Kenneth B. Ain, M.D.

PROFESSOR OF MEDICINE
THE CARMEN L. BUCK CHAIR OF CANCER RESEARCH
UNIVERSITY OF KENTUCKY MEDICAL CENTER

I. *Office Address*: Thyroid Oncology Program,
Division of Endocrinology & Molecular Medicine,
Department of Internal Medicine, Room MN524
800 Rose Street, Lexington, KY 40536-0298

Telephone: (859) 323-3778 *FAX*: (859) 323-5707 *Email*: kbain1@email.uky.edu

Birth Date: June 27, 1956 *Spouse*: M. Sara Rosenthal, Ph.D., Assist. Prof., UK

Certifications:

Endocrinology, Diabetes and Metabolism Certificate # 95750 Date: 11/10/87
Internal Medicine Certificate # 95750 Date: 9/12/84

State Licensure: Kentucky: 1991 — present License # 27682

II. *Education*:

INSTITUTION & LOCATION	DEGREE	YEAR	FIELD
Brown University, Providence, RI	B.Sc.	1978	Biology
Brown University, Providence, RI	M.D.	1981	Medicine
Hahnemann University, Philadelphia, PA	Intern & Resident	1984	Internal Medicine
University of Chicago, Chicago, IL	Fellow	1987	Endocrinology
National Institutes of Health, Bethesda, MD	Senior Staff Fellow	1990	Thyroid Oncology

III. *Professional Experience*:

1984-1987	Endocrinology Fellow	University of Chicago
1987-1989	Endocrinology Fellow	NIDDK, National Institutes of Health
1989-1991	Senior Staff Fellow	NIDDK, National Institutes of Health
1991-1996	Assistant Professor	University of Kentucky
1996-2001	Associate Professor (tenured)	University of Kentucky
2001- current	Professor of Medicine (tenured)	University of Kentucky

IV. *Academic Appointment*:

4/1/07- current Professor of Medicine, tenured, full time
The Carmen L. Buck Chair of Cancer Research
Div. of Endocrinology & Molecular Medicine, University of Kentucky

7/1/03-3/31/07 Professor of Medicine, tenured, full time
The Carmen L. Buck Chair of Cancer Research
Div. of Hematology and Oncology, University of Kentucky

7/1/01-6/30/03 Professor of Medicine, tenured, full time
Div. of Endocrinology & Molecular Medicine, University of Kentucky

7/1/96-6/30/01 Associate Professor of Medicine, tenured, full time
Div. of Endocrinology & Molecular Medicine, University of Kentucky

1/1/91-6/30/96: Assistant Professor of Medicine, full time
Div. of Endocrinology & Molecular Medicine, University of Kentucky

1/30/92-current: Associate Member of Graduate Faculty, Dept. Physiology, Univ of KY

V. *Hospital and Clinical Appointments*:

University of Kentucky Medical Center, Lexington, KY
- Professor of Medicine, full time
- Director, Univ. of Kentucky Thyroid Oncology Program

Veterans Administration Medical Center, Lexington, KY
- Staff Member, Department of Medicine & Research Service, part time
- Director, Thyroid Clinic and Endocrinology Clinic

•Director, Thyroid Cancer Research Laboratory

VI. *Consulting*:

International:

Ezra L'Marpeh: Thyroid Oncology consultant for Israeli patients

Sub-Committee Chair, Thyroid Cancer, National Academy of Clinical Biochemistry

National:

Member, National Thyroid Cancer Treatment Cooperative Study

Member, Endocrine Sect., American College of Surgeons Oncology Group

Consultant, Administar Federal (Medicaid Region: Kentucky/Ohio)

NIH Study Section Member, Integrative & Clinical Endocrinology & Reproduction, 2007

State and Local:

Director, Univ. of Kentucky Thyroid Oncology Program

Director, Thyroid Clinic, VAMC, Cooper Drive Division, Lexington, KY

Director, Endocrine Clinic, VAMC, Cooper Drive Division, Lexington, KY

VII. *Special Assignments* :

Patient Clinics:

1. Director, Thyroid Clinic, VAMC.
2. Director, University of Kentucky Thyroid Oncology Program.
3. Director, Endocrinology Clinic, VAMC

Research Laboratory

Director, Thyroid Cancer Research Laboratory, VAMC, Lexington, KY.

