38. 市原淳弘、林　松彦、廣田展久、津金澤浩彦、小浦優佳子、多田由布子、猿田享男：傍糸球体細胞においてアンジオテンシンⅡタイプ2受容体が活性レニン産生に及ぼす影響、日本腎臓学会学術総会、2003年5月、東京
39. 黒田真理、篠村裕之、小林絵美、清水良子、石黒喜美子、中里優一、林　松彦、猿田享男：原発性糸球体腎炎における細胞外マトリックス・プロテオグリカンの糸球体内発現と尿中排泄の検討、日本腎臓学会学術総会、2003年5月、東京
40. 高瀬　敦、丸茂文史、浅井昌樹、内村英輝、林　松彦、猿田享男：尿細管間質障害におけるNF-κB依存性腎内Angiotensin2の産生、日本腎臓学会学術総会、2003年5月、東京
41. 荒木崇志、林　松彦、猿田享男：PKCの下流で腎臓形態形成に関与するMTF/L47のクローニング及びその機能解析、日本腎臓学会学術総会、2003年5月、東京
42. 吉野　純、門川俊明、辻　美保子、林　松彦、猿田享男：急性腎不全回復期におけるLeukemia Inhibitory Factor（LIF）の役割、日本腎臓学会学術総会、2003年5月、東京
43. 清水良子、篠村裕之、黒田真理、小林絵美、石黒喜美子、林　松彦、猿田享男：バイグリカン過剰発現マウスの樹立と血管障害発症との関連の検討、日本腎臓学会学術総会、2003年5月、東京
44. 辻　美保子、門川俊明、吉野　純、河内裕、清水不二雄、林　松彦、猿田享男、抗Thy1.1抗体1-22-3による可逆性および不可逆性腎障害ラットのマイクロアレイ解析、日本腎臓学会学術総会、2003年5月、東京
45. 清水良子、篠村裕之、黒田真理、小林絵美、石黒喜美子、林　松彦、猿田享男：ゲノム情報応用による腎臓に発現している新たな細胞外マトリックス蛋白の検討、日本腎臓学会学術総会、2003年5月、東京
46. 井田　隆、吉川桃乃、安藤亮一、千田佳子、周立民、佐々木成：ラット馬杉腎炎における細胞増殖に関与する因子の検討、第46回日本腎臓学会学術総会、2003年5月、東京
47. 伊藤友浩、頼建光、石橋賢一、桑原道雄、内田信一、佐々木成：Tissue and Cellular Distribution and Intracellular Localization of Aquaporin 12、第46回日本腎臓学会学術総会、2003年5月、東京
48. 田中啓之、寺田典生、岡戸丈和、島村治子、井下聖司、寺岡弘文、河内　裕、佐々木成：マウスES細胞より腎構成細胞（podocyte）への分化誘導の試み、第46回日本腎臓学会学術総会、2003年5月、東京
49. 寺田典生、田中啓之、岡戸友和、島村治子、井下聖司、桑原道雄、佐々木成：急性腎不全における転写因子Ets-1の発現と働き、第46回日本腎臓学会学術総会、2003年5月、東京
50. 横尾　隆、宇都宮保典、鈴木孝秀、川村哲也、細谷龍男：ヒト臍帯血を用いた炎症特異的遺伝子導入法の開発、第46回日本腎臓学会学術総会、2003年5月、東京
51. 田中啓之、岡戸丈和、井下聖司、寺田典生、佐々木成：マウスES細胞より腎構成細胞への分化誘導の試み、第24回日本炎症再生学会、2003年11月、京都

52. 清水良子、篠村裕之、黒田真理、小林絵美、石黒貴美子、荒井香代子、林　松彦、猿田享男：細胞外マトリックス蛋白バイグリカンは血管平滑筋細胞の増殖・遊走をもたらす心血管障害因子である、第26回日本高血圧学会総会、2003年11月、宮崎

53. 菱川慶一、丸茂文史、三浦茂樹、中西朝人、松崎有未、高瀬　敦、林　松彦、猿田享男、岡野栄之、藤田敏郎：腎臓由来体性幹細胞の包括的遺伝子発現解析、生理的機能解析およびその局在の検討、第26回日本高血圧学会総会、2003年11月、宮崎

54. 林　松彦：特別講演：腎臓再生および進行性腎障害新規治療法の開発、第4回腎不全病態治療研究会、2003年11月、東京

55. R. Kato, S. Miyazawa, M. Uwano, Y. Natori. Phenotypic transition of rat proximal tubular cells to macrophage-like cells in vivo and in vitro identified by monoclonal antibody ED-1. World Congress of Nephrology, June 2003, Berlin

56. S. Miyazawa, R. Kato, O. Hotta, Y. Natori. Phenotypic transition in human tubular epithelial cells into macrophage-like cells in vitro. World Congress of Nephrology, June 2003, Berlin

57. Narita I, Goto S, Saito N, Song J, Omori K, Kondo D, Sakatsume M, Gejyo F. Angiotensinogen gene variation and renoprotective efficacy of renin-angiotensin system blockade in IgA nephropathy. World Congress of Nephrology, June 2003, Berlin

58. Masaya Yamato, Takahito Ito, Norio Ishida, Yasuhiro Kita, Akira Suzuki, Hirotsugu Iwatani, Enyu Imai, Masatsugu Hori. Circadian rhythm orchestrates the growth of the nephron in the rat kidney. World Congress of Nephrology, June 2003, Berlin

59. Enyu Imai. Satellite symposium-glomerulonephritis and progression to renal insufficiency - stem cell, their role in glomerular disease. World Congress of Nephrology, June 2003, Berlin

60. Enyu Imai. Forefronts in Nephrology - Immunology in renal disease - side population cells of the kidney. World Congress of Nephrology, June 2003, Schorfheide

61. Enyu Imai. Post-Satellite Symposium: Stem cells and vascular repair in Nephrology. World Congress of Nephrology, June 2003, Berlin

62. Enyu Imai. Can bone marrow differentiate into renal cells? GFP transgenic mice tell the contribution. World Congress of Nephrology, June 2003, Berlin

63. Takase O, Marumo T, Asai M, Uchimura H, Hayashi M, Saruta T. NF-kappa B dependent increase in intrarenal angiotensin II induced by proteinuria. The 57th Annual fall conference and scientific sessions of the council for high blood pressure research, September 2003, Washington DC

64. Ichihara A, Hayashi M, Koura Y, Tada Y, Saruta T. Lolng-term effects of hydrophilic and lipophilic statins on blood pressure and aortic stiffness of hypertensive patients. The 57th Annual fall conference and

scientific sessions of the counsil for hihg blood pressure research, September 2003, Washington DC

65. Takasato M ,Nishinakamura R. Identification of kidney mesenchymal genes by a combination of microarray analysis and Sall1- GFP knockin mice. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
66. R. Kato, S. Miyazawa, M. Uwano, Y. Katayama, Yu. Natori, Y. Natori: Involvement of phenotypic transition of proximal tubular epithelial cells to macrophage-like cells in progression of interstitial fibrosis. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
67. Narita I, Goto S, Saito N, Sakatsume M, Kondo D, Song J, Ajiro J, Saga D, Sato F, Gejyo F. Interaction between ace and α -adducin gene polymorphisms in the progression of IgA nephropathy in Jpanese patiens. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
68. Sato F, Narita I, Goto S, Kondo D, Song J, Ajiro J, Saga D, Saito N, Ueno M, Sakatsume M, Gejyo F. Role of genetic polymorphisms of transforming growth factor b1 on clinical and histological manifestations of immunoglobulin a nephropathy. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
69. Sakatsume M, Saga D, Kaneko Y, Sato F, Ajiro J, Kondo D, Narita I, Gejyo F. L-Selectin (CD62L) in urine. As a Marker of Cell-Mediated inflammation in kidneys. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
70. Hirotsugu Iwatani, Takahito Ito, Enyu Imai, Wataru Ikeda, Toshio Imai, Masaya Yamato, Akira Suzuki, Naohiko Ueda, Masatsugu Hori, Yoshimi Takai. Involvement of NECL2/TSLC1 in the renal development and regeneration. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
71. Isao Matsui, Takahito Ito, Akira Suzuki, Masaya Yamato, Hirotsugu Iwatani, Yoshitaka Akagi, Enyu Imai, Masatsugu Hori. A strategy to discover genes that are implicated in the repair process of injured rat glomeruli. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
72. Masaya Yamato, Takahito Ito, Norio Ishida, Yasuhiro Kita, Akira Suzuki, Hirotsugu Iwatani, Masafumi Yamato, Enyu Imai, Masatsugu Hori. Circadian rhythm orchestrates the growth of the nephron in the rat kidney. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
73. Emi Kobayashi, Hiroyuki Sasamura, Mizuo Mifune, Ryoko Shimizu-Hirota, Mari Kuroda, Matsuhiko Hayashi, Takao Saruta. Hepatocyte growth factor regulates TGF- β modulatory proteoglycans in interstitial fibroblasts by ERK1/2- and P38 MAPK-dependent pathways. The 36th

