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13. ABSTRACT (Maximum 200 Words)

The central hypothesis is that *bcl-2* protein over expression confers intrinsic resistance to chemotherapy in patients with hormone-refractory prostate cancer (HRPC), therefore downregulation of *bcl-2* protein by the antisense oligonucleotide directed to Bcl-2, G3139, will enhance the antitumor activity of docetaxel in patients HRPC. To address this hypothesis and determine the predictive biomarkers for response to this therapy a phase II clinical study of G3139 combined with docetaxel was initiated in men with HRPC. The specific aims of the current grant (PC010504) are to demonstrate that *bcl-2* over expression in prostate cancer specimens, the degree of *bcl-2* downregulation in normal peripheral blood mononuclear cells (MNCs), and the pharmacokinetic parameters of G3139 and docetaxel will predict prostate cancer responsiveness to G3139 and docetaxel. Preliminary Results: thirty-one patients have been entered on the clinical study. Original tumor specimens have been obtained in 30/31 patients and immunohistochemical Bcl-2, Bax, Bcl-X_l expression will be determined in year 2. The mean G3139 steady-state concentrations were 5.51±1.63 μg/mL with moderate interpatient variability whereas MNC Bcl-2 protein expression declined by a median of 58% following 5 days of G3139 therapy. In year 2 and 3 of the grant the predictive biomarker and pharmacokinetic relationships will be determined.

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PC010504: Predictive Biomarkers of Response to *bcl*-2 Biomodulation by G3139 (antisense oligonucleotide to bcl-2) with Docetaxel in Hormone-Refractory Prostate Cancer

INTRODUCTION

The central hypothesis is that *bcl-2* protein overexpression confers intrinsic resistance to chemotherapy in patients with hormone-refractory prostate cancer (HRPC), therefore downregulation of *bcl-2* protein by G3139 will enhance the antitumor activity of docetaxel in patients HRPC. We further hypothesize and the focus of the current grant application is that patients whose tumors utilize *bcl-2* overexpression as a mechanism to escape the apoptotic events of chemotherapy will benefit from G3139 biomodulation, whereas tumors that exhibit other mechanisms for impaired apoptosis, such as diminished Bax expression, will fail to respond or fail to have a durable response. The specific aims of this project are to demonstrate (1) that *bcl-2* overexpression in prostate cancer specimens is a predictive biomarker for enhanced responsiveness to G3139 and docetaxel therapy; (2) that the degree of *bcl-2* downregulation in normal tissue surrogate (peripheral blood mononuclear cells) will predict prostate cancer responsiveness to G3139 and docetaxel; and (3) whether the pharmacokinetic parameters of G3139 and docetaxel are predictive of *bcl-2* biomodulation and antitumor activity, respectively.

BODY

Annual Report Year 1 (0-12 months)

A total of 31 patients have been entered into the clinical study entitled A Phase I/II pharmacokinetic and biologic correlative study of G3139 (antisense oligonucleotide directed to bcl-2) and docetaxel in patients with hormone-refractory prostate cancer and accrual of new patients is now complete. This accrual is somewhat faster than predicted and has permitted the correlative biologic studies to proceed moderately ahead of schedule. The clinical study has been overseen by Dr. Anthony Tolcher, the principal investigator of the clinical study and the biologic correlative grant, and Dr. Eric Rowinsky (co-investigator). The correlative biologic and pharmacokinetic studies are the companion to the clinical study and funded by the current Department of Defense Grant (PC010504). The accomplishments of year 1 are described below in order of the Tasks described in the original grant application.

Task 1: Immunohistochemical Detection of bcl-2, bcl-X_L, and Bax from patients entered onto phase II study of G3139 and docetaxel for HRPC

- ***a. Obtain primary tissue blocks (paraffin embedded) from each patient entered on Phase II study (30 patients total) for banking, section paraffin blocks for representative tumor, and perform immunohistochemical staining for bcl-2, bcl-X_L, and Bax staining. 24 months.***
- ***b. Pathologic scoring of all immunohistochemical stained specimens will be complete by end of year 2. (24 months).***

To date, paraffin blocks or unstained slides representitive of the original biopsy specimens have been obtained from 30 of the 31 patients entered. One specimen cannot be obtained and will not be pursued further. These specimens have been batched for uniformity in staining technique and will undergo immunohistochemical staining for Bcl-2, bcl-X_L, Bax staining in the next 6 months. Personnel changes for Task 1 include the

addition of Dr. Jeffrey Kreisberg (CV attached in appendix), an associate member of the Institute for Drug Development, who will be substituted for Dr. Shan Wu. Dr. Kreisberg brings to the project his expertise in immunohistochemical detection of predictive biomarkers (see attached publications). Furthermore, the important work by Kreisberg and others have examined in prostate cancer specimens apoptotic regulatory pathways mediated by the PTEN/Akt signal transduction pathway.[1] We will therefore examine, in addition to the stated biomarkers in Task 1, upstream regulators of the proapoptotic protein BAD including phospho-Akt and PTEN. This work is being performed by J. Kreisberg (co-investigator), and Dean Troyer (co-investigator).

Task 2: Quantification of G3139 mediated bcl-2 downregulation in peripheral blood mononuclear cells.

- ***a. Obtain isolate blood mononuclear cells (MNCs) from all patients (30 patients) at the two time points (prior to G3139 therapy and on day 5), isolate protein 18-24 months.***
- ***b. Perform western assay for bcl-2 protein. 18-24 months.***

Paired collections of peripheral blood mononuclear cells (MNC) have been obtained on 27 of 31 patients to date. Bcl-2 has been quantified by western blot methods on all 27 patients and the values have been normalized using quantification of actin expression. The majority of patients have marked decrements in Bcl-2 protein expression at day 6 compared to pretreatment values although a minority of patients have either no change in Bcl-2 expression or an increase (Figure 1). The median change in MNC Bcl-2 protein levels for the entire patient population to date was a 58% decrement (range +444% to –99.5%). The median decrement in bcl-2 protein by day 6 for the 19 patients who had declines was –71%. The differences in the magnitude of decline in Bcl-2 protein expression will be analyzed with respect to G3139 steady-state concentrations and patient's clinical response to therapy and the relationships determined (Task 4 Year 3).

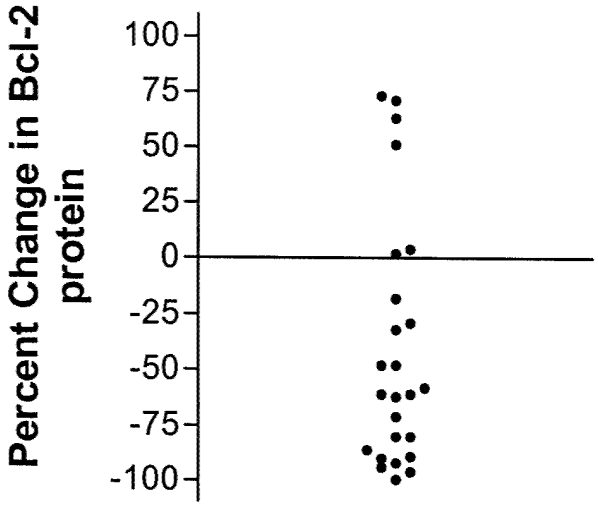

Figure 1: Distribution of percent change in Bcl-2 protein expression in 27 patients treated with G3139 (antisense oligonucleotide directed to Bcl-2). A single patient had a 444% rise in Bcl-2 expression with data point not shown in this figure. This work and analysis was performed by E. Izbicka (co-investigator), Gilbert Carrizales (research associate), Eric Rowinsky (co-investigator) and Anthony Tolcher (Principal Investigator)

Task 3: Pharmacokinetic Sampling of G3139 and docetaxel from patients entered on Phase II study.

a. ***Collect G3139 and docetaxel plasma samples for pharmacokinetic analysis from all 30 patients (18-24 months).***
b. ***Perform high-performance liquid chromatography to determine plasma concentrations of each agent (18-24 months).***

The analysis for G3139 is complete for 31 of 31 patients. Steady-state concentrations were reached by 24-hours following the start of the infusion and the mean steady-state concentration of G3139 is 5.51 (± 1.63) μg/mL. Figure 2 illustrates the mean values at each time point for the population as a whole. Overall there is only modest inter-patient

variability at 7 mg/kg/day of G3139 in this large patient sample although there are some outlier results that may have implications for the effectiveness of Bcl-2 downregulation measured in the surrogate normal mononuclear cells. This work has been performed by Dr. John Kuhn (co-investigator).

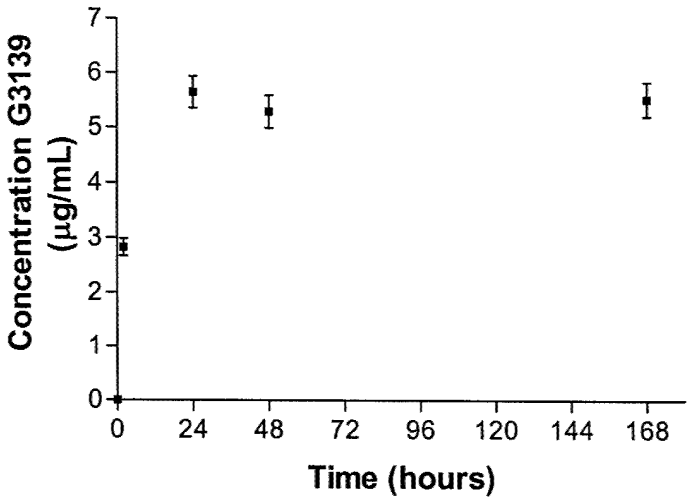

Figure 2: Mean values for G3139 plasma concentrations at 2, 24, 48, and 168-hours in patients receiving 7 mg/kg/day G3139 CIVI for 7 days

In years 2 and 3 the relationship of G3139 steady-state concentrations to Bcl-2 protein downregulation in peripheral blood mononuclear cells (MNCs) (Task 4b) will be explored.

Docetaxel pharmacokinetic parameters will be examined during year 2.

Task 4: Examine the predictive pharmacokinetic and biomarkers for response to bcl-2 biomodulation by G3139 and docetaxel.

a. Examine relationships between the biomarkers of bcl-2, bcl-X_L, and Bax expression and clinical outcome (6-12 months, Year 3).

b. ***Examine relationships between MNCs and G3139 steady-state concentrations, and patient clinical outcome (e.g. response rate, time to progression, survival). (6-12 months, Year 3).***
c. ***Model docetaxel pharmacokinetic parameters, and determine relationships with clinical outcome (6-12 months, Year 3)***

The examination of the relationships of the pharmacokinetic, predictive biomarkers and clinical outcome and analysis will occur in year 3 of the grant year.

Key Research Accomplishments (Year 1)

- Quantified MNC Bcl-2 protein decrements (and increments) following antisense Bcl-2 therapy and documented median decrement following 5 days of therapy.
- Quantified G3139 steady-state concentrations for 31 patients

Reportable Outcomes:

The data is too preliminary after 12 months to report outcomes

Conclusions:

The data is too preliminary after 12 months to draw conclusions. However, to more thoroughly address the predictive markers of apoptosis, we will expand the examination of pathways that regulated apoptosis and the original tumor blocks will also be subjected to immunohistochemistry for address the status of Akt activation which regulates the Bcl-2 family member BAD and we will complete the tasks of year 2 and 3 in the time allotted.

