FIG. 1

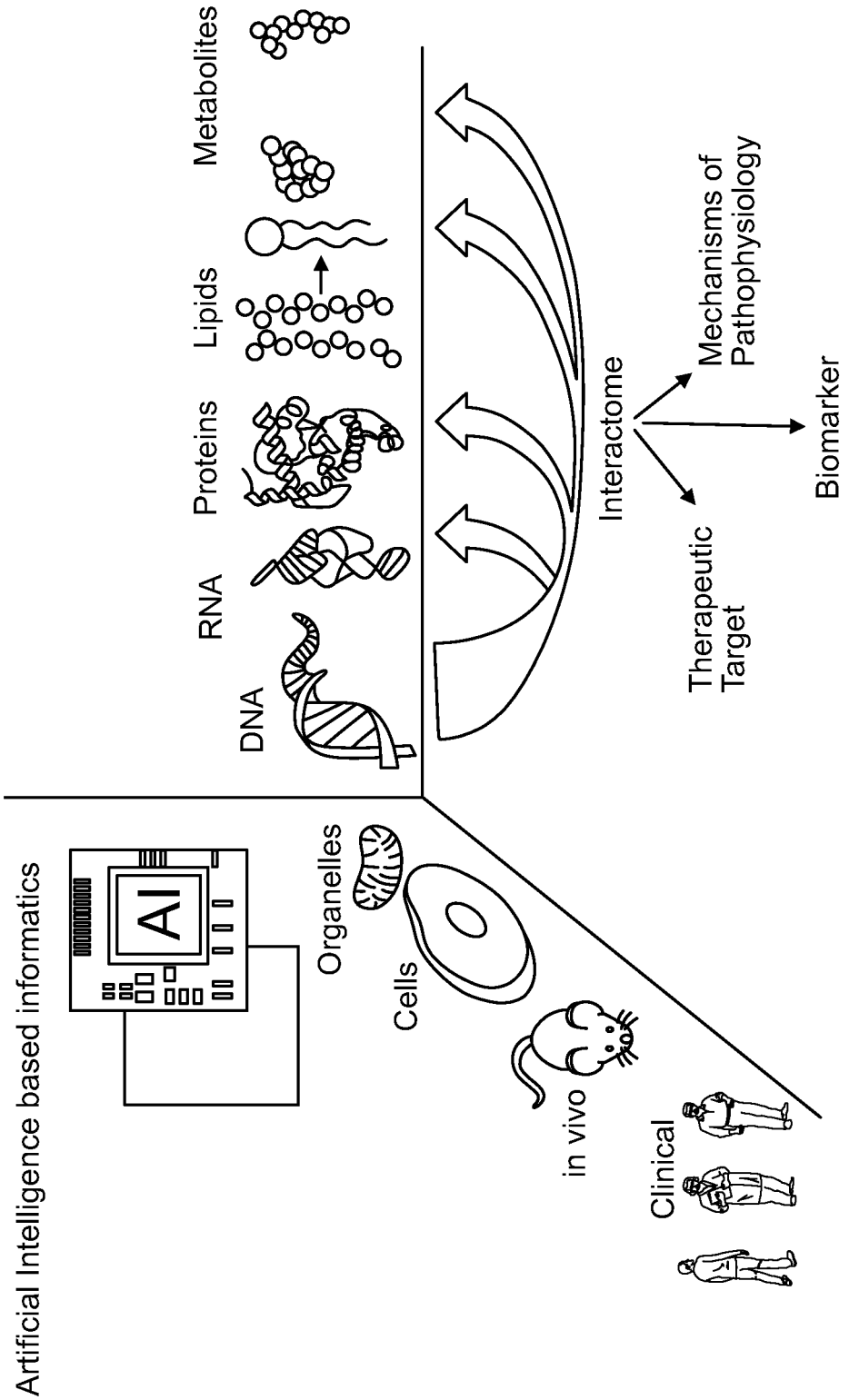

Artificial Intelligence based informatics
AI
Organelles
Cells
in vivo
Clinical
DNA
RNA
Proteins
Lipids
Metabolites
Interactome
Therapeutic Target
Mechanisms of Pathophysiology
Biomarker

