulin levels on leucine metabolism in normal man. *Surg Forum* **33:91-93, 1982**
19. **Abumrad NN**, Williams PE, and WW Lacy. Hormonal regulation of leucine metabolism in the conscious dog. In: Young V, Blackburn G, Grant J, (ed.) **Amino Acids: Metabolism and Medical Applications**. Boston: Wright-PSG, 1983:96-100
20. Sandler MP, Robinson RP, Rabin D, Lacy WW, and **NN Abumrad**. The effect of thyroid hormones on gluconeogenesis and on forearm metabolism in man. *J Clinical Endocrinology and Metabolism* **56:479-485, 1983**
21. McCallister B, Lacy WW, Williams PE, and **NN Abumrad**. Leupeptin inhibits ACTH induced protein breakdown in the conscious dog. *J Clin Investigation* **71:390-394, 1983**
22. Miller BM and **NN Abumrad**. The physiologic and nutritional significance of plasma-free amino acid levels. *J Parent Ent Nutr* **7:163-170, 1983**
23. Gooch BR, **Abumrad NN**, Robinson RP, Patrick M, Campbell D, and OB Crofford. Exercise in insulin-dependent diabetes mellitus: the effect of continuous insulin infusion using the subcutaneous, intravenous and intra peritoneal sites. *Diabetes Care* **6:122-128, 1983**.
24. McCallister B, Miller BM, Lacy WW, McRae J, and **NN Abumrad**. The effect of acute and chronic glucocorticoid excess on leucine kinetics and on protein turnover in vivo. *J Surg Research* **35:426-432, 1983**
25. Miller BM, Cersosimo E, McRae J, Williams PE, Lacy WW, and **NN Abumrad**. Inter-organ relationships of alanine and glutamine during fasting in the conscious dog. *J Surg Research* **35:310-318, 1983**
26. Whiteneck JM, Powell CS, **Abumrad NN**, Dunbar LL, and RH Dean. Acute changes in renal function: Validation of a simple isotopic technique for the measurement of renal clearance. *Curr Sur, Sept-Oct*: **365-368, 1983**

27. Stewart E, Miller B, McCallister B, Lacy WW, and **NN Abumrad**. Leupeptin prevents organ atrophy in rats fasted for a long period. *Surg Forum* 34:88-90, 1983
28. Cersosimo E, Miller B, Lacy W, and **NN Abumrad**. Alpha-ketoisocaproate, not leucine, is responsible for nitrogen sparing during progressive fasting in normal male volunteers. *Surg Forum* 34:96-98, 1983
29. Radosevich P, McRae JR, Williams PE, and **NN Abumrad**. The effect of the opiate antagonists, morphine and naloxone on glucose turnover independent of changes in insulin and glucagon. *Surg Forum* 34:56-58, 1983
30. Radosevich P, Williams PE, McRae J, Lacy W, Orth D, and **NN Abumrad**. β -endorphin inhibits glucose production in the conscious dog. *J Clin Investigation* 73:1237-1241, 1984
31. **Abumrad N**, Cersosimo E, and W Lacy. Physiologic Role of Branched Chain Amino and Keto Acids In Vivo. In: Adibi SA, Schauder P, ed. **Branched Chain Amino and Keto Acids in Health and Disease**. Basel: Karger, 1984:162-184
32. Miller B, Hoxworth B, Buckspan R, Nanney L, Lacy WW, and **NN Abumrad**. Leupeptin's effect on organ weight, RNA, DNA, and protein content after long bone fracture in the rat. *J Surg Research* 36:453-461, 1984
33. Radosevich PM, Williams PE, Lacy DB, McRae JR, Steiner KE, Cherrington AD, Lacy WW, and **NN Abumrad**. Effects of morphine on glucose homeostasis in the conscious dog. *J Clin Investigation* 74:1473-1480, 1984
34. Gooch BR, **Abumrad NN**, Robinson RP, and OB Crofford. Near normalization of metabolism of IDDM: comparison of continuous subcutaneous (CSII) versus intra peritoneal (CIPI) insulin delivery. *Horm Metab Res* 16:190-194, 1984
35. Buckspan RJ, Hoxworth BT, and **NN Abumrad**. Alpha-ketoisocaproate spares glucose utilization in overnight fasted man. *Surg Forum* 35:100-102, 1984
