

Molecular/Genetic Analysis of Pancreatic Cancer

1

Nodit L, McGrath KM, Zahid M, Jani N, schoedel KE, Ohori NP, Carty S, Finkelstein S, Khalid A. Endoscopic Ultrasound Guided Fine Needle Aspirate Microsatellite Loss Analysis and Pancreatic Endocrine Tumor Outcome. Clin Gastroenterol Hepatol. Epub Sep 21, 2006.

2

Schoedel KE, **Finkelstein SD**, Ohori P. K-Ras Microsatellite Marker Analysis of Fine Needle Aspirates of Intraductal Papillary Mucinous Neoplasms of the Pancreas. Diagnostic Cytopathology 34(9):605-8, 2006 Sept.

3

Lapkus O, Gologan O, Liu Y, Swalsky P, Wilson MM, **Finkelstein SD**, Silverman JD. Determination of Sequential Mutation Accumulation in Pancreas and Bile Duct Brushing Cytology. Modern Pathology. 19(7):907-13. 2006 July.

4

Khalid A, Nodit L, Zahid M, Bauer K, Brody D, **Finkelstein SD**, McGrath KM. Endoscopic Ultrasound Fine Needle Aspirate DNA Analysis to Differentiate Malignant and Benign Pancreatic Masses. American Journal of Gastroenterology. 101(11):2493-2500, 2006 Nov.

5

Zhang L., Chenwei L., Mahmood R., van Golen K., Greenson J., Li G., D'Silva, NJ., Li X., Burant CF., Logsdon CD, Simeone DM. "Identification of a putative tumor suppressor gene Rap1GAP in pancreatic cancer." Cancer Research. 66(2):898-906, 2006 Jan 15.

6

Rindi G., Bordi C. "Endocrine Tumours of the gastrointestinal tract: aetiology, molecular pathogenesis and genetics." Best Practice & Research in Clinical Gastroenterology. 19(4):519-34, 2005 Aug.

7

Yang YM, Liu TH, Chen YJ, Jiang WJ, Qian JM, LuX, Gao J., Wu SF, Sang XT, Chen J. "Chromosome 1q loss of heterozygosity frequently occurs in sporadic insulinomas and is associated with tumor malignancy." International Journal of Cancer. 117(2): 234-40, 2005 Nov 1.

8

Pizzi S., Azzoni C., Bottarelli L., Campanini N., D'Adda T., Pasquali C., Rossi G., Rindi G., Bordi C. "RASSF1A promoter methylation and 3p21.3 loss of heterozygosity are features of foregut, but not midgut and hindgut, malignant endocrine tumours." Journal of Pathology. 206(4):409-16, 2005 Aug.

9

Sato N., Parker AR., Fukushima N., Miyagi Y., Iacobuzio-Donahue CA., Eshleman JR., Goggins M., "Epigenetic inactivation of TFPI-2 as a common mechanism associated with growth and invasion of pancreatic ductal adenocarcinoma." Oncogene. 24(5):850-8, 2005 Jan 27.

10

Florida G., Grilli G., Salvatore M., Pescucci C., Moore PS, Scarpa A, Taruscio D. "Chromosomal alterations detected by comparative genomic hybridization in nonfunctioning endocrine pancreatic tumors." *Cancer Genetics & Cytogenetics*. 156(1):23-30, 2005 Jan 1.

11

Pantalone D, Pelo E, Minuti B, Giotti I, Mazza E, Falchini M, Neri B, Nesi G, Roberta Girardi L, Pulli R, Credi G, Torricelli F. "p53 and DPC4 alterations in the bile of patients with pancreatic carcinoma". *Journal of Surgical Oncology*. 88(4):210-6, 2004 Dec. 15.

12

Ryschich E, Cebotari O, Fabian OV, Autschbach F, Kleeff J, Friess H, Bierhaus A, Buchler MW, Schmidt J. "Loss of heterozygosity in the HLA class I region in human pancreatic cancer." *Tissue Antigens*. 64(6):696-702, 2004 Dec.