Patient Internet Resources:

2007 – current: Moderator & Director: Thyroidcancerhelp: Thyroid Cancer Patient Educational Forum

VIII. *Honors*:

Sigma Xi 1981

Honorable Order of Kentucky Colonels, commissioned 1998

The Carmen L. Buck Chair of Cancer Research, Markey Cancer Center, since 2003

Mentor Recognition Award, Univ. of KY Clinical & Translational Science Conference, June 12, 2007

IX. *Professional Activity and Public Service*:

Membership in Professional Organizations (date joined is shown):

1. American Thyroid Association, member, 1991
   Program Committee 1993; Standards of Care Committee 1994-1998;
   Public Health Committee 1999-2004; Research Committee 2007
   Laboratory Standards Committee, 2008
2. American College of Physicians, member, 1987
3. Sigma Xi, member, 1981
4. American Association for the Advancement of Science, member, 1972
5. Endocrine Society, member, 1992
6. Lucille Markey Cancer Center, member, 1991.

Review Boards:

1. Journal of Clinical Endocrinology and Metabolism
2. Thyroid
3. Cancer Research
4. Endocrinology
5. Journal of Endocrinology
6. Cancer Chemotherapy and Pharmacology
7. Journal of Clinical Investigation
8. Cancer
9. Critical Reviews in Oncology/Hematology

10. Grant Reviewer for Research Council of the Netherlands
11. Molecular Cancer Therapeutics
12. Endocrine-Related Cancer
13. Lancet Oncology

X. *Research and Creative Productivity*:

- Publications:

Journal Articles: (in chronological order)

1. **Ain KB**, Barrall DT, Perez RG, & Ward HA. Patterns of automotive safety restraint use in Rhode Island: impact of the child passenger restraint law. R.I. Med J 64: 515-19, 1981.

2. **Ain KB**, Mori Y, & Refetoff S. Reduced clearance rate of thyroxine-binding globulin (TBG) with increased sialylation: a mechanism for estrogen-induced elevation of serum TBG concentration. J Clin Endocr Metab 65: 689-96, 1987.

3. **Ain KB**, Refetoff S, Sarne DH, & Murata Y. Effect of estrogen on the synthesis and secretion of thyroxine-binding globulin by a human hepatoma cell line, Hep G2. Molecular Endocrinology 2: 313-23, 1988.

4. **Ain KB** & Refetoff S. Relationship of oligosaccharide modification to the cause of serum thyroxine-binding globulin excess. J Clin Endocr Metab 66: 1037-43, 1988.

5. Sakurai A, Takeda K, **Ain KB**, Ceccarelli P, Nakai A, Seino S, Bell GI, Refetoff S, & DeGroot LJ. Generalized resistance to thyroid hormone associated with a mutation in the ligand binding domain of human thyroid hormone receptor ß. Proc Nat Acad Sci USA 86: 8977-81, 1989.

6. Sarne DH, Sobieszczyk S, **Ain KB**, & Refetoff S. Serum thyrotropin and prolactin in the syndrome of generalized resistance to thyroid hormone: responses to thyrotropin releasing hormone stimulation and triiodothyronine suppression. J Clin Endocr Metab 70: 1305-11, 1990.

7. Axiotis CA, Merino MJ, **Ain KB**, Norton JA. Papillary endothelial hyperplasia in the thyroid following fine-needle aspiration. Arch Pathol Lab Med 115: 240-42, 1991.

8. Robbins JR, Merino MJ, Boice Jr JD, Ron E, **Ain KB**, Alexander R, Norton JA, & Reynolds J. Thyroid cancer: a lethal endocrine neoplasm. Ann Intern Med 115: 133-147, 1991.

9. **Ain KB**, Refetoff S, Fein HG, & Weintraub BD. Pseudomalabsorption of levothyroxine. JAMA 266: 2118-20, 1991.

10. **Ain KB**, Pucino F, Shiver TM, & Banks SM. Thyroid hormone levels affected by time of blood sampling in thyroxine-treated patients. Thyroid 3: 81-85, 1993.

11. **Ain KB**, DeWitt PA, Gardner TG, & Berryman SW. Low-iodine tube-feeding diet for iodine-131 scanning and therapy. Clinical Nuclear Medicine 19: 504-7, 1994.

12. **Ain KB** & Shih W-J. False-positive iodine-131 uptake at a tracheostomy site: discernment with thallium-201 imaging. Clinical Nuclear Medicine 19: 619-21, 1994.