36. Radosevich PM, Williams PE, Ling N, and **NN Abumrad**. Acetylation modifies effect of β -endorphin on glucose homeostasis. *Surg Forum* 35:73-75, 1984
37. Stevenson RW, Steiner KE, **Abumrad NN**, and AD Cherrington. Insulin action in vivo. In: Alberti KGMM, Krall LP, ed. **Annual Review of Diabetes**. Amsterdam: Elsevier Science Publisher, 418-445, 1985
38. **Abumrad NN**, Abumrad NA, Sandler MP, and WW Lacy. The metabolic effects and fate of branched chain and keto acids across the human skeletal muscle. In: **Proceedings of the 5th International Symposium on Ammonia Metabolism**. Basel: Karger, 1985:216-28
39. Scott WH, **Abumrad NN**, and DN Orth. Tumors of the adrenal cortex and Cushing's syndrome (hypercortisolism). *Ann Surgery* 201:586-594, 1985
40. **Abumrad N**, Cersosimo E, and W Lacy. Physiologic Role of Branched Chain Amino and Keto Acids In Vivo. In: Adibi SA, Schauder P, ed. **Branched Chain Amino and Keto Acids in Health and Disease**. Basel: Karger, 1984:162-184
41. Hoxworth B, Miller B, Radosevich R, Buckspan R, Lacy W, and **NN Abumrad**. Insulin's effect on leucine turnover changes during early fasting in the conscious dog. *Diabetes* 34:295-299, 1985

42. Radosevich PM, Lacy DB, Williams PE, and **NN Abumrad**. Glucoregulatory changes during hyperglycemia induced by intracerebroventricular β -endorphin in the conscious dog. *Surg Forum* 36:22-24, 1985
43. Hoxworth BT, Cersosimo E, Williams PE, and **NN Abumrad**. Glutamine is a powerful regulator of lipolysis and ketogenesis of fasting *in vivo* independent of changes in either insulin or acid-base balance. *Surg Forum* 36:40-43, 1985
44. **Abumrad NN** and M Caldwell. **Hormonal substrate interrelationships. The Cellular Reaction.** In: Rombeau JL, Caldwell M, ed. Chicago: AMA Press, 2:29-52, 1986
45. Husami T and **NN Abumrad**. Adverse metabolic consequences of nutritional support: Micronutrients. **Surgical Clinics of North American** 66: 1049-1070, 1986
46. Cersosimo E, Williams P, Hoxworth B, Lacy W, and **N Abumrad**. Glutamine blocks lipolysis and ketogenesis of fasting. *Am J Physiology* 250:E248-E252, 1986
47. **Abumrad NN** and M Caldwell. Hormonal substrate interrelationships. In **The Cellular Reaction.** Rombeau JL, Caldwell M, ed. Chicago: AMA Press, 2:29-52, 1986
48. **Abumrad NN**, Abumrad NA, Sandler MP, and WW Lacy. The metabolic effects and fate of branched chain and keto acids across the human skeletal muscle. In: **Proceedings of the 5th International Symposium on Ammonia Metabolism.** Basel: Karger, 1985:216-28
49. Bluett MK, **Abumrad NN**, Arab N, and F Ghishan. Aboral changes in D-glucose transport by human intestinal brush-border membrane vesicles. *Biochem J* 237:229-234, 1986
50. Cersosimo E, Williams PE, Radosevich PM, Hoxworth BT, Lacy WW, and **NN Abumrad**. Role of glutamine in adaptations in nitrogen metabolism during fasting. *Am J Physiology* 250:E622-E628, 1986
51. Buckspan R, Hoxworth B, Cersosimo E, Devlin J, Horton E, and **N Abumrad**. Alpha-ketoisocaproate is superior to leucine in sparing glucose utilization in man. *Am J Physiology* 251:E648-E653, 1986
52. Husami T and **NN Abumrad**. Adverse metabolic consequences of nutritional support: Micronutrients. *Surg Clin N Am* 66: 1049-1070, 1986
53. Nesbitt JC, McDougal WS, Lowe W, **Abumrad NN**, and WA Nylander. A new model to study acute and chronic renal failure. *Am Surgeon* 52:651-653, 1986