13

Khalid A, Pal R, Sasatomi E, Swalsky P, Slivka A, Whitcomb D, **Finkelstein S**. "Use of microsatellite marker loss of heterozygosity in accurate diagnosis of pancreaticobiliary malignancy from brush cytology samples." *Gut*. 53(12):1860-5, 2004 Dec.

14

Gress, TM. "Molecular diagnosis of pancreatobiliary malignancies in brush cytologies of biliary strictures." *Gut*. 53(12):1727-9, 2004 Dec.

15

Yu GZ, Zhu MH, Zhu Z, Ni CR, Zheng JM, Li FM. "Genetic alterations and reduced expression of tumor suppressor p33(ING1b) in human exocrine pancreatic carcinoma." *World Journal of Gastroenterology*. 10(24):3597-601, 2004 Dec 15.

16

Khalid A, **Finkelstein S**, McGrath K. "Molecular diagnosis of solid and cystic lesions of the pancreas." *Gastroenterology Clinics of North America*. 33(4):891-906, 2004 Dec.

17

Schwark T, Bachmann C, von Wurmb-Schwark N. "STR gyping of ductal adenocarcinomas of the pancreas and healthy control tissue in 18 individuals." *Legal Medicine*. 6(3):170-3, 2004 Jul.

18

Moore PS, Missiaglia E, Beghelli S, Bragantini E, Mina MM, Zamboni G, Falconi M, Scarpa A. "Allelotype of ampulla of Vater cancer; highly frequent involvement of chromosome 11." *Journal of Cancer Research & Clinical Oncology*. 130(6):339-45, 2004 Jun.

19

Arnold CN, Sosnowski A, Blum HE. "Analysis of molecular pathways in neuroendocrine cancers of the gastroenteropancreatic system." *Annals of the New York Academy of Sciences*. 1014:218-9, 2004 Apr.

20

Lefter LP, Sunamura M, Furukawa T, Yastuoka T, Abe H, Inoue H, Abe T, Egawa S, Miura K, Morita R, Horii A, Matsuno S. "Functional analysis of chromosome 18 in pancreatic cancer: strong evidence for new tumour suppressor genes." *Asian Journal of Surgery*. 27(2):85-92, 2004 Apr.

21

Kuroki T, Yendamuri S, Trapasso F, Matsuyama A, Aqeilan RI, Alder H, Rattan S, Cesari R, Nolli ML, Williams NN, Mori M, Kanematsu T, Croce CM. "The tumor suppressor gene WWOX at FRA16D is involved in pancreatic carcinogenesis." *Clinical Cancer Research*. 10(7):2459-65, 2004 Apr 1.

22

Wada K, Takada T, Yasuda H, Amano H, Yoshida M, Sugimoto M, Irie H. "Does "clonal progression" relate to the development of intraductal papillary mucinous tumors of the pancreas?" *Journal of Gastrointestinal Surgery*. 8(3):289-96, 2004 Mar-Apr.

23

Iacobuzio-Donahue CA, van der Jeijden MS, Baumgartner MR, Troup WJ, Romm JM, Doheny K, Pugh E, Yeo CJ, Goggins MG, Hruban RH, Kern SE. "Large-scale allelotype of pancreaticobiliary carcinoma provides quantitative estimates of genome-wide allelic loss." *Cancer Research*. 64(3):871-5, 2004 Feb. 1.

24

Keleg S, Buchler P, Ludwig R, Buchler MW, Friess H. "Invasion and metastasis in pancreatic cancer." *Molecular Cancer*. 2:14, 2003 Jan 22.

25

Ohuri NP, Fowler MH, Swalsky PA, Pal R, Thompson J, **Finkelstein SD**. "Comparative molecular analysis of loss of heterozygosity in adenocarcinoma in bile duct brushings and corresponding surgical pathology specimens." *Cancer*. 99(6):379-84, 2003 Dec 25.

26

Hua Z, Zhang YC, Hu XM, Jia ZG. "Loss of DPC4 expression and its correlation with clinicopathological parameters in pancreatic carcinoma." *World Journal of Gastroenterology*. 9(12):2764-7, 2003 Dec.