FIG. 2A

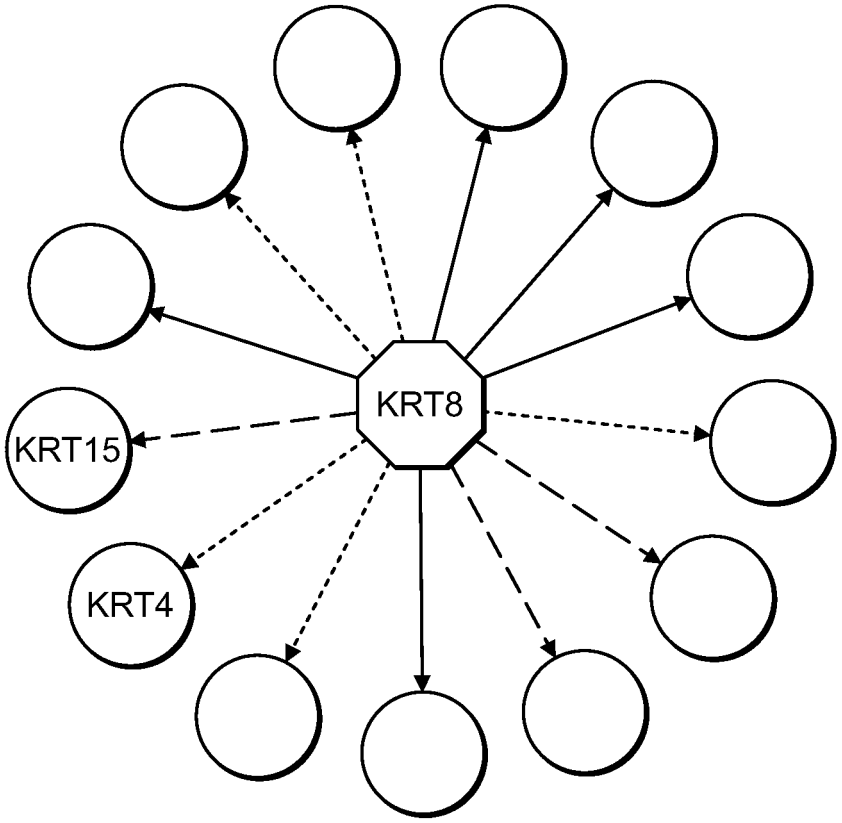


FIG. 2B

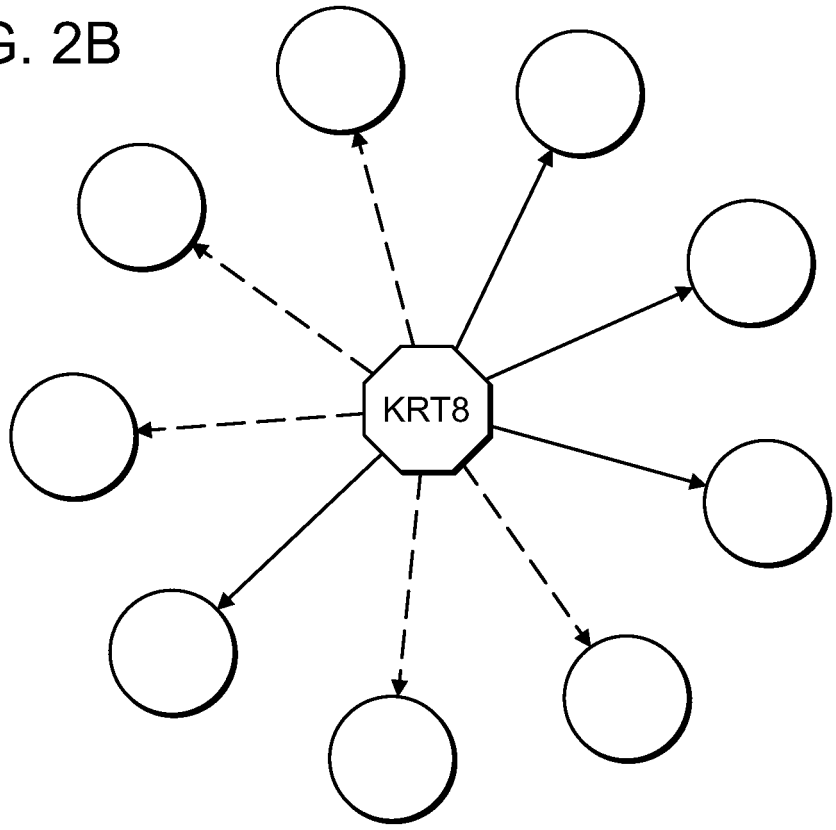


FIG. 2C

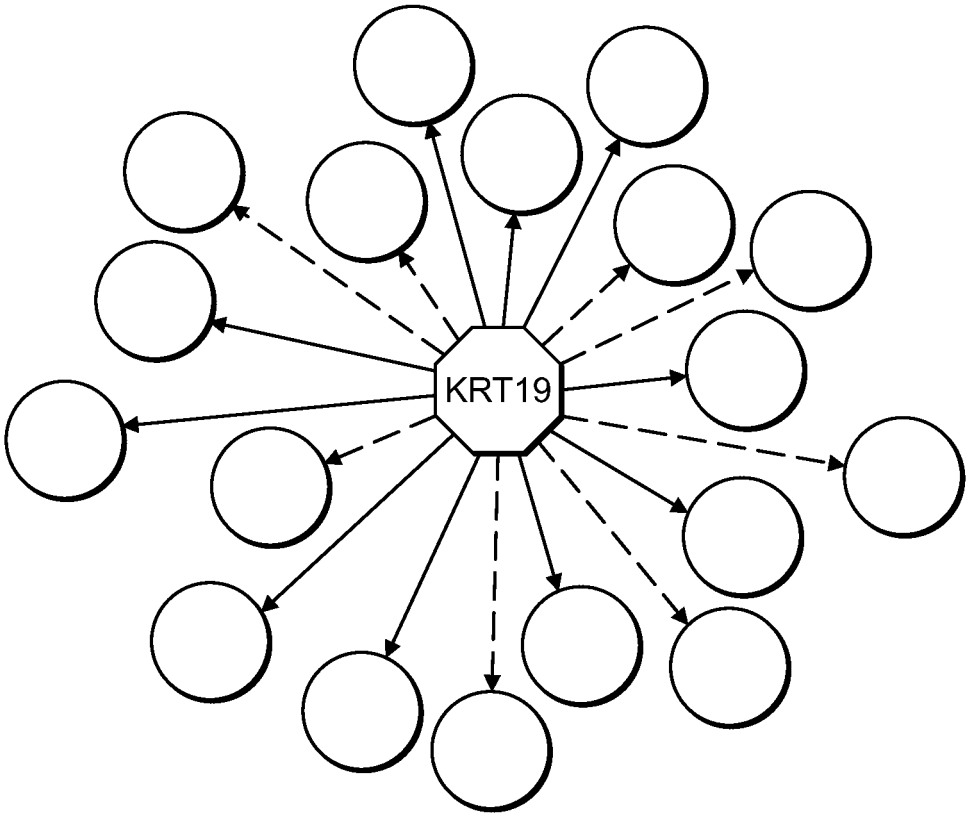


FIG. 3A

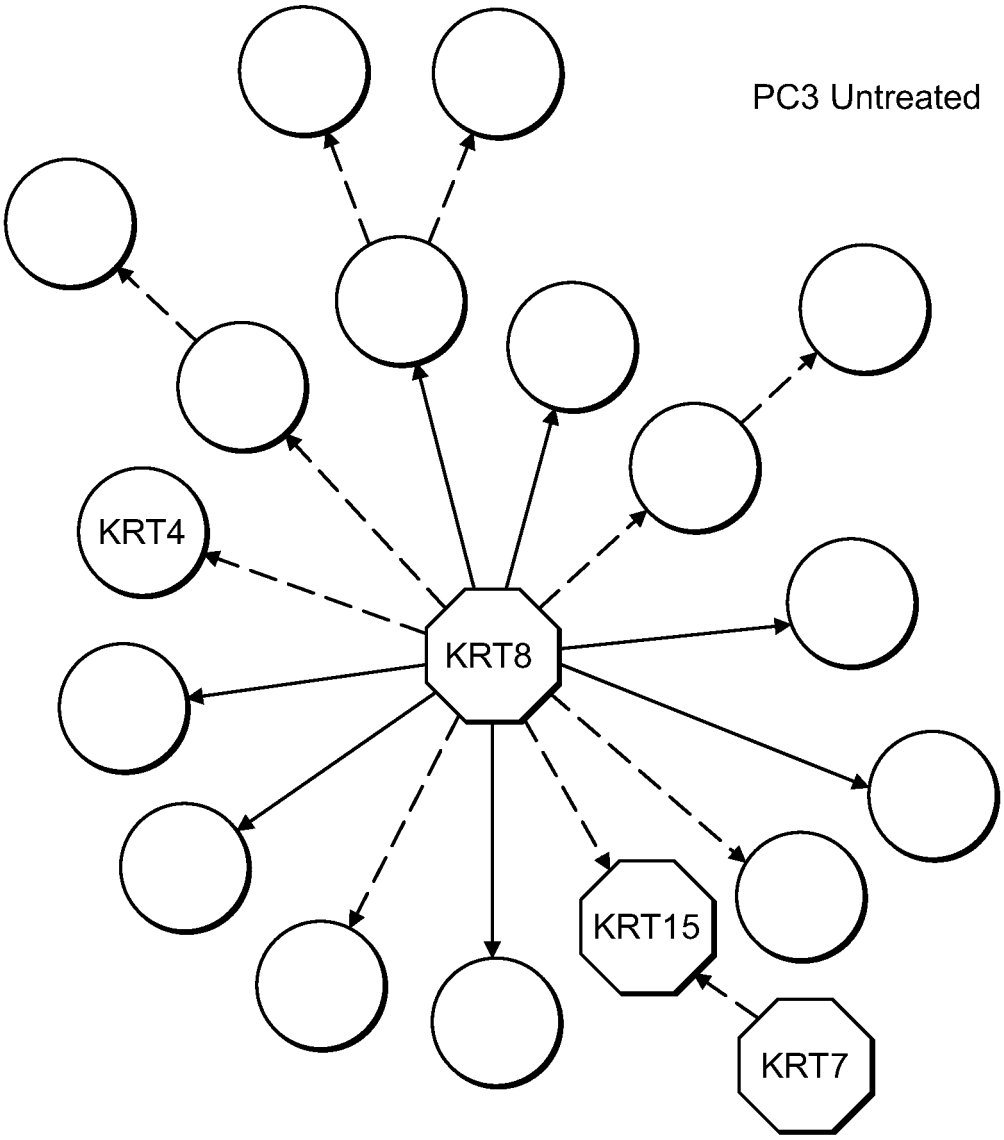


FIG. 3B

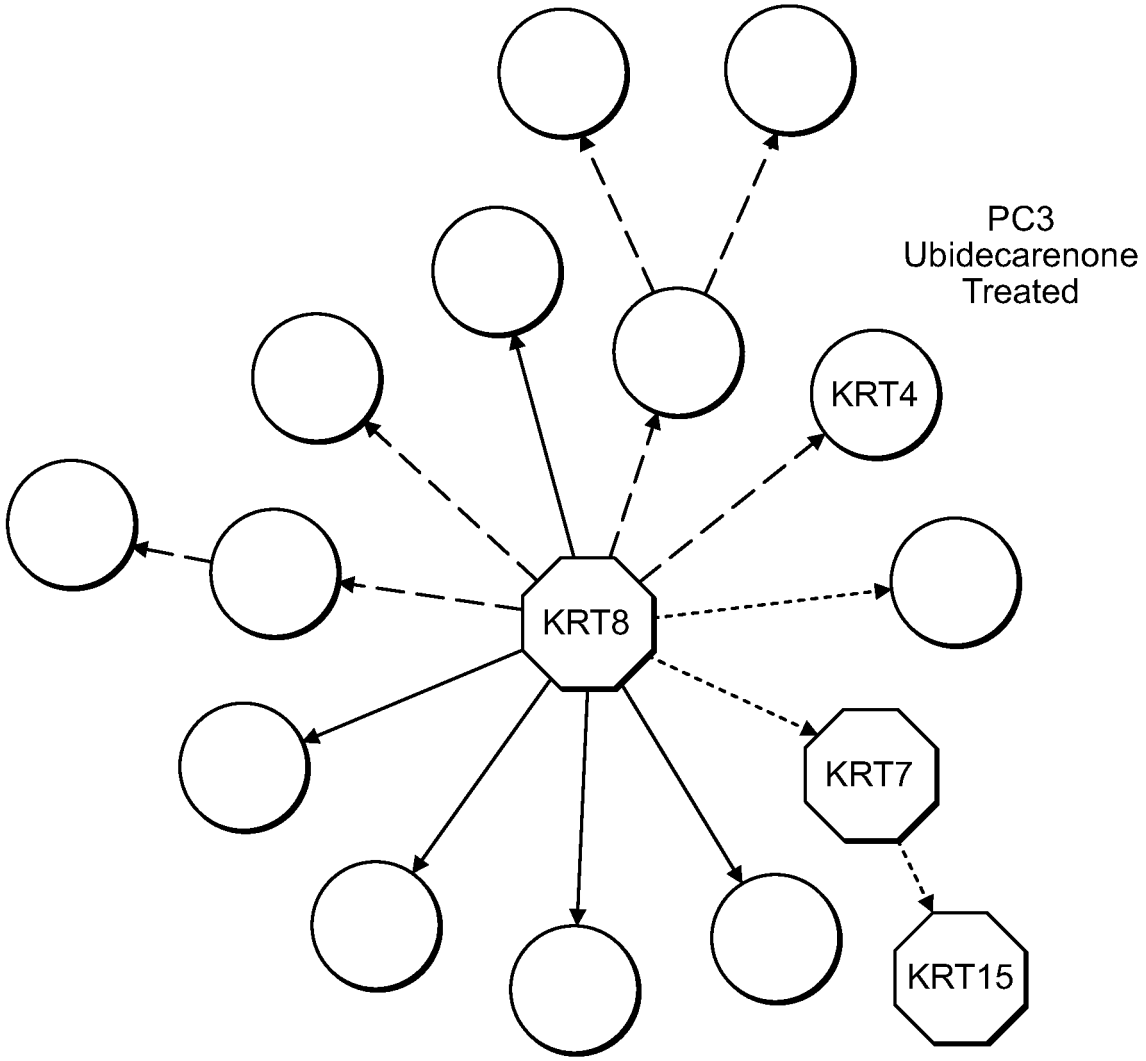


FIG. 3C

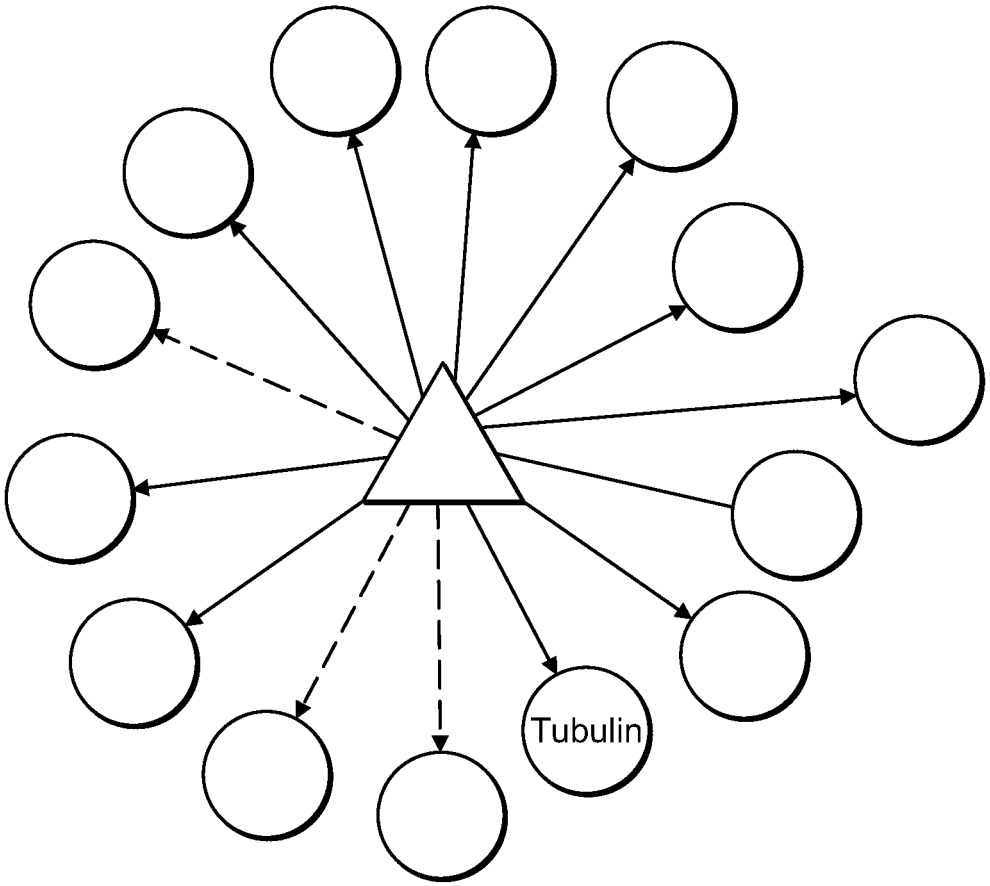
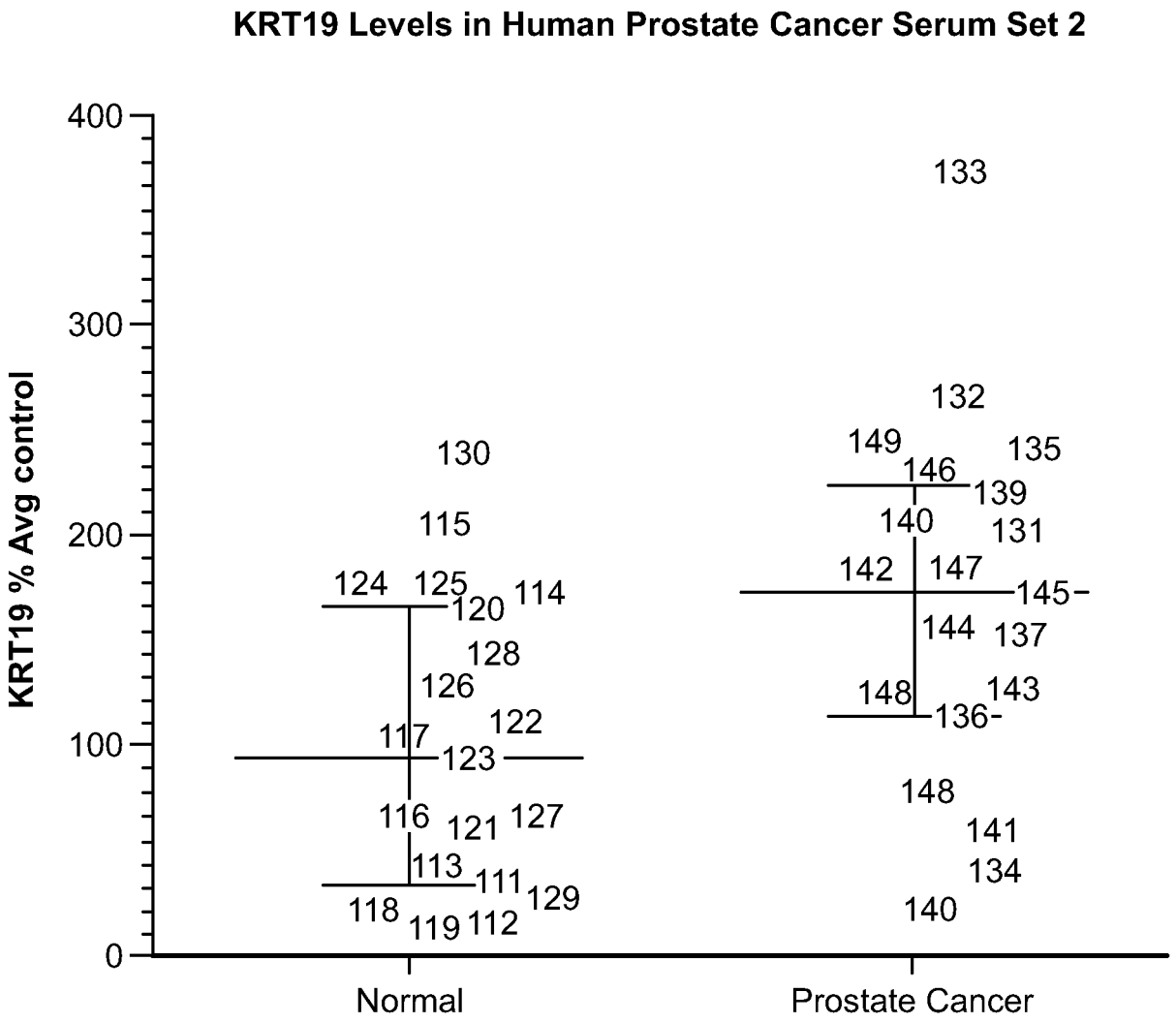