54. Goldstein R, Steed M, Williams PE, **Abumrad NN**, and AD Cherrington. Catabolic effects of chronic hypercortisolemia during insulin deficiency. *Surg Forum* 37:15-18, 1986
55. Zhang SY, Frexes-Steed M, Williams PE, Brown LL, Kulaylat MM, and **NN Abumrad**. Leucine Clamp: A new method to assess tissue sensitivity and specificity to leucine and its disposal independent of changes in leucine concentration. *Surg Forum* 37:39-41, 1986
56. Goldstein R, Wasserman D, Williams PE, Lacy B, Carr K, Cherrington A, and **NN Abumrad**. Metabolic effects of epinephrine during chronic hypercortisolemia. *Surg Forum* 38:1-4, 1987
57. **Abumrad NN** and MN Kulaylat. The Gastroenteropancreatic endocrine system and its tumors. In: Scott HW Jr, Sawyers JL, Eds. **Surgery of the Stomach Duodenum and Small Intestine.** Blackwell Scientific Publishers: Boston, 1987:79-114

58. Cherrington AD, Stevenson RW, Steiner KE, Davis MA, Myers SR, Adkins BA, **Abumrad NN**, and PE Williams. Insulin, Glucagon, and Glucose as regulators of hepatic glucose uptake and production in vivo *Diabetes/ Metabolism Reviews* 3:307-332, 1987
59. Melki IA, Bulus NM, and **NN Abumrad**. Trace elements in nutrition. *Nutrition in Clinical Practice* 2:230-240, 1987
60. Devlin JT, **Abumrad NN**, Hoxworth B, Buckspan R, and ES Horton. Extra-pancreatic effects of L-leucine infusion in leucine-sensitive and control subjects. *Metabolism: Clin & Exp* 36:697-702, 1987
61. Geer RJ, Williams PE, Lairmore T, and **NN Abumrad**. Glucagon: An important stimulator of gut and hepatic glutamine metabolism. *Surg Forum* 38:27-29, 1987
62. Cersosimo E, Williams PE, O'Donovan, Lacy DB, and **NN Abumrad**. Role of acidosis in regulating hepatic nitrogen metabolism during fasting in conscious dog. *Am J Physiology* 252:E313-E319, 1987
63. McGee GS, Kulaylat MM, and **NN Abumrad**. Defective glucose utilization in patients with functioning β -cell tumors persists after tumor excision. *Ann Surg* 206:449-457, 1987
64. Lochs H, Williams PE, Morse EL, **Abumrad NN**, and SA Adibi. Metabolism of glycyl-leucine and its constituent amino acids by liver, muscle, kidney, and gut in conscious dogs. *Contr Infus Ther Clin Nutr* 17:167-170, 1987
65. Melki IA, Bulus NM, and **NN Abumrad**. Trace elements in nutrition. *Nutrition in Clinical Practice* 2:230-240, 1987
66. Cersosimo E, Williams PE, O'Donovan, Lacy DB, and **NN Abumrad**. Role of acidosis in regulating hepatic nitrogen metabolism during fasting in conscious dog. *Am J Physiol* 252:E313-E319, 1987
67. **Abumrad NN** and MN Kulaylat. The Gastroenteropancreatic endocrine system and its tumors. In: Scott HW Jr, Sawyers JL, Eds. **Surgery of the Stomach Duodenum and Small Intestine**. Blackwell Scientific Publishers: Boston, 1987:79-114
68. Kikuchi K, **Abumrad NN**, and FK Ghishan. Na⁺/H⁺ exchange by brush border membrane vesicles of human ileal small intestine. *Gastroenterology* 95:388-393, 1988
69. Lochs H, Williams PE, Morse EL, **Abumrad NN**, and SA Adibi. Metabolism of dipeptides and their constituent amino acids by liver, gut, kidney, and muscle. *Am J Physiol* 254:E588-E594, 1988
70. Kulaylat MN, Frexes-Steed M, Geer R, Williams PE, and **NN Abumrad**. The role of leucine in hepatic ketogenesis. *Surgery* 103:351-360, 1988
71. Lipman JJ, Colowick SP, Lawrence PL, and **NN Abumrad**. Aluminum induced encephalopathy in the rat. *Life Sciences* 42(8):863-875, 1988
72. Brown LL, Williams PE, Becker TA, Ensley RJ, May ME, and **NN Abumrad**. A rapid HPLC method to measure plasma leucine: Importance in the study of leucine kinetics in vivo. *J Chromatography* 426(2):370-375, 1988