27

Kim SG, Wu TT, Lee JH, Yun YK, Issa JP, Hamilton SR, Rashid A. "Comparison of epigenetic and genetic alterations in mucinous cystic neoplasm and serous microcystic adenoma of pancreas." *Modern Pathology*. 16(11):1086-94, 2003 Nov.

28

Butz J, Wickstrom E, Edwards J. "Characterization of mutations and loss of heterozygosity of p53 and K-ras2 in pancreatic cancer cell lines by immobilized polymerase chain reaction." *BMC Biotechnology*. 3:11, 2003 Jul 23.

29

Sahin F, Maitra A, Argani P, Sato N, Maehara N, Montgomery E, Goggins M, Hruban RH, Su GH. "Loss of Stk11/Ikb1 expression in pancreatic and biliary neoplasms." *Modern Pathology*. 16(7):686-91, 2003 Jul.

30

Wild A, Ramaswamy A, Langer P, Celik I, Fendrich V, Chaloupka B, Simon B, Bartsch DK. "Frequent methylation-associated silencing of the tissue inhibitor of metalloproteinase-3 gene in pancreatic endocrine tumors." *Journal of Clinical Endocrinology & Metabolism*. 88(3):1367-73, 2003 Mar.

31

Chen YJ, Vortmeyer A, Zhuang Z, Huang S, Jensen RT. "Loss of heterozygosity of chromosome 1q in gastrinomas: occurrence and prognostic significance." *Cancer Research*. 63(4):817-23, 2003 Feb 15.

32

Fleming JB, Minna JD. "Inactivation of tumor suppressor genes by promoter methylation is important in the pathogenesis of pancreatic cancer." *Cancer Biology & Therapy*. 1(3):297-9, 2002 May-Jun.

33

Nakata B, Yashiro M, Nishioka N, Aya M, Yamada S, Takenaka C, Ohira M, Ishikawa T, Nishino H, Wakasa K, Hirakawa K. "Genetic alternations in adenoma-carcinoma sequencing of intraductal papillary-mucinous neoplasm of the pancreas." *International Journal of Oncology*. 21(5):1067-72, 2002 Nov.

34

Wild A, Langer P, Celik I, Chaloupka B, Bartsch DK. "Chromosome 22q in pancreatic endocrine tumors: identification of a homozygous deletion and potential prognostic associations of allelic deletions." *European Journal of Endocrinology*. 147(4):507-13, 2002 Oct.

35

Patel SA, Adams R, Goldstein M, Moskaluk CA. "Genetic analysis of invasive carcinoma arising in intraductal oncocytic papillary neoplasm of the pancreas." *American Journal of Surgical Pathology*. 26(8):1071-7, 2002 Aug.

36

Kerr NJ, Chun YH, Yun K, Heathcott RW, Reeve AE, Sullivan MJ. "Pancreatoblastoma is associated with chromosome 11p loss of heterozygosity and IGF2 overexpression." *Medical and Pediatric Oncology*. 39(1):52-4, 2002 Jul.

37

Ohori NP, Khalid A, Etemad B, **Finkelstein SD**. "Multiple loss of heterozygosity without K-ras mutation identified by molecular analysis on fine-needle aspiration cytology specimen of acinar cell carcinoma of pancreas" *Diagnostic Cytopathology*. 27(1):42-6, 2002 Jul.

38

Guo SS, Wu AY, Sawicki MP. "Deletion of chromosome 1, but not mutation of MEN-1, predicts prognosis in sporadic pancreatic endocrine tumors." *World Journal of Surgery*. 26(7):843-7, 2002 Jul.

39

Wada K. "p16 and p53 gene alterations and accumulations in the malignant evolution of intraductal papillary-mucinous tumors of the pancreas." *Journal of Hepato-Biliary-Pancreatic Surgery*. 9(1):76-85, 2002.

40

Sunamura M, Yatsuoka T, Motoi F, Duda DG, Kimura M, Abe T, Yokoyama T, Inoue H, Oonuma M, Takeda K, Matsuno S. "Gene therapy for pancreatic cancer based on genetic characterization of the disease." *Journal of Hepato-Biliary-Pancreatic Surgery*. 9(1):32-8, 2002.