Annual Meeting of the American Society of Nephrology, November 2003, San Diego

74. Mihoko Tsuji, Toshiaki Monkawa, Jun Yoshino, Hiroshi Kawachi, Fujio Shimizu, Matsuhiko Hayashi, Takao Saruta. A gene cluster of kidney injury molecules was identified by microarray analysis of reversible and irreversible thy-1 glomerulonephritis. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
75. Jun Yoshino, Toshiaki Monkawa, Mihoko Tsuji, Matsuhiko Hayashi, Takao Saruta. Leukemia inhibitory factor participates in tubular regeneration during experimental acute renal failure. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
76. Takashi Araki, Matsuhiko Hayashi, Takao Saruta. Cloning and characterization a novel gene promoting rreteric bud branching in the metanephros. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
77. Ryoko Shimizu-Hirota, Hiroyuki Sasamura, Mari Kuroda, Emi Kobayashi, Matsuhiko Hayashi, Takao Saruta. Transgenic mice with over-expression of biglycan develop enhanced vascular proliferation and migration. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
78. Osamu Takase, Takeshi Marumo, Hideki Uchimura, Masaki Asai, Keiichi Hishikawa, Matsuhiko Hayashi, Takao Saruta. NF-kB dependent genes induced by proteinuria. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
79. Tanaka H, Terada Y, Okado T, Inoshita S, Kuwahara M, Teraoka H, Kawachi H, Sasaki S. Induction of podocytes from mouse embyronic stem cells. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
80. Terada Y, Tanaka H, Okado T, Inoshita S, Kuwahara M, Teraoka H, Sasaki S. Embryoid-body cells derived from Wnt4-transformed mouse embryoid Stem Cell Line Show Differentiation into Renal Tubular Cells. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
81. Terada Y, Tanaka H, Okado T, Inoshita S, Kuwahara M, Sato Y, Sasaki S. Ets-1 Is Transcriptionally up-regulated in hypoxia in vivo and in vitro and promotes cell cycle progression of renal tubules. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
82. Takashi Yokoo, Yoichi Miyazaki, Yasunori Utsunomiya, Tetsuya Kawamura, Tatsuo Hosoya. Podocyte regeneration by human mesenchymal stem cells using a relay culture system. The 36th Annual Meeting of the American Society of Nephrology, November 2003, San Diego
83. 田中啓之、寺田典生、岡戸文和、島村治子、井下聖司、寺岡弘文、河内 裕、佐々木成：マウス Wnt4 導入 ES 細胞から腎構成細胞への分化誘導の試み、第 3 回再生医療学会、2004 年 3 月、千葉

84. 菱川慶一、三浦茂樹、吉岡浩、森有一、藤田敏郎：熱可逆性ゲルを用いたヒト間葉系幹細胞の選択的分化誘導、第3回再生医療学会、2004年3月、千葉
85. 菱川慶一、丸茂文史、中西朝人、三浦茂樹、高瀬敦、松崎有未、猿田享男、林松彦、岡野栄之、藤田敏郎：腎臓における組織幹細胞システムのnicheは間質である、第3回再生医療学会、2004年3月、千葉
86. 渡部正彦、菱川慶一、高柳淳、清水信義、中木敏：ヒト乳癌細胞 の転写因子NF-kB阻害によるアポトーシス誘導、第77回日本薬理学会年会、2004年３月、大阪
87. 加藤里奈、宇和野幹子、片山幸枝、名取有美子、宮澤しのぶ、名取泰博：近位尿細管上皮細胞のマクロファージ様細胞への形質変化- モデル系を用いた検討- 、第47回日本腎臓学会学術総会、2004年5月、宇都宮
88. 成田一衛：IgA腎症の発症と進展に関わる遺伝的背景の解明：厚生労働省特定疾患対策研究報告、第47回日本腎臓学会学術総会、2004年5月、宇都宮
89. 秋山史大、成田一衛、下条文武、中村祐輔：IgA腎症関連遺伝子の同定-SNPマーカーによるゲノムワイドスクリーニング、第47回日本腎臓学会学術総会、2004年5月、宇都宮
90. 近藤大介、成田一衛、佐藤文則、後藤　眞、小川　麻、斉藤徳子、坂爪　実、西慎一、上野光博、今井直史、下条文武：IgA腎症における第6染色体上一塩基多型の解析、第47回日本腎臓学会学術総会、2004年5月、宇都宮
91. 坂爪　実、嵯峨大介、小川　麻、金子佳賢、上野光博、成田一衛、芝紀代子、下条文武：尿の免疫細胞・赤血球および蛋白電気泳動解析による腎病変の予測、第47回日本腎臓学会学術総会、2004年5月、宇都宮
92. 嵯峨大介、坂爪　実、金子佳賢、小川　麻、黒田　毅、安城淳哉、佐藤文則、近藤大介、成田一衛、下条文武：ラット抗GBM抗体腎炎のBezafibrateによる治療効果、第47回日本腎臓学会学術総会、2004年5月、宇都宮
93. 田中啓之、寺田典生、岡戸文和、島村治子、井下聖司、寺岡弘文、佐々木成：マウスES細胞よりpodocyteへのin vitroでの分化誘導の検討、第47回日本腎臓学会学術総会、2004年5月、宇都宮
94. 寺田典生、田中啓之、岡戸文和、島村治子、井下聖司、寺岡弘文、佐々木成：マウスWnt4導入ES細胞から腎構成細胞への分化誘導の試み、第47回日本腎臓学会学術総会、2004年5月、宇都宮
95. 岡戸文和、寺田典生、田中啓之、島村治子、井下聖司、寺岡弘文、佐々木成：片側尿管結紮（UUO）腎症におけるアポトーシス及び線維化形成とASK1遺伝子の関わり、第47回日本腎臓学会学術総会、2004年5月、宇都宮
96. 内村英輝、丸茂文史、高瀬　敦、河内　裕、清水不二雄、菱川慶一、藤田敏郎、林　松彦、猿田享男：培養骨髄細胞の腎臓内投与は、Thy-1腎炎の糸球体内皮障害を抑制する、第47回日本腎臓学会学術総会、2004年5月、宇都宮
97. 浅井昌樹、門川俊明、福田誠一、丸茂文史、河内　裕、清水不二雄、林　松彦、猿田享男：進行性腎炎モデルに対する抗

アルドステロン薬の効果、第47回日本腎臓学会学術総会、2004年5月、宇都宮

98. 小林絵美、篠村裕之、清水良子、荒井香代子、石黒貴美子、林　松彦、猿田享男：バイグリカンの腎間質の線維化抑制作用：過剰発現マウスを用いた検討、第47回日本腎臓学会学術総会、2004年5月、宇都宮

99. 高瀬　敦、丸茂文史、菱川慶一、林　松彦、猿田享男：蛋白尿における腎内NFkappaB依存性遺伝子の検討、第47回日本腎臓学会学術総会、2004年5月、宇都宮