FIG. 3D



Bars represent median with interquartile range

FIG. 4

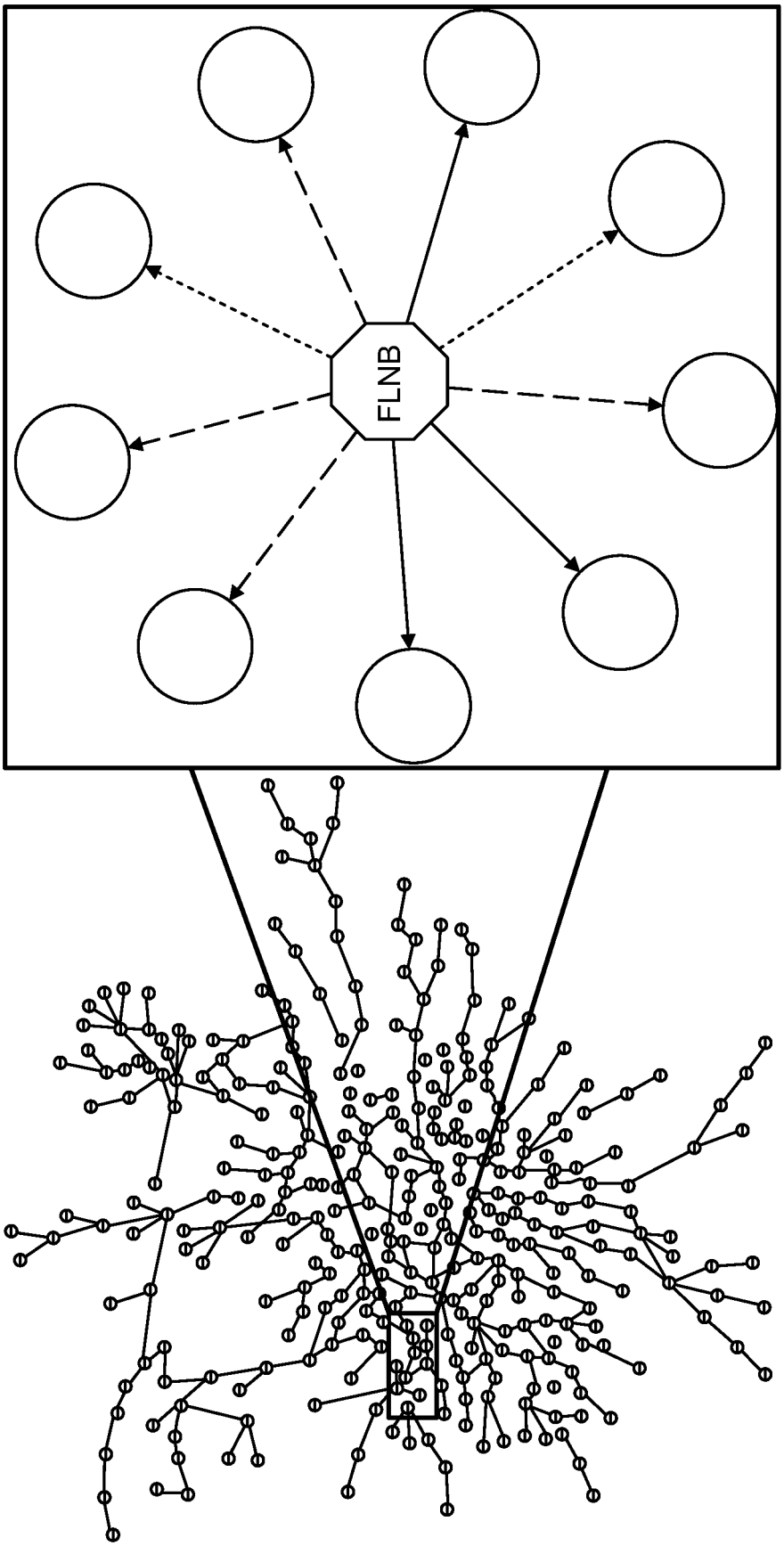


FIG. 5

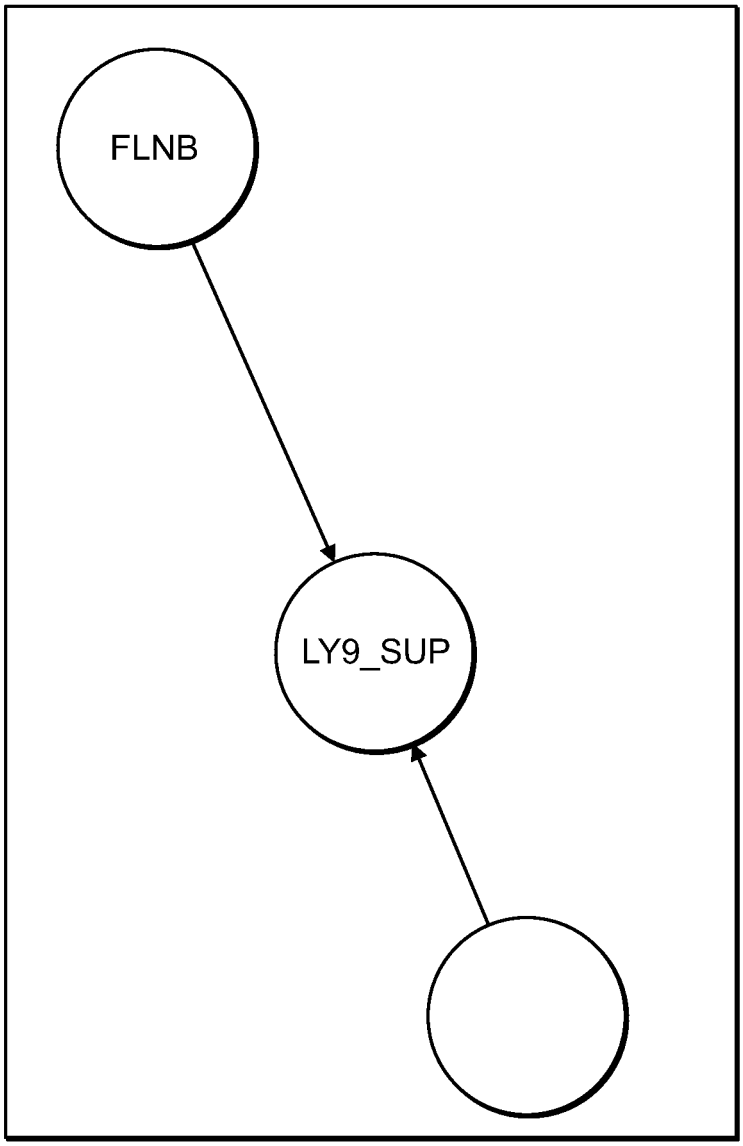


FIG. 6A

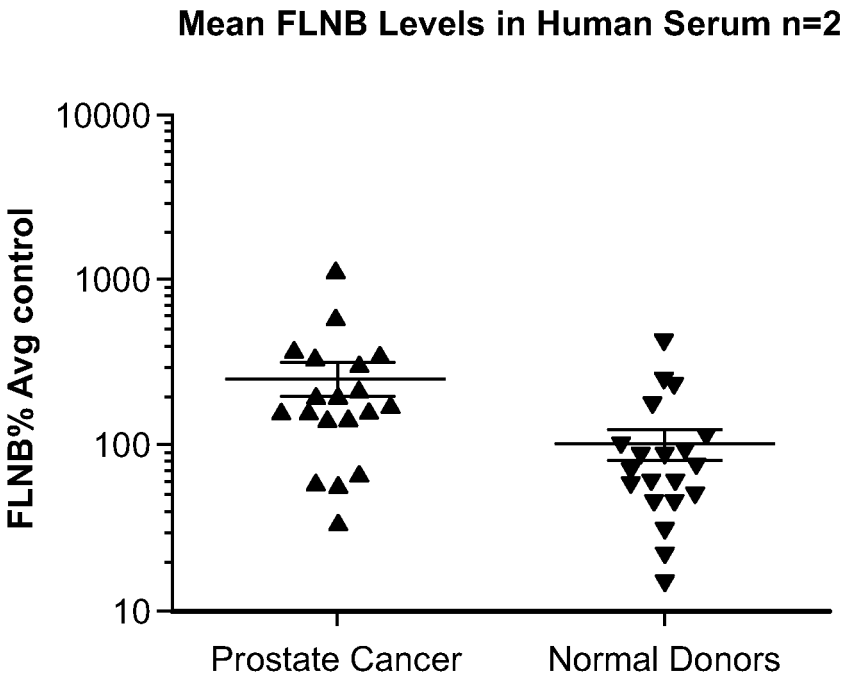

Mean FLNB Levels in Human Serum n=2
FLNB% Avg control
10000
1000
100
10
Prostate Cancer
Normal Donors

FIG. 6B

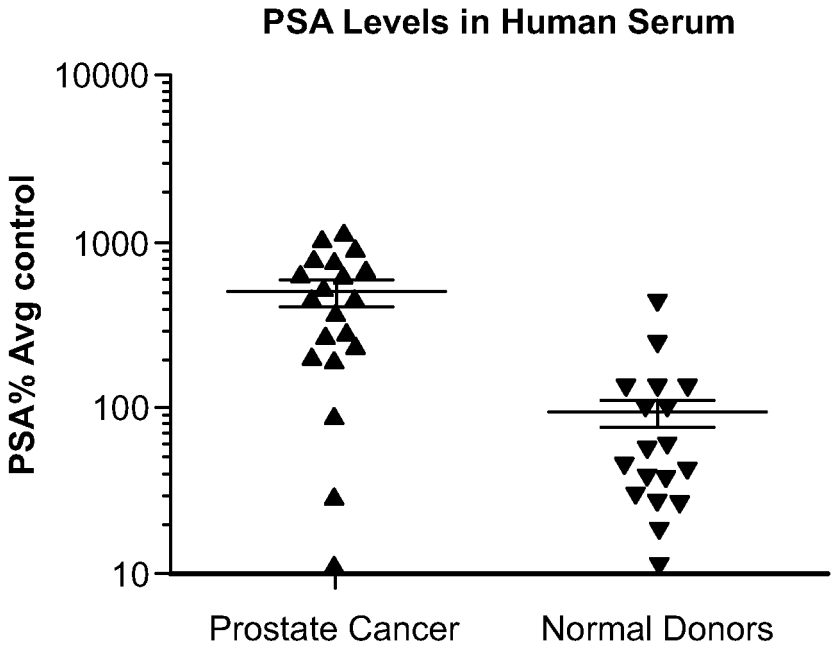

PSA Levels in Human Serum
PSA% Avg control
10000
1000
100
10
Prostate Cancer
Normal Donors

FIG. 7

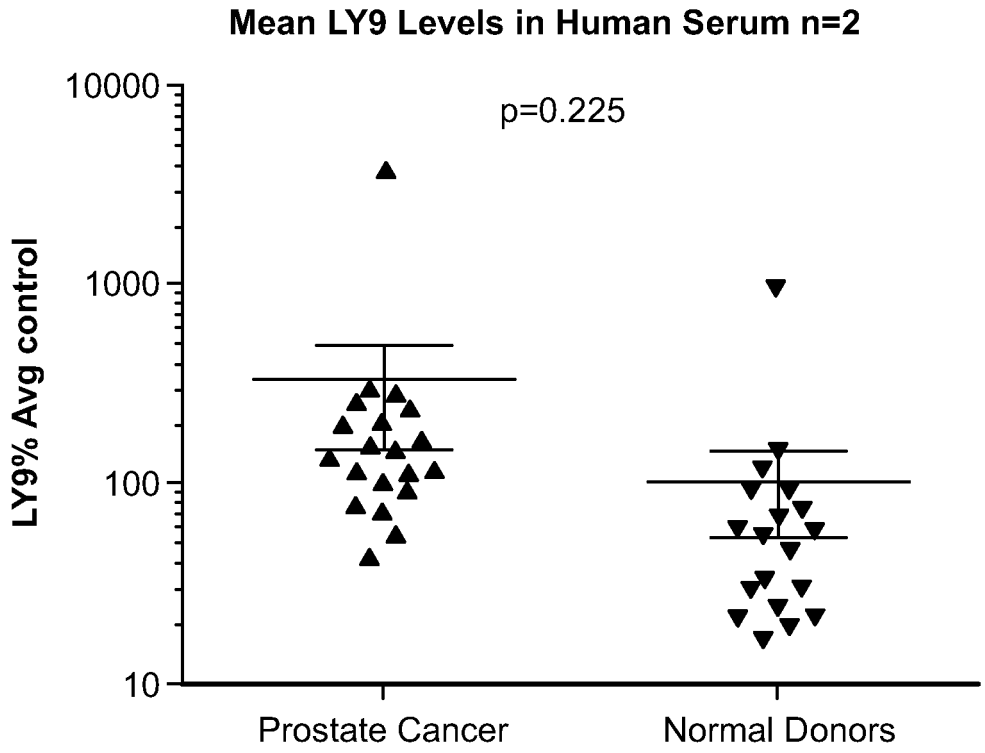

Mean LY9 Levels in Human Serum n=2
p=0.225
LY9% Avg control
10000
1000
100
10
Prostate Cancer
Normal Donors