41

Guo SS. Arora C. Shimoide AT. Sawicki MP. "Frequent deletion of chromosome 3 in malignant sporadic pancreatic endocrine tumors." *Molecular & Cellular Endocrinology*. 190(1-2):109-14, 2002 Apr 25.

42

Pourani J. Kaserer K. Pfragner R. "Cytogenetic and molecular analyses of multiple endocrine neoplasias of the MEN1 syndrome." *International Journal of Oncology*. 20(5):971-6, 2002 May.

43

Lott ST. Chandler DS. Curley SA. Foster CJ. El-Naggar A. Frazier M. Strong LC. Lovell M. Killary AM. "High frequency loss of heterozygosity in von Hippel-Lindau (VHL)-associated and sporadic pancreatic islet cell tumors: evidence for a stepwise mechanism for malignant conversion in VHL tumorigenesis." *Cancer Research*. 62(7):1952-5, 2002 Apr 1.

44

Abraham SC. Wu TT. Hruban RH. Lee JH. Yeo CJ. Conlon K. Brennan M. Cameron JL. Klimstra DS. "Genetic and immunohistochemical analysis of pancreatic acinar cell carcinoma: frequent allelic loss on chromosome 11p and alterations in the APC/beta-catenin pathway." *American Journal of Pathology*. 160(3):953-62, 2002 Mar.

45

Wang C. Lu X. Liu G. Dai L. Xu T. Chen Y. Gao C. Wen X. Qian J. "Detailed deletion mapping on chromosome region 9p21 in human periampullary neoplasms." *Chinese Medical Journal*. 114(6):588-91, 2001 Jun.

46

Sato N. Rosty C. Jansen M. Fukushima N. Ueki T. Yeo CJ. Cameron JL. Iacobuzio-Donahue CA. Hruban RH. Goggins M. "STK11/LKB1 Peutz-Jeghers gene inactivation in intraductal papillary-mucinous neoplasms of the pancreas." *American Journal of Pathology*. 159(6):2017-22, 2001 Dec.

47

Maurice D. Pierreux CE. Howell M. Wilentz RE. Owen MJ. Hill CS. "Loss of Smad4 function in pancreatic tumors: C-terminal truncation leads to decreased stability." *Journal of Biological Chemistry*. 276(46):43175-81, 2001 Nov 16.

48

Youssef EM. Kaneko K. Yatsuoka T. Hayashi Y. Hoshi M. Horii A. Furukawa T. "Human BAC contig covering the deleted region in pancreatic cancer at 12q21." *DNA Sequence*. 11(6):541-6, 2001.

49

Barghorn A. Komminoth P. Bachmann D. Rutimann K. Saremaslani P. Muletta-Feurer S. Perren A. Roth J. Heitz PU. Speel EJ. "Deletion at 3p25.3-p23 is frequently encountered in endocrine pancreatic tumours and is associated with metastatic progression." *Journal of Pathology*. 194(4):451-8, 2001 Aug.

50

Barghorn A. Speel EJ. Farspour B. Saremaslani P. Schmid S. Perren A. Roth J. Heitz PU. Komminoth P. "Putative tumor suppressor loci at 6q22 and 6q23-q24 are involved in the malignant progression of sporadic endocrine pancreatic tumors." *American Journal of Pathology*. 158(6):1903-11, 2001 Jun.

51

Inoue H. Furukawa T. Sunamura M. Takeda K. Matsuno S. Horii A. "Exclusion of SMAD4 mutation as an early genetic change in human pancreatic ductal tumorigenesis." *Genes, Chromosomes & Cancer*. 31(3):295-9, 2001 Jul.

52

Luttges J. Galehdari H. Brocker V. Schwarte-Waldhoff I. Henne-Bruns D. Kloppel G. Schmiegel W. Hahn SA. "Allelic loss is often the first hit in the biallelic inactivation of the p53 and DPC4 genes during pancreatic carcinogenesis." *American Journal of Pathology*. 158(5):1677-83, 2001 May.

53

Wilentz RE. Argani P. Hruban RH. "Loss of heterozygosity or intragenic mutation, which comes first?" *American Journal of Pathology*. 158(5):1561-3, 2001 May.