100. 菱川慶一、丸茂文史、中西朝人、三浦茂樹、高瀬　敦、松崎有未、猿田享男、林　松彦、岡野栄之、藤田敏郎：腎臓体性幹細胞システムのnicheは間質に存在する、第47回日本腎臓学会学術総会、2004年5月、宇都宮

101. 吉野　純、門川俊明、辻　美保子、林　松彦、猿田享男：腎線維化における転写制御因子slug/snailの役割、第47回日本腎臓学会学術総会、2004年5月、宇都宮

102. 市原淳弘、林　松彦、金城　雪、多田由布子、西山　成、猿田享男：糖尿病性腎症進展過程における腎内レニン・アンジオテンシン系、第47回日本腎臓学会学術総会、2004年5月、宇都宮

103. 辻　美保子、門川俊明、吉野　純、河内裕、清水不二雄、林　松彦、猿田享男：腎線維化におけるthymosinβ4、β10の役割、第47回日本腎臓学会学術総会、2004年5月、宇都宮

104. 西中村隆一：Sallファミリーによる腎臓発生機構、第47回日本腎臓学会学術総会、2004年5月、宇都宮

105. 市原淳弘、林　松彦、金城　雪、多田由布子、西山　成、猿田享男：糖尿病性腎症進展過程における腎臓内レニン・アンジオテンシン系の検討、第77回日本内分泌学会学術総会、2004年6月、京都

106. 丸茂文史、今井直彦、下澤達雄、菱川慶一、藤田敏郎：アンギオテンシンIIタイプ1受容体拮抗薬は、尿細管間質障害による腎臓Side Population細胞の減少を抑制する、第２７回日本高血圧学会、2004年10月、宇都宮

107. 成田一衛、坂爪　実、下条文武：IgA腎症と遺伝子多型. シンポジウム:IgA腎症の病態展開、第55回日本電気泳動学会総会、2004年11月、東京

108. 西中村隆一：腎臓発生におけるWnt シグナル、第27回日本分子生物学会、2004年12月、神戸

109. 長船健二、西中村隆一：新規コロニーアッセイ法を用いた胎生マウス腎臓前駆細胞の単離、第27回日本分子生物学会、2004年12月、神戸

110. Hayashi M. Stem cell therapy and regeneration factor for acute renal failure. The 5th Japan-Europe Nephrology Forum, March 2004, Hakone

111. Harada M, Nishinakamura R. Generation of metanephric mesenchyme-specific conditional knockout system. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis

112. Osafune K, Nishinakamura R. Identification of multipotent renal progenitors in the embryonic mouse kidney by a novel colony-forming assay. The 37th Annual Meeting of the American Society of

Nephrology, November 2004, St Louis

113. Kato R, Uwano M, Katayama Y, Natori Y, Natori Y. Characterization of Macrophage-like Cells Derived from Proximal Tubular Epithelial Cells in Culture. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis
114. Sakatsume M, Kubota R, Ogawa A, Saga D, Narita I, Gejyo F. The prospective study for prediction of renal injury by analyses of immune effector cells, red blood cells and protein profile I urine. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis
115. Mori H, Kaneko Y, Narita I, Gejyo F. Renal survival in IgA nephropathy is associated with monocyte chemoattractant protein-1 A-2518G polymorphism. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis
116. Kadomura M, Narita I, Omori K, Gejyo F. Vascular endothelial growth factor gene polymorphism affects on the long-term renal survival in IgA nephropathy. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis
117. Masaya Yamato, Takahito Ito, Hirotsugu Iwatani, Enyu Imai, Masatsugu Hori, Norio Ishida. A DNA-binding protein oscillating with the circadian rhythm orchestrates the cell cycle of rat renal epithelial cells: a novel mechanism to regulate the cell cycle. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis
118. Isao Matsui, Takahito Ito, Enyu Imai, Masatsugu Hori. Searching for podocytes-protection system. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis
119. Hirotsugu Iwatani, Yu Wang, Takahito Ito, Masaya Yamato, Isao Matsui, Enyu Imai, Masatsugu Hori. Fetal cells spontaneously engrafted in mother rats contribute to the remodeling of liver and kidney after injury. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis
120. Terada Y, Tanaka H, Kobayashi T, Kuwahara M, Sasaki S. Aurora Kinases regulate G2/M transition of rat mesangial cells. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis
121. Kobayashi T, Terada Y, Tanaka H, Kuwahara M, Sasaki S. Expression of Notch-1 and Its Ligand Jagged-1 in rat acute renal failure. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis
122. Tanaka H, Terada Y, Kobayashi T, Kuwahara M, Sasaki S. Induction of renal tubular cells and podocytes from mouse stem cells. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis
123. Yoshino J, Monkawa T, Tsuji M, Hayashi M, Saruta T. Transcriptional repressor Slug: a new player in tubular epihelial-mesenchyal transition. The 37th Annual Meeting of the

American Society of Nephrology, November 2004, St Louis

124. Hishikawa K, Marumo T, Matsuzaki Y, Takase O, Hayashi M, Saruta T, Nakauchi H, Nakaki T, Okano H, Fujita T. Loacalization and functional analysis of adult stem like-cell in kidney. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis

125. Asai M, Monkawa T, Marumo T, Fukuda S, Kawachi H, Shimizu F, Hayashi M, Saruta T. Spironolactone in combination with cilazapril ameliorate proteinuria and renal interstitial fibrosis in antiy-Thy-1 irreversible nephritis rat. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis

126. Marumo T, Uchimura H, Takase O, Kawachi H, Shimizu F, Hayashi M, Saruta T, Hishikawa K, Fujita T. Reduction of endothelial injury and mesangial cell activation by entrarenal injection of bone marrow-derived angiogenic cells in experimental glomerulonephritis. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis

127. Takashi Yokoo, Yoichi Miyazaki, Yasunori Utsunomiya, Tetsuya Kawamura, Tatsuo Hosoya. Ex vivo regeneration of the murine kidney from human mesenchymal stem cells in cultured whole rodent embryos. The 37th Annual Meeting of the American Society of Nephrology, November 2004, St Louis

128. 今井直彦、菱川慶一、松崎有未、丸茂丈史、林　松彦、岡野栄之、藤田敏郎：HDAC阻害薬は腎臓SP細胞活性化を介して慢性糸球体腎炎進展を抑制する、第4回日本再生医療学会総会、2005年3月、大阪

129. 丸茂丈史、内村英輝、高瀬　敦、河内　裕、清水不二雄、林　松彦、猿田享男、菱川慶一、藤田敏郎：糸球体腎炎に対する血管新生細胞療法の有効性、第4回日本再生医療学会総会、2005年3月、大阪

130. Nishinakamura R. Essential roles of Sall family in Kidney development. ISN (International Society of Nephrology) Forefronts in Nephrology "Stem cell and regeneration of the kidney", January 2005, Karuizawa

131. Osafune K, Nishinakamura R. Identification of multipotent renal progenitors in the embryonic mouse kidney by a novel colony-forming assay. ISN (International Society of Nephrology) Forefronts in Nephrology "Stem cell and regeneration of the kidney", January 2005, Karuizawa

132. Tkasato M, Nishinakamura R. Identification of kidney mesenchymal genes by a combination of microarray analysis and Sall1-GFP knockiu mice. ISN (International Society of Nephrology) Forefronts in Nephrology "Stem cell and regeneration of the kidney", January 2005, Karuizawa

133. Monkawa T, Hayashi M. Search for genes expressed during progression and recovery in the diseased kidney. ISN (International Society of Nephrology) Forefronts in Nephrology "Stem cell and regeneration of the kidney", January 2005, Karuizawa

134. Keiichi Hishikawa, Takeshi Marumo,

Toshiro Fujita. Do we really need "stem" cell for renal regeneration? ISN (International Society of Nephrology) Forefronts in Nephrology "Stem cell and regeneration of the kidney", January 2005, Karuizawa

135. Takeshi Marumo, Hideki Uchimura, Osamu Takase, Hiroshi Kawachi, Fujio Shimizu, Matsuhiko Hayashi, Takao Saruta, Keiichi Hishikawa and Toshiro Fujita. Angiogenic cell therapy reduces endothelial injury and inflammatory responses in glomerulonephritis. ISN (International Society of Nephrology) Forefronts in Nephrology "Stem cell and regeneration of the kidney", January 2005, Karuizawa