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Immunohistochemical Demonstration of Phospho-Akt in High Gleason Grade Prostate Cancer[1]

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ABSTRACT

Purpose: **Whereas the early stage of prostate cancer is marked by excessive proliferation, in advanced stages of the disease, a decreased apoptotic death rate (increased cell survival) also contributes to net tumor growth. Altered regulation of the mitogen-activated protein kinase (MAPK)-regulated cell proliferation and Akt-regulated cell survival pathways are suspected causes. In this study, we wanted to determine: (*a*) whether the degree of Akt activation can be assessed by immunohistochemical staining of paraffin-embedded human prostate cancer biopsies with an antibody to phospho-Akt (Ser473); and (*b*) whether phospho-MAPK/Erk1/2 and phospho-Akt expression are altered in prostate cancer.**

Experimental design: **To examine the activation status of MAPK/Erk1/2 and Akt, archival paraffin-embedded sections from 74 cases of resected prostate cancer were immunostained with antibodies to phospho-MAPK/Erk1/2 (Thr202/Tyr204) and phospho-Akt (Ser473).**

Results: **The staining intensity for phospho-Akt was significantly greater in Gleason grades 8–10 (92% of such cases staining strongly) compared with prostatic intraepithelial neoplasia and all other grades of prostate cancer (only 10% of these cases staining strongly; $P \leq 0.001$). The staining intensity for phospho-MAPK/Erk, on the other hand, was significantly greater for normal, hyperplastic, and prostatic intraepithelial neoplasia lesions but declined with disease progression, reaching its lowest level of expression in high Gleason grades 8–10 ($P < 0.0001$).**

Conclusion: **The activation state of the cell survival protein Akt can be analyzed in human prostate cancer by immunohistochemical staining of paraffin-embedded tissue with a phospho-specific Akt (Ser473) antibody. Advanced disease is accompanied by activation of Akt and inactivation of Erk.**

INTRODUCTION

Prostate cancer causes more than 41,000 deaths annually in the United States and is the second leading cause of cancer deaths in men (1). Although prostate cancer is initially dependent on androgens for growth and, thus, is responsive to androgen ablation, progression to an androgen-insensitive state generally ensues (1). When this occurs, the prognosis is poor, because no systemic therapy is effective. Therefore, there is an urgent need for targeted nonhormonal treatment that inhibits prostatic cancer cells. In normal prostate epithelium, cell proliferation is balanced by an equal rate of apoptosis, such that there is neither involution nor overgrowth (1). In prostate cancer this balance is altered. Whereas the early stage of the disease is marked by excessive proliferation, in advanced stages of the disease, net growth of the tumor results from a decreased apoptotic death rate (cell survival) in addition to increased proliferation (1).

Activation of the PI3k[3]/serine-threonine kinase Akt signaling pathway promotes cell survival by inhibiting apoptosis through phosphorylation of the proapoptotic protein BAD and other proteins (2–5), whereas activation of the MAPK signaling pathway is accompanied by increased cellular proliferation (6, 7). *PTEN* is a tumor suppressor gene that is altered and inactive in many types of tumors, including prostate cancer (2, 3). Among its substrates are the lipid products of PI3k, phosphatidylinositol 3,4,-bisphosphate, and phosphatidylinositol 3,4,5-trisphosphate, which mediate the activation of Akt (4, 5). It was demonstrated recently by IHC that high Gleason-grade prostate cancer displays loss of tumor suppressor phosphatase PTEN (2). This suggests that increased activation of Akt in poorly differentiated prostatic carcinoma results from the loss of PTEN.

In this paper, with phospho-specific antibodies we demonstrate by IHC that advanced prostate cancer is accompanied by the expression of the activated (phosphorylated) form of Akt and decreased expression of activated MAPK/Erk1/2. These results may provide the molecular basis for the observed activation of a cell survival pathway that has been reported to

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[1] Supported by a Merit Review from the Office of Research and Development, Medical Research Service, Department of Veterans Affairs (to J. I. K.), and a grant from the San Antonio Cancer Institute. J. I. K. is a Career Scientist with the Department of Veterans Affairs.
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[3] The abbreviations used are: PI3k, phosphatidylinositol 3′-kinase; MAPK, mitogen-activated protein kinase; IHC, immunohistochemistry; PIN, prostatic intraepithelial neoplasia; Erk, extracellular-regulated kinase; TBS-T, tris-buffered saline-tween.

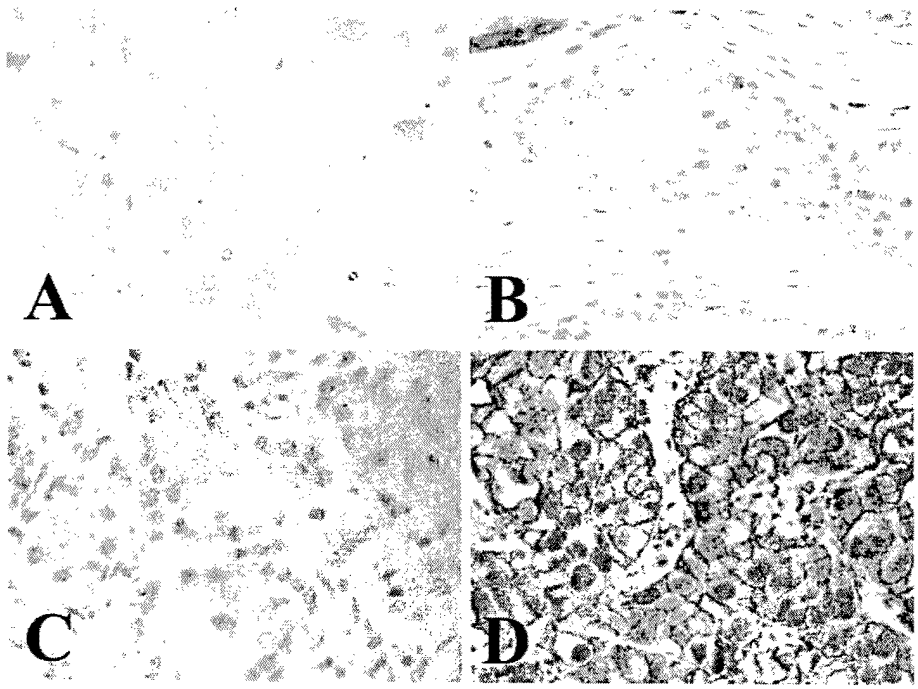

Fig. 1 Immunoperoxidase staining for phospho-Akt using a phospho-specific Akt (Ser 473) antibody. *A*, negative control. *B*, PIN showing weak cytoplasmic staining for phospho-Akt. *C*, well-differentiated adenocarcinoma showing weak cytoplasmic staining. *D*, poorly differentiated carcinoma showing strong membrane staining for phospho-Akt (×40, original magnification).

contribute significantly to the progression of prostate cancer growth (1).

MATERIALS AND METHODS

Primary Antibodies. Rabbit polyclonal phospho-Akt (Ser 473; Cell Signaling Technology, Beverly, MA, Cat. No. 9277, IHC specific) was used at a 1:50 dilution; rabbit polyclonal phospho-p44/42 MAP kinase (Thr 202/Tyr 204; Cell Signaling Technology; IHC-specific) at a 1:50 dilution; rabbit polyclonal Akt (Santa Cruz Biotechnology Inc., Santa Cruz, CA) at a 1:50 dilution; and rabbit polyclonal Erk1 (Santa Cruz Biotechnology) at a 1:100 dilution.

Analysis of Human Tissues. A total of 74 formalin-fixed, paraffin-embedded human primary prostate cancer specimens were studied from the archival files of Audie Murphy Veterans Medical Center. Fifty-three samples were obtained from radical prostatectomies, and 22 samples were obtained from transurethral resections. H&E-stained slides were reviewed for Gleason score. In a majority of the cases, adjacent areas of normal prostatic epithelium, benign prostatic hyperplasia, and PIN were also available for review along with infiltrating carcinoma.

IHC. Sections were heated to 60°C, and rehydrated in xylene and graded alcohols. Antigen retrieval was performed with 0.01 M citrate buffer at pH 6.0 for 20 min in a 95% water bath. Slides were allowed to cool for another 20 min, followed by sequential rinsing in PBS and 50 mM Tris-HCl (pH 7.6), 150 mM NaCl, Tween 20 (0.1%; TBS-T). Endogenous peroxidase activity was quenched by incubation in TBS-T containing 3% hydrogen peroxide. Each incubation step was carried out at room temperature and was followed by three sequential washes (5 min each) in TBS-T. Sections were incubated in primary antibody diluted in TBS-T containing 1% ovalbumin and 1 mg/ml sodium azide (12 h) followed by incubations with biotinylated secondary antibody for 15 min, peroxidase-labeled streptavidin for 15 min (LSAB-2; Dako Corp., Carpinteria, CA), and diaminobenzidine and hydrogen peroxide chromogen substrate (Dako Corp.) along with 3,3′-diaminobenzidine enhancer (Signet) for 10 min. Slides were counterstained with hematoxylin and mounted. The negative controls were incubated with nonimmune rabbit IgG in place of primary antibody.

One representative slide per case was evaluated with the above antibodies. The proportion of carcinoma and PIN staining, and the intensity of staining seen in different areas of the same slide were analyzed according to criteria described previously in the literature (8). The intensity is designated as 0 when no tumor cells stain, 1+ when 10–20% of cells stain (weak), 2+

Table 1 Relationship between phospho-Akt staining intensity *vs.* Gleason score

Weak staining had scores of 0 and 1+. Strong staining intensity had scores of 2+ and 3+. The staining intensity for phospho-Akt is significantly greater in Gleason grade 8–10 compared with PIN, and all other grades of cancer ($P \leq 0.001$).