54

Ryu B. Song J. Sohn T. Hruban RH. Kern SE. "Frequent germline deletion polymorphism of chromosomal region 8p12-p21 identified as a recurrent homozygous deletion in human tumors." *Genomics*. 72(1):108-12, 2001 Feb 15.

55

Hessman O. Skogseid B. Westin G. Akerstrom G. "Multiple allelic deletions and intratumoral genetic heterogeneity in men1 pancreatic tumors." *Journal of Clinical Endocrinology & Metabolism*. 86(3):1355-61, 2001 Mar.

56

Moore PS. Orlandini S. Zamboni G. Capelli P. Rigaud G. Falconi M. Bassi C. Lemoine NR. Scarpa A. "Pancreatic tumours: molecular pathways implicated in ductal cancer are involved in ampullary but not in exocrine nonductal or endocrine tumorigenesis." *British Journal of Cancer*. 84(2):253-62, 2001 Jan.

57

Rigaud G. Missiaglia E. Moore PS. Zamboni G. Falconi M. Talamini G. Pesci A. Baron A. Lissandrini D. Rindi G. Grigolato P. Pederzoli P. Scarpa A. "High resolution allelotype of nonfunctional pancreatic endocrine tumors: identification of two molecular subgroups with clinical implications." *Cancer Research*. 61(1):285-92, 2001 Jan 1.

58

Moore PS. Zamboni G. Brighenti A. Lissandrini D. Antonello D. Capelli P. Rigaud G. Falconi M. Scarpa A. "Molecular characterization of pancreatic serous microcystic adenomas: evidence for a tumor suppressor gene on chromosome 10q." *American Journal of Pathology*. 158(1):317-21, 2001 Jan.

59

Handel-Fernandez ME. Nassiri M. Arana M. Perez MM. Fresno M. Nadji M. Vincek V. "Mapping of genetic deletions on the long arm of chromosome 22 in human pancreatic adenocarcinomas." *Anticancer Research*. 20(6B):4451-6, 2000 Nov-Dec.

60

Mohr VH. Vortmeyer AO. Zhuang Z. Libutti SK. Walther MM. Choyke PL. Zbar B. Linehan WM. Lubensky IA. "Histopathology and molecular genetics of multiple cysts and microcystic (serous) adenomas of the pancreas in von Hippel-Lindau patients." *American Journal of Pathology*. 157(5):1615-21, 2000 Nov.

61

Barbera VM. Martin M. Marinoso L. Munne A. Carrato A. Real FX. Fabre M. "The 18q21 region in colorectal and pancreatic cancer: independent loss of DCC and DPC4 expression." *Biochimica et Biophysica Acta*. 1502(2):283-96, 2000 Oct 18.

62

Perren A. Komminoth P. Saremaslani P. Matter C. Feurer S. Lees JA. Heitz PU. Eng C. "Mutation and expression analyses reveal differential subcellular compartmentalization of PTEN in endocrine pancreatic tumors compared to normal islet cells." *American Journal of Pathology*. 157(4):1097-103, 2000 Oct.

63

Bergman L. Boothroyd C. Palmer J. Grimmond S. Walters M. Teh B. Shepherd J. Hartley L. Hayward N. "Identification of somatic mutations of the MEN1 gene in sporadic endocrine tumours." *British Journal of Cancer*. 83(8):1003-8, 2000 Oct.

64

Yatsuoka T. Sunamura M. Furukawa T. Fukushige S. Yokoyama T. Inoue H. Shibuya K. Takeda K. Matsuno S. Horii A. "Association of poor prognosis with loss of 12q, 17p, and 18q, and concordant loss of 6q/17p and 12q/18q in human pancreatic ductal adenocarcinoma." *American Journal of Gastroenterology*. 95(8):2080-5, 2000 Aug.

65

Sakai Y. Yanagisawa A. Shimada M. Hidaka E. Seki M. Tada Y. Harada T. Saisho H. Kato Y. "K-ras gene mutations and loss of heterozygosity at the p53 gene locus relative to histological characteristics of mucin-producing tumors of the pancreas." *Human Pathology*. 31(7):795-803, 2000 Jul.