136. Sakaki M, Nishinakamura R. Murine homologue of SALL4, a causative gene for Okihiro syndrome, is essential for early embryogenesis and proliferation of embryonic stem cells. Keystone Symposia, February 2005, Banff

3. その他

日本経済新聞 2003 年 5 月 19 日 19 面取材記事「腎臓細胞増殖に関与ー動物の「体内時計」ー」

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「腎臓病予防と治療の最新情報」2005 年 2 月 20 日東京
「腎臓病を悪化させない秘訣とは– 透析回避のために– 」東京慈恵会医科大学腎臓高血圧内科、川村 哲也
「腎臓は再生できるか」東京大学腎臓再生医療講座、菱川 慶

H. 知的所有権の取得状況

「遺伝子多型解析を用いた IgA 腎症診断および IgA 腎症診断用キット」
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研究成果の刊行に関する一覧表

雑誌

発表者氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
Osafune K, Nishinakamura R, Komazaki S, Asashima M.	In vitro induction of the pronephric duct in Xenopus explants.	Development Growth and Differentiation	44 (2)	161-7	2002
Yoshida T, Yoshino J, Hayashi M, Saruta T.	Identification of a renal proximal tubular cell-specific enhancer in the mouse 25-hydroxyvitamin D 1alpha-hydroxylase gene.	Journal of the American Society of Nephrology	13 (6)	1455-63	2002
Narita I, Saito N, Goto S, Shirasaki A, Morioka Y, Jin S, Omori K, Sakatsume M, Arakawa M, Gejyo F.	Role of genetic polymorphism in the SA gene on the blood pressure and prognosis of renal function in patients with IgA nephropathy.	Hypertension Research	25 (6)	831-836	2002
Ichikawa Y, Ishikawa T, Takahashi S, Hamaguchi Y, Morita T, Nishizuka I, Yamaguchi S, Endo I, Ike H, Togo S, Oki S, Shimada H, Kadota K, Nakamura S, Goto H, Nitanda H, Satomi S, Sakai T, Narita I, Gejyo F, Tomaru Y, Shimizu K, Hayashizaki Y, Okazaki Y.	Identification of genes regulating colorectal carcinogenesis by using the algorithm for diagnosing malignant state method.	Biochemical and Biophysical Research Communications	296 (2)	497-506	2002
Kaimori JY, Takenaka M, Nagasawa Y, Nakajima H, Izumi M, Akagi Y, Imai E, Hori M.	Quantitative analyses of osteopontin mRNA expression in human proximal tubules isolated from renal biopsy tissue sections of minimal change nephrotic syndrome and IgA glomerulonephropathy patients.	American Journal of Kidney Diseases	39 (5)	948-57	2002
Akiyama F, Tanaka T, Yamada R, Ohnishi Y, Tsunoda T, Maeda S, Takei T, Obara W, Ito K, Honda K, Uchida K, Tsuchiya K, Nitta K, Yumura W, Nihei H, Ujiie T, Nagane Y, Miyano S, Suzuki Y, Fujioka T, Narita I, Gejyo F, Nakamura Y.	Single-nucleotide polymorphisms in the class II region of the major histocompatibility complex in Japanese patients with immunoglobulin A nephropathy.	Journal of Human Genetics	47 (10)	532-538	2002
Nakajima H, Takenaka M, Kaimori JY, Nagasawa Y, Kosugi A, Kawamoto S, Imai E, Hori M, Okubo K.	Gene expression profile of renal proximal tubules regulated by proteinuria.	Kidney International	61 (5)	1577-87	2002
Nagatoya K, Moriyama T, Kawada N, Takeji M, Oseto S, Murozono T, Ando A, Imai E, Hori M.	Y-27632 prevents tubulointerstitial fibrosis in mouse kidneys with unilateral ureteral obstruction.	Kidney International	61 (5)	1684-95	2002

発表者氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
Narita I, Saito N, Goto S, Jin S, Omori K, Sakatsume M, Gejyo F.	Role of uteroglobin G38A polymorphism in the progression of IgA nephropathy in Japanese patients.	Kidney International	61 (5)	1853-1858	2002
Ito Y, Kawachi H, Morioka Y, Nakatsue T, Koike H, Ikezumi Y, Oyanagi A, Natori Y, Natori Y, Nakamura T, Gejyo F, Shimizu F.	Fractalkine expression and the recruitment of CX3CR1+ cells in the prolonged mesangial proliferative glomerulonephritis.	Kidney International	61 (6)	2044-57	2002
Ito T, Suzuki A, Imai E, Horimoto N, Ohnishi T, Daikuhara Y, Hori M.	Tornado extraction: a method to enrich and purify RNA from the nephrogenic zone of the neonatal rat kidney.	Kidney International	62 (3)	763-9	2002
Kuroda M, Sasamura H, Shimizu-Hirota R, Mifune M, Nakaya H, Kobayashi E, Hayashi M, Saruta T.	Glucocorticoid regulation of proteoglycan synthesis in mesangial cells.	Kidney International	62 (3)	780-9	2002
Goto S, Narita I, Saito N, Watanabe Y, Yamazaki H, Sakatsume M, Shimada H, Nishi S, Ueno M, Akazawa K, Arakawa M, Gejyo F.	A(-20)C polymorphism of the angiotensinogen gene and progression of IgA nephropathy.	Kidney International	62 (3)	980-985	2002
Okado T, Terada Y, Tanaka H, Inoshita S, Nakao A, Sasaki S.	Smad7 mediates transforming growth factor-β-induced apoptosis in mesangial cells.	Kidney International	62 (4)	1178-1186	2002
Terada Y, Tanaka H, Okado T, Shimamura H, Inoshita S, Kuwahara M, Akiba T, Sasaki S.	Ligand-regulatable erythropoietin production by plasmid injection and in vivo electroporation.	Kidney International	62 (6)	1966-1976	2002
Takei T, Iida A, Nitta K, Tanaka T, Ohnishi Y, Yamada R, Maeda S, Tsunoda T, Takeoka S, Ito K, Honda K, Uchida K, Tsuchiya K, Suzuki Y, Fujioka T, Ujiie T, Nagane Y, Miyano S, Narita I, Gejyo F, Nihei H, Nakamura Y.	Association between single-nucleotide polymorphisms in selectin genes and immunoglobulin A nephropathy.	The American Journal of Human Genetics	70 (3)	781-786	2002
Nakamura H, Isaka Y, Tsujie M, Rupprecht HD, Akagi Y, Ueda N, Imai E, Hori M.	Introduction of DNA enzyme for Egr-1 into tubulointerstitial fibroblasts by electroporation reduced interstitial alpha-smooth muscle actin expression and fibrosis in unilateral ureteral obstruction (UUO) rats.	Gene Therapy	9 (8)	495-502	2002
Ou ZL, Hotta O, Natori Y, Sugai H, Taguma Y, Natori Y.	Enhanced expression of C chemokine lymphotactin in IgA nephropathy.	Nephron	91 (2)	262-9	2002