13. Smith CD, **Ain KB**, Ryan S, & Ngai BC. Systemic embolism in thyrotoxicosis without cardiac arrhythmia. Thyroid 4: 209-11, 1994.

14. **Ain KB** & Taylor K, Somatostatin analogs affect proliferation of human thyroid carcinoma cell lines in vitro. J Clin Endocrinol Metab 78: 1097-1102, 1994.

15. Smith CD & **Ain KB**. Human brain metabolism *in vivo* in hypothyroidism studied with ^{31}P magnetic resonance spectroscopy. Lancet 345: 619-20, 1995.

16. Pineda JD, Lee T, **Ain KB**, Reynolds J, & Robbins J. Iodine-131 therapy for thyroid cancer patients with elevated thyroglobulin and negative diagnostic scan. J Clin Endocrinol Metab 80: 1488-92, 1995.

17. **Ain KB**. Papillary thyroid carcinoma: etiology, assessment, and therapy. Endocrinol Metab Clin N Amer 24: 711-60, 1995.

18. **Ain KB**. Strategies in the management of differentiated thyroid carcinoma. IM-Internal Medicine 17 (1): 45-58, 1996.

19. Shih W-J, Stipp V, Magoun S, **Ain KB**, & Pulmano C. Medullary thyroid carcinoma imaged by Tc-99m MIBI SPECT and Tl-201 chloride-Tc-99m pertechnetate subtraction SPECT. Clinical Nuclear Medicine 21 (3): 213-7, 1996.

20. Boghaert ER, **Ain KB**, Taylor K, Greenberg VL, Fowler C, & Zimmer SG. Quantitative and qualitative differences in growth, invasion, and metastasis of an anaplastic and a papillary human thyroid cancer cell line *in vitro* and *in vivo*. J Clin Exp Metastases 14 (5): 440-50, 1996.

21. **Ain KB**, Tofiq S, & Taylor KD. Antineoplastic activity of taxol against human anaplastic thyroid carcinoma cell lines *in vitro* and *in vivo*. J Clin Endocrinol Metab 81 (10): 3650-3, 1996.

22. **Ain KB**, Pucino F, Csako G, Wesley RF, Drass JA, Clark C, Ketteridge P, Crawford K, Banks SM, & Dorworth TE. Effects of formulary restrictions on levothyroxine dosage strength availability. Pharmacotherapy 16 (6): 1103-10, 1996.

23. Singer PA, Cooper DS, Daniels GH, Ladenson PW, Greenspan FS, Levy EG, Braverman LE, Clark OH, McDougall IR, **Ain KB**, Dorfman SG. Treatment guidelines for patients with thyroid nodules and well-differentiated thyroid cancer. Arch Intern Med 156: 2165-72, 1996.

24. **Ain KB**, Taylor KD, Tofiq S, & Venkataraman G. Somatostatin receptor subtype expression in human thyroid and thyroid carcinoma cell lines. J Clin Endocrinol Metab 82 (6): 1857-62, 1997.

25. Musgrave YM, Davey DD, Weeks JA, Banks ER, Rayens MK, & **Ain KB**. Assessment of fine needle aspiration sampling technique in thyroid nodules. Diagnostic Cytopathology 18 (1): 76-80, 1998.

26. Graff JR, Herman JG, Greenberg V, Westra B, Saji M, **Ain KB**, Zeiger M, Zimmer SG, & Baylin SB. Distinct patterns of E-cadherin CpG island methylation in papillary, follicular, Hürthle's cell, and poorly differentiated thyroid carcinoma. Cancer Research 58 (10): 2063-6, 1998.

27. Venkataraman GM, Yatin M, **Ain KB**. Cloning of the human sodium-iodide symporter promoter and characterization in a differentiated human thyroid cell line, KAT-50. Thyroid 8 (1): 63-69, 1998.

28. **Ain KB**. Anaplastic thyroid carcinoma: behavior, biology, and therapeutic approaches. Thyroid 8 (8): 715-26, 1998.

29. Sherman SI, Brierley JD, Sperling M, **Ain KB**, Bigos ST, Cooper DS, Haugen BR, Ho M, Klein I, Ladenson PW, Robbins J, Ross DS, Specker B, Taylor T, & Maxon HR. Prospective multicenter study of treatment of thyroid carcinoma: Initial analysis of staging and outcome. Cancer 83 (5): 1012-21, 1998.