66

Sato T. Konishi K. Kimura H. Maeda K. Yabushita K. Tsuji M. Miwa A. "Evaluation of PCNA, p53, K-ras and LOH in endocrine pancreas tumors." *Source Hepato-Gastroenterology*. 47(33):875-9, 2000 May-Jun.

67

Heinmoller E. Dietmaier W. Zirngibl H. Heinmoller P. Scaringe W. Jauch KW. Hofstadter F. Ruschoff J. "Molecular analysis of microdissected tumors and preneoplastic intraductal lesions in pancreatic carcinoma." *American Journal of Pathology*. 157(1):83-92, 2000 Jul.

68

Yamano M. Fujii H. Takagaki T. Kadowaki N. Watanabe H. Shirai T. "Genetic progression and divergence in pancreatic carcinoma." *American Journal of Pathology*. 156(6):2123-33, 2000 Jun.

69

Hruban RH. Wilentz RE. Kern SE. "Genetic progression in the pancreatic ducts. [Review] [39 refs]" *American Journal of Pathology*. 156(6):1821-5, 2000 Jun.

70

Goggins M. Hruban RH. Kern SE. "BRCA2 is inactivated late in the development of pancreatic intraepithelial neoplasia: evidence and implications." *American Journal of Pathology*. 156(5):1767-71, 2000 May.

71

Hilgers W. Song JJ. Haye M. Hruban RR. Kern SE. Fearon ER. "Homozygous deletions inactivate DCC, but not MADH4/DPC4/SMAD4, in a subset of pancreatic and biliary cancers." *Genes, Chromosomes & Cancer*. 27(4):353-7, 2000 Apr.

72

Tarafa G. Villanueva A. Farre L. Rodriguez J. Musulen E. Reyes G. Seminago R. Olmedo E. Paules AB. Peinado MA. Bachs O. Capella G. "DCC and SMAD4 alterations in human colorectal and pancreatic tumor dissemination." *Oncogene*. 19(4):546-55, 2000 Jan 27.

73

Hilgers W. Koerkamp BG. Geradts J. Tang DJ. Yeo CJ. Hruban RH. Kern SE. "Genomic FHIT analysis in RER+ and RER- adenocarcinomas of the pancreas." *Genes, Chromosomes & Cancer*. 27(3):239-43, 2000 Mar.

74

van den Berg W. Tascilar M. Offerhaus GJ. Albores-Saavedra J. Wenig BM. Hruban RH. Gabrielson E. "Pancreatic mucinous cystic neoplasms with sarcomatous stroma: molecular evidence for monoclonal origin with subsequent divergence of the epithelial and sarcomatous components." *Modern Pathology*. 13(1):86-91, 2000 Jan.

75

Hessman O. Lindberg D. Einarsson A. Lillhager P. Carling T. Grimelius L. Eriksson B. Akerstrom G. Westin G. Skogseid B. "Genetic alterations on 3p, 11q13, and 18q in nonfamilial and MEN 1-associated pancreatic endocrine tumors." *Genes, Chromosomes & Cancer*. 26(3):258-64, 1999 Nov.

76

Vortmeyer AO. Lubensky IA. Skarulis M. Li G. Moon YW. Park WS. Weil R. Barlow C. Spiegel AM. Marx SJ. Zhuang Z. "Multiple endocrine neoplasia type 1: atypical presentation, clinical course, and genetic analysis of multiple tumors." *Modern Pathology*. 12(9):919-24, 1999 Sep.

77

Ghimenti C. Lonobile A. Campani D. Bevilacqua G. Caligo MA. "Microsatellite instability and allelic losses in neuroendocrine tumors of the gastro-entero-pancreatic system" *International Journal of Oncology*. 15(2):361-6, 1999 Aug.

78

Hilgers W. Su GH. Groot Koerkamp B. Tang DJ. Shekher MC. Sugar AY. Yeo CJ. Hruban RH. Kern SE. "Novel homozygous deletions of chromosomal band 18q22 in pancreatic adenocarcinoma identified by STS marker scanning." *Genes, Chromosomes & Cancer*. 25(4):370-5, 1999 Aug.