FIG. 8A

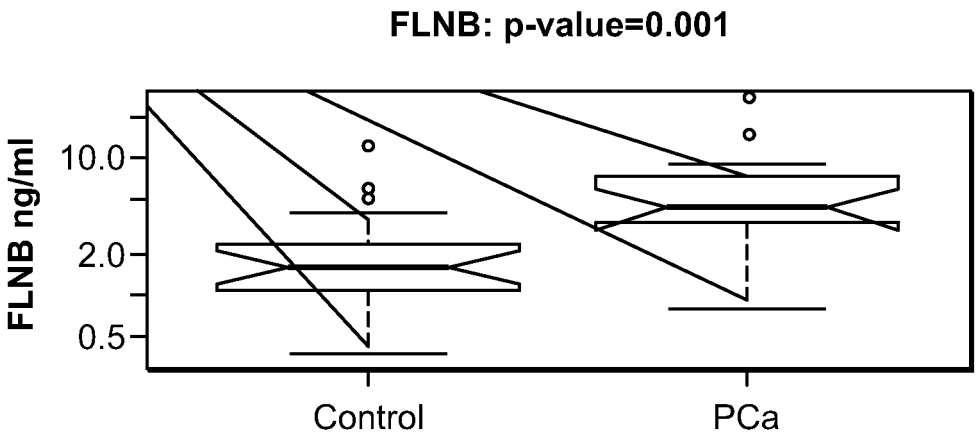


FIG. 8B

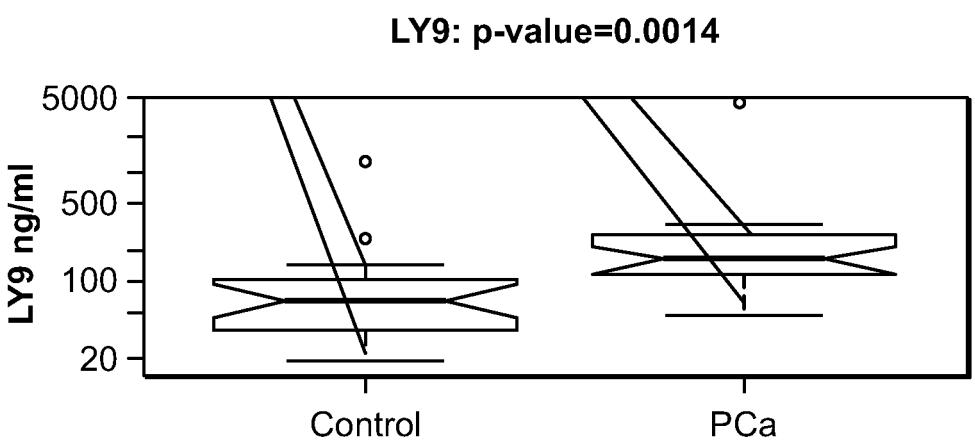


FIG. 8C

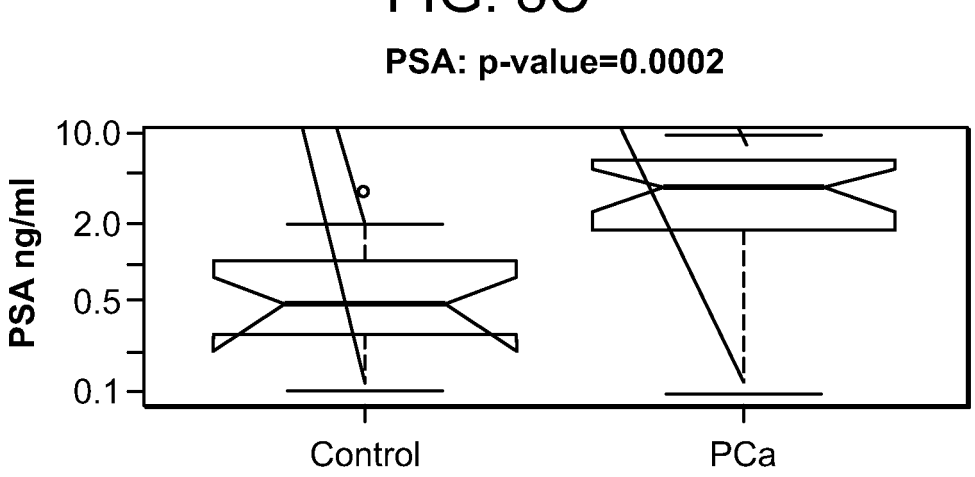


FIG. 9A

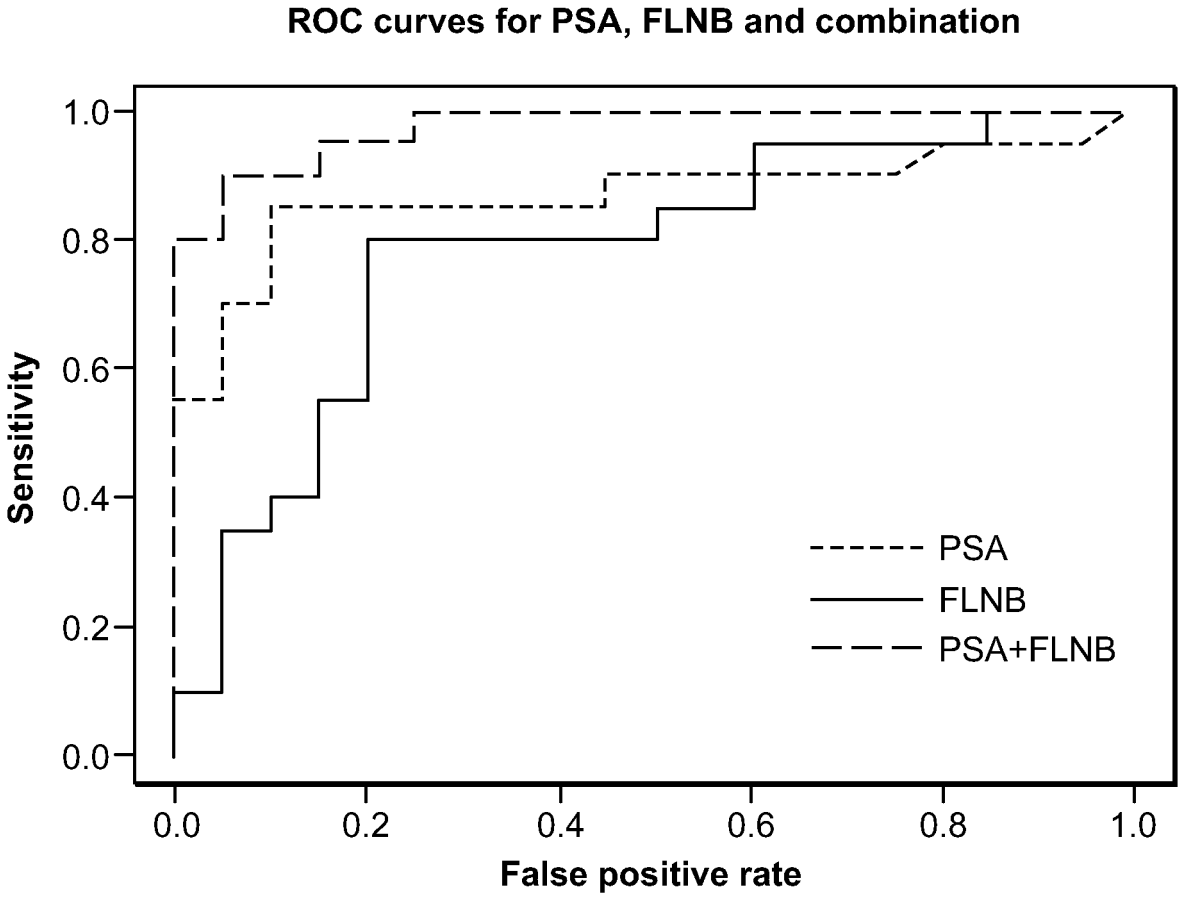


FIG. 9B

Marker	AUC
PSA	0.87
FLNB	0.78
PSA + FLNB	0.975

FIG. 10A

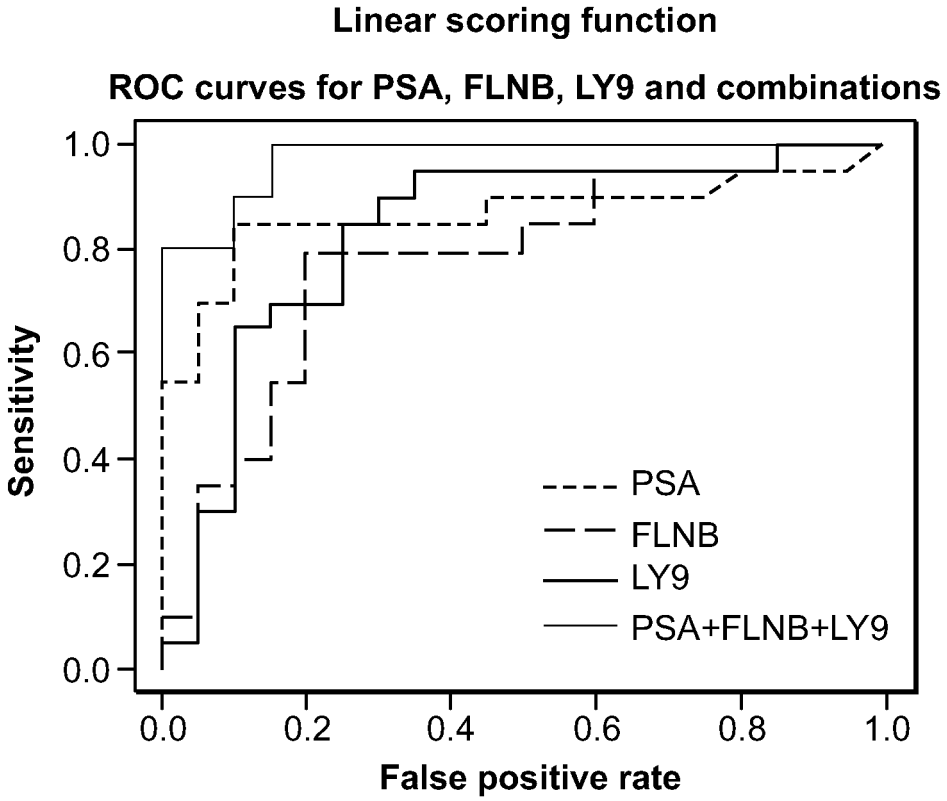


FIG. 10B

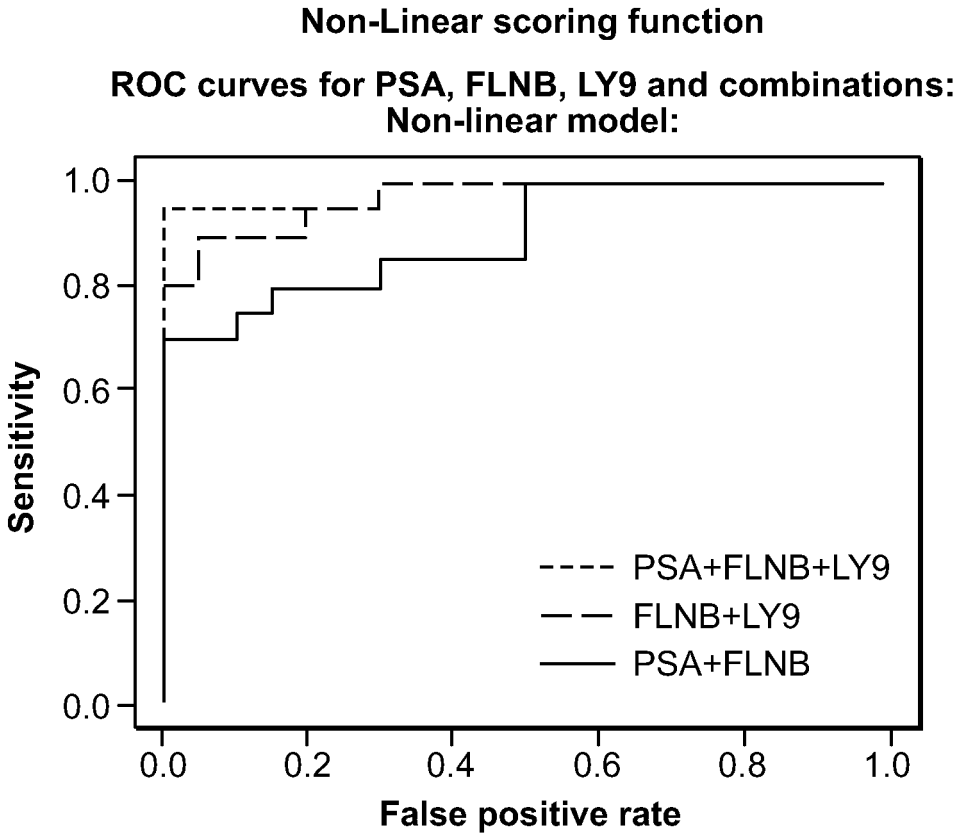


FIG. 11

Human Serum (Prostate Cancer)							
Label	**Lot Number**	**UID**	**Gender**	**Medications**	**Race**	**Diagnosis**	**Age**
1	BRH590798	71152	Male	Vitamin D, Citracal	Hispanic	Prostate cancer	59
2	BRH590799	70021	Male	Multivitamins	African American	Prostate Cancer	50
3	BRH590800	7074	Male	Multivitamin; Aspirin; Paxil; Albuterol;Levitra	Caucasian	Prostate Cancer	63
4	BRH590801	72295	Male	Aredia,Trelstar	Caucasian	Prostate cancer	76
5	BRH590802	72297	Male	Casodex, Metoprolol, Clonidine, Amlodipine, Zometa, Lupron	African American	Prostate cancer	59
6	BRH590803	23738	Male	Lexapro; Pravastatn	Caucasian	Prostate Cancer	49
7	BRH590804	23796	Male	Keppra; Aspirin; Calcium; Prilosec;Taxotere	Caucasian	Prostate Cancer	62
8	BRH590805	71712	Male	Aredia, Lupron, Casodex, Restoril, Hydroxycodone	Caucasian	Prostate cancer, 5'11 bone LN,Hypoproliferative anemia	75
9	BRH590806	71119	Male	Lipitor	Caucasian	Prostate cancer, Acid reflux, High Cholesterol	47
10	BRH590807	25716	Male	Prilosec; Lipitor	Caucasian	Prostate Cancer; High Cholesterol	54

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FIG. 11 (cont.)

			Normal Serum				
Stage	**Surgery**	**Other Comments**	**Label**	**Lot Number**	**Gender**	**Race**	**Age**
TNM, T1C	Radiation for prostate cancer	Date of diagnosis 4/29/11, Stage of prostate cancer TNM, T1C	**21**	BRH590923	Male	Caucasian	57
Pre-Treatment, 1C	Hernia	PSA Level: 4, grade = 3	**22**	BRH590924	Male	Caucasian	48
Stage T1C; PSA Level:6; Gleason Score:7	Double Hernia		**23**	BRH590925	Male	Caucasian	59
Stable disease state; 4		Patient undergoing chemotherapy	**24**	BRH590926	Male	Caucasian	72
Stable disease state; 4			**25**	BRH590927	Male	African American	57
Stage T1C			**26**	BRH590928	Male	Caucasian	48
Stage 4; Flare-Up			**27**	BRH590929	Male	Caucasian	59
Stable disease state; 4			**28**	BRH590930	Male	Caucasian	68
T1C	Arthroscopic Knee Tonsillectomy, Appendectomy, Fissurectomy	Prostate cancer stage T1C, Date of diagnosis 7/11, PSA level 2.6, Gleason score 6	**29**	BRH590931	Male	Caucasian	45
Stable; Stage T1C			**30**	BRH590932	Male	Caucasian	50

FIG. 11 (cont.)

11	BRH590808	30186	Male	Vytorin; Atenolol; Altace; Aspirin	Hispanic	Prostate Cancer; High Cholesterol	62
12	BRH590809	72135	Male	ASA; MVI; Vantin; Septra	African American	Prostate cancer	48
13	BRH590810	100989	Male	Casodex, Lupron	Caucasian	Prostate cancer	80
14	BRH590811	49545	Male	Tri-Cor; Prilosec; Klor-Con; Edecrin; Simvastatin; Vitamin D	Caucasian	Prostate Cancer; High Cholesterol	69
15	BRH590812	49568	Male	Lupron; Depot; synthroid	Caucasian	Prostate Cancer; High Cholesterol; HTN; Thyroid	54
16	BRH590813	49564	Male	Benicar; Atenolol; Neurotin; Plavix; Prednisone; Cymbalta; Zometa	Caucasian	Prostate Cancer	75
17	BRH590814	103500	Male	Prochlorperazine, maleate, Prednisone,Resveratrol, Synthroid, Lisinopril, Lasix	Caucasian	Prostate Cancer	86
18	BRH590815	45168	Male	None	Caucasian	Prostate Cancer	58
19	BRH590816	61323	Male	Aspirin; Benicar; Amlodipine; Triamterene; Multaq	Caucasian	Prostate Cancer; Atrial Fibrillation; High Cholesterol	60
20	BRH590817	61324	Male	Allopurinol; Aspirin; Vitamins	Caucasian	Prostate Cancer; Atrial Fibrillation	68

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FIG. 11 (cont.)

Stage T1C	Robotic Prostatectomy (8/16/10) ; Heart Stents x4		**31**	BRH590933		Hispanic	58
T1C	Back surgery	Prostate cancer stage TIC; Date of diagnosis 9/16/11; PSA value 4.23; Gleason score 7	**32**	BRH590934	Male	African American	46
Stable Disease State	Ulcers, Hernia	Date of diagnosis 4/17/01, Grade T1C, Gleason score 7; PSA=12.33	**33**	BRH590935	Male	Caucasian	71
Stage 4; Stable	Appendectomy; Craniotomy; Thoracoscopy		**34**	BRH590936	Male	Caucasian	66
Stage 4; Stable			**35**	BRH590937	Male	Caucasian	52
Stage 4; Stable	Bariatric Surgery; Prostate Seed Implants		**36**	BRH590938	Male	Caucasian	70
4	Partial Thyroidectomy 1958	Date of diagnosis 4/17/01, Grade T1C, Gleason score 7	**37**	BRH590939	Male	Caucasian	71
PreTreatment		PSA= 4.4, Grade 7, Stage 3b	**38**	BRH590940	Male	Caucasian	56
Stage T1C; PreTreatment	Cardiac Ablation	PSA Level= 2.6; Gleason Score=6	**39**	BRH590941	Male	Caucasian	58
Stage T2b; PreTreatment	Valve Replacement Repair	PSA Level=9.3; Gleason Score=7, grade = 4	**40**	BRH590942	Male	Caucasian	63

FIG. 12

Label	Vendor	Prostate Cancer Stage	Case ID / Lot	Specimen ID	Age	Sex	Ethnicity	Clinical Test Results
111	Bioreclamation		BRH621393		67	Male	Hispanic	
112	Bioreclamation		BRH621389		49	Male	African American	
113	Bioreclamation		BRH621390		63	Male	African American	
114	Bioreclamation		BRH621391		54	Male	Hispanic	
115	Bioreclamation		BRH621392		66	Male	African American	

FIG. 12 (cont.)

Clinical Diagnosis (specimen)	Clinical Diagnoses (patient)	Medications
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	

FIG. 12 (cont.)

116	Asterand		69871	248975A8	65	Male	Caucasian	
117	Asterand		66017	220676A8	56	Male	Caucasian	
118	Asterand		66010	220673A8	56	Male	Caucasian	
119	Asterand		65953	220643A8	59	Male	Caucasian	
120	Asterand		69874	248976A8	66	Male	Caucasian	
121	Asterand		67494	235614A8	55	Male	Caucasian	
122	Asterand		69865	248981A7	65	Male	Caucasian	
123	Asterand		67461	235607A6	56	Male	Caucasian	
124	Asterand		67502	235640A7	59	Male	Caucasian	
125	Asterand		69929	263798A7	62	Male	Caucasian	

FIG. 12 (cont.)

Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	

FIG. 12 (cont.)