発表者氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
Nakaya H, Sasamura H, Mifune M, Shimizu-Hirota R, Kuroda M, Hayashi M, Saruta T.	Prepubertal treatment with Angiotensin receptor blocker causes partial attenuation of hypertension and renal damage in adult dahl salt-sensitive rats.	Nephron	91 (4)	710-8	2002
Ohashi T, Uchida K, Uchida S, Sasaki S, Nihei H.	Intracellular mislocalization of mutant podocin and correction by chemical chaperones.	Histochemistry and Cell Biology	119 (3)	257-264	2003
Hayama A, Rai T, Sasaki S, Uchida S.	Molecular mechanisms of Bartter syndrome caused by mutations in the BSND gene.	Histochemistry and Cell Biology	119 (6)	485-493	2003
Suzuki A, Ito T, Imai E, Yamato M, Iwatani H, Kawachi H, Hori M.	Retinoids regulate the repairing process of the podocytes in puromycin aminonucleoside-induced nephrotic rats.	Journal of the American Society of Nephrology	14 (4)	981-91	2003
Terada Y, Tanaka H, Okado T, Shimamura H, Inoshita S, Kuwahara M, Sasaki S.	Expression and function of the developmental gene Wnt-4 during experimental acute renal failure in rats.	Journal of the American Society of Nephrology	14 (5)	1223-33	2003
Shimamura H, Terada Y, Okado T, Tanaka H, Inoshita S, Sasaki S.	The PI3-kinase-Akt pathway promotes mesangial cell survival and inhibited apoptosis in vitro via NF-kB and Bad.	Journal of the American Society of Nephrology	14 (6)	1427-1434	2003
Yoshino J, Monkawa T, Tsuji M, Hayashi M, Saruta T.	Leukemia inhibitory factor is involved in tubular regeneration after experimental acute renal failure.	Journal of the American Society of Nephrology	14 (12)	3090-101	2003
Daniel C, Takabatake Y, Mizui M, Isaka Y, Kawashi H, Rupprecht H, Imai E, Hugo C	Antisense oligonucleotides against thrombospondin-1 inhibit activation of tgf-beta in fibrotic renal disease in the rat in vivo.	American Journal of Pathology	163 (3)	1185-92	2003
Kaneko Y, Sakatsume M, Xie Y, Kuroda T, Igashima M, Narita I, Gejyo F.	Macrophage metalloelastase as a major factor for glomerular injury in anti-glomerular basement membrane nephritis.	The Journal of Immunology	170 (6)	3377-3385	2003
Sato A, Matsumoto Y, Koide U, Kataoka Y, Yoshida N, Yokota T, Asashima M, Nishinakamura R.	Zinc finger protein Sall2 is not essential for embryonic and kidney development.	Molecular and Cellular Biology	23 (1)	62-69	2003
Hirota N, Ichihara A, Koura Y, Tada Y, Hayashi M, Saruta T.	Transmural pressure control of prorenin processing and secretion in diabetic rat juxtaglomerular cells.	Hypertension Research	26 (6)	493-501	2003
Ichihara A, Hayashi M, Hirota N, Okada H, Koura Y, Tada Y, Kaneshiro Y, Tsuganezawa H, Saruta T.	Angiotensin II type 2 receptor inhibits prorenin processing in juxtaglomerular cells.	Hypertension Research	26 (11)	915-21	2003

発表者氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
Kaimori JY, Takenaka M, Nakajima H, Hamano T, Horio M, Sugaya T, Ito T, Hori M, Okubo K, Imai E.	Induction of glia maturation factor-beta in proximal tubular cells leads to vulnerability to oxidative injury through the p38 pathway and changes in antioxidant enzyme activities.	Journal of Biological Chemistry	278 (35)	33519-27	2003
Yokoo T, Sakurai K, Ohashi T, Kawamura T.	Stem cell gene therapy for chronic renal failure.	Current Gene Therapy	3 (5)	387-394	2003
Narita I, Goto S, Saito N, Song J, Omori K, Kondo D, Sakatsume M, Gejyo F.	Renoprotective efficacy of renin-angiotensin inhibitors in IgA nephropathy is influenced by ACE A2350G polymorphism.	Journal of Medical Genetics	40 (12)	E130	2003
Song J, Narita I, Goto S, Saito N, Omori K, Sato F, Ajiro J, Saga D, Kondo D, Sakatsume M, Gejyo F.	Gender specific association of aldosterone synthase gene polymorphism with renal survival in patients with IgA nephropathy.	Journal of Medical Genetics	40 (5)	372-376	2003
Narita I, Goto S, Saito N, Song J, Ajiro J, Sato F, Saga D, Kondo D, Akazawa K, Sakatsume M, Gejyo F.	Interaction between ACE and ADD1 gene polymorphisms in the progression of IgA nephropathy in Japanese patients.	Hypertension	42 (3)	304-309	2003
Obara W, Iida A, Suzuki Y, Tanaka T, Akiyama F, Maeda S, Ohnishi Y, Yamada R, Tsunoda T, Takei T, Ito K, Honda K, Uchida K, Tsuchiya K, Yumura W, Ujiie T, Nagane Y, Nitta K, Miyano S, Narita I, Gejyo F, Nihei H, Fujioka T, Nakamura Y.	Association of single-nucleotide polymorphisms in the polymeric immunoglobulin receptor gene with immunoglobulin A nephropathy (IgAN) in Japanese patients.	Journal of Human Genetics	48 (6)	293-299	2003
Kobayashi S, Dono K, Tanaka T, Takahara S, Isaka Y, Imai E, Nagano H, Tomoaki K, Umeshita K, Nakamori S, Sakon M, Monden M.	Gene transfer into the liver by plasmid injection into the portal vein combined with electroporation.	The Journal of Gene Medicine	5 (3)	201-8	2003
Kobayashi S, Dono K, Takahara S, Isaka Y, Imai E, Zhenhui L, Nagano H, Tomoaki K, Umeshita K, Nakamori S, Sakon M, Monden M.	Electroporation-mediated ex vivo gene transfer into graft not requiring injection pressure in orthotopic liver transplantation.	The Journal of Gene Medicine	5 (6)	510-7	2003
Takase O, Hirahashi J, Takayanagi A, Chikaraishi A, Marumo T, Ozawa Y, Hayashi M, Shimizu N, Saruta T.	Gene transfer of truncated IkappaBalpha prevents tubulointerstitial injury.	Kidney International	63 (2)	501-13	2003
Tsuboi N, Utsunomiya Y, Kawamura T, Kikuchi T, Hosoya T, Ohno T, Yamda H.	Shedding of growth-suppressive gangliosides from glomerular mesangial cells undergoing apoptosis.	Kidney International	63 (3)	936-946	2003

発表者氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
Carl M, Akagi Y, Weidner S, Isaka Y, Imai E, Rupprecht HD.	Specific inhibition of Egr-1 prevents mesangial cell hypercellularity in experimental nephritis.	Kidney International	63 (4)	1302-12	2003
Xie Y, Nishi S, Ueno M, Imai N, Sakatsume M, Narita I, Suzuki Y, Akazawa K, Shimada H, Arakawa M, Gejyo F.	The efficacy of tonsillectomy on long-term renal survival in patients with IgA nephropathy.	Kidney International	63 (5)	1861-1867	2003
Asai T, Kuwahara M, Kurihara H, Sakai T, Terada Y, Marumo F, Sasaki S.	Pathogenesis of nephrogenic diabetes insipidus by aquaporin-2 C-terminus mutations.	Kidney International	64 (1)	2-10	2003
Yokoo T, Ohashi T, Utsunomiya Y, Okamoto A, Suzuki T, Shen J-S, Tanaka T, Kawamura T, Hosoya T.	Gene delivery using human cord blood-derived CD34+ cells into inflamed glomeruli in NOD/SCID mice.	Kidney International	64 (1)	102-109	2003
Narita I, Goto S, Saito N, Song J, Omori K, Kondo D, Sakatsume M, Gejyo F.	Angiotensinogen gene variation and renoprotective efficacy of renin-angiotensin system blockade in IgA nephropathy.	Kidney International	64 (3)	1050-1058	2003
Kobayashi E, Sasamura H, Mifune M, Shimizu-Hirota R, Kuroda M, Hayashi M, Saruta T.	Hepatocyte growth factor regulates proteoglycan synthesis in interstitial fibroblasts.	Kidney International	64 (4)	1179-88	2003
Oseto S, Moriyama T, Kawada N, Nagatoya K, Takeji M, Ando A, Yamamoto T, Imai E, Hori M.	Therapeutic effect of all-trans retinoic acid on rats with anti-GBM antibody glomerulonephritis.	Kidney International	64 (4)	1241-52	2003
Song J, Sakatsume M, Narita I, Goto S, Omori K, Takada T, Saito N, Ueno M, Gejyo F.	Peroxisome proliferator-activated receptor gamma C161T polymorphisms and survival of Japanese patients with immunoglobulin A nephropathy.	Clinical Genetics	64 (5)	398-403	2003
Araki T, Hayashi M, Saruta T.	Cloning and characterization of a novel gene promoting ureteric bud branching in the metanephros.	Kidney International	64 (6)	1968-77	2003
Narita I, Goto S, Saito N, Song J, Kondo D, Omori K, Kawachi H, Shimizu F, Sakatsume M, Ueno M Gejyo F.	Genetic polymorphism of NPHS1 modifies the clinical manifestations of Ig A nephropathy.	Laboratory Investigation	83 (8)	1193-1200	2003
Araki T, Hayashi M, Nakanishi K, Morishima N, Saruta T.	Caspase-9 takes part in programmed cell death in developing mouse kidney.	Nephron Experimental Nephrology	93 (3)	E117-24	2003
Yamauchi K. Rai T. Kobayashi K. Sohara E. Suzuki T. Itoh T. Suda S. Hayama A. Sasaki S. Uchida S.	Disease-causing mutant WNK4 increases paracellular chloride permeability and phosphorylates claudins.	Proceedings of the National Academy of Sciences of the United States of America	101 (13)	4690-4694	2004