Gleason score	Number of cases	Weak staining intensity	Strong staining intensity
PIN	51	51	0
2–4	9	8	1
5–6	26	21	4
7	14	9	5
8–10	25	2	23

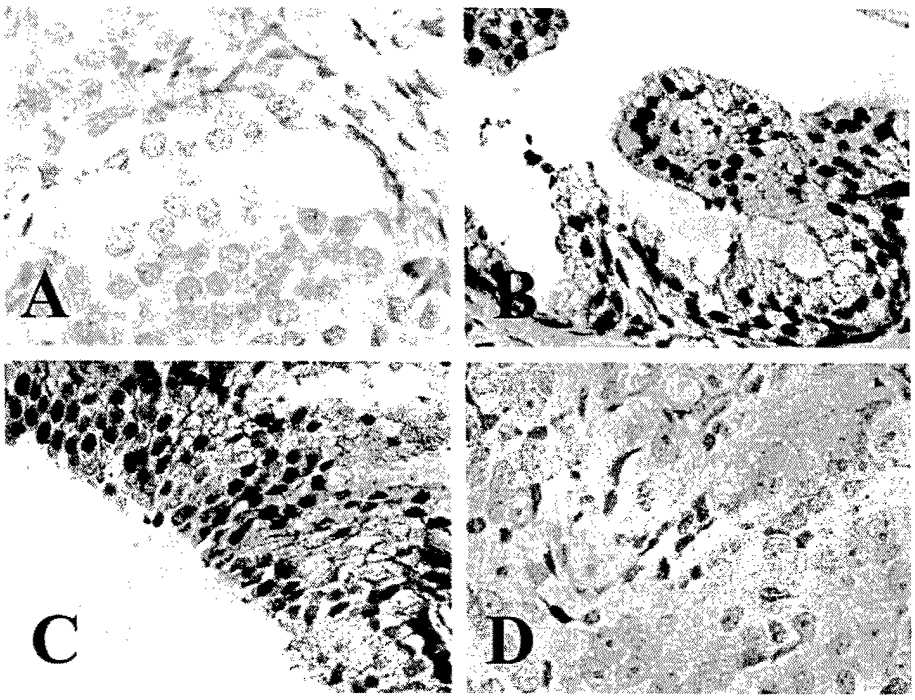

Fig. 2 Immunoperoxidase staining for phospho-Erk1/2 using a phospho-specific MAPK/Erk1/2 (Thr202/Tyr204) antibody. *A*, negative control. *B*, hyperplasia showing strong nuclear staining for phospho-MAPK/Erk1/2. *C*, PIN showing strong nuclear staining for phospho-MAPK/Erk1/2. *D*, poorly differentiated carcinoma showing weak staining for phospho-MAPK/Erk1/2. Note positive staining in vessels-serves as intrinsic positive control (×40, original magnification).

Table 2 Relationship between phospho-MAPK/Erk1/2 staining intensity *vs.* Gleason score

Weak staining had scores of 0 and 1+ and strong staining intensity is 2+ and 3+. The staining intensity for phospho-MAPK/Erk1/2 is significantly greater in normal, hyperplasia, and PIN *versus* all grades of cancer ($P < 0.0001$). PIN was significantly greater than normal ($P \leq 0.001$) and hyperplasia ($P \leq 0.03$).

Gleason score	Number of cases	Weak staining intensity	Strong staining intensity
Normal	60	17	43
Hyperplasia	53	20	33
PIN	51	3	48
2–4	9	3	6
5–6	26	17	9
7	14	13	1
8–10	25	21	4

when 20–50% of cells stain (moderate), and 3+ when >50% of cells stain (strong).

Imaging. Digital images for photomicroscopy were acquired with a Cool Snap camera from Nikon. Minor adjustments in the captured images were performed identically and in parallel for the images presented using Adobe PhotoShop 5.5. Composite images were made using Microsoft PowerPoint and printed on a Phaser 780 plus printer (Tetronix Co., Westborough, MA).

Statistics. For statistical analyses, groups scored 0 and 1+ were combined ("weak staining") as were groups scored 2+ and 3+ ("strong staining"). Statistical analysis was performed by using χ^2 analyses with Kappa and McNemar statistics in contingency tables for agreement and disagreement of specific comparisons (9). Normality of residuals was assessed for phospho-Akt and phospho-MAPK Erk levels each analyzed separately to assure valid analyses. The analyses were performed using a statistical analysis system on a PC-compatible computer with SAS 6.12 software (SAS Institute, Cary, NC).

RESULTS

Increased Expression of Phospho-Akt (Ser473) in Paraffin-embedded Poorly Differentiated Prostate Cancer. The PI3k dependent serine threonine kinase Akt (also known as protein kinase B) has been implicated in mediating cell survival in various prostate cancer cells (2, 3, 10, 11). Therefore, we examined human prostate cancer tissues by IHC to determine whether the expression of the activated (phosphorylated) form of the cell survival protein Akt correlated with prostate cancer differentiation. Ninety percent of PIN, well to moderately differentiated adenocarcinomas, and Gleason score 7 carcinomas were either completely negative or showed only weak staining (intensity score of 0 to 1+) for phospho-Akt ($P < 0.001$; Fig. 1; Table 1). Phospho-Akt staining intensity progressed as the disease progressed with strongest staining observed in the highest Gleason scores. That is, >90% of poorly differentiated adenocarcinomas (Gleason score 8–10) exhibited strong staining for phospho-Akt (intensity score of 2 to 3+), ($P \leq 0.001$; Fig. 1; Table 1). Interestingly, the staining appeared to be localized to the membrane where Akt has been shown to be active (4, 5). Total Akt levels were expressed in all of the tissues with no change in the degree of expression during disease progression.

Decreased Expression of Phospho-MAPK/Erk1/2 in Paraffin-embedded Poorly Differentiated Prostate Cancer. In contrast to the PI3k/Akt signaling pathway, the MAPK signaling pathway is well recognized for mediating cell prolifera-

tion. As a measure of MAPK activation, we used an antibody that recognized phosphorylated MAPK/Erk1/2. More than 75% of normal, hyperplastic, and PIN displayed strong staining (2+ to 3+) for phospho-MAPK/Erk1/2 (Fig. 2; Table 2). Phospho-MAPK/Erk1/2 staining was significantly greater in PIN *versus* hyperplasia ($P \leq 0.03$) and normal ($P \leq 0.001$). The intensity of staining decreased as the disease progressed to carcinoma, with only 27% of the tumor cells showing strong staining for phospho-MAPK/Erk1/2 ($P < 0.0001$). The weakest staining was observed in poorly differentiated cancers (Fig. 2; Table 2). The staining appeared to be localized to the nucleus. Total Erk levels were expressed in all of the tissues with no change in the degree of expression during disease progression.

DISCUSSION

Immunohistochemical examination of paraffin-embedded human prostate cancer showed that 92% of the poorly differentiated adenocarcinomas of the prostate stained strongly for phospho-Akt in a membrane location. In all other grades of prostate cancer as well as in PIN, only 10% stained for phospho-Akt. On the other hand, >75% of normal, hyperplastic, and PIN lesions showed a high level of expression of phospho-MAPK/Erk1/2 that significantly decreased in adenocarcinoma.

This is the first report of the immunohistochemical detection of phospho-(active) Akt using a phospho-specific antibody in paraffin-embedded human prostate cancer. Similar to our observations, Paweletz *et al.* (11) showed by reverse-phase protein microarrays that cancer progression was associated with increased phosphorylation of Akt and suppression of apoptotic pathways as measured using antibodies to cleaved caspase 7 and poly(ADP-ribose) polymerase.

Advanced prostate cancer is often accompanied by androgen independence, and growth of the tumor becomes dependent on activation of cell survival pathways as well as cell proliferation pathways. Graff *et al.* (10) showed that Akt activation was markedly increased in an androgen-independent LNCaP cell line that was isolated from LNCaP xenografts. In addition to increased Akt activation, there was increased phosphorylation and inactivation of the proapoptotic protein BAD, a target protein of Akt, and decreased expression of the cyclin inhibitor, p27kip1 (10). These results would explain the emergence of an antiapoptotic pathway in androgen-independent prostate cancer as well as explain the enhanced proliferation observed in advanced prostate cancers. In human prostate cancer, the tumor suppressor phosphatase PTEN is mutated and inactive (2, 3, 10, 11). This phosphatase normally negatively regulates components of the Pl3k pathway such as the cell survival protein Akt. Loss of PTEN activity is accompanied by increased expression of the activated form of Akt and activation of cell survival pathways. Similar to our findings by IHC, Paweletz *et al.* (11) demonstrated in protein microarrays that prostate tumor progression is accompanied by increased expression of phospho-Akt. Importantly, this coincided with suppression of apoptosis. Also similar to our findings, they showed that expression of phospho-Erk was suppressed with progression of disease. These findings are in contrast to the IHC studies by Gioeli *et al.* (12) who showed increased expression of phospho-MAPK with increasing Gleason score. Studies by Zimmerman and Moeling (13) may explain our observations of high phospho-Akt expression accompanied by low levels of phospho-MAPK/Erk; namely, they showed that phospho-Akt inactivates Raf by direct phosphorylation on Ser259, resulting in inhibition of the Raf-MEK-Erk signaling pathway. In conclusion, we show by IHC on paraffin-embedded tissue that progression of prostate cancer is accompanied by increased levels of phospho-Akt and decreased levels of phospho-MAPK/Erk. Understanding the mechanisms of prostate tumor growth could prove critical to developing new effective therapies for prostate cancer.

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12. Gioeli, D., Mandell, J. W., Petroni, G. R., Frierson, H. F., and Weber, M. J. Activation of mitogen associated protein kinase associated with prostate cancer progression. Cancer Res., *59:* 279–284, 1999.

13. Zimmerman, S., and Moelling, K. Phosphorylation and regulation of Raf by Akt (Protein kinase B). Science (Wash. DC), *286:* 1741–1744, 1999.

Curriculum Vitae

JEFFREY IRA KREISBERG, Ph.D.

I. Personal Data:

Date of Preparation: 09/02

1.	Birth Date:	07/07/49
2.	Birthplace:	Far Rockaway, New York
3.	Citizenship Status:	United States
4.	Social Security No.:	215-54-6224
5.	Marital Status:	Married
6.	Children:	3
7.	Address:	Dept. of Surgery, UTHSCSA 7703 Floyd Curl Drive San Antonio, Texas 78229
8.	Phone Number:	(210)-567-5892

II. Education:

1975	Ph.D. in Experimental Pathology	University of Maryland School of Medicine
1971	B.S. in Biology	State University of New York at Albany
1967-1969		City University of New York, Queens College

III. Postgraduate Training:

1976-1977	Research Fellow	Department of Pathology, Harvard Medical School
1975-1976	Research Associate	Department of Pathology, University of Alabama Medical Center

IV. Academic Appointments:

March 2000-pres	Professor	Professor Department of Surgery, University of Texas Health Science Center San Antonio
Sep 1992-present	Professor	Department of Molecular Medicine, University of Texas Health Science Center San Antonio
Apr 1989 -present	Career Scientist	Department of Veterans Affairs
Sep 1989-2000	Professor	Department of Pathology, University of Texas Health Science Center San Antonio
Sep 1989-present	Professor	Department of Medicine, University of Texas Health Science Center San Antonio
Sep 1983-Aug 1989	Associate Professor	Department of Pathology, University of Texas Health Science Center San Antonio
Sep 1983-Aug.1989	Associate Professor	Department of Medicine, University of Texas Health Science Center San Antonio
Jul 1980-1983	Assistant Professor	Department of Pathology, University of Texas Health Science Center San Antonio
Jul 1979-1980	Assistant Biologist	Massachusetts General Hospital, Department of Medicine, Boston, Masschusetts
Jul 1978-1980	Assistant Professor	Department of Pathology, Harvard Medical School, Boston, Massachusetts
Jul 1977-1978	Instructor	Department of Pathology, Harvard Medical School, Boston, Massachusetts

V. Administrative Responsibilities and Teaching:

A. Teaching

1980-1999	Lecturer, Cell Injury and Environmental Pathology, Sophomore Pathology Course, Medical School UTHSCSA, 3 hours/yr.
1980-1999	Laboratory Instructor, Sophomore Pathology Course, Medical School UTHSCSA, 30 hours/yr.
1980-1999	Lecturer, Cell Injury, University of Texas School of Pharmacy, Austin, Texas. 8 hours/yr.
1988-1999	**Course Master**, General Concepts of Pathology, Sophomore Pathology Course, Medical School, UTHSCSA
1995-2000	Lecture, Actin Stress Fibers, The Graduate School, UTHSCSA. 2 hours/yr.
1998-1999	Lecturer, Cell Injury and Adaptation, Dental School, UTHSCSA, 3 hours/yr.
1998-1999	Lecturer, Cell Injury and Adaptation, Dental Hygiene, UTHSCSA, 3 hours/yr.
1998-1999	Lecturer, Cell Injury and Adaptation, Occupational Therapy, UTHSCSA, 3 hours/yr.