126	Asterand		69926	263785A8	65	Male	Caucasian	
127	Asterand		62916	196638A7	50	Male	Caucasian	
128	Asterand		69908	263789A8	66	Male	Caucasian	
129	Asterand		69892	263771A6	64	Male	Caucasian	
130	Asterand		69896	263762A8	69	Male	Caucasian	
131	Bioreclamation	Stage I	BRH621388	84101	85	Male		PSA: 0.1, Gleason score: 7 & 8
132	Bioreclamation	Stage I	BRH621384	71119	47	Male		PSA: 2.6, Gleason score: 6
133	Bioreclamation	Stage I	BRH621385	71299	66	Male		Gleason score: 7
134	Bioreclamation	Stage I	BRH621386	73599	57	Male		Gleason score: 7
135	Bioreclamation	Stage I	BRH621387	100989	80	Male		Gleason score: 7

FIG. 12 (cont.)

Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
Normal control donor	Normal control donor (Status: Ongoing)	
		Uroxatrol, Vesicare, Atenolol, Furosemide, KlorCon, ASA, Calcium chew
		Lipitor
		Levothyroxine, Metformin, Glimepiride, Avapro, Atenolol, Chlorathalidone, Proscar, Flomax
		Aspirin, Carvediol, Lipitor, Losartan, Januvia
		Casodex, Lupron

FIG. 12 (cont.)

136	Asterand	Stage II	64938	220537A6	65	Male	Caucasian	PSA: 0.32(ng/ml)
137	Asterand	Stage II	64960	222331A8	55	Male	Caucasian	PSA: 4.5(ng/ml), Gleason score: 6(3+3=6)
138	Asterand	Stage II	67709	248842A6	56	Male	Caucasian	PSA: 5.34(ng/ml), Gleason score: 7(3+4=7)
139	Asterand	Stage II	65594	220578A8	59	Male	Caucasian	PSA: 7.5(ng/ml), Gleason score: 5(3+2=5)
140	Asterand	Stage II	65451	224670A8	73	Male	Caucasian	PSA: 15.7(ng/dl), Gleason score: 6(3+3=6)
141	Asterand	Stage III	64030	217315A8	56	Male	Caucasian	PSA: 2.8(ng/ml), Gleason score: 9(4+5=9)

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FIG. 12 (cont.)

Adenocarcinoma of the prostate gland	Hypertension (Status: Ongoing), Adenocarcinoma of the prostate gland (Status: New)	Enalapril
Adenocarcinoma of the prostate gland	Adenocarcinoma of the prostate gland (Status: New)	Multivitamin, Cod liver oil, Flonase
Adenocarcinoma of the prostate gland	Hypercholesterolemia (Status:), Depression (Status:), Anxiety (Status:), Gout (Status:), Borderline diabetes (Status:), Gastroesophageal reflux disease (Status:), Adenocarcinoma of the prostate gland (Status: New)	Crestor, Uloric, Tamsulosin, Amitiza, Nexium, Ambien, Xanax, Celexa
Adenocarcinoma of the prostate gland	Adenocarcinoma of the prostate gland (Status:New)	
Adenocarcinoma of the prostate gland	Hypertension(Status:Ongoing), Adenocarcinoma of the prostate gland (Status:New)	
Adenocarcinoma of the prostate gland	Pericarditis (Status:Past), Petite mal seizures (Status: Past), Increased cholesterol (Status: Ongoing), Adenocarcinoma of the prostate gland (Status:New)	Allegra-D, Zocor, Lexapro, Ambien, Viagra, Multivitamin, Tylenol pm

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FIG. 12 (cont.)

142	Asterand	Stage III	66588	238745A8	68	Male	Caucasian	PSA: 4.44(ng/ml), Gleason score: 8(4+4=8)
143	Asterand	Stage III	63718	217346A8	56	Male	Caucasian	PSA: 5.6(ng/ml), Gleason score: 6(3+3=6)
144	Asterand	Stage III	63191	190121A8	59	Male	Caucasian	PSA: 15.5(mmol/L), Gleason score: 7(3+4=7)
145	Asterand	Stage III	66517	238792A8	62	Male	Caucasian	PSA: 24.72(ng/ml), Gleason score: 9(4+5=9)
146	Asterand	Stage IV	66533	241880A8	76	Male	African American	PSA: 1.31(ng/ml)

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FIG. 12 (cont.)

Adenocarcinoma of the prostate gland	Sleep apnea (Status: Ongoing), Osteoarthritis (Status: Ongoing), Type 2 diabetes (Status: Ongoing), Gastroesophageal reflux disease (Status: Ongoing), Adenocarcinoma of the prostate gland (Status: New)	Alprazolam, Tramadol hcl, Loratadine, Lisinopril, Simvastatin, Metformin HCl, Ranitidine, Fenobirate, Glipizide, Actos
Adenocarcinoma of the prostate gland	Osteoarthritis of the neck (Status: Ongoing), Hypertension (Status: Ongoing), Adenocarcinoma of the prostate gland (Status: New)	Green vibrance, Diovan, Aspirin, Excedrin
Adenocarcinoma of the prostate gland	Hypertension (Status:Ongoing), Adenocarcinoma of the prostate gland (Status:New)	Gibomet, Enalapril
Acinar cell adenocarcinoma of the prost	Hypertension (Status: Ongoing), Hypercholesterolemia (Status: New), Glaucoma (Status: Ongoing), Acinar cell adenocarcinoma of the prostate Gland (Status: New)	Simvastatin, Amlodipine, Lisinopril, Latanoprost
	Cancer of the prostate - stage 4 (Status: Ongoing)	

FIG. 12 (cont.)

147	Asterand	Stage IV	70060	262110A8	50	Male	Hispanic	PSA: 3.36(ng/mL), Gleason : 9(4+5=9)
148	Asterand	Stage IV	66534	241895A8	80	Male	Caucasian	PSA: 15.52(ng/ml)
149	Asterand	Stage IV	68411	196648A8	64	Male	Caucasian	PSA: 30(ng/dl), Gleason score:6(3+3=6)
150	Asterand	Stage IV	66950	245729A8	86	Male	Caucasian	PSA: 66.49(ng/ml)

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FIG. 12 (cont.)

Adenocarcinoma of the prostate gland	Diverticulosis (Status: Ongoing), Bilateral inguinal hernia (Status: Ongoing), Depression (Status: Ongoing), Hematospermia (Status: Past), Gastroesophageal reflux disease (Status: Ongoing), Degenerative joint disease (Status: Ongoing), Adenocarcinoma of the prostate (Status: Ongoing), Metastatic neoplasm, adenocarcinoma of the bone marrow (Status: Ongoing)	Bicalutamide, Aredia, Lupron, Zometa, Paxil, Xqeva, Ketaconazole, Hydrocortisone, Prednisone, Taxotere, Oxycodone, Fentanyl transdermal patch
	Cancer of the prostate - stage 4 (Status: Ongoing)	
Adenocarcinoma of the prostate gland	Adenocarcinoma of the prostate gland (Status:New)	Avodart
Prostate cancer Stage 4	Chronic obstructive pulmonary disease (Status: Ongoing), Cancer of the prostate - Stage 4 (Status: Ongoing), Degenerative disc disease (Status: Ongoing), Cataract (Status: Past), Cataract (Status: Past)	

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FIG. 13

1. **FLNa**

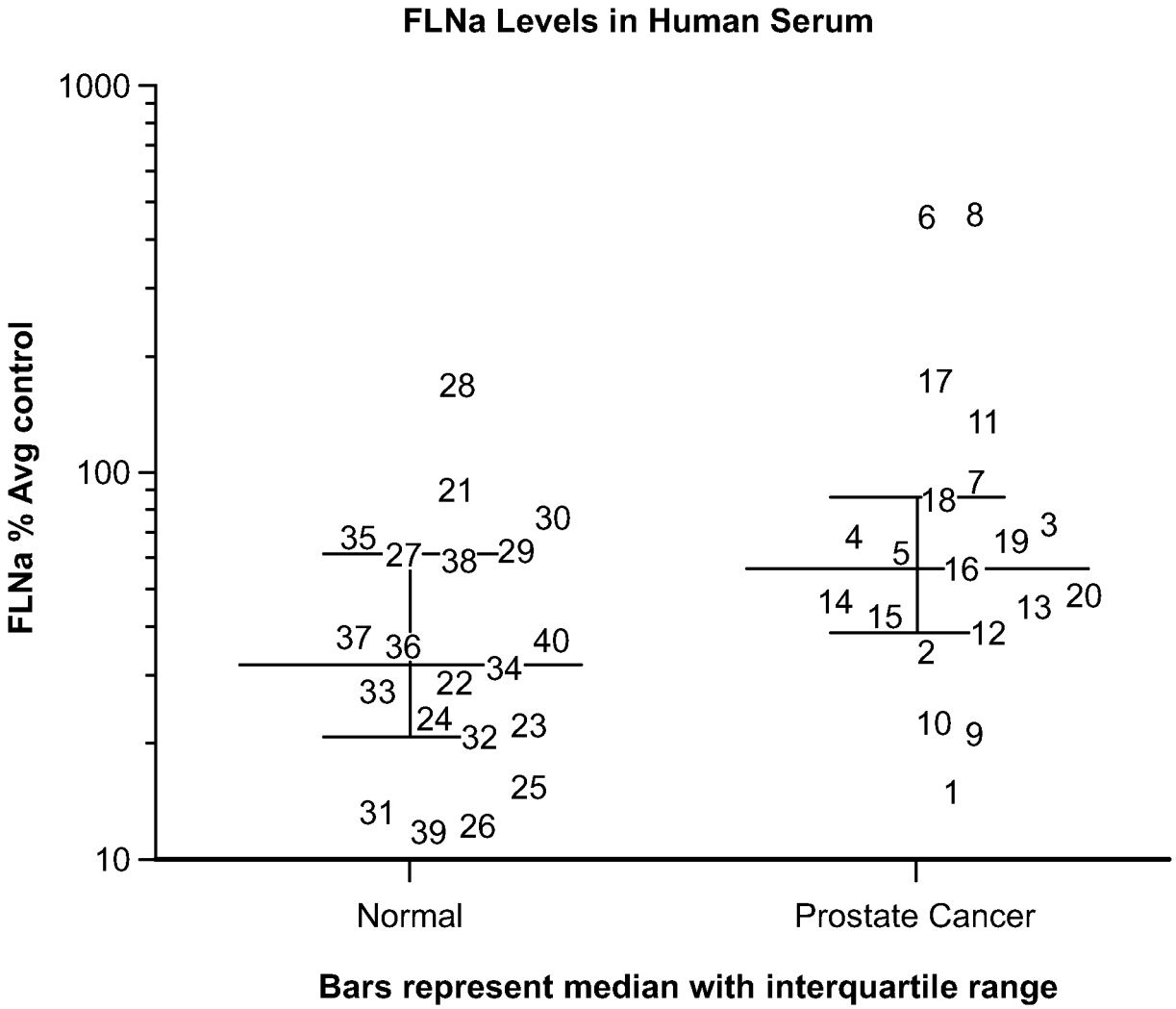
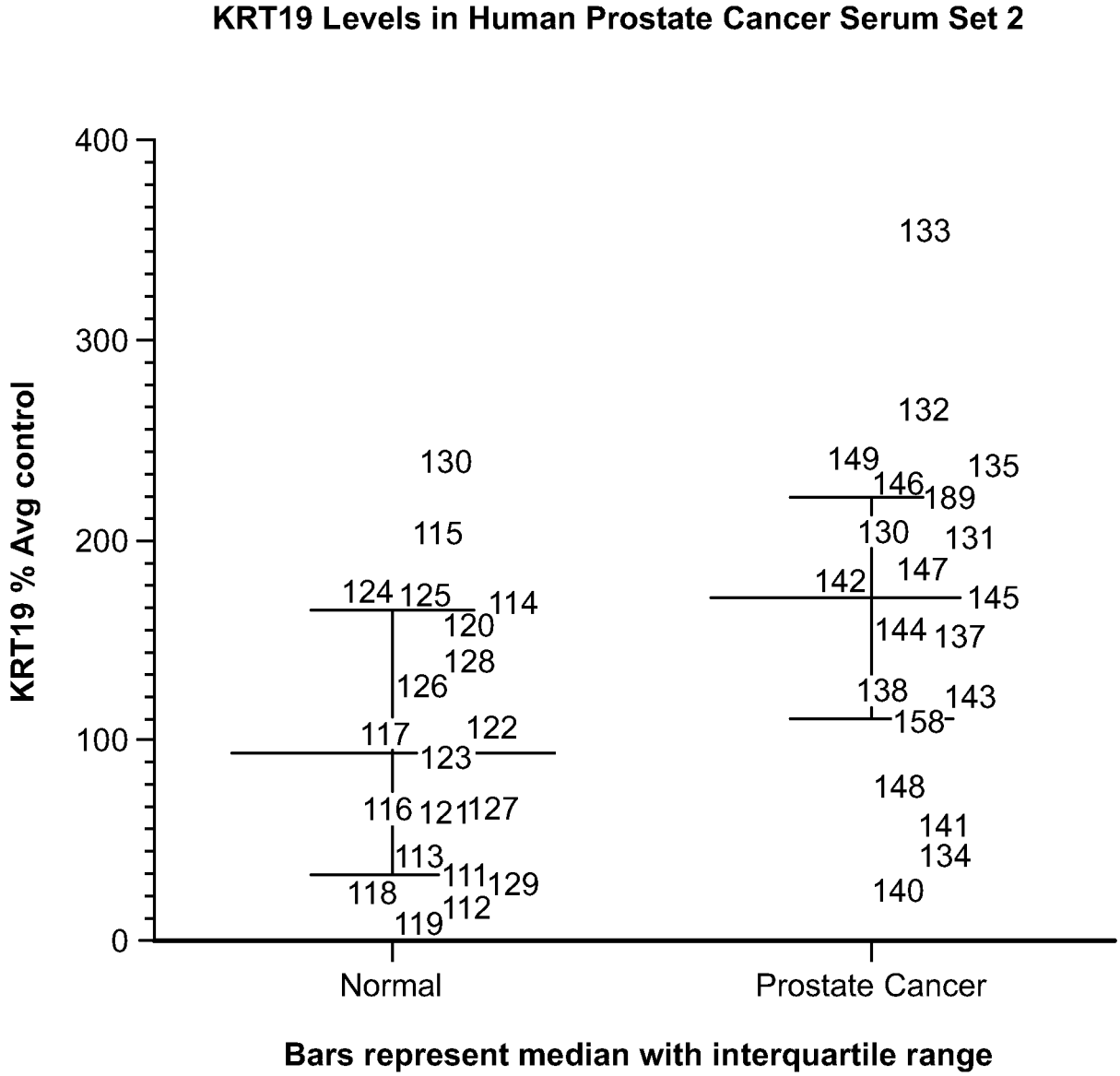

FLNa Levels in Human Serum
FLNa % Avg control
1000
100
10
Normal
Prostate Cancer
Bars represent median with interquartile range