発表者氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
Ichihara A, Hayashi M, Kaneshiro Y, Suzuki F, Nakagawa T, Tada Y, Koura Y, Nishiyama A, Okada H, Uddin MN, Nabi AH, Ishida Y, Inagami T, Saruta T.	Inhibition of diabetic nephropathy by a decoy peptide corresponding to the "handle" region for nonproteolytic activation of prorenin.	Journal of Clinical Investigation	114 (8)	1128-35	2004
Takasato M, Osafune K, Matsumoto Y, Yoshida N, Meguro H, Aburatani H, Asashijma M, Nishinakamura R.	Identification of kidney mesenchymal genes by a combination of microarray analysis and Sall1- GFP knockin mice.	Mechanisms of Development	121 (6)	547-557	2004
Nakayama N, Han CY, Cam L, Lee JI, Pretorius J, Fisher S, Rosenfeld R, Scully S, Nishinakamura R, Duryea D, Van G, Bolon B, Yokota T, Zhang K.	A novel chordin-like BMP inhibitor, CHL2, expressed preferentially in chondrocytes of developing cartilage and osteoarthritic joint cartilage.	Development	131 (1)	229-240	2004
Nakayama K, Natori Y, Sato T, Kimura T, Sugiura A, Sato H, Saito T, Ito S, Natori Y.	Altered expression of NDST-1 messenger RNA in puromycin aminonucleoside nephrosis.	Journal of Laboratory and Clinical Medicine	143 (2)	106-14	2004
Nakajima H, Takenaka M, Kaimori JY, Hamano T, Iwatani H, Sugaya T, Ito T, Hori M, Imai E.	Activation of the signal transducer and activator of transcription signaling pathway in renal proximal tubular cells by albumin.	Journal of the American Society of Nephrology	15 (2)	276-85	2004
Ma J, Matsusaka T, Yang H, Kawachi H, Shimizu F, Isaka Y, Imai E, Kon V, Ichikawa I.	Local actions of endogenous angiotensin II in injured glomeruli.	Journal of the American Society of Nephrology	15 (5)	1268-76	2004
Takeji M, Kawada N, Moriyama T, Nagatoya K, Oseto S, Akira S, Hori M, Imai E, Miwa T.	CCAAT/Enhancer-binding protein delta contributes to myofibroblast transdifferentiation and renal disease progression.	Journal of the American Society of Nephrology	15 (9)	2383-90	2004
Tanaka H, Terada Y, Kobayashi, Okado T, Inoshita S, Kuwahara M, Seth A, Sato Y, S Sasaki S.	Expression and function of Ets-1 during experimental acute renal failure in rats.	Journal of the American Society of Nephrology	15 (12)	3083-3092	2004
Yazawa K, Isaka Y, Takahara S, Imai E, Ichimaru N, Shi Y, Namba Y, Okuyama A.	Direct transfer of hepatocyte growth factor gene into kidney suppresses cyclosporin A nephrotoxicity in rats.	Nephrology, Dialysis, Transplantation	19 (4)	812-6	2004
Xie Y, Nishi S, Fukase S, Nakamura H, Chen X, Imai N, Sakatsume M, Saito A, Ueno M, Narita I, Yamamoto T, Gejyo F.	Different type and localization of CD44 on surface membrane of regenerative renal tubular epithelial cells in vivo.	American Journal of Nephrology	24 (2)	188-197	2004
Watabe M, Hishikawa K, Takayanagi A, Shimizu N, Nakaki T.	Caffeic acid phenethyl ester induces apoptosis by inhibition of NFkappaB and activation of Fas in human breast cancer MCF-7 cells.	Journal of Biological Chemistry	279 (7)	6017-6026	2004

発表者氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
Hishikawa K, Miura S, Marumo T, Yoshioka H, Mori Y, Takato T, Fujita T.	Gene expression profile of human mesenchymal stem cells during osteogenesis in three-dimensional thermoreversible gelation polymer.	Biochemical and Biophysical Research Communications	317 (4)	1103-1107	2004
Sato A, Kishida S, Tanaka T, Kikuchi A, Kodama T, Asashima M, Nishinakamura, R.	Sall1, a causative gene for Townes-Brocks syndrome, enhances the canonical Wnt signaling by localizing to heterochromatin.	Biochemical and Biophysical Research Communications	319 (1)	103-113	2004
Wang Y, Iwatani H, Ito T, Horimoto N, Yamato M, Matsui I, Imai E, Hori M.	Fetal cells in mother rats contribute to the remodeling of liver and kidney after injury.	Biochemical and Biophysical Research Communications	325 (3)	961-7	2004
Sato F, Narita I, Goto S, Kondo D, Saito N, Ajiro J, Saga D, Ogawa A, Kadomura M, Akiyama F, Kaneko Y, Ueno M, Sakatsume M, Gejyo F.	Transforming growth factor-beta1 gene polymorphism modifies the histological and clinical manifestations in Japanese patients with IgA nephropathy.	Tissue Antigens	64 (1)	35-42	2004
Suzuki A, Iwatani H, Ito T, Imai E, Okabe M, Nakamura H, Isaka Y, Yamato M, Hori M.	Platelet-derived growth factor plays a critical role to convert bone marrow cells into glomerular mesangial-like cells.	Kidney International	65 (1)	15-24	2004
Xie, Y. Chen, X. Nishi, S. Narita, I. Gejyo, F.	Relationship between tonsils and IgA nephropathy as well as indication of tonsillectomy.	Kidney International	65 (4)	1135-1144	2004
Iwatani H, Ito T, Imai E, Matsuzaki Y, Suzuki A, Yamato M, Okabe M, Hori M.	Hematopoietic and nonhematopoietic potentials of Hoechst(low)/side population cells isolated from adult rat kidney.	Kidney International	65 (5)	1604-14	2004
Mizui M, Isaka Y, Takabatake Y, Mizuno S, Nakamura T, Ito T, Imai E, Hori M	Electroporation-mediated HGF gene transfer ameliorated cyclosporine nephrotoxicity.	Kidney International	65 (6)	2041-53	2004
Miyazawa S, Hotta O, Doi N, Natori Y, Nishikawa K, Natori Y.	Role of mast cells in the development of renal fibrosis: use of mast cell-deficient rats.	Kidney International	65 (6)	2228-37	2004
Isaka Y, Nakamura H, Mizui M, Takabatake Y, Horio M, Kawachi H, Shimizu F, Imai E, Hori M.	DNAzyme for TGF-beta suppressed extracellular matrix accumulation in experimental glomerulonephritis.	Kidney International	66 (2)	586-90	2004
Imai E, Nakajima H, Kaimori JY.	Albumin turns on a vicious spiral of oxidative stress in renal proximal tubules.	Kidney International	66 (5)	2085-7	2004
Shimizu-Hirota R, Sasamura H, Kuroda M, Kobayashi E, Hayashi M, Saruta T.	Extracellular matrix glycoprotein biglycan enhances vascular smooth muscle cell proliferation and migration.	Circulation Research	94 (8)	1067-74	2004