B. Grants

1980-pres	Principal Investigator of grants from the National Institutes of Health and Department of Veterans Affairs totalling over $2,500,000 in direct costs (see pp 19-21).

C. Fellows Trained

1981-1982	William Stewart, Ph.D.
1981-1983	Dorie Swertz, Ph.D.
1981-1984	Dean Troyer, M.D.
1987-1992	William Glass II, M.D., Ph.D.
1988-1993	Suzanne H. Ayo, M.D.
1994-1995	Victoria Magnusson, Ph.D.
1996-pres	Paramita Ghosh, Ph.D.
1997-1998	Nandini Ghosh-Choudhury, Ph.D.
1999	Magarita Mikhailova, Ph.D.
1999	Shazli Malik, M.D.

D. Administrative Courses Taken

1996	The Management Development Institute, South Texas Veterans Health Care System, San Antonio, Texas. Introduction to Management. March 13-15
1996	Cornell University School of Continuing Education. Administrative Management Institute. July 21-26.

VI. Professional Affiliations:

a) Current professional and scientific organizations and societies:

*** indicates election or examination required for membership**

1975	American Association for the Advancement of Science
*1978	American Society of Nephrology
*1978	American Association of Pathologists
*1980	The American Society for Cell Biology
1980	American Diabetes Association
1982	The Tissue Culture Association
*1985	International Society of Nephrology
1986	American Heart Association *(Council on the Kidney in Cardiovascular Disease)*
*1994	American Physiological Society
*1997	San Antonio Cancer Institute
*1998	American Association of Cancer Research

b) Past and current committees:

Department:

1999-2000	Tenure and Promotions Committee
1997-1998	Tenure and Promotions Committee
1988-1997	Seminars in Pathology, Chair
1988-1996	Education Committee, Member
1986-1987	Seminars in Pathology, Member

School:

2000-pres	Selection subcommittee, Medical School
1999-2000	Post-Tenure Evaluation Committee, Department of Medicine
1996-1998	Interview Subcommittee, Medical School Admissions Committee
1997	Nominating Committee, Graduate Assembly
1995-1996	Finance Sub-Committee of the LCME Self Study Committee

University:

2001-2002	Faculty Senate
1999-1999	Ad hoc Committee to Review Tenure and Promotion Guidelines
1998-1999	Faculty Tenure and Promotions Committee, Chair
1996-1998	Faculty Tenure and Promotions Committee
1996-1998	Committee on Committees
1991-1992	Preclinical Promotions Committee, Chair
1990-1992	Preclinical Promotions Committee
1989-1990	Educational Resources Committee, Chair
1988-1990	Educational Resources Committee
1985-1986	Energy Conservations Committee, Member

1984-1985 Subcommittee on Physical Safety, Member

Audie Murphy Veterans Administration Hospital:

2001-pres Research and Development Committee
1996-1999 Research and Development Committee
1998-1999 Research and Development Committee, Chair
1998-1999 VISN 17 Research Committee

c) Other professional activities:

2001-pres Grass Roots Committee, American Heart Association, Texas Affiliate
2001-pres Grass Roots Committee, American Society of Nephrology
1998 Ad hoc Member, General Medicine B Study Section, National Institutes of Health
1998 Chairman: Abstract Review Team: "Mediators, signaling, cell growth and neoplasia/hormones/peptides. American Society of Nephrology, October 1998
1995 Member, grant review committee. National Institutes of Health. (August 9).
1994-pres Member, Study Section, American Heart Association, Cardiorenal
1994 Abstract Reviewer, American Society of Nephrology
1994-pres Member, Study Section,Texas Affiliate, American Heart Association
1994 Member, pre-site visit team (University of Colorado School of Medicine, June 15-16).
1992 Member, National Institutes of Health site visit team (Washington University School of Medicine, December 16-18).
1992 Member, National Institutes of Health pre-site visit team (University of Colorado, July 9-10).
1991 Member, Special Study Section, National Institutes of Health, Chicago Illinois, October 15-17.
1990 Member, Department of Veteran's Affairs site visit team (San Francisco VA, September 10, 1990).
1990 Member, National Institutes of Health site visit team (New York Medical College, January 31-February 2, 1990).
1990 Member, National Institutes of Health Pathology A Study Section, Taos, New Mexico, February 28-March 5, 1990.
1988-1989 Member, 1989 Program Committee, The American Society of Nephrology
1988-1994 Member, Editorial Board, *American Journal of Physiology: Renal, Fluid and Electrolyte Physiology*
1988-1992 Member, Texas Affiliate, American Heart Association Central Research Review Committee
1987 Program Chairman, Tissue Cell Culture, American Society of Nephrology Meetings

1987-present	Member, External Review Committee, The University of Colorado Health Sciences Center (Dr. Robert W. Schrier)
1987	Member, Special Study Section, National Institutes of Health, February 26, 1987
1986-1991	Member, Outside Advisory Group, Cystic Fibrosis Core Center, Case Western University
1986-1991	Consulting for Cystic Fibrosis Core Center, Case Western University (Dr. Pam Davis)
1986	Member of the National Institutes of Health site visit team (University of Minnesota Medical School, August 27-28, 1986)
1985-1988	Member, Veterans Administration Merit Review Board, Nephrology
1985	*Ad hoc* member, National Institutes of Health Pathology A Study Section
1985	Member, Special Planning Committee, NIADDK, National
1984	Member of the National Institutes of Health site visit team (University of Minnesota Medical School, November 12-15, 1984)
1984	Member of the National Institutes of Health site visit team (Michael Reese Hospital, Chicago, IL, October 25-29, 1984)
1984	Member, Special Study Section, National Institutes of Health, Bethesda, MD, April
1983	Chairman, National Institutes of Health site visit team (Harvard Medical School, Boston, MA, July 27-29, 1983)
1982	Member, National Institutes of Health site visit team (St. Louis, MO, December 9-10)
1982	Member, National Institutes of Health site visit team (St. Louis, MO, September 8-10)
1979	Consultant in Pathology, Kidney Disease Institute, New York Department of Health, Albany, New York (Dr. Peter Burkholder)
1979	Consultant in Pathology, Yale University School of Medicine (Laboratory of Dr. Michael Kashgarian)

Journal Reviewer

New England Journal of Medicine
Anatomical Record
American Journal of Anatomy
Kidney International
Journal of Clinical Investigation
Laboratory Investigation
American Journal of Physiology (member of Editorial Board)
Hypertension
In Vitro
Diabetes
American Journal of Pathology
Journal of Laboratory and Clinical Investigation

d) Community activities:

1984-present	Science lectures/arrangements for HSC field trips; elementary school health classes
1984-present	Arrange Third Form St. Mary's Hall field trips to HSC

VII. Honors and Awards:

1969-1971	New York Regents Incentive Award
1971-1975	NIH Predoctoral Training Grant
1989-2003	Department of Veterans Affairs, Career Scientist Award

VIII. Bibliography:

Books and/or Book Chapters:

1. Karnovsky MJ and Kreisberg JI: Isolation and characterization of rat glomerular cell *in vitro*. IN: Functional Ultrastructure of the Kidney. Manusbach AB, Olsen TS and Christensen EI, editors. Academic Press, New York, 1980, pp 119-132.

2. Carlson WD, Quay S, Dzau VJ, Kreisberg J, Slater E and Haber E: Biosynthesis of renin in dog kidney: Evidence for the existence of prorenin. IN: Heterogeneity of Renin and Renin Substrate. Sambhi M, editor. Elsevier-North Holland, New York, 1981, pp 33-43.

3. Kreisberg JI, Matthys E and Venkatachalam MA: Pathology of acute renal failure. IN: Conference on Drugs and Environmental Toxins. Pinehurst, North Carolina, Plenum Medical Book Co., 1982, pp 11-23.

4. Kreisberg JI: Isolation and culture of homogeneous populations of glomerular cell types. IN: Cell Separation: Methods and Selected Applications. TG Pretlow II and T. Pretlow, editors. Academic Press, 1982, pp 247-259.

5. Kreisberg JI and Karnovsky MJ: Characterization of rat glomerular cells *in vitro*. IN: Immune Mechanisms in Renal Disease. Michael A and Cummings N, editors. Plenum Press, 1983, pp 189-200.

6. Kreisberg JI, Matthys E and Venkatachalam MA: Morphological factors in acute renal failure. IN: Acute Renal Failure. Brenner BM and Lazarus JM, editors, W.B. Saunders Co., Philadelphia, 1983, pp 21-46.

7. Schwertz DW, Troyer DA, Kreisberg JI and Venkatachalam MA: Pathogenesis of membrane damage in aminoglycoside and mercuric chloride toxicity. Insight from *in vitro* models. IN: Drugs and Kidney. Bertani T, Remuzzi G and Garattini S, editors. Raven Press, New York, 1986, pp 107-122.

8. Kreisberg JI and Venkatachalam MA: Morphological factors in acute renal failure. IN: Acute Renal Failure. Brenner BM and Lazarus JM, editors. W.B. Saunders Co., Churchill Livingstone, Inc., Philadelphia, 1988, pp 45-66.

9. Troyer DA and Kreisberg JI: Isolation and study of glomerular cells. IN: Methods in Enzymology 191, eds. Sidney Fleischer & Becca Fleischer, Academic Press, 1990, pp 141-152.

10. Handler JS and Kreisberg JI: Renal cell culture. IN: The Kidney. Brenner BM and Rector FC, editors. W.B. Saunders Co., Philadelphia , 1991, pp 110-132.

Papers published or in press

*** indicates those papers that are refereed**

1.* Middlebrook G, Salmon BJ and Kreisberg JI: Sterilization of L. monocytogenes by guinea pig peritoneal exudate cell cultures. Cell Immunol 4:270-283, 1974.

2.* Kreisberg JI, Bulger RE, Trump BF and Nagle RB: Effects of transient hypotension on the structure and function of rat kidney. Virchows Arch Path 11:121-133, 1976.

3.* Kreisberg JI, Pitts AM and Pretlow TG II: Separation of proximal tubule cells from suspensions of rat kidney cells in density gradients of Ficoll in tissue culture medium. Am J Path 86:591-602, 1977.