79

Bartsch D. Barth P. Bastian D. Ramaswamy A. Gerdes B. Chaloupka B. Deiss Y. Simon B. Schudy A. "Higher frequency of DPC4/Smad4 alterations in pancreatic cancer cell lines than in primary pancreatic adenocarcinomas." *Cancer Letters*. 139(1):43-9, 1999 May 3.

80

Su GH. Hruban RH. Bansal RK. Bova GS. Tang DJ. Shekher MC. Westerman AM. Entius MM. Goggins M. Yeo CJ. Kern SE. "Germline and somatic mutations of the STK11/LKB1 Peutz-Jeghers gene in pancreatic and biliary cancers." *American Journal of Pathology*. 154(6):1835-40, 1999 Jun.

81

Bartsch D. Hahn SA. Danichevski KD. Ramaswamy A. Bastian D. Galehdari H. Barth P. Schmiegel W. Simon B. Rothmund M. "Mutations of the DPC4/Smad4 gene in neuroendocrine pancreatic tumors." *Oncogene*. 18(14):2367-71, 1999 Apr 8.

82

Sorio C. Baron A. Orlandini S. Zamboni G. Pederzoli P. Huebner K. Scarpa A. "The FHIT gene is expressed in pancreatic ductular cells and is altered in pancreatic cancers." *Cancer Research*. 59(6):1308-14, 1999 Mar 15.

83

Hilgers W. Tang DJ. Sugar AY. Shekher MC. Hruban RH. Kern SE. "High-resolution deletion mapping of chromosome arm 1p in pancreatic cancer identifies a major consensus region at 1p35." *Genes, Chromosomes & Cancer*. 24(4):351-5, 1999 Apr.

84

Gortz B. Roth J. Krahenmann A. de Krijger RR. Muletta-Feurer S. Rutimann K. Saremaslani P. Speel EJ. Heitz PU. Komminoth P. "Mutations and allelic deletions of the MEN1 gene are associated with a subset of sporadic endocrine pancreatic and neuroendocrine tumors and not restricted to foregut neoplasms." *American Journal of Pathology*. 154(2):429-36, 1999 Feb.

85

Ebrahimi SA. Wang EH. Wu A. Schreck RR. Passaro E Jr. Sawicki MP. "Deletion of chromosome 1 predicts prognosis in pancreatic endocrine tumors." *Cancer Research*. 59(2):311-5, 1999 Jan 15.

86

Fujii T. Kawai T. Saito K. Hishima T. Hayashi Y. Imura J. Hironaka M. Hosoya Y. Koike M. Fukayama M. "MEN1 gene mutations in sporadic neuroendocrine tumors of foregut derivation." *Pathology International*. 49(11):968-73, 1999 Nov.

87

Nikiforova MN. Nikiforov YE. Biddinger P. Gnepp DR. Grosebacher LA. Wajchenberg BL. Fagin JA. Cohen RM. "Frequent loss of heterozygosity at chromosome 3p14.2-3p21 in human pancreatic islet cell tumours." [see comment]. *Clinical Endocrinology*. 51(1):27-33, 1999 Jul.

88

Perren A. Roth J. Muletta-Feurer S. Saremaslani P. Speel EJ. Heitz PU. Komminoth P. "Clonal analysis of sporadic pancreatic endocrine tumours." *Journal of Pathology*. 186(4):363-71, 1998 Dec.

89

Beghelli S. Pelosi G. Zamboni G. Falconi M. Iacono C. Bordi C. Scarpa A. "Pancreatic endocrine tumours: evidence for a tumour suppressor pathogenesis and for a tumour suppressor gene on chromosome 17p." *Journal of Pathology*. 186(1):41-50, 1998 Sep.

90

Goggins M. Shekher M. Turnacioglu K. Yeo CJ. Hruban RH. Kern SE. "Genetic alterations of the transforming growth factor beta receptor genes in pancreatic and biliary adenocarcinomas." *Cancer Research*. 58(23):5329-32, 1998 Dec 1.