発表者氏名	論文タイトル名	発表誌名	巻号	ページ	出版年
Yokoo T, Ohashi T, Shen JS, Sakurai K, Miyazaki Y, Utsunomiya Y, Takahashi M, Terada Y, Eto Y, Kawamura T, Osumi N, Hosoya T.	Human mesenchymal stem cells in rodent whole-embryo culture are reprogrammed to contribute to kidney tissues.	Proceedings of the National Academy of Sciences of the United States of America	102 (9)	3296-300	2005
Hishikawa K, Marumo T, Miura S, Nakanishi A, Matsuzaki Y, Shibata K, Kohike H, Komori T, Hayashi M, Nakaki T, Nakauchi H, Okano H, Fujita T.	Leukemia inhibitory factor induces multi-lineage differentiation of adult stem-like cells in kidney via kidney-specific cadherin 16.	Biochemical and Biophysical Research Communications	328 (1)	288-291	2005
Ohtsubo S, Iida A, Nitta K, Tanaka T, Yamada R, Ohnishi Y, Maeda S, Tsunoda T, Takei T, Obara W, Akiyama F, Ito K, Honda K, Uchida K, Tsuchiya K, Yumura W, Ujiie T, Nagane Y, Miyano S, Suzuki Y, Narita I, Gejyo F, Fujioka T, Nihei H, Nakamura Y.	Association of a single-nucleotide polymorphism in the immunoglobulin mu-binding protein 2 gene with immunoglobulin A nephropathy.	Journal of Human Genetics	50 (1)	30-35	2005
Alchi B, Nishi S, Kondo D, Kaneko Y, Matsuki A, Imai N, Ueno M, Iguchi S, Sakatsume M, Narita I, Yamamoto T Gejyo F.	Osteopontin expression in acute renal allograft rejection.	Kidney International	67 (3)	886-96	2005
Uchimura H, Marumo T, Takase O, Kawachi H, Shimizu F, Hayashi M, Saruta T, Hishikawa K, Fujita T.	Intrarenal injection of bone marrow-derived angiogenic cells reduces endothelial injury and mesangial cell activation in experimental glomerulonephritis.	Journal of the American Society of Nephrology	in press		2005
Takabatake Y, Isaka Y, Mizui M, Kawachi H, Shimizu F, Ito T, Hori M, Imai E.	Exploring RNA interference as a therapeutic strategy for renal disease.	Gene Therapy	in press		2005

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In vitro induction of the pronephric duct in *Xenopus* explants

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The earliest form of embryonic kidney, the pronephros, consists of three components: glomus, tubule and duct. Treatment of the undifferentiated animal pole ectoderm of *Xenopus laevis* with activin A and retinoic acid (RA) induces formation of the pronephric tubule and glomus. In this study, the rate of induction of the pronephric duct, the third component of the pronephros, was investigated in animal caps treated with activin A and RA. Immunohistochemistry using pronephric duct-specific antibody 4A6 revealed that a high proportion of the treated explants contained 4A6-positive tubular structures. Electron microscopy showed that the tubules in the explants were similar to the pronephric ducts of normal larvae, and they also expressed *Gremlin* and *c-ret*, molecular markers for pronephric ducts. These results suggest that the treatment of *Xenopus* ectoderm with activin A and RA induces a high rate of differentiation of pronephric ducts, in addition to the differentiation of the pronephric tubule and glomus, and that this *in vitro* system can serve as a simple and effective model for analysis of the mechanism of pronephros differentiation.

Key words: activin, pronephric duct, retinoic acid, *Xenopus*.

Introduction

Vertebrates develop a succession of three forms of kidney during embryonic and adult life: the pronephros (first kidney), mesonephros (middle kidney) and metanephros (final kidney). All three kidneys have the same basic functional unit, the nephron, and similar mechanisms and regulatory genes are probably involved in nephron development in all three (Vize *et al.* 1997). The simplicity of the pronephros makes its developmental system an attractive model for studying kidney morphogenesis. The pronephros consists of three components: (i) the pronephric glomus, which filters waste from the bloodstream into the coelom; (ii) the pronephric tubule, which collects the waste from the coelom; and (iii) the pronephric duct, which carries the waste to the exterior via the cloaca (Vize *et al.* 1997). Two monoclonal antibodies that specifically recognize different parts of the pronephros have been developed (Vize *et al.* 1995): antibody 3G8 recognizes the pronephric tubule and otic vesicle, and antibody 4A6 specifically recognizes the pronephric duct. The molecular nature of the antigens targeted by these antibodies remains unknown, except that by western blotting it has been found that antibody 4A6 recognizes a 50 kDa protein. Investigations using these antibodies have elucidated mechanisms of pronephros development, such as the timing of specification (Brennan *et al.* 1998) and the spatial relationship of the primordia of the pronephric tubules and ducts in normal embryos (Vize *et al.* 1995).

The *in vitro* inducibility of these pronephric components has been analyzed using an animal cap model. Animal cap ectoderm, fated to become epidermis and neural tissue in normal development, differentiates to form the pronephric tubule and glomus when treated with activin A and retinoic acid (RA; Moriya *et al.* 1993; Brennan *et al.* 1999). In this report, we used antibody 4A6 to show that the *in vitro* treatment of animal cap ectoderm with activin A and RA very frequently induces differentiation of the pronephric duct.

Materials and Methods

Animal cap assay

Xenopus late blastulae (stage 9; Nieuwkoop & Faber 1956) were de-jellied by treatment with 2% cysteine hydrochloride in Steinberg's solution (58 mM NaCl,

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0.67 mM KCl, 0.34 mM $Ca(NO_3)_2$, 0.83 mM $MgSO_4$, 3 mM HEPES and 100 mg/L kanamycin sulfate, pH 7.8). The vitelline membrane of the blastula embryo was removed with fine forceps, and the presumptive ectoderm (animal cap) was isolated with tungsten needles. The ectoderm was removed in 0.6–0.7 mm squares, unless indicated otherwise. The explants were incubated for 1 h in Steinberg's solution containing recombinant human activin A (10 ng/mL; kindly provided by Dr Y. Eto, Ajinomoto Co. Inc., Kawasaki, Japan), and all-*trans* RA (10^{-4} M; Sigma, St Louis, MO, USA). After washing, the explants were cultured in Steinberg's solution at 20°C until they were equivalent to stage 40–42 in normal embryos, unless indicated otherwise.

Immunohistochemistry

Embryos and explants were fixed in MEMFA (0.1 M MOPS, pH 7.4, 2 mM EGTA, 1 mM $MgSO_4$ and 3.7% formaldehyde) and subsequently dehydrated in methanol and stored at −20°C. Both embryo and explant tissues were rehydrated with phosphate-buffered saline (PBS), then blocked with PBT (PBS, 0.1% Triton X)/20% goat serum for 1 h at room temperature. Hybridoma supernatant (3G8 or 4A6; kindly provided by Dr E. A. Jones, Warwick University, Coventry, UK), was diluted with PBT/20% goat serum, 1:2 for 3G8 and 1:1 for 4A6, and incubated overnight at 4°C. After washing the samples five times with PBT at room temperature, secondary incubation with a 1:4000 dilution of goat antimouse IgG + IgM conjugated to alkaline phosphatase (Biosource, Camarillo, CA, USA) was done overnight at 4°C. Samples were washed five times with PBT at room temperature, and an alkaline phosphatase blue color reaction was done by using 4-nitroblue tetrazolium chloride/5-bromo-4-chloro-3-indolylphosphate substrate (NBT/BCIP; Roche Diagnostics Corporation,