4.* Pretlow TG II, Brattain MG and Kreisberg JI: Separation and characterization of epithelial cells from prostates and prostatic carcinomas: A review for the National Prostatic Cancer Workshop. Cancer Treatment Reports 61:157-160, 1977.

5.* Kreisberg JI, Sachs G, Pretlow TG II and Mc Guire RA: Separation of proximal tubule cells from suspensions of rat kidney cells by free-flow electrophoresis. J Cell Phys 93:169-172, 1977.

6.* Kreisberg JI, Brattain MG and Pretlow TG II: Studies on human benign hyperplastic prostate maintained in organ culture. Invest Urol 15:252-255, 1977.

7.* Helms SR, Brattain MG, Pretlow TG II and Kreisberg JI: "Prostatic acid phosphatase?" A comparison of acid phosphatase activities in epithelial cells, granulocytes, monocytes, lymphocytes, and platelets purified by velocity sedimentation in isokinetic gradients of Ficoll in tissue culture medium. Am J Path 88:529-538, 1977.

8.* Kreisberg JI, Hoover RL and Karnovsky MJ: Isolation and characterization of rat glomerular epithelial cells *in vitro*. Kidney Int 14:21-30, 1978.

9.* Pretlow TG, Kreisberg JI, Fine WD, Zieman GA and Pretlow TP: Velocity sedimentation at low centrifugal force in isokinetic gradients. Biochem J 174:303-308, 1978.

10.* Kreisberg JI and Karnovsky MJ: Focal glomerular sclerosis in the fawn-hooded rat. Am J Pathol 92:637-652, 1978.

11.* Pretlow TG, Kreisberg JI, Zieman GA, Wilson JVK, Pitts A and Zaremba JL: Subpopulation of human tonsillar lymphocytes with mitochondria which are visible by light microscopy. Blood 52:762-769, 1978.

12.* Ryan GB, Heiun SJ, Kreisberg JI and Karnovsky MJ: Effect of hemodynamic factors on the distribution of anionic groups in the glomerular capillary wall. J Ultrastr Res 65:227-233, 1978.

13.* Jones RT, Kreisberg JI, Linhardt GE and Trump BF: Studies of the ischemic pancreas in shock. Adv in Shock Res 1:197-207, 1979.

14.* Kreisberg JI, Wayne DB and Karnovsky MJ: Rapid and focal loss negative charge associated with mononuclear cell infiltration early in nephrotoxic nephritis. Kidney Int 16:290-300, 1979.

15.* Ausiello DA, Kreisberg JI, Roy C and Karnovsky MJ: Contraction of cultured rat glomerular mesangial cells after stimulation with angiotensin II and arginine vasopressin. J Clin Invest 65:754-760, 1980.

16.* Kreisberg JI, Mills JW, Rabito C, Jarrell A and Leaf A: Protection of cultured renal tubular epithelial cells from anoxic cell injury with polyethylene glycol. Proc Natl Acad Sci 77:5445-5447, 1980.

17.* Kreisberg JI, Karnovsky MJ and Levine L: Prostaglandin production by cultured glomerular epithelial and mesangial cells. Kidney Int 22:355-359, 1982.

18.* Kreisberg JI: Insulin requirement for contraction of cultured rat glomerular mesangial cells in response to angiotensin II: A possible role for insulin in modulating glomerular hemodynamics. Proc Natl Acad Sci 79:4190-4192, 1982.

19.* Uglesity A, Kreisberg JI and Levine L: Stimulation of arachidonic acid metabolism in rat kidney mesangial cells by bradykinin, antidiuretic hormone, and their analogues. Prostaglandins, Leukotrienes and Medicine 10:83-93, 1983.

20.* Schwertz DW, Kreisberg J and Venkatachalam M: Characterization of rat kidney proximal tubule brush border membrane-associated phosphatidylinositol phosphodiesterase. Arch Biochem Biophys 224:555-567, 1983.

21.* Kreisberg JI, Patel PY: The effects of insulin, glucose and diabetes on prostaglandin production by cultured glomerular mesangial cells. Prostaglandins, Leukotrienes and Medicine 11:431-442, 1983.

22.* Rabito CA, Kreisberg JI and Wight D: Alkaline phosphatase and alpha-glutamyltranspeptidase as polarization markers during the organization of LLC-PK_1 cells into an epithelial membrane. J Biol Chem 259:574-582, 1984.

23.*

24.* Matthys E, Patel PY, Kreisberg JI, Stewart J and Venkatachalam MA: Lipid alterations induced by renal ischemia: Pathogenetic factor in membrane damage. Kidney Int 26:153-161, 1984.

25.* Schwertz DW, Kreisberg JI and Venkatachalam MA: Effects of aminoglycosides on proximal tubule brush border membrane prostaglandin inositol-specific phospholipase C. J Pharm Expt Therap 231:48-55, 1984.

26.* Venkatachalam MA and Kreisberg JI: Agonist induced isotonic contraction of cultured mesangial cells after multiple passage. Am J Physiol 249:C48-C55, 1985.

27.* Troyer DW, Kreisberg JI, Schwertz DW and Venkatachalam MA: The effects of vasopressin on phosphoinositides and prostaglandin production in cultured mesangial cells. Am J Physiol 249:F139-F147, 1985.

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29.* Schwertz DW, Troyer DA, Kreisberg JI and Venkatachalam MA: Pathology and pathogenesis of nephrotoxic membrane damage. Transplantation Proceedings Vol XVIII, Suppl 1 (August), pp 64-71, 1985.

30.* Kreisberg JI and Venkatachalam MA: Membrane alterations in renal cell injury due to impaired energy metabolism. Molecular Physiology 8:599-614, 1985.

32.* Troyer DA, Kreisberg JI and Venkatachalam MA: Lipid alterations following mercuric chloride treatment of LLC-PK_1 cells. Kidney Int 29:530-538, 1986.

32.* Schwertz DW, Kreisberg JI and Venkatachalam MA: Gentamicin induced alterations in pig kidney epithelial (LLC-PK_1) cells in culture. J Pharm Expt Therap 236:254-262, 1986.

33.*

34.* Bonventre JV, Skorecki KL, Kreisberg JI and Cheung JY: Vasopressin increases cytosolic free calcium concentration in glomerular mesangial cells. Am J Physiol 251:F94-F102, 1986.

35.* Kreisberg JI, Patel PY, Venkatachalam MA and Taylor G: Elevations of intracellular cAMP results in a change in cell shape that resembles dome formation in cultured rat glomerular epithelial cells. In Vitro 22:392-396, 1986.

36.* Troyer DA, Gonzalez OF, Venkatachalam MA and Kreisberg JI: Elevation of cAMP in cultured mesangial cells diminishes vasopressin-stimulated increases of phosphate uptake and ^{32}P specific activity in ATP but has no effect on phosphoinositide metabolism. J Biol Chem 262:1614-1617, 1987.

37.* Pugliese F, Singh AK, Kasinath BS, Kreisberg JI and Lewis EJ: Neutralization of the glomerular epithelial cell polyanion is associated with enhanced prostanoid production. Kidney Int 32:57-61, 1987.

38.* Troyer DA, Gonzalez OF, Douglas JA and Kreisberg JI: Phorbol ester inhibits arginine vasopressin activation of phospholipase A and promotes action of and prostaglandin production by cultured mesangial cells. Biochem J 251:907-912, 1988.

39.* Venkatachalam MA, Patel YJ, Kreisberg JI and Weinberg JM: Energy thresholds which determine membrane integrity and injury in a renal epithelial cell line (LLC-PK1). Relationships to phospholipid degradation and unesterified fatty acid accumulation. J Clin Invest 81:745-758, 1988.

40.* Kreisberg JI: The cell biology and biochemistry of the glomerular mesangium. Mineral Electrolyte Metab 14:167-175, 1988.

41.* Glass WF II, Radnik RA, Garoni JA and Kreisberg JI: Urokinase-dependent adhesion loss and shape change after cyclic adenosine monophosphate elevation in cultured rat mesangial cells. J Clin Invest 82:1992-2000, 1988.

42.* Kremer S, Troyer D, Kreisberg J and Skorecki K: Interaction of atrial natriuretic peptide stimulated guanylate cyclase and vasopressin-stimulated calcium signalling pathways in the glomerular cell. Arch Biochem Biophys 260:763-770, 1988.

43.* Appling DR, Ayo SH and Kreisberg JI: Immunolocalization of C_1-tetrahydrofolate synthase in the rat kidney. Biochem Biophys Res Comm, No. 2, 168:625-630, 1990.

44.* Ayo SH, Radnik RA, Garoni JA, Glass WF II and Kreisberg JI: High glucose causes an increase in extracellular matrix proteins in cultured mesangial cells. Am J Pathol 136:1339-1348, 1990.

45.* Ayo SH, Radnik RA, Glass WF II, Garoni JA, Rampt E, Appling DR and Kreisberg JI: Increased extracellular matrix synthesis and mRNA in mesangial cells grown in high glucose medium. Am J Physiol 260:F185-F191, 1991.

46.* Ayo SH, Radnik R, Garoni J, Troyer DA and Kreisberg JI.: High glucose increases diacylglycerol mass and activates protein kinase C in mesangial cell cultures. Am J Physiol 261:F571-F577, 1991.

47.* Glass WF II, Rampt E, Garoni JA, Fenton JW II and Kreisberg JI: Regulation of mesangial cell adhesion and shape by thrombin. Am J Physiol 261:F336-F344, 1991.

48.* Troyer DA, Gonzalez OF, Padilla RM and Kreisberg JI: Vasopressin and phorbol ester-stimulated phosphatidylcholine metabolism in mesangial cells. Am J Physiol 262:F185-F191, 1992.

49.* Troyer DA, Padilla R, Kreisberg J and Glass W: Stimulation of the thrombin receptor of human glomerular mesangial cells by SFLL-peptide. J Biol Chem, 267:20126-20131, 1992.

50. Kreisberg JI and Ayo SH: The glomerular mesangium in diabetes mellitus. Kidney Int 43:109-113, 1993.

51.* Glass WF II, Kreisberg JI and Troyer DA: Two-chain urokinase, receptor, and type 1 inhibitor in cultured human mesangial cells. Am J Physiol 264:F532-F539,1993.

52.* Glass WF II, and Kreisberg JI: Regulation of integrin-mediated adhesion at focal contacts by cyclic AMP. J Cell Physiol 157:296-306, 1993.

53.* Glass WF II, Troyer DA and Kreisberg JI: Regulation of mesangial cell function by thrombin. Seminars in Thrombosis and Hemostasis 20:333-338, 1994.

54* Feng L, Xia Y, Kreisberg JI, Wilson CB: Interleukin-1A (IL-1) stimulates KC synthesis in rat mesangial cells: Glucocorticoids inhibit KC induction by IL-1. Am J Physiol 266:F713-F722,1994.

55.* Kreisberg JI, Radnik R, Garoni J, Ayo SH, and Saikumar P: High glucose stimulates c fos and c jun transcripts and proteins in mesangial cell cultures. Kidney Int 46:105-112, 1994.