FIG. 14

2. KRT19



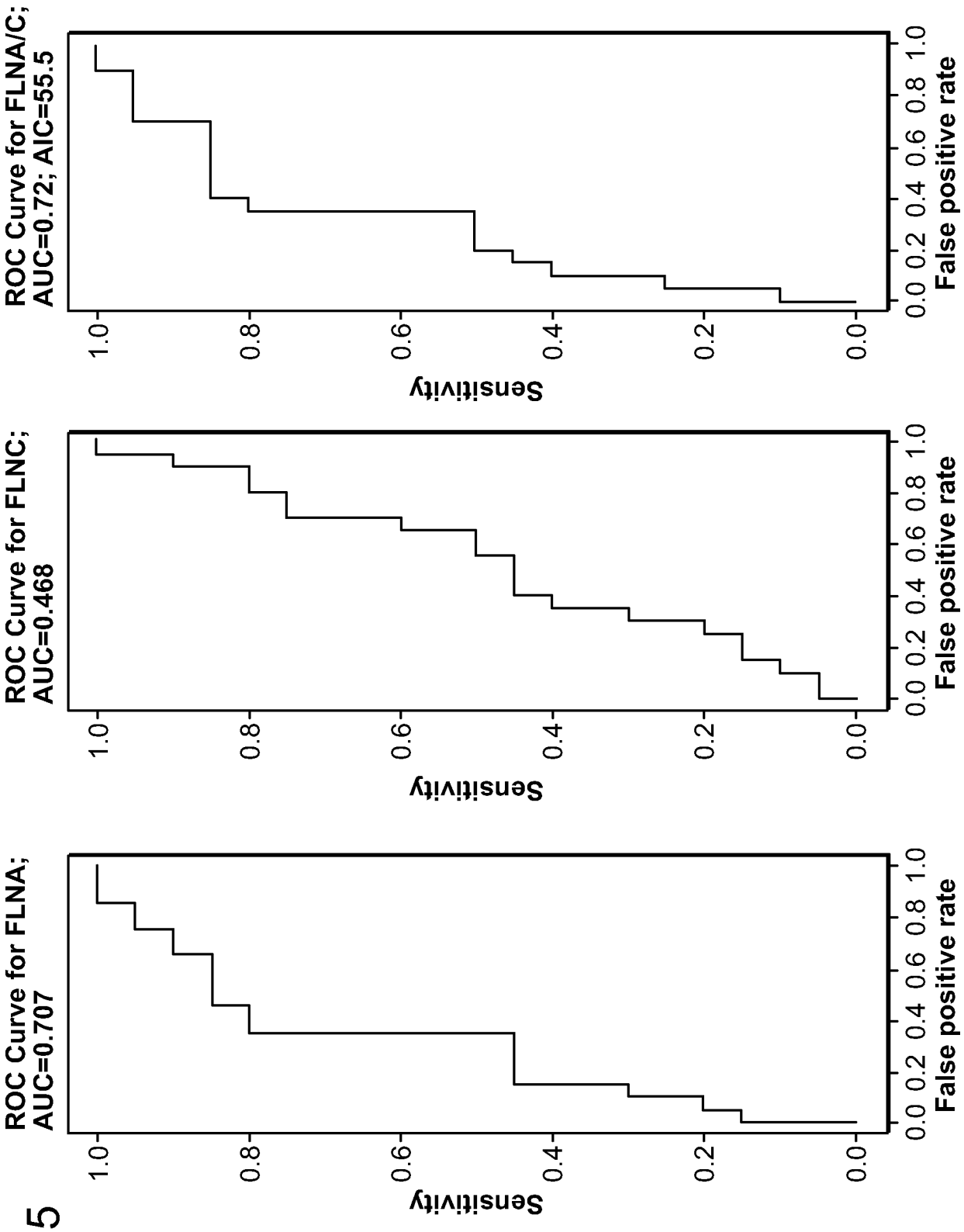

ROC Curve for FLNA/C;
AUC=0.72; AIC=55.5
Sensitivity
1.0
0.8
0.6
0.4
0.2
0.0
False positive rate
0.0 0.2 0.4 0.6 0.8 1.0
ROC Curve for FLNC;
AUC=0.468
Sensitivity
1.0
0.8
0.6
0.4
0.2
0.0
False positive rate
0.0 0.2 0.4 0.6 0.8 1.0
ROC Curve for FLNA;
AUC=0.707
Sensitivity
1.0
0.8
0.6
0.4
0.2
0.0
False positive rate
0.0 0.2 0.4 0.6 0.8 1.0

FIG. 15

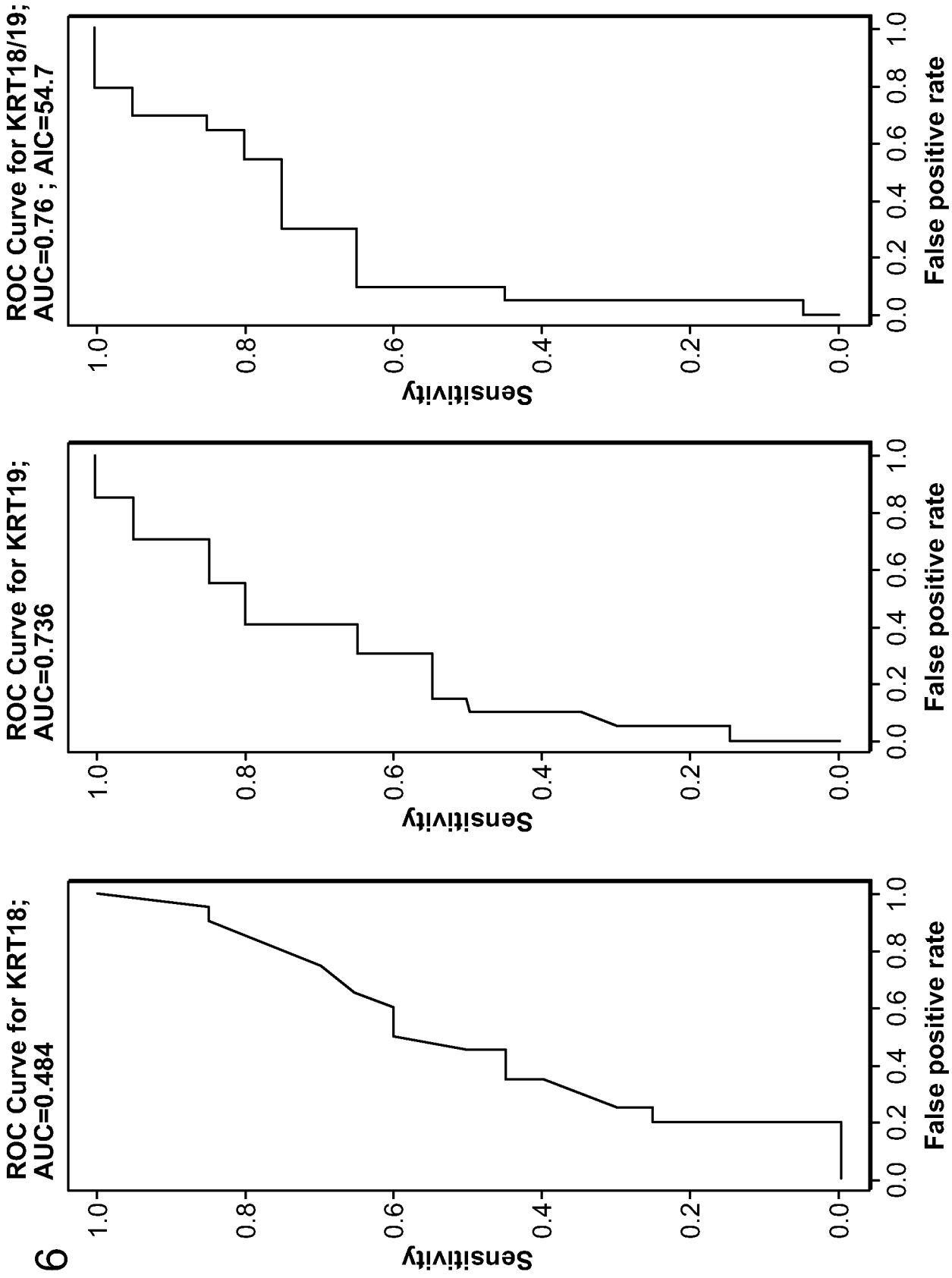

ROC Curve for KRT18/19;
AUC=0.76 ; AIC=54.7
Sensitivity
False positive rate
ROC Curve for KRT19;
AUC=0.736
Sensitivity
False positive rate
ROC Curve for KRT18;
AUC=0.484
Sensitivity
False positive rate

FIG. 16

FIG. 17

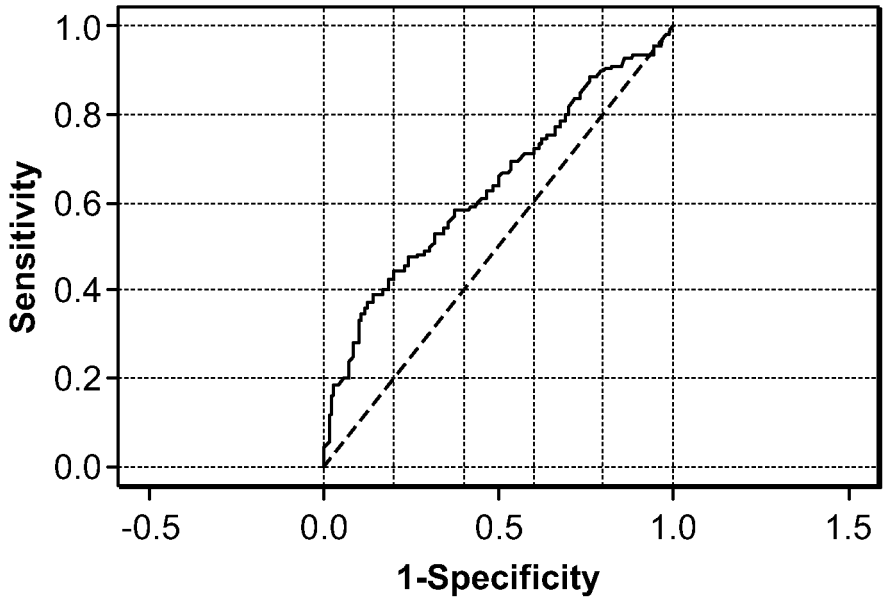
	CA vs. Others		CA vs. BPH		High Gleason vs. Low		High Gleason vs. Others		Super High Gleason vs. Others	
	Biomarker	AUC	Biomarker	AUC	Biomarker	AUC	Biomarker	AUC	Biomarker	AUC
Individual	PSA	0.569	PSA	0.564	PSA	0.619	PSA	0.631	PSA	0.67
	Age	0.62	Age	0.621	Age	0.622	Age	0.662	Age	0.7
	FLNA	0.574	FLNA	0.696	FLNA	0.515	FLNA	0.56	FLNA	0.542
	FLNB	0.51	FLNB	0.516	FLNB	0.528	FLNB	0.515	FLNB	0.515
	Krt19	0.519	Krt19	0.618	Krt19	0.573	Krt19	0.567	Krt19	0.574
	P2-1	0.55	P2-1	0.636	P2-1	0.527	P2-1	0.551	P2-1	0.528
	P2-2	0.502	P2-2	0.582	P2-2	0.528	P2-2	0.552	P2-2	0.53
	P3-1	0.51	P3-1	0.524	P3-1	0.547	P3-1	0.529	P3-1	0.5
	P4-2	0.522	P4-2	0.595	P4-2	0.551	P4-2	0.555	P4-2	0.578
Two Combined (top)	Age & FLNB	0.63	FLNA & Krt19	0.717	Age & PSA	0.659	Age & PSA	0.696	Age & PSA	0.765
Three Combined (top)	Age & FLNB & PSA	0.635	FLNA & Krt19 & Age	0.735	PSA & Age & FLNB	0.685	PSA & Age & FLNB	0.717	PSA & Age & FLNB	0.804
Four Combined (top)	Age & FLNA & P2-1 & P2-2	0.637	FLNA & Krt19& P2-1 & Age	0.746	PSA & Age & FLNB & P3-1	0.693	PSA & Age & FLNB & P3-1	0.723	PSA & Age & FLNB & P2-2	0.81
			FLNA & Krt19 & Age & P4-2	0.746						
Five Combined (top)	Age & FLNA & PSA & P2-2 & P2-1	0.644	FLNA & Krt19 & Age & P2-1 & P3-1	0.764	PSA & Age & FLNB & P3-1 & Krt19	0.694	No Improvement		PSA & Age & FLNB & P2-2 & P2-1	0.811

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FIG. 18

PCA vs. Else: Sensitivity match PSA; cutoff=0.4455

```
> title(main=list(paste("PSA&Age&FLNA&FLNB&P2-1&P4-2:PCA vs.  Else;
AUC=",round(1r1$auc,3), sep=""), cex=1))
> mod1
call: glm(formula = as.factor(PCA) ~ PSA + Age + FLNA +FLNB + p21+
    P42, family = binominal ("probit"), data = data)
Coefficients:
(Intercept)         PSA         Age        FLNA        FLNB         P21         P42
  -1.875729    0.031445    0.024374   -0.001906    0.211370    0.144692   -0.067658
Degrees of Freedom: 294 Total (i.e. Null);  288 Residual
Null Deviance:          408.5
Residual Deviance:    389.9    AIC: 403.9
```




```
> ConfusionMatrix(data$prediction, data$PCA, positive="1")
confusion Matrix and Statistics
          Reference
Prediction   0   1
         0  48  35
         1  94 118
                Accuracy : 0.5627
                  95% CI : (0.504, 0.6201)
    No Information Rate : 0.5186
    P-Value [ACC > NIR] : 0.07244
                   Kappa : 0.1109
Mcnemar's Test P-Value : 3.28e-07
            Sensitivity : 0.7712
            Specificity : 0.3380
         Pos Pred Value : 0.5566
         Neg Pred Value : 0.5783
             Prevalence : 0.5186
         Detection Rate : 0.4000
   Detection Prevalence : 0.7186
      Balanced Accuracy : 0.5546
       'Positive' class : 1
```