30. Aziz SM, Worthen DR, Yatin M, **Ain KB**, & Crooks PA. A unique interaction between polyamine and MDR (P-glycoprotein) transporters in cultured Chinese hamster ovary cells transfected with mouse MDR-1 gene. Biochem Pharmacol 56 (2): 181-7, 1998.

31. Venihaki M, **Ain KB**, Dermitzaki E, Gravanis A, & Margioris AN. KAT45, a noradrenergic human pheochromocytoma cell line producing corticotropin-releasing hormone. Endocrinology 139 (2): 713-22, 1998.

32. Blagosklonny MV, Giannakakou P, Wojtowicz M, Romanova LY, **Ain KB**, Bates SE, & Fojo T. Effects of p53-expressing adenovirus on the chemosensitivity and differentiation of anaplastic thyroid cancer cells. J Clin Endocrinol Metab 83 (7): 2516-2522, 1998.

33. Cooper DS, Specker B, Ho M, Sperling M, Ladenson PW, Ross DS, **Ain KB**, Bigos ST, Brierley JD, Haugen BR, Klein I, Robbins J, Sherman SI, Taylor T, & Maxon HR. Thyrotropin suppression and disease progression in patients with differentiated thyroid cancer: results from the National Thyroid Cancer Treatment Cooperative Registry. Thyroid 8 (9): 737-43, 1998.

34. Taylor T, Specker B, Robbins J, Sperling M, Ho M, **Ain KB**, Bigos ST, Brierley J, Cooper DS, Haugen BR, Hay I, Hertzberg V, Klein I, Klein H, Ladenson PW, Nishiyama R, Ross DS, Sherman SI, & Maxon HR. Outcome after treatment of high-risk papillary and non-Hürthle-cell follicular thyroid carcinoma. Ann Int Med 129 (8): 622-27, 1998.

35. **Ain KB**. Anaplastic thyroid carcinoma: a therapeutic challenge. Sem Surg Oncol 16 (1): 64-69, 1999.

36. Weinstein LJ & **Ain KB.** Primary thyroid lymphoma: a comprehensive assessment and clinical approach. The Endocrinologist 9: 45-51, 1999.

37. Koong SS, Reynolds JC, Movius EG, Keenan AM, **Ain KB**, Lakshmanan MC, & Robbins JR. Lithium as a potential adjuvant to I-131 therapy of metastatic well differentiated thyroid carcinoma. J Clin Endocrinol Metab 84 (3): 912-916, 1999.

38. Yatin SM, Yatin M, Aulick T, **Ain KB**, & Butterfield DA. Alzheimer's amyloid ß-peptide associated free radicals increase rat embryonic neuronal polyamine uptake and ornithine decarboxylase activity: protective effect of vitamine E. Neuroscience Letters 263: 17-20, 1999.

39. Venkataraman GM, Yatin M, Marcinek R, & **Ain KB**. Restoration of iodide uptake in dedifferentiated thyroid carcinoma: relationship to human Na^+/I^- symporter gene methylation status. J Clin Endocrinol Metab 84 (7): 2449-2457, 1999.

40. Yatin M, Venkataraman GM, Marcinek R, & **Ain KB**. Polyamine metabolism and transport inhibition in a human anaplastic thyroid carcinoma cell line *in vitro* and *in vivo*. Thyroid 9 (8): 805-814, 1999.

41. Bretz JD, Rymaszewski M, Arscott PL, Myc A, **Ain KB**, Thompson NW, & Baker Jr. JR. TRAIL death pathway expression and induction in thyroid follicular cells. J Biol Chem 274 (33): 23627-32, 1999.

42. **Ain KB**. Unusual types of thyroid cancer. Rev Endocrin Metab Disorders 1 (3): 225-31, 2000.

43. Ladenson PW, Singer PA, **Ain KB**, Bagchi N, Bigos ST, Levy EG, Smith SA, & Daniels GH. American Thyroid Association guidelines for detection of thyroid dysfunction. Arch Intern Med 160 (11): 1573-5, 2000.

44. **Ain KB**, Egorin MJ, & DeSimone PA. Treatment of anaplastic thyroid carcinoma with paclitaxel: phase 2 trial using ninety-six-hour infusion. Thyroid 10 (7): 587-94, 2000.