56.* Kreisberg JI, Garoni J, Radnik RA, and Ayo SH: High glucose and TGFß1 stimulate fibronectin gene expression through a cAMP response element in rat glomerular mesangial cells. Kidney Int 46:1019-1024, 1994.

57.* Kreisberg JI and Kreisberg SH: High glucose activates protein kinase C and stimulates fibronectin gene expression by enhancing a cAMP response element. Kidney Int 48:S3-S11, 1995.

58.* Kreisberg JI, Radnik RA, Kreisberg SH: Phosphorylation of cAMP responsive element binding protein after treatment of mesangial cells with high glucose plus TGFβ or PMA: Possible role in enhanced fibronectin gene expression. Kidney Int, 50:805-810, 1996.

59. Kreisberg JI, Radnik RA, Schwartz MA. Involvement of Rho and Myosin Phosphorylation in cAMP-Induced Disassembly of Actin Stress Fibers. Am J Physiol 273:F283-F288, 1997.

60.* Ghosh PM, Mott GE, Radnik RA, Stapleton ML, Ghidoni JJ, Kreisberg JI: Lovastatin induces apoptosis by inhibiting mitotic and post mitotic events. Biochim. Biophys. Acta., 1359: 13-24, 1997.

61.* Ghosh PM, Stapleton ML, Mott GE, Ghosh-Choudhury N, Thomas CA, Foster BA, Greenberg NM, and Kreisberg JI: Role of RhoA activation and actin stress fiber formation in the growth of a murine prostate tumor cell line. Oncogene, 18: 4120-4130, 1999.

62. Ghosh PM, Moyer ML, Mott GE, and Kreisberg JI: Role of Cyclin E overexpression on lovastatin-induced G1 arrest and RhoA inactivation in NIH3T3 cells. J. Cellular Biochem 74:532-543, 1999.

63. Walls C, Kreisberg, JI, Ludwena R: Presence of the BII isotype of tubulin in the nuclei of cultured mesangial cells from rat kidney. Cell Motility and the Cytoskeleton 42:274-284, 1999.

64. Kitten AM, Kreisberg, JI, Olson, MS: Expression of osteogenic protein-1 mRNA in cultured kidney cells. J Cell Physiol. 181:410-415, 1999.

65. Ghosh-Choudhury N, Ghosh-Choudhury G, Celeste A, Ghosh PM, Moyer M, Abboud SL, Kreisberg JI: Bone morphogenic protein-2 induces cyclin kinase inhibitor p21 and hypophosphorylation of retinoblastoma protein in estradiol-treated MCF-7 human breast cancer cells. Biochim et Biophysica Acta 1497: 186-196, 2000.

66. Jackson JG, Kreisberg JI, Koterba AP, Yee D, Brattain MG: Phosphorylation and nuclear exclusion of the forkhead transcription factor FKHR after epidermal growth factor treatment in human breast cancer cells. Oncogene, 19: 4574-4581, 2000.

67. Heilig CW, Kreisberg JI, Freytag S, Murakami T, Ebina Y, Guo L, Heilig K, Loberg R, Qu X, Jin Y, Henry D, Brosius FC. Antisense-GLUT 1 protects mesangial cells from D-glucose induced glucose transporter and fibronectin expression. Amer J Physiol 280: F657-666, 2001.

68. Ghosh PM, Kreisberg JI: Arginine vasopressin stimulates mesangial cell growth by activating the epidermal growth factor receptor. Amer J Physiol, 280:F972-F979, 2001.

69. Walss-Bass C, Kreisberg JI, Luduena RF: Mechanism of localization of BII-tubulin in the nuclei of cultured rat kidney mesangial cells. Cell Motility and the Cytoskeleton, 49: 208-217, 2001.

70. Walss-Bass C, Kreisberg JI, Luduena RF: Interaction of betaIV-tubulin isotype with actin stress fibers in rat kidney mesangial cells. Cell Motility and the Cytoskeleton 49: 200-207, 2001.

71. Sawhney RS, Guo-Hao K, Humphrey LE, Ghosh P, Kreisberg JI, Brattain MG: Differences in sensitivity of biological functions mediated by epidermal growth

factor receptor activation with respect to endogenous and exogenous ligands. J Biol Chem 277: 75-86, 2002.

72. Malik SN, Brattain M, Ghosh, PM, Troyer DA, Prihoda T, Bedolla R, Kreisberg JI: Immunohistochemical demonstration of phospho-Akt in high Gleason grade prostate cancer. Clin Cancer Res 8: 116-1171, 2002.

73. Ghosh PM, Bedolla R, Mikhailova M, Kreisberg JI: RhoA-dependent murine prostate cancer cell proliferation and apoptosis: role of PKCζ. Cancer Res 62: 2630:-2636, 2002.

74. Bandyopadhyay A, Zhu L, Malik SN, Kreisberg JI, Brattain MG, Sprague EA, Luo J, Lopez-Casillas F, Sun L-Z: Extracellular domain of TGFb type III receptor inhibits angiogenesis and tumor growth in human cancer cells. Oncogene, 21: 3541-3551, 2002.

Abstracts:

1. Salmon B, Kreisberg JI and Middlebrook G: Listericidal activities of macrophages from *Bascillus Calmette-Guerin* immunized guinea pigs by specific and non-specific mitogens. Fed Proc 32:1039a, 1973.

2. Kreisberg JI, Bulger RE, Nagle R and Trump BF: Effects of sustained hypotension on the structure and function of rat kidney. American Society of Nephrology, Kidney Int 8:469a, 1975.

3. Kreisberg JI, Brattain MG and Pretlow TG II: Acid phosphatase in prostatic cancer. Fed Proc 35:625a, 1976.

4. Jones RT, Kreisberg JI, Schnaper LA and Trump BF: Formation of lysosomes following shock or glucagon treatments. Fed Proc 35:652a, 1976.

5. Kreisberg JI and Karnovsky MJ: Rapid and focal loss of negative charge (NC) following administration of nephrotoxic serum in rats. Kidney Int 12:515a, 1977.

6. Kreisberg JI, Karnovsky MJ, Emmett NL and Barger AC: Isolation and culture of a "renin" containing cell from rat glomeruli. VII International Congress of Nephrology, Montreal, 1978.

7. Kreisberg JI, Emmett NL, Barger AC and Karnovsky MJ: Techniques for the isolation and culture of glomerular epithelial cells from rat glomeruli and their discrimination from other cell types. VII International Congress of Nephrology, Montreal, 1978.

8. Ausiello DA, Kreisberg JI, Roy C and Karnovsky MB: Contraction of cultured rat glomerular mesangial (MS) cells after stimulation with angiotensin II (AGII) and arginine vasopressin (AVP). Kidney Int 16:804a, 1979.

9. Barnes L, Guy M, Lifschitz MD and Kreisberg JI: Angiotensin II receptors in mesangial cells cultured from rat glomeruli. American Society of Nephrology, 1980.

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11. Troyer D, Kreisberg JI and Venkatachalam MA: Role of calcium (Ca^{++}) in plasma membrane blebbing and cell death in a kidney epithelial cell line (LLC-PK_1) after toxin exposure. Kidney Int 21:207a, 1982.

12. Kreisberg JI, Venkatachalam MA and Patel PY: Catecholamine-stimulation of cAMP in mesangial cells is associated with a change in cell shape resembling contraction and is reversed by PGE_2. American Society of Nephrology, December 1983.

13. Venkatachalam MA, Troyer DA, Stewart JH and Kreisberg JI: Free acids may mediate $HgCl_2$-induced plasma membrane damage in LLC-PK_1 cells. American Society of Nephrology, December 1983. American Society of Nephrology, December 1983.

14. Schwertz DW, Kreisberg JI and Venkatachalam MA: Effects of gentamicin on proximal tubule brush border membrane phosphatidylinositol-specific phospholipase C. American Society of Nephrology, December 1983.

15. Dzau VJ and Kreisberg JI: Identification and regulation of renin in cultured rat mesangial cells. American Society of Nephrology, December 1983.

16. Troyer DA, Kreisberg JI, Patel Y and Venkatachalam MA: Vasopressin causes increased metabolism of polyphosphoinositides in cultured glomerular mesangial cells. American Society of Nephrology, December 1983.

17. Kreisberg JI and Venkatachalam MA: Cell-to-substrate adhesion in mesangial (MS) cells is affected by hormones which affect contractile behavior. Kidney Int 27:259a, 1985.

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20. Patel Y, Kreisberg JI and Venkatachalam MA: Glycolysis, ATP and membrane integrity in LLC-PK_1 cells. Kidney Int 27:236a, 1985.

21. Schwertz DW, Gonzalez OF, Kreisberg JI and Venkatachalam MA: Gentamicin-induced alterations in pig kidney epithelial cells (LLC-PK_1) in culture. Kidney Int 27:237a, 1985.

22. Venkatachalam MA and Kreisberg JI: Techniques to facilitate the expression of isotonic contraction in cultured mesangial cells. Kidney Int 27:269a, 1985.

23. Glass WF, Venkatachalam MA and Kreisberg JI: Cyclic nucleotide phosphodiesterase activities in cultured glomerular mesangial cells. Fed Proc 44:697a, 1985.

24. Patel PY, Venkatachalam MA and Kreisberg JI: Cell-to-substrate adhesion in mesangial (MS) cells is affected by hormones which affect contractile behavior. Fed Proc 44:1016a, 1985.

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26. Kreisberg JI and Venkatachalam MA: Membrane alterations in acute renal failure. International Union of Biochemistry Satellite Symposium on Protecting Tissues Against Hypoxia, Amsterdam, August 22-24, 1985.

27. Troyer DA, Venkatachalam MA, Bonventre JV and Kreisberg JI: Influence of cyclic nucleotides (cAMP) on inositol phospholipid (InsPL) metabolism in cultured mesangial cells. Kidney Int 29:1, 347a, 1985.

28. Kreisberg JI, Troyer DA and Venkatachalam MA: Phorbol myristate acetate (PMA) stimulates glycolysis and contracts cultured (MS) cells. Kidney Int 29:1, 338a, 1986.

29. Venkatachalam MA, Troyer DA and Kreisberg JI: Inositol phospholipid (InsPL) metabolism in mesangial (MS) cells induced by phorbol myristate acetate (PMA). Kidney Int 29:1, 348a, 1986.

30. Troyer DA, Venkatachalam MA, Bonventre JV and Kreisberg JI: Influence of cyclic nucleotides (cAMP) on inositol phospholipid (InsPL) metabolism in cultured mesangial (MS) cells. Fed Proc 45:1564a, 1986.

31. Glass WF, Venkatachalam MA, Patel PY and Kreisberg JI: Arginine vasopressin (AVP) inhibits isoproterenol-stimulated adenylate cyclase (AC) in cultured rat mesangial cells. Fed Proc 45:1565a, 1986.

32. Venkatachalam M, Patel P and Kreisberg J: Uridine provides glycolytic ATP and salvages LLC-PK_1 cells deprived of oxidative phosphorylation. Kidney Int 31:403a, 1987.