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FIG. 19

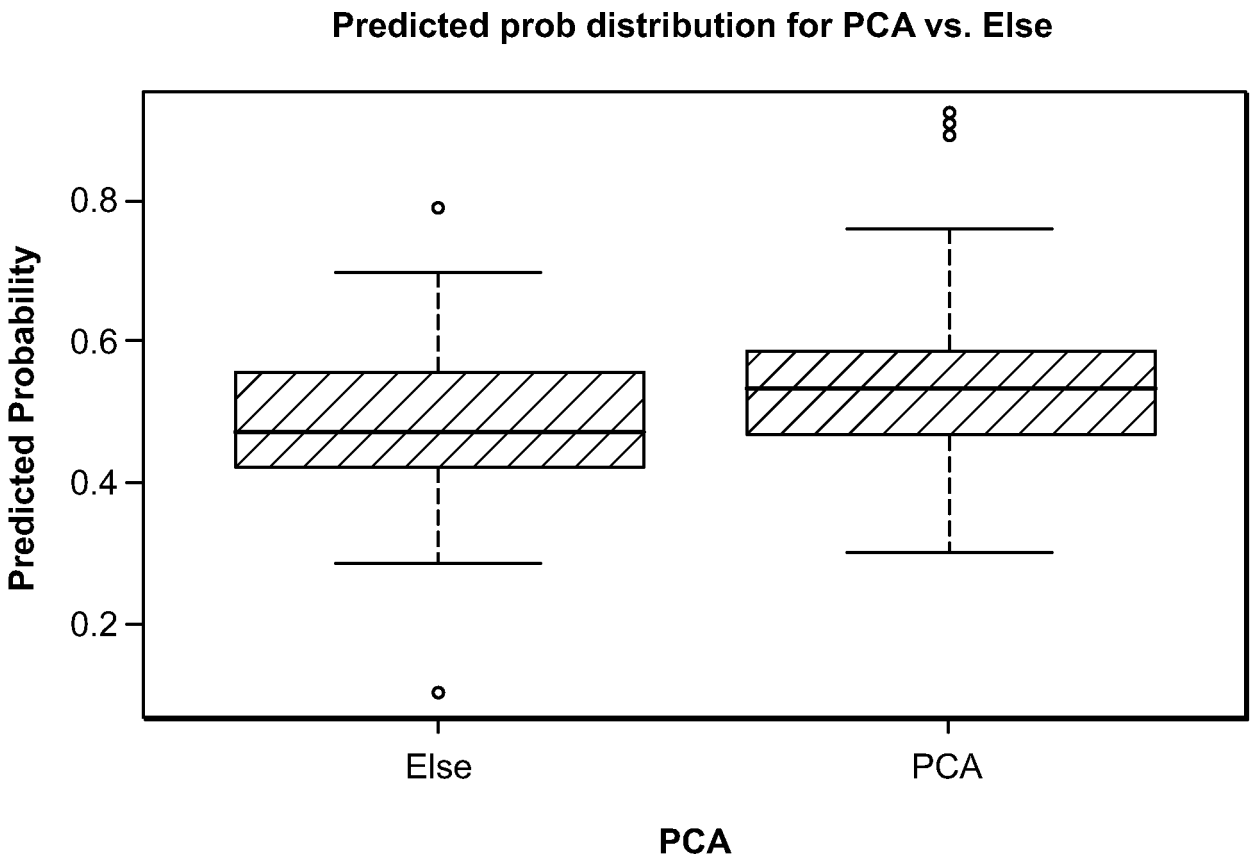

Predicted prob distribution for PCA vs. Else
Predicted Probability
0.8
0.6
0.4
0.2
Else
PCA
PCA

FIG. 20 Accuracy Analysis

Confusion Matrix and Statistics

Prediction	Reference 0	1
0	29	12
1	52	65

Accuracy : 0.5949
95% CI : (0.514, 0.6722)
No Information Rate : 0.5127
P-Value [ACC > NIR] : 0.02304
Kappa : 0.1996
Mcnemar's Test P-Value : 1.088e-06
Sensitivity : 0.8442
Specificity : 0.3580
Pos Pred Value : 0.5556
Neg Pred Value : 0.7073
Prevalence : 0.4873
Detection Rate : 0.4114
Detection Prevalence : 0.7405
Balanced Accuracy : 0.6011

'Positive' class : 1

Relative risk

Exposed group

Number with positive (bad) outcome: a= 65

Number with negative (good) outcome: b= 52

Control group

Number with positive (bad) outcome: c= 12

Number with negative (good) outcome: d= 29

Test

Results

Relative risk	1.8981
95 % CI	1.1482 to 3.1380
z statistic	2.499
	P = 0.0125

Odds ratio

Cases with positive (bad) outcome

Number in exposed group: a= 65

Number in control group: c= 12

Cases with negative (good) outcome

Number in exposed group: b= 52

Number in control group: d= 29

Test

Results

Odds ratio	3.0208
95 % CI	1.4054 to 6.4933
z statistic	2.832
	P = 0.0046

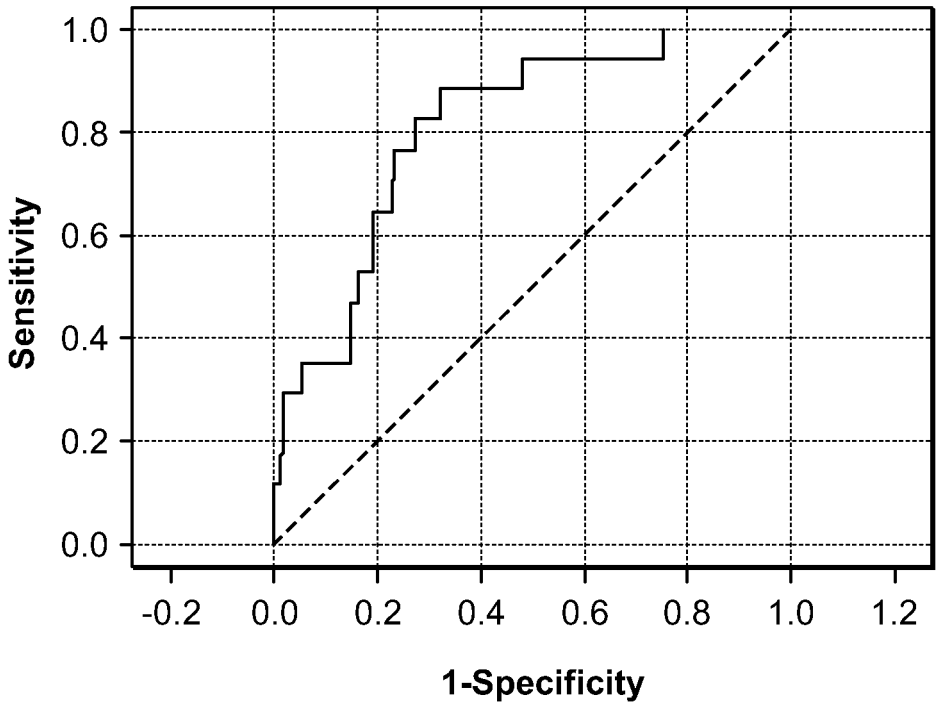
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FIG. 21

Super High Gleason vs. Else: Sensitivity > =0.95; cutoff = 0.01997

```
>mod1
call: glm(formula = as.factor(PCA) ~ PSA + Age + FLNB +P42, family = binominal ("probit"),
    data = data)
Coefficients:
(Intercept)         PSA         Age        FLNB         P42
  -3.21767     0.05097     0.03302    -0.31903    -0.10216
Degrees of Freedom: 294 Total (i.e. Null);  290 Residual
Null Deviance:          130
Residual Deviance:    107.9    AIC: 117.9
```

PSA & Age & FLNB & P4-2: Super High Gleason vs. Else; AUC=0.81




```
> confusionMatrix(data$prediction,
data$PCA, positive="1")
          Reference
Confusion Matrix and Statistics
Prediction   0   1
         0  69   0
         1 209  17
               Accuracy : 0.2917
                 95% CI : (0.2403, 0.347)
    No Information Rate : 0.9424
    P-Value [ACC > NIR] : 1
                  Kappa : 0.0367
 Mcnemar's Test P-Value : <2e-16
            Sensitivity : 1.00000
            Specificity : 0.24820
         Pos Pred Value : 0.07522
         Neg Pred Value : 1.00000
             Prevalence : 0.05763
         Detection Rate : 0.05763
   Detection Prevalence : 0.76610
      Balanced Accuracy : 0.62410
       'Positive' class : 1
```

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FIG. 22

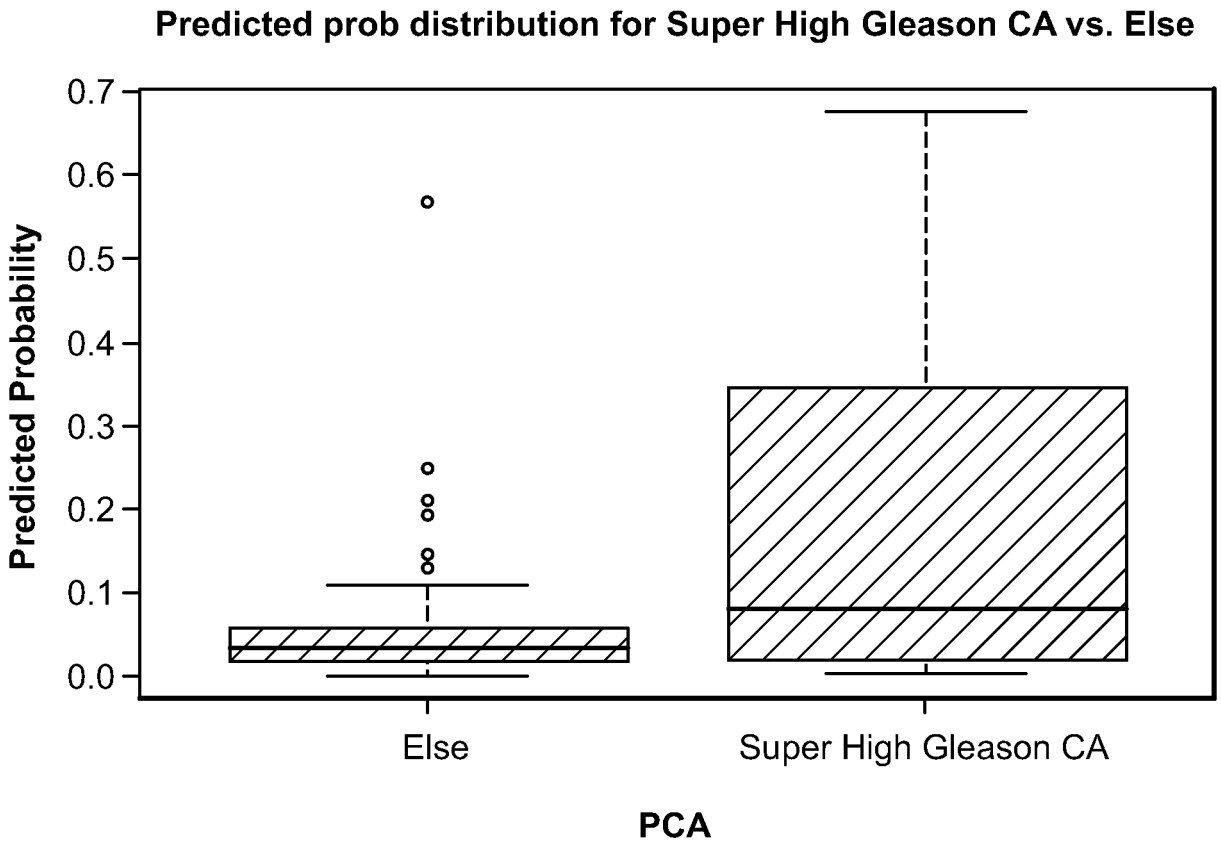

Predicted prob distribution for Super High Gleason CA vs. Else
Predicted Probability
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Else
Super High Gleason CA
PCA

FIG. 23

Confusion Matrix and Statistics

Prediction	Reference 0	1
0	39	2
1	112	6

Accuracy : 0.283
95% CI : (0.2145, 0.3598)
No Information Rate : 0.9497
P-Value [ACC > NIR] : 1
Kappa : 0.0011
Mcnemar's Test P-Value : <2e-16

Sensitivity : 0.75000
Specificity : 0.25828
Pos Pred Value : 0.05085
Neg Pred Value : 0.95122
Prevalence : 0.05031
Detection Rate : 0.03774
Detection Prevalence : 0.74214
Balanced Accuracy : 0.50414

'Positive' class : 1

Relative risk

Exposed group

Number with positive (bad) outcome: a= 6

Number with negative (good) outcome: b= 112

Control group

Number with positive (bad) outcome: c= 2

Number with negative (good) outcome: d= 39

Test

Results

Relative risk	1.0424
95 % CI	0.2190 to 4.9624
z statistic	0.052
	P = 0.9584

Odds ratio

Cases with positive (bad) outcome

Number in exposed group: a= 6

Number in control group: c= 2

Cases with negative (good) outcome

Number in exposed group: b= 112

Number in control group: d= 39

Test

Results

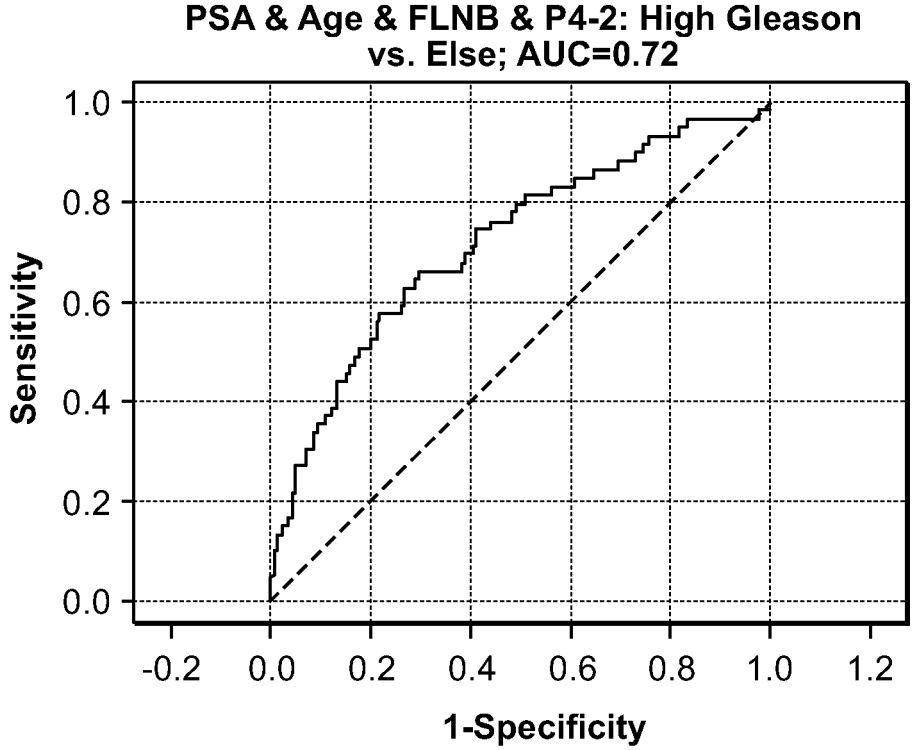
Odds ratio	1.0446
95 % CI	0.2024 to 5.3923
z statistic	0.052
	P = 0.9584