45. **Ain KB.** Management of undifferentiated thyroid cancer. Baillieres Best Pract Res Clin Endocrinol Metab 14 (4): 615-29, 2000.

46. Alsanea O, Wada N, **Ain KB**, Wong M, Taylor K, Ituarte PH, Treseler PA, Weier HU, Freimer N, Siperstein AE, Duh QY, Takami H, & Clark OH. Is familial non-medullary thyroid carcinoma more aggressive than sporadic thyroid cancer? A multicenter series. Surgery 128 (6):1043-1050; discussion 1050-1041, 2000.

47. Yatin SM, Yatin M, Varadarajan S, **Ain KB**, & Butterfield DA. Role of spermine in amyloid ß-peptide-associated free radical-induced neurotoxicity. J Neurosci Res 63 (5): 395-401, 2001.

48. Greenberg VL, Williams JM, Boghaert E, Mendenhall M, **Ain KB**, & Zimmer SG. Butyrate alters the expression and activity of cell cycle components in anaplastic thyroid carcinoma cells. Thyroid 11 (1): 21-29, 2001.

49. Ouyang B, Knauf JA, **Ain KB**, Nacev B, & Fagin JA. Mechanisms of aneuploidy in thyroid cancer cell lines and tissues: evidence for mitotic checkpoint dysfunction without mutations in BUB1 and BUBR1. Clin Endocrinol (Oxf) 56(3):341-50, 2002.

50. Dziba JM, Marcinek R, Venkataraman G, Robinson JA, & **Ain KB**. Combretastatin A4 phosphate has primary antineoplastic activity against human anaplastic thyroid carcinoma cell lines and xenograft tumors. Thyroid 12 (12): 1063-70, 2002.

51. Slominski A, Wortsman J, Kohn L, **Ain KB**, Venkataraman GM, Pisarchik A, Chung JH, Giuliani C, Thornton M, Slugocki G, & Tobin DJ. Expression of hypothalamic-pituitary-thyroid axis related genes in the human skin. J Invest Dermatol 119:1449-55, 2002.

52. **Ain KB**, Lee C, Williams K 2002 Phase II trial of thalidomide for therapy of radioiodine-unresponsive papillary and follicular thyroid carcinomas and medullary thyroid carcinomas: preliminary results. Cancer Invest 21:Suppl 1: 38-9

53. Xu X, Quiros RM, Gattuso P, **Ain KB**, & Prinz RA. High prevalence of BRAF gene mutation in papillary thyroid carcinomas and thyroid tumor cell lines. Cancer Res 63 (15): 4561-67, 2003.

54. Xu X, Quiros RM, Maxhimer JB, Jiang P, Marcinek R, **Ain KB**, Platt JL, Shen J, Gattuso P, & Prinz RA. Inverse correlation between heparan sulfate composition and heparanase-1 gene expression in thyroid papillary carcinomas: a potential role in tumor metastasis. Clin Cancer Res 9 (16, Pt 1): 5968-79, 2003.

55. Dziba JM & **Ain KB**. Imatinib mesylate (Gleevec; STI571) monotherapy is ineffective in suppressing human anaplastic thyroid carcinoma cell growth *in vitro*. J Clin Endocrinol Metab 89 (5): 2127-35, 2004.

56. Whitley RJ, **Ain KB**. Thyroglobulin: a specific serum marker for the management of thyroid carcinoma. Clin Lab Med 24:29-47, 2004

57. Mitsiades CS, McMillin D, Kotoula V, Poulaki V, McMullan C, Negri J, Fanourakis G, Tseleni-Balafouta S, **Ain KB**, & Mitsiades N. Antitumor effects of the proteasome inhibitor bortezomib in medullary and anaplastic thyroid carcinoma cells *in vitro*. J Clin Endocrinol Metab 91 (10): 4206-16, 2006.

58. Jonklaas J, Sarlis NJ, Litofsky D, **Ain KB**, Bigos ST, Brierley JD, Cooper DS, Haugen BR, Ladenson PW, Magner J, Robbins J, Ross DS, Skarulis M, Maxon HR, & Sherman SI. Outcomes of patients with differentiated thyroid carcinoma following initial therapy. Thyroid 16 (12):1229-42, 2006.

59. Li W, Venkataraman GM, & **Ain KB**. Protein synthesis inhibitors, in synergy with 5-azacytidine, restore sodium/iodide symporter gene expression in human thyroid adenoma cell line, KAK-1, suggesting trans-active transcriptional repressor. J Clin Endocrinol Metab. 92 (3):1080-7, 2007.