33. Kreisberg JI, Patel PY, Venkatachalam MA and Troyer DA: Synthetic atrial peptide (APII) fails to inhibit inositol trisphosphate (IP3) release and contraction induced by vasopressin (V) in cultured (MS) cells. Kidney Int 31:277a, 1987.

34. Troyer D, Venkatachalam M and Kreisberg J: The effects of cAMP on phosphate transport and specific activity of 32P in ATP and phosphoinositide metabolism in vasopressin (VP) treated cultured mesangial (MS) cells. Kidney Int 31:184a, 1987.

35. Kreisberg JI, Radnik RA, Glass WF and Venkatachalam MA: Vasoactive agents that affect mesangial (MS) cell adhesion and shape change alter plasminogen activators (PA) located in cellular adhesion plaques (AP). The American Society of Cell Biology 27th Annual Meeting, St. Louis, MO, November 16-20, 1987.

36. Glass WFII, Radnik RA and Kreisberg JI: uPA-dependent mesangial cell shape change and adhesion loss is associated with fibronectin and laminin release. Kidney Int 35:156a, 1989.

37. Kreisberg JI, Radnik RA, Ayo SH, Garoni JA, Rampt ER and Appling DR: Increased fibronectin synthesis and expression of mRNA in mesangial cells cultured in high glucose medium. The American Society of Nephrology 22nd Annual Meeting, Washington, DC, December 3-6, 1989.

38. Glass WF and Kreisberg JI: Alterations to the supramolecular structure of fibronectin by cAMP elevation in rat mesangial cells. J. Cell Biol. 111: 399a, 1990.

39. Ayo SH and Kreisberg JI: Heparin increases hillock formation in mesangial cell cultures. J. Cell Biol. 111: 19a, 1990.

40. Ayo SH and Kreisberg JI: High glucose increases diacylglycerol mass and activates protein kinase C in mesangial cell cultures: a possible mechanism for increased ECM synthesis. Forefronts in Nephrology Symposium, "Mesangial cells and extracellular matrix". Kloster Banz near Erlangen-Nurnberg, Germany. June 9-12, 1991.

41. Glass WF and Kreisberg JI: Regulation of integrin-mediated adhesion in rat mesangial cells. American Society of Nephrology Annual Meetings, Nov. 17-20, 1991.

42. Troyer DA, Kreisberg JI and Glass WF: Release of urokinase-type plasminogen activator (u-PA) from mesangial (MS) cells treated with phospholipase C. American Society of Nephrology Annual Meetings, Nov. 17-20, 1991.

43. Glass WF, and Kreisberg JI: Regulation of integrin-mediated adhesion by cAMP in rat mesangial cells. Amer Soc Nephrology Annual Meetings, Nov 17-20, 1991.

44. Kreisberg J, Radnik RA, Garoni J, Ayo S: Role of proteolytically activated protein kinase C in the stimulation of mRNA levels of extracellular matrix proteins by

high glucose in mesangial cell cultures. Amer Society of Cell Biology Annual Meetings, 1992.

45. Kreisberg J, Ayo SH, Garoni J, Radnik RA: The glomerular mesangium in diabetes mellitus. FASEB meetings 1993.

46. Kreisberg JI, Ayo SH, Garoni J, and Radnik RA: The glomerular mesangium in diabetes mellitus. The XII International Meetings of Nephrology, Jerusalem, Israel,June 13-18,1993.

47. Kreisberg JI, Radnik RA, Garoni J, and Ayo SH: Role of proteolyically activated protein kinase C in the stimulation of mRNA levels of extracellular matrix proteins by high glucose in mesangial cell cultures. JASN 4:491a, 1993.

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49. Kreisberg JI: Modulation of mesangial cell function by glucose. 6th World Congress for Microcirculation. Munich August 25-30, 1996

50. Kitten AM, Kreisberg JI, Lee JC, Olson MS: Expression of OP-1/BMP-7 and its receptors in the kidney. J. Bone Mineral Res 11(Suppl. 1):S310, 1996.

51. Ghosh PM, Mott GE, Stapleton ML, Ghosh-Choudhury N, and Kreisberg JI: Lovastatin causes apoptosis in a prostate cancer cell line derived from the TRAMP mouse by inhibiting mitotic and post-mitotic events. 7th Annual Symposium on Cancer Research in San Antonio. July 25, 1997.

52. Kreisberg JI, Ghosh PM, Mott GE, Stapleton ML, and Ghosh-Choudhury N: Lovastatin causes apoptosis in a mouse prostate cancer cell line by inhibiting mitotic and post-mitotic events. AACR. Tumor Suppressor Genes, Victoria Canada, September 26-30, 1997.

53. Kreisberg, J, Ghosh-Choudhury, N; Stapleton, M; Ghosh, P: Role of RhoA activation and actin stress fiber formation in prostate tumor cell growth. JASN 9: A2263, 1998.

54. Walss, C., Kreisberg, JI, Luduena, RF: Presence of α βII-tubulin in the nucleoli of cultured rat kidney mesangial cells. Mol. Biol. Cell 9: 152a, 1998.

55. Walss, C, Prasad, V, Kreisberg, JI, Luduena, RF: Interaction of the βII-tubulin isotype with actin stress fibers in cultured rat kidney mesangial cells. Mol. Biol Cell 9: 409a, 1998.

Invited Reviews and Editorials:

1. Venkatachalam MA, Stein JH, Kreisberg JI and Lifschitz MD: Salvage of ischemic cells by impermeant solute and ATP. *Editorial*, Lab Invest 49:1-3, 1983.

2. Troyer DA, Kreisberg JI, Schwertz DW and Venkatachalam MA: Inositol phospholipid metabolism in the kidney. *Invited review*, Ann Rev Physiol 48:51-71, 1986.

3. Kreisberg JI: Contractile properties of the glomerular mesangium. *Invited review*, Fed Proc 42:3053-3057, 1983.

4. Kreisberg JI and Karnovsky MJ: Glomerular cells in culture. *Invited review*, Kidney Int 23:439-447, 1983.

5. Kreisberg JI, Venkatachalam M and Troyer D: Contractile properties of cultured glomerular mesangial cells. *Invited review*, Am J Physiol 249:F457-F463, 1985.

6. Kreisberg JI and Hassid: Functional properties of glomerular cells in culture. *Invited review*, Mineral and Electrolyte Metabolism 12:25-31, 1986.

7. Kreisberg: Cell biology and bichemistry of the glomerular mesangium. *Invited review*, Mineral and Electrolyte Metabolism 14:167-175, 1988.

8. Kreisberg JI and Wilson PW: Renal cell culture. *Invited review,* J Electron Microscopic Tech 9:238-263, 1988.

9. Kreisberg JI: Hyperglycemia and Microangiopathy. Direct regulation by glucose of microvascular cells. *Invited review,* Biology of Disease. Lab Invest, 67:416-426,1992.

IX. Invited Lectures and Workshops:

1. Lecture: *Characterization of rat glomerular cells in vitro.* Symposium on Immune Mechanisms in Renal Disease. National Institute of Arthritis, Metabolic and Digestive Diseases, October 2-4, 1978, Washington, D.C.

2. Workshop: *Renal cells in culture.* International Congress of Nephrology, June 18-23, 1978, Montreal.

3. Lecture: *Properties of glomerular cells in culture.* Pathology Grand Rounds, Peter Bent Brigham Hospital, Harvard Medical School, October 16, 1978.

4. Lecture: *Properties of glomerular cells in culture.* Yale University School of Medicine, Department of Pathology, March 6, 1979.

5. Seminar: *Contractile and phagocytic cells in the glomerular mesangium.* Yale University School of Medicine, Department of Pathology, March 7, 1979.

6. Invited Symposium: *Contractile properties of the glomerular mesangium.* The American Society of Nephrology, Chicago, December 12, 1982.

7. Invited Symposium: *Contractile properties of the glomerular mesangium.* The American Physiological Society, April 1983.

8. Invited Symposium: *Hormone induced contractile responses in cultured glomerular mesangial cells.* Gordon Conference, January 23-27, 1984.

9. Invited Symposium: *Factors affecting contractile function of mesangium. Satellite Symposium on Glomerular Function,* La Jolla, California, June 16-18, 1984.

10. Invited Symposium: *Membrane alterations and ARF.* Satellite Symposium on Acute Renal Failure, San Antonio, Texas, June 19-21, 1984.

11. Workshop: Co-Chairman, National Institutes of Health *Workshop on Renal Cell Culture*, September 9-10, 1985, Bethesda, Maryland.

12. Invited Symposium: *Membrane alterations in acute renal failure.* The International Union of Biochemistry: Protecting Tissues Against Hypoxia. Amsterdam, Holland, August 22-24, 1985.

13. Invited Lecture: *Contractile properties of the glomerular mesangium.* The Department of Physiology, University of Massachusetts Medical School, November 26, 1984.

14. Co-Chairman of the session *Cell biology of renal hormones* at the Federation of American Societies for Expermental Biology meetings, Anaheim, California, April 1985.

15. Invited Lecture: *Glomerular cells in culture.* The University of Utah School of Medicine, February 10, 1986.

16. Invited Symposium: *Contractile properties of cultured mesangial cells.* American Society of Nephrology, 1986.

17. Invited Symposium: *Biology of mesangial cells.* American Physiological Society, 1986.

18. Invited Lecture: *Biology of mesangial cell contraction.* Nephrology Service, Brooke Army Medical Center, Fort Sam Houston, Texas, October 20, 1986.

19. Invited Lecture: *Biology of mesangial cell contraction.* Department of Medicine, Case Western University, Cleveland, Ohio, November 12, 1986.

20. Invited Lecture: *Biology of mesangial cell contraction.* American Society of Nephrology, December 7-10, 1986, Washington, D.C.

21. Invited Workshop: Co-Moderator *Renal cells in culture*, American Society of Nephrology, December 7-10, 1986, Washington, D.C.

22. Invited Lecture: *Synthetic atrial peptide (APII) fails to inhibit inositol trisphosphate (IP3) release and contraction induced by vasopressin (V) in cultured mesangial (MS) cells*. American Society of Nephrology, December 7-10, 1986, Washington, D.C.

23. Invited Lecture: *The effects of cAMP on phosphate transport and specific activity of ^{32}P in ATP and phosphoinositide metabolism in vasopressin (VP) treated cultured (MS) cells.* American Society of Nephrology, December 7-10, 1986, Washington, D.C.

24. Invited Lecture: *Biology of contractile mesangial cells.* Department of Pharmacology, University of Virginia School of Medicine, Charlottesville, Virginia, March 5, 1987.

25. Invited Lecture: *The cell biology of cultured renal mesangial cells.* Department of Pathology, The University of Texas Health Science Center at San Antonio, Texas, March 16, 1987.

26. Invited Lecture: *Relationship of polyphosphoinositide turnover, myosin light chain phosphorylation and mesangial cell contraction*. FASEB Symposium on Cellular Mechanisms of Mesangial Cell Contraction, Washington, D.C., April 2, 1987.