73. Hourani H, Williams P, Geer R, Frexes-Steed M, Melki I, Morris JA, and **NN Abumrad**. Insulin-Induced hypoglycemia: A model for the study of enhanced proteolysis. *Surg Forum* 39:55-57, 1988

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75. Wasserman DH, and **NN Abumrad**. Physiological bases for the treatment of the physically active individual with diabetes. *Sports Med* 7:376-392, 1989
76. **Abumrad NN**, Williams PE, Frexes-Steed M, Geer R, Flakoll P, Cersosimo E, Brown LL, Melki I, Bulus N, Hourani R, Hubbard M, and F Ghishan. Inter-organ metabolism of amino acids in vivo. *Diabetes/Metabolism Reviews* 5:213-226, 1989
77. Van Voorhis K, Said HM, Ghishan FK, and **NN Abumrad**. Transport of glutamine in rat intestinal brush border membrane vesicles. *Biochim Biophys Acta* 978:51-55, 1989
78. Radosevich PM, Lacy DB, Brown LL, Williams PE, and **NN Abumrad**. Central effects of Beta-endorphins on glucose homeostasis in the conscious dog. *Am J Physiol* 256:E322-E330, 1989
79. Said HM, Voorhis KV, Ghishan FK, **Abumrad NN**, Nylander W, and R Redha. Transport characteristics of glutamine in human intestinal brush-border membrane vesicles. *Am J Physiol* 256:G240-G245, 1989
80. Pietsch JB, Leonard BS, Neblett WW, **Abumrad NN**, FK Ghishan. Burn injury alters intestinal glutamine transport. *J Surg Res* 46:296-299, 1989
81. Hicks BA, Stein R, **Abumrad NN**, Williams P, Wahoff D, and AA Demetriou. Development of a bio-artificial pancreas utilizing transformed β cells. *Surg Forum* 40:17-19, 1989
82. Ghishan FK, Sutter W, Said H, Leonard D, Pietsch J, and **NN Abumrad**. Glutamine transport by rat basolateral membrane vesicles. *Biochim Biophys Acta* 979:77-81, 1989
83. Miller BM, Traverso LW, Freeny PC, and **NN Abumrad**. Failure of somatostatin or an analog to promote closure of end pancreatic fistulae. *Int J Pancreat* 4:65-72, 1989
84. Bulus NM, **Abumrad NN**, and FK Ghishan. Characteristics of glutamine transport in dog jejunal brush border membrane vesicles. *Am J Physiology* 257:G80-G85, 1989
85. **Abumrad NN**, Morse EL, Lochs H, Williams PE, and SA Adibi. Possible sources of glutamine for parenteral nutrition: Impact on glutamine metabolism. *Am J Physiology* 257:E228-E234, 1989
86. Hill JO, Peters JC, Yang D, Sharp T, Kaler M, **Abumrad NN**, and HL Greene. Thermogenesis in humans during overfeeding with medium chain triglycerides. *Metabolism: Clin & Exp* 38:641-648, 1989
87. Bulus N, Cersosimo E, Ghishan F, and **NN Abumrad**. Physiologic importance of glutamine. *Metabolism: Clin & Exp* 38:1-5, 1989
88. Radosevich PM, Nash J, Brooks LD, O'Donovan C, Kulaylat M, Fanberg J, Rizk N, Williams PE, and **NN Abumrad**. Effects of low- and high-intensity exercise on plasma and cerebrospinal fluid levels of ir- β -endorphin, ACTH, cortisol, norepinephrine and glucose in the conscious dog. *Brain Research* 498:89-98, 1989
89. Flakoll PJ, Kulaylat M, Frexes-Steed M, Hourani H, Brown LL, Hill JO and **NN Abumrad**. Amino acids augment insulin's suppression of whole body proteolysis. *Am J Physiology* 257:E839-E847, 1989

90. Cersosimo E, Williams PE, Geer R, Lairmore T, Ghishan F, and **NN Abumrad**. Importance of ammonium ions in regulating hepatic glutamine synthesis during fasting. *Am J Physiol* **257:E514-E519, 1989**
91. Hubbard MM, Husami T, and **Abumrad NN**. Non-functioning adrenal tumors: Dilemmas in management. *Am Surg* **55:516-522, 1989**
92. Van Voorhis K, Said HM, Ghishan FK, and **NN Abumrad**. Transport of glutamine in rat intestinal brush border membrane vesicles. *Bioch Biophys Acta* **978:51-55, 1989**