60. **Ain KB**, Lee C, & Williams KD Phase II Trial of Thalidomide for Therapy of Radioiodine-Unresponsive and Rapidly Progressive Thyroid Carcinomas. Thyroid 17 (7):663-70, 2007.

Books, Chapters & Internet/Computer Publications:

1. **Author of 3 chapters in**: Tietz NW, Conn RB, & Pruden EL, eds. Applied Laboratory Medicine (Philadelphia, WB Saunders Co), 1992.

2. **Ain KB**. "Management of thyroid cancer." In Diseases of the Thyroid, ed. Braverman LE. p. 287-317. (Totowa, NJ.: Humana Press, Inc.), 1997.

3. **Ain KB**. "Chemotherapy and immunotherapy of thyroid carcinoma." In UpToDate®: (Textbook on Computer Disc). Wellesley, MA. UpToDate, Inc., 1998, 2000 (revision).

4. **Ain KB**. "Rare forms of thyroid cancer." In Thyroid Cancer, ed. Fagin JA. p. 319-340. (Boston, MA.: Kluwer Academic Publishers), 1998.

5. **Ain KB.** "Thyroid malignancies." In Oncologic Therapies, eds. Vokes EE & Golomb HB. p. 977-1000. (Berlin: Springer-Verlag), 1999.

6. **Ain KB.** "Management of poorly differentiated thyroid cancer." In Harrison's Online (internet version of Harrison's Principles of Internal Medicine), eds. Braunwald E, Fauci AS, Isselbacher KJ, Hauser SL, Longo DL, & Jameson JL. (New York: McGraw-Hill), 1999.

7. **Ain KB.** "Thyroid malignancies, Chapter 45." In Oncologic Therapies, Second Edition, eds. Vokes EE & Golomb HB, p. 609-625. (Berlin: Springer-Verlag), 2003.

8. **Ain KB**. "Thyroid Cancer." In Conn's Current Therapy 2002, eds. Rakel RE & Bope ET, p. 652-657. (Philadelphia: WB Saunders Co), 2002.

9. **Ain KB**. "Pathobiology of antineoplastic therapy in undifferentiated thyroid cancer." In Molecular Basis of Thyroid Cancer, ed. Farid NR, p. 357-367 (Boston: Kluwer Academic Publishers), 2004.

10. **Ain KB** & Rosenthal MS. The Complete Thyroid Book, (New York: McGraw-Hill Publishing Co), 2005.

11. **Ain KB**. "Thyroid Cancer." In Hematology-Oncology Therapy, eds. Boyiadzis MM, Lebowitz PF, Frame JN, Fojo AT, p. 479-85 (New York: McGraw-Hill, Medical Pub. Division), 2006.

12. **Author of 2 chapters in**: Scott MG, Gronowski AB, & Eby CS, eds. Tietz's Applied Laboratory Medicine, 2nd Edition (Hoboken, NJ, John Wiley & Sons, Inc.), 2007.

Computer Program:

1. **^{131}I Dosimetry Program for Thyroid Carcinoma (Simplex & SimplexRSRC)**
   Co-Authors: Kenneth B. Ain & Robert Wesley (Clinical Center, NIH, Bethesda, MD)

Genbank DNA Sequences:

1. Accession Number: AF059566 (Submitted: 3/13/98; Published: 4/25/98); Authors: Venkataraman GM & **Ain KB**; Definition: Homo sapiens sodium-iodide symporter gene, promoter and partial coding sequence.

Patents Awarded and Pending:

1. U.S. Patent Application No. 08/531,025: "Method for Elimination of Interference of Human Autoantibodies in the Performance of Assays for Endogenous Analytes" **HELD**

2. U.S. Patent No. 6,015,376 (issued 1/18/00): "DNA Sequence Corresponding to the Minimal Essential Promoter of the Human Sodium-Iodide Symporter (hNIS)" **AWARDED**

3. U.S. Patent No. 7,029,879 (issued 4/18/06): "Iodide Uptake Restoration in Thyroid Cancer," **AWARDED**.

4. U.S. Patent Provisional Application No. 60/907,881 (final filing 4/21/08): "A Trans-Active Transcriptional Repressor of the Sodium/Iodide Symporter (NIS) Gene and Methods of Use" **PENDING REVIEW**