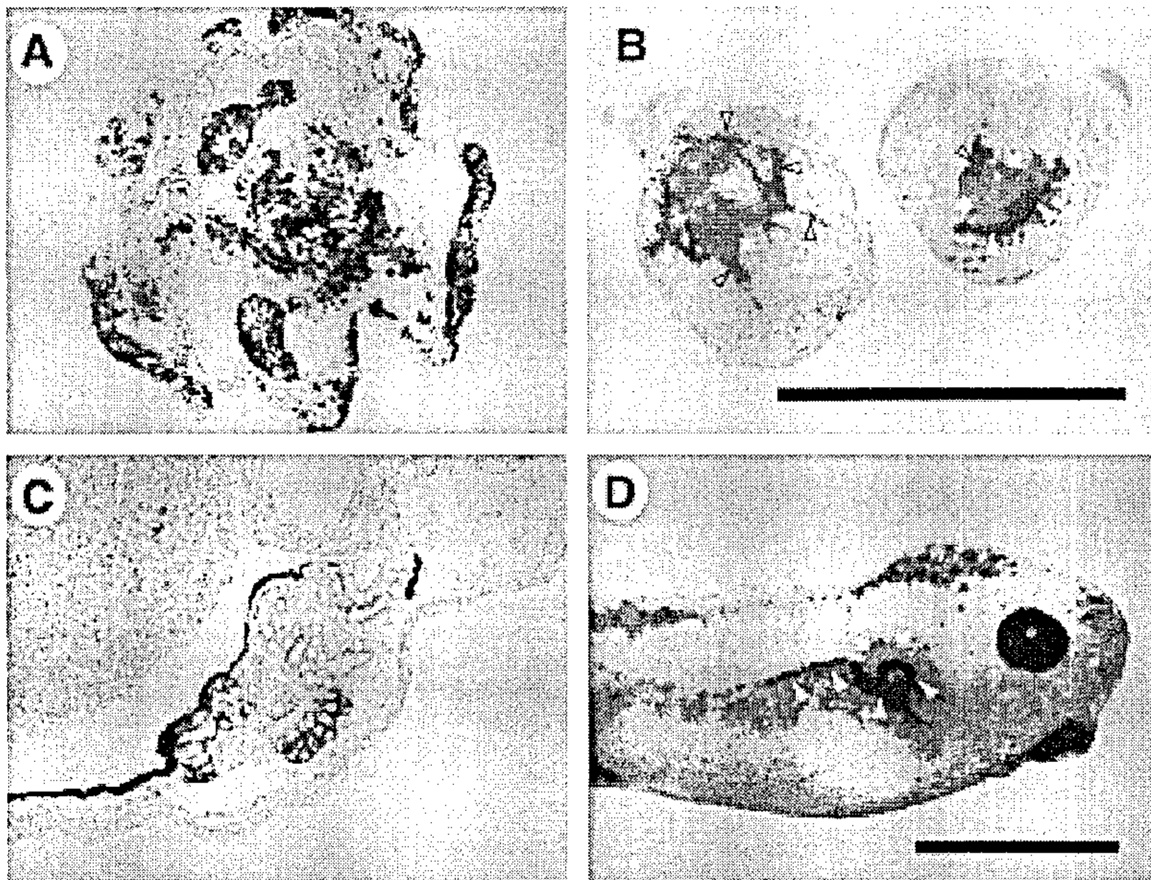

Fig. 1. Double immunostaining of a stage 42 equivalent *Xenopus* explant (A,B) and stage 40 larvae (C,D) using pronephric duct-specific antibody 4A6 (blue) and pronephric tubule-specific antibody 3G8 (red). Whole-mount immunostaining patterns (B,D) and photomicrographs of sections (A,C) are shown. (A,B) Explants treated with activin A and retinoic acid contain both 3G8-positive (pronephric tubule, arrows) and 4A6-positive tubular structures (pronephric duct, arrowheads). Bar, 1 mm.

Indianapolis, IN, USA). Samples were fixed again with MEMFA, dehydrated through a graded series of ethanol and xylene, embedded in paraffin, and sectioned at 10 µm.

Whole-mount double staining was carried out by first-round staining with 4A6 antibody using NBT/BCIP and fixation in MEMFA for 30 min, followed by second-round staining with 3G8 antibody using the Fast Red Tablet substrate (Roche Diagnostics Corporation). For light microscopy, the first-round stained explants were sectioned at 10 µm and subjected to the second round of staining.

Electron microscopy

Stage 42 tadpoles and the explants cultured to stage 42 equivalence after treatment with activin A and RA were prefixed in 3% paraformaldehyde, 2.5% glutaraldehyde and 0.1 M cacodylate buffer (pH 7.4) for 1 day. The explants and tadpoles were then washed with the buffer and postfixed in 1% OsO_4 and 0.1 M cacodylate buffer (pH 7.4) for 2 h. After washing with the buffer, the explants and tadpoles were dehydrated through a graded series of ethanol and acetone and embedded in epoxy resin. Ultrathin sections were cut and were double stained with uranyl acetate and lead citrate, and the sections were examined with a transmission electron microscope (JEM-200CX; Jeol, Tokyo, Japan).

Whole-mount in situ *hybridization*

Whole-mount *in situ* hybridization was performed using the method described by Harland (1991). 1.5 kb partial fragments of *Gremlin* and *c-ret* amplified by the polymerase chain reaction (PCR) were subcloned into PCRII vector (Invitrogen Corporation, Carlsbad, CA, USA) and sequenced. The primers used for PCR were: 5′-TGTAGCAGCCTCACATGGAC-3′ and 5′-CCACCCCTGACCTCAATAAA-3′ for *Gremlin*; and 5′-AAGATGACACAGCCCCATTC-3′ and 5′-GGGATG-CACTCTCTTTCAGC-3′ for *c-ret*. After linearization of the templates, RNA probes were transcribed with Sp6 and T7 RNA polymerases (Promega, Madison, WI, USA). For histological analysis, stained explants and embryos were sectioned at 10–20 µm.

Results

Immunohistochemistry demonstrating the pronephric tubule and duct induced in explants

Ectoderm explants treated with activin A and RA were examined by immunohistochemistry. Double staining using pronephric duct-specific antibody 4A6 and pronephric tubule-specific antibody 3G8 was positive for both in the tubular structure of the explants (Fig. 1A,B). Staining of 4A6 was seen around the entire cell surface of the tubular epithelia of the explants (Fig. 1A), similar to that in the pronephric duct cells in stage 40 tadpoles (Fig. 1C). In contrast, 3G8 stained the apical surface of the tubule cells in the explants (Fig. 1A), the same as in stage 40 tadpoles (Fig. 1C). These staining patterns are consistent with the original report of Vize *et al.* (1995). Whole-mount staining (Fig. 1B,D) and light microscopic examination (Fig. 1A,C) revealed that the two antibodies stained different portions of the tubular structure,

Table 1. Induction of 4A6-positive tubular structures in explants treated with activin A and retinoic acid

	0 ng/mL activin A		10 ng/mL activin A	
	0 M RA†	10^{-4} M RA†	0 M RA†	10^{-4} M RA†
0.4–0.5 mm	0/16 (0)	0/27 (0)	0/23 (0)	21/29 (72)
0.6–0.7 mm	0/14 (0)	0/29 (0)	3/30 (10)	30/33 (91)
Ventral side	0/15 (0)	0/26 (0)	4/33 (12)	26/27 (96)
Dorsal side	0/15 (0)	0/30 (0)	2/29 (7)	23/40 (58)

†Figures represent the ratios of the number of explants with 4A6-positive tubular structures to the total number of explants. Figures in parentheses show the ratios as percentages. RA, retinoic acid.

Table 2. Induction rate of 4A6- or 3G8-positive tubular structures in explants cultured until equivalent to various stages of normal larvae

	Stage 27†	Stage 32†	Stage 37/38†	Stage 42†	Stage 47†
4A6-positive rate	0/25 (0)	0/25 (0)	12/33 (36)	23/25 (92)	11/11 (100)
3G8-positive rate	0/11 (0)	12/12 (100)	8/12 (67)	11/14 (79)	11/13 (85)

†Figures represent the ratios of the number of explants with 4A6- or 3G8-positive tubular structures to the total number of explants. Figures in parentheses show the ratios as percentages.