FIG. 24

High Gleason vs. Else: Sensitivity > =0.8; cutoff = 0.1603

```
>mod1
call: glm(formula = as.factor(PCA) ~ PSA + Age + FLNB +P42, family = binominal ("probit"),
    data = data)
Coefficients:
(Intercept)          PSA          Age         FLNB          P42
  -2.05002      0.04659      0.02420      0.33548     -0.10820

Degrees of Freedom: 294 Total (i.e. Null);  290 Residual
Null Deviance:      295.2
Residual Deviance:  268    AIC: 278
```




```
> confusionMatrix(data$prediction,
data$PCA, positive="1")
Confusion Matrix and Statistics
          Reference
Prediction   0   1
         0 116  11
         1 120  48
               Accuracy : 0.5559
                 95% CI : (0.4972, 0.6135)
    No Information Rate : 0.8
    P-Value [ACC > NIR] : 1

                  Kappa : 0.1802
 Mcnemar's Test P-Value : <2e-16
            Sensitivity : 0.8136
            Specificity : 0.4915
         Pos Pred Value : 0.2857
         Neg Pred Value : 0.9134
             Prevalence : 0.2000
         Detection Rate : 0.1627
   Detection Prevalence : 0.5695
      Balanced Accuracy : 0.6525
       'Positive' class : 1
```

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FIG. 25

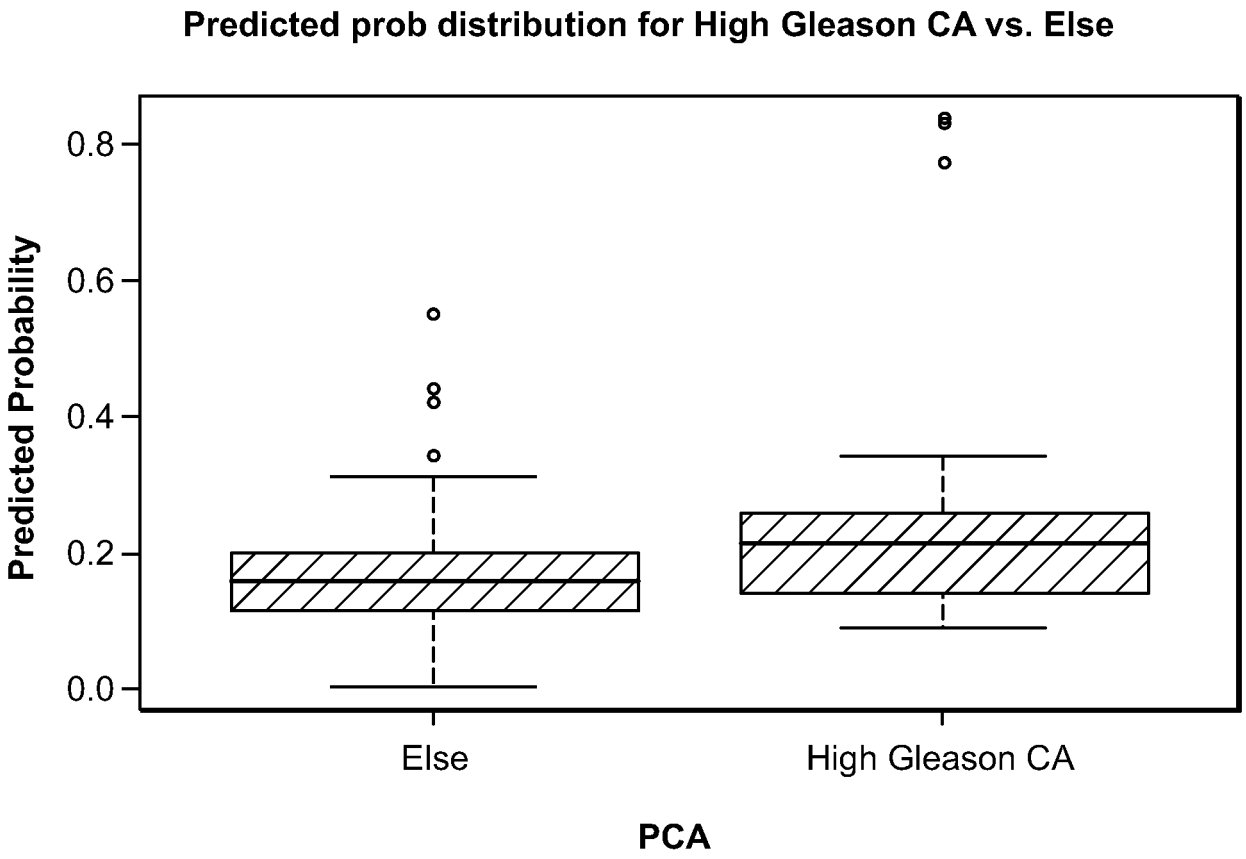

Predicted prob distribution for High Gleason CA vs. Else
Predicted Probability
0.0
0.2
0.4
0.6
0.8
Else
High Gleason CA
PCA

FIG. 26 **Accuracy Analysis**

Confusion Matrix and Statistics

Prediction	Reference 0	1
0	66	9
1	63	21

Accuracy : 0.5472
95% CI : (0.4664, 0.6261)
No Information Rate : 0.8113
P-Value [ACC > NIR] : 1
Kappa : 0.1252
Mcnemar's Test P-Value : 4.208e-10
Sensitivity : 0.7000
Specificity : 0.5116
Pos Pred Value : 0.2500
Neg Pred Value : 0.8800
Prevalence : 0.1887
Detection Rate : 0.1321
Detection Prevalence : 0.5283
Balanced Accuracy : 0.6058

'Positive' class : 1

Relative risk

Exposed group

Number with positive (bad) outcome: a= 21

Number with negative (good) outcome: b= 63

Control group

Number with positive (bad) outcome: c= 9

Number with negative (good) outcome: d= 66

Test

Results

Relative risk	2.0833
95 % CI	1.0180 to 4.2635
z statistic	2.009
	P = 0.0446

Odds ratio

Cases with positive (bad) outcome

Number in exposed group: a= 21

Number in control group: c= 9

Cases with negative (good) outcome

Number in exposed group: b= 63

Number in control group: d= 66

Test

Results

Odds ratio	2.4444
95 % CI	1.0408 to 5.7409
z statistic	2.052
	P = 0.0402

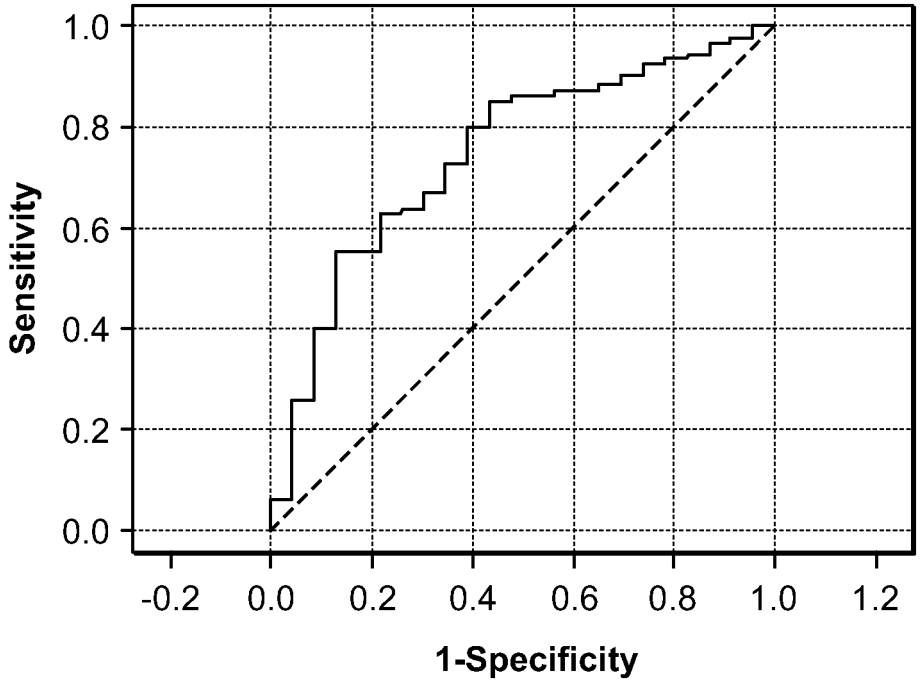
FIG. 27

PCA vs. BPH: Sensitivity > =0.8; cutoff = 0.8758

```
>mod1
call: glm(formula = as.factor(PCA) ~ Age + FLNA + KRT19 + P21, family = binominal ("probit"),
    data = data)
Coefficients:
(Intercept)          Age         FLNA        KRT19          P21
  3.339085     0.017895   -0.003951   -0.076261   -0.566652

Degrees of Freedom: 195 Total (i.e. Null);  191 Residual
Null Deviance:          141.7
Residual Deviance:    127.6    AIC: 137.6
```

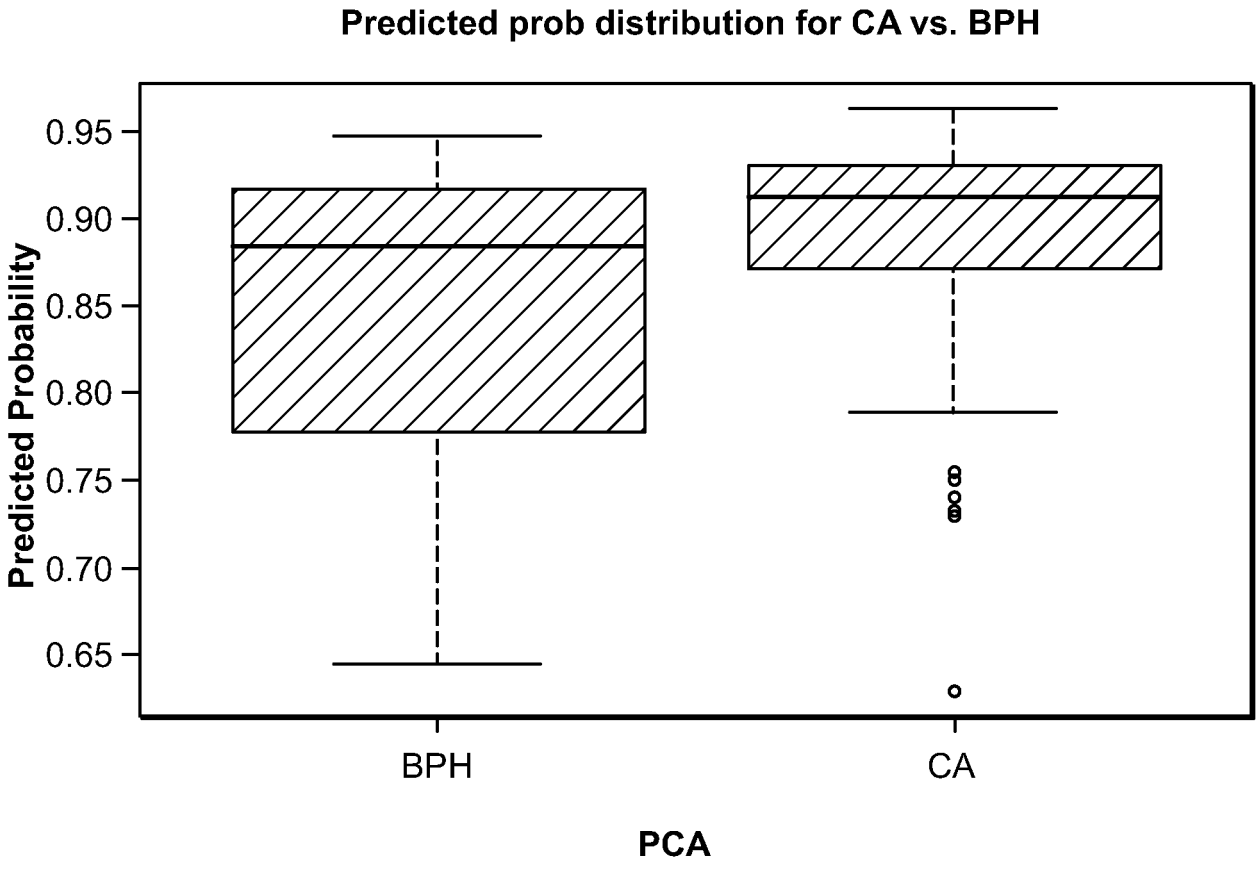
Age & FLNA & KRT-19 & P2-1 vs. BPH; AUC=0.746




```
> confusionMatrix(data$prediction,
data$PCA, positive="1")
 Confusion Matrix and Statistics
          Reference
Prediction   0   1
         0  14  34
         1   9 139
               Accuracy : 0.7806
                 95% CI : (0.7161, 0.8364)
    No Information Rate : 0.8827
    P-Value [ACC > NIR] : 0.9999829
                  Kappa : 0.2802
 Mcnemar's Test P-Value : 0.0002522
            Sensitivity : 0.8035
            Specificity : 0.6087
         Pos Pred Value : 0.9392
         Neg Pred Value : 0.2917
             Prevalence : 0.8827
         Detection Rate : 0.7092
   Detection Prevalence : 0.7551
      Balanced Accuracy : 0.7061
       'Positive' class : 1
```

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FIG. 28


Predicted prob distribution for CA vs. BPH
Predicted Probability
0.95
0.90
0.85
0.80
0.75
0.70
0.65
BPH
CA
PCA

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FIG. 29 Accuracy Analysis

Confusion Matrix and Statistics

Prediction	Reference 0	1
0	4	26
1	7	55

Accuracy : 0.6413
95% CI : (0.5346, 0.7387)
No Information Rate : 0.8804
P-Value [ACC > NIR] : 1.000000
Kappa : 0.0244
Mcnemar's Test P-Value : 0.001728

Sensitivity : 0.6790
Specificity : 0.3636
Pos Pred Value : 0.8871
Neg Pred Value : 0.1333
Prevalence : 0.8804
Detection Rate : 0.5978
Detection Prevalence : 0.6739
Balanced Accuracy : 0.5213

'Positive' class : 1

Relative risk

Exposed group

Number with positive (bad) outcome: a= 55

Number with negative (good) outcome: b= 7

Control group

Number with positive (bad) outcome: c= 26

Number with negative (good) outcome: d= 4

Test

Results

Relative risk	1.0236
95 % CI	0.8669 to 1.2085
z statistic	0.275
	P = 0.7834

Odds ratio

Cases with positive (bad) outcome

Number in exposed group: a= 55

Number in control group: c= 26

Cases with negative (good) outcome

Number in exposed group: b= 7

Number in control group: d= 4

Test

Results

Odds ratio	1.2088
95 % CI	0.3248 to 4.4983
z statistic	0.283
	P = 0.7773

FIG. 30