91

Wang EH. Ebrahimi SA. Wu AY. Kashefi C. Passaro E Jr. Sawicki MP. "Mutation of the MENIN gene in sporadic pancreatic endocrine tumors." *Cancer Research*. 58(19):4417-20, 1998 Oct 1.

92

Hoglund M. Gorunova L. Jonson T. Dawiskiba S. Andren-Sandberg A. Stenman G. Johansson B. "Cytogenetic and FISH analyses of pancreatic carcinoma reveal breaks in 18q11 with consistent loss of 18q12-qter and frequent gain of 18p." *British Journal of Cancer*. 77(11):1893-9, 1998 Jun.

93

Kimura M. Furukawa T. Abe T. Yatsuoka T. Youssef EM. Yokoyama T. Ouyang H. Ohnishi Y. Sunamura M. Kobari M. Matsuno S. Horii A. "Identification of two common regions of allelic loss in chromosome arm 12q in human pancreatic cancer." *Cancer Research*. 58(11):2456-60, 1998 Jun 1.

94

Su GH. Hilgers W. Shekher MC. Tang DJ. Yeo CJ. Hruban RH. Kern SE. "Alterations in pancreatic, biliary, and breast carcinomas support MKK4 as a genetically targeted tumor suppressor gene." *Cancer Research*. 58(11):2339-42, 1998 Jun 1.

95

Shan L. Nakamura Y. Nakamura M. Yokoi T. Tsujimoto M. Arima R. Kameya T. Kakudo K. "Somatic mutations of multiple endocrine neoplasia type 1 gene in the sporadic endocrine tumors." *Laboratory Investigation*. 78(4):471-5, 1998 Apr.

96

Okami K. Wu L. Riggins G. Cairns P. Goggins M. Evron E. Halachmi N. Ahrendt SA. Reed AL. Hilgers W. Kern SE. Koch WM. Sidransky D. Jen J. "Analysis of PTEN/MMAC1 alterations in aerodigestive tract tumors." *Cancer Research*. 58(3):509-11, 1998 Feb 1.

97

Hessman O. Lindberg D. Skogseid B. Carling T. Hellman P. Rastad J. Akerstrom G. Westin G. "Mutation of the multiple endocrine neoplasia type 1 gene in nonfamilial, malignant tumors of the endocrine pancreas." *Cancer Research*. 58(3):377-9, 1998 Feb 1.

98

Hoglund M. Gorunova L. Andren-Sandberg A. Dawiskiba S. Mitelman F. Johansson B. Cytogenetic and fluorescence in situ hybridization analyses of chromosome 19 aberrations in pancreatic carcinomas: frequent loss of 19p13.3 and gain of 19q13.1-13.2. *Genes, Chromosomes & Cancer*. 21(1):8-16, 1998 Jan.

99

Sakurada A. Suzuki A. Sato M. Yamakawa H. Orikasa K. Uyeno S. Ono T. Ohuchi N. Fujimura S. Horii A. "Infrequent genetic alterations of the PTEN/MMAC1 gene in Japanese patients with primary cancers of the breast, lung, pancreas, kidney, and ovary." *Japanese Journal of Cancer Research*. 88(11):1025-8, 1997 Nov.

100

Mahlamaki EH. Hoglund M. Gorunova L. Karhu R. Dawiskiba S. Andren-Sandberg A. Kallioniemi OP. Johansson B. "Comparative genomic hybridization reveals frequent gains of 20q, 8q, 11q, 12p, and 17q, and losses of 18q, 9p, and 15q in pancreatic cancer." *Genes, Chromosomes & Cancer*. 20(4):383-91, 1997 Dec.

101

Fujii H. Inagaki M. Kasai S. Miyokawa N. Tokusashi Y. Gabrielson E. Hruban RH. "Genetic progression and heterogeneity in intraductal papillary-mucinous neoplasms of the pancreas." *American Journal of Pathology*. 151(5):1447-54, 1997 Nov.

102

Vortmeyer AO. Lubensky IA. Fogt F. Linehan WM. Khettry U. Zhuang Z. "Allelic deletion and mutation of the von Hippel-Lindau (VHL) tumor suppressor gene in pancreatic microcystic adenomas." *American Journal of Pathology*. 151(4):951-6, 1997 Oct.