93. Nash JA, Radosevich PM, Lacy DB, Rizk N, Williams PE, and **NN Abumrad**. Effects of naloxone on glucose homeostasis during insulin-induced hypoglycemia. *Am J Physiology* **257:E367-E373, 1989**
94. Bulus NM, **Abumrad NN**, and FK Ghishan. Characteristics of glutamine transport in dog jejunal brush border membrane vesicles. *Am J Physiol* **257:G80-G85, 1989**
95. Hourani H, Lacy DB, Morris JA and **NN Abumrad**. The role of central (CNS) glucopenia in modulating the proteolytic response of acute stress. *Surg Forum* **51:28-29, 1990**
96. **Abumrad NN**; Frexes-Steed M. What getting sick means. *J Parent Enteral Nutrition* **14:157S-163S, 1990**
97. Ghishan FK, Arab N, Bulus N, Said H, Pietsch J, **Abumrad NN**. Glutamine transport by human intestinal basolateral membrane vesicle. *Am J Clinical Nutrition* **51:612-616, 1990**
98. Hill JO, Peters JC, Swift LL, Yang D, Sharp T, **Abumrad NN**, and HL Greene. Changes in blood lipids during six days of overfeeding with medium or long chain triglycerides. *J Lipid Research* **31:407-416, 1990**
99. Frexes-Steed M, Warner ML, Bulus N, Flakoll PJ, and **NN Abumrad**. Role of insulin and branched-chain amino acids in regulating protein metabolism during fasting. *Am J Physiology* **258:E907-E917, 1990**
100. Vanvoorhis K, Said HM, **Abumrad N** and Ghishan FK. Effect of chemically induced diabetes mellitus on glutamine transport in rat intestine. *Gastroenterology* **98:862-866, 1990**
101. Al-Mahroos FT, Bulus N, **Abumrad NN**, Said HM, and F Ghishan. Maturational changes in glutamine transport by rat jejunal brush border membrane vesicles. *Pediatric Research* **27:519-524, 1990**
102. Williams PE, Flakoll PJ, Frexes-Steed M and **NN Abumrad**. In vivo methods for measurements of amino acid metabolism. In: S. Nissen, ed. **Regulation of Protein and Amino Acid Metabolism**, Elsevier, North Holland, 1990
103. Hourani H, Williams PE, Morris JA, May ME and **NN Abumrad**. Effect of insulin-induced hypoglycemia on protein metabolism in vivo. *Am J Physiology* **259:E342-E350, 1990**
104. **Abumrad NN**, Yazigi N, Cersosimo E, Hourani H, Gedde S, Bulus N, and P Williams. Glutamine metabolism during starvation. *J Parent Enteral Nutrition* **14:71S-76S, 1990**
105. Hourani H, Lacy DB, Nammour TM, **Abumrad NN**, and JA Morris. Differential effects of alpha and beta-adrenergic blockade on glucose and lactate metabolism during acute stress. *J Trauma* **30:1116-1124, 1990**

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108. Richards W, O'Dorisio T, Parish K, Geer R, Rice D, Roberts T, and **NN Abumrad**. Octreotide acetate induces fasting small bowel motility in patients with dumping syndrome. *J Surg Res* 49:483-487, 1990
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110. Flakoll PJ; Brown LL; Frexes-Steed M; **Abumrad NN**. Use of amino acid clamps to investigate the role of insulin in regulating protein breakdown in vivo. *J Parenteral and Enteral Nutrition* 15:81S-85S, 1991
111. Wasserman DH, Geer RJ, Rice DE, Tracy D, Flakoll PJ, Brown LL, Hill JO and **NN Abumrad**. Interaction of exercise and insulin action in man. *Am J Physiology* 260:E37-E45, 1991
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113. Flakoll PJ, Kulaylat M, Frexes-Steed M, Hill JO, and **NN Abumrad**. Amino acids enhance insulin resistance to exogenous glucose infusion in overnight fasted humans. *J Parenteral and Enteral Nutrition* 15:123-127, 1991
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