27. Invited Lecture: *The cell biology of cultured renal mesangial cells*. Department of Pathology, Rhode Island Hospital, Brown University, Providence, Rhode Island, April 21, 1987.

28. Invited Lecture: *The cell biology of cultured renal mesangial cells*. University of Kansas Medical Center, Department of Medicine, Kansas City, Kansas, May 8, 1987.

29. Invited Lecture: *The cell biology of cultured renal mesangial cells*. Department of Pharmacology, University of Tennessee Health Science Center, Memphis, Tennessee, June 3, 9187.

30. Invited Lecture: *The contribution of mesangial cells in the control of the glomerular microcirculation.* Anatomisches Institut der Universitat Heidelberg, Fed Rep Germany, October 6-8, 1987.

31. Invited Lecture: *Glomerular mesangial cells*. Department of Immunology, Center for Hygiene, Freiburg, Fed Rep Germany, October 11, 1987.

32. Invited Lecture: *Vasoactive agents that affect mesangial (MS) cell adhesion and shape change alter plasminogen activators (PA) located in cellular adhesion plques (AP).* 27th Annual Meeting of the American Society for Cell Biology, November 16-20, 1987, St. Louis, Missouri.

33. Invited Lecture: *Vasoactive agents that affect mesangial (MS) cell adhesion and shape change alter plasminogen activators (PA) located in cellular adhesion*

plaques (PA). American Society of Nephrology, December 13-16, 1987, Washington, D.C.

34. Invited Lecture: *A novel hormone responsive glycan-phospholipid in cultured mesangial cells.* American Society of Nephrology, December 13-16, 1987, Washington, D.C.

35. Invited Lecture: *The cell biology of cultured renal mesangial cells.* Second World Congress on Diabetes Research, International Juvenile Diabetes Foundation Meeting, Monte Carlo, March 6-9, 1988.

36. Chairman, Minisymposium: *Diabetic renal disease.* Federation of American Societies for Experimental Biology, March 1989.

37. Invited Lecture: *The molecular mechanism of mesangial cell adhesion.* International Society of Nephrology Symposium on Signal Transduction, Cape Cod, Massachusetts, October 9-12, 1988.

38. Invited Lecture: *Contractile properties of cultured mesangial cells.* Instituto Mexicano de Investigaciones Nefrologicas, November 16-19, 1988, Acapulco, Mexico.

39. Invited Lecture: *Cell to matrix interactions in cultured mesangial cells.* Instituto Mexicano de Investigaciones Nefrologicas, November 16-19, 1988, Acapulco, Mexico.

40. Invited Participant: FASEB Summer Conference on Renal hemodynamics: *Integrative and cellular control mechanisms*, June 11-16, 1989.

41. Invited Lecture: *The molecular mechanism of mesangial cell adhesion.* American Society for Renal Biochemistry and Metabolism, Salamanca, Spain, June 27, 1989.

41. Invited Lecture: *Contractile properties of the glomerular mesangium.* Second International Congress of Physiology, Helsinki, Finland, July 9-12, 1989.

42. Invited Lecture: *The cell biology of cultured mesangial cells.* Smith Kline & French Laboratories, King of Prussia, Pennsylvania, September 13, 1989.

43. Invited Lecture: *The cell biology and adhesion of cultured mesangial cells.* The Finsen Institute, Copenhagen, Denmark, October 10, 1989.

44. Invited Lecture: *Glomerular mesangium in diabetic nephropathy.* National Kidney Foundation Symposium on Diabetic Nephropathy, New Orleans, Louisiana, October 20, 1989.

45. Symposium Moderator: *The cell biology and pathology of the mesangium.* American Society of Nephrology, December 3-6, 1989.

46. Invited Lecture: Urokinase-type plasminogen activator expression and mesangial cell shape change. Philippe Laudat Conference on "Basic and clinical aspects of plasminogen activation", Bischenberg, France,October 7-11,1990.

47. Chairman: *Intergrin and Matrix*. Forefronts in Nephrology, "Mesangial cells and extracellular matrix", Symposium of the International Society of Nephrology. Kloster Banz, near Erlanger-Nurnberg, Germany, June 9-12, 1991.

48. Invited Lecture: *The glomerular mesangium in diabetes mellitus*. Cellular biology and molecular biology of basements in health and disease. Airlie Center, Virginia, September 19-22, 1991.

49. Invited Lecture: The glomerular mesangium in diabetes mellitus. Division of Nephrology, Rush Medical School, May 1993.

50. Invited symposium: The glomerular mesangium in diabetes mellitus. The XII International Congress of Nephrology, Jerusalem, Israel, June 13-18, 1993.

51. Co-chairman: Cytokines and glomerular injury. The American Society of Nephrology, Orlando, FA, October 26-29, 1994.

52. Invited symposium: Activation of protein kinase C in glomerular cells in diabetes. International Symposium Pathogenesis of Diabetic Nephropathy: Experimental Approaches. Seoul, Korea Jan. 1995.

53. Invited lecturer: Mechanisms of mesangial cell shape change and adhesion loss following cAMP elevation. Department of Medical Physiology, Texas A and M University Health Sciences Center, College Station, TX. February 22, 1995.

54. Invited lecturer: The effect of high glucose on extracellular matrix synthesis by cultured mesangial cells. Henry Ford Hospital, Division of Nephrology, Detroit, Michigan. April 6, 1995.

55. Invited lecturer: The effect of high glucose on extracellular matrix synthesis by mesangial cells: pathogenic mechanisms of diabetic nephropathy. Division of Nephrology, San Diego VA Medical Center, October 17, 1995.

56. Invited lecturer: Modulation of mesangial cell function by glucose. 6th World Congress for Microcirculation. Munich August 25-30, 1996.

57. Chairman: Cytokines and glomerular injury. The American Society of Nephrology, New Orleans, LA, November 3-6, 1996.

58. Invited lecturer: The effect of high glucose on mesangial cell extracellular matrix synthesis. The American Society of Nephrology, New Orleans, LA, November 1996.

59. Chairman: Hormonal regulation of renal function. The American Society of Nephrology, Philadelphia, PA, October 25-28, 1998.

60. Invited Speaker, Target drug assessment using immunohistochemistry. Cancer Therapy and Research Center, San Antonio, TX. February 20, 2002.
61. Invited Speaker:, Target drug assessment using immunohistochemistry. Colon Cancer Workshop, UTHSCSA May 30, 2002.
62. A Tribute to Morris Karnovsky, Harvard Medical School, "The Glomerular Mesangial Cell, Friend and Foe. June 10, 2002.
63. Invited Speaker, "Detection of Activated Cell Signaling Proteins in Prostate Cancer". 23rd Annual Conference on Aging:Clinical Challenges and Controversies in Prostate Cancer: Prevention, Treatment and Quality of Life Issues in Older Men", September 27-28, 2002, San Antonio, Texas.
64. Invited Speaker, "Target Drug Assessment using Immunohistochemistry". Annual Meeting of The National Surgical Adjuvant Breast and Bowel Project, October 31- November 3, 2002, Tampa, Florida.

X. Current Projects

(1) Biomarkers for poor clinical outcome in prostate cancer

(2) Mechanisms by which RhoA affect prostate tumor cell growth.

XI. Research Support

NATIONAL

National Institutes of Health
Pathobiology of Diabetic Glomerulosclerosis
DK 29787-09
08/01/81 thru 12/31/96
$1,500,000 direct costs
Principal Investigator

National Institutes of Health
Pathobiology of Occlusive Vascular Disease
2T32HL07446-16
1996-2001
$523,600 direct costs
Preceptor

National Institutes of Health
"Metastatic potential of colorectal carcinoma-APRC Supplement"
Type: Supplement Period: 2000-2002
$54, 000
Principal Investigator

National Institutes of Health
"Biological evaluation of CCI-779 in brain tumors"
Type: Quick Trials for Cancer Therapies
06/02-06/04
$160,000 direct costs
Co-investigator

National Institutes of Health
"Biological evaluation of ZD1839 in colon cancer"
Type: Quick Trials for Cancer Therapies
06/02-06/04
$160,000 direct costs
Co-investigator

National Institutes of Health
"ErbB1 and ErbB2 Blockade in Advanced Breast Cancer"
Type: Quick Trials for Cancer Therapies
10/02-9/04
$250,000 direct costs
Co-investigator

Kronos Foundation
"Modulation of age related changes in plasma membrane signal transduction by dietary fatty acids"
04/01-03/03
$250,000
Co-investigator

Veterans Administration
Career Scientist Award
04/01/89 thru 03/31/03
$1,000,000
Principal Investigator

American Diabetes Association
Mechanisms by which High Glucose Increases Fibronectin Transcription
01/01/96 thru 12/31/97
$100,000
Principal Investigator

Veteran's Administration-Merit Review
Pathobiology of Diabetic Glomerulosclerosis
04/01/96 thru 03/31/01
$500,000 direct costs
Principal Investigator

Veteran's Administration-Shared Equipment Grant
Confocal Microscope
1998
$240,000
Principal Investigator

Pending

Veteran's Administration
"RhoA dependent and independent pathways of prostate cancer growth"
04/03-03/08
$750,000 direct costs
Principal Investigator

LOCAL

San Antonio Cancer Institute
Efficacy of Protein Prenylation Inhibitors on Apoptotic Cell Death in Adenocarcinoma of the Prostate
02/01/97 thru 01/31/98
$20,000

Fellows' Support:

William Glass II, M.D., Ph.D.:

National Kidney Foundation Fellowship
Molecular basis of mesangial cell adhesion
Dr. Jeffrey Kreisberg, Mentor
July 1, 1987 through June 30, 1988
$19,000

Veterans Administration
Research Advisory Group Summary Statement
Dynamics of extracellular matrix structure in mesangial cell function
Principal Investigator
Dr. Jeffrey Kreisberg, Mentor
July 1, 1990 through June 30, 1992
$60,842

American Heart Association, Texas Affiliate, Inc.
Grant-in-Aid Award
Nonenzymatic glycosylation and mesangial cell matrix accumulation
Principal Investigator
Dr. Jeffrey Kreisberg, Mentor
July l, 1989 through June 30, 1991
$55,000

National Institutes of Health
First Award
Alteration of mesangial cell function by thrombin
Principal Investigator
Dr. Jeffrey Kreisberg, Mentor
July 1, 1991 through June 30, 1996
$331,124

Suzanne H. Ayo, M.D.

National Kidney Foundation Fellowship
Mechanisms of increased mesangial matrix deposition in diabetic nephropathy
Dr. Jeffrey Kreisberg, Mentor
July 1, 1989 to June 30, 1990
$21,000

American Heart Association, Texas Affiliate, Inc.
Grant-In-Aid Award
Molecular mechanism of extracellular matrix accumulation in mesangial cells
Principal Investigator
Dr. Jeffrey Kreisberg, Mentor
July 1, 1993 to June 30, 1995
$83,600

Nandini Ghosh-Choudhury, Ph.D.

Institutional Grant
Molecular mechanisms of breast cancer cell growth
Principal Investigator
Dr. Jeffrey Kreisberg, Mentor
June 1, 1998 to May 31, 1999
$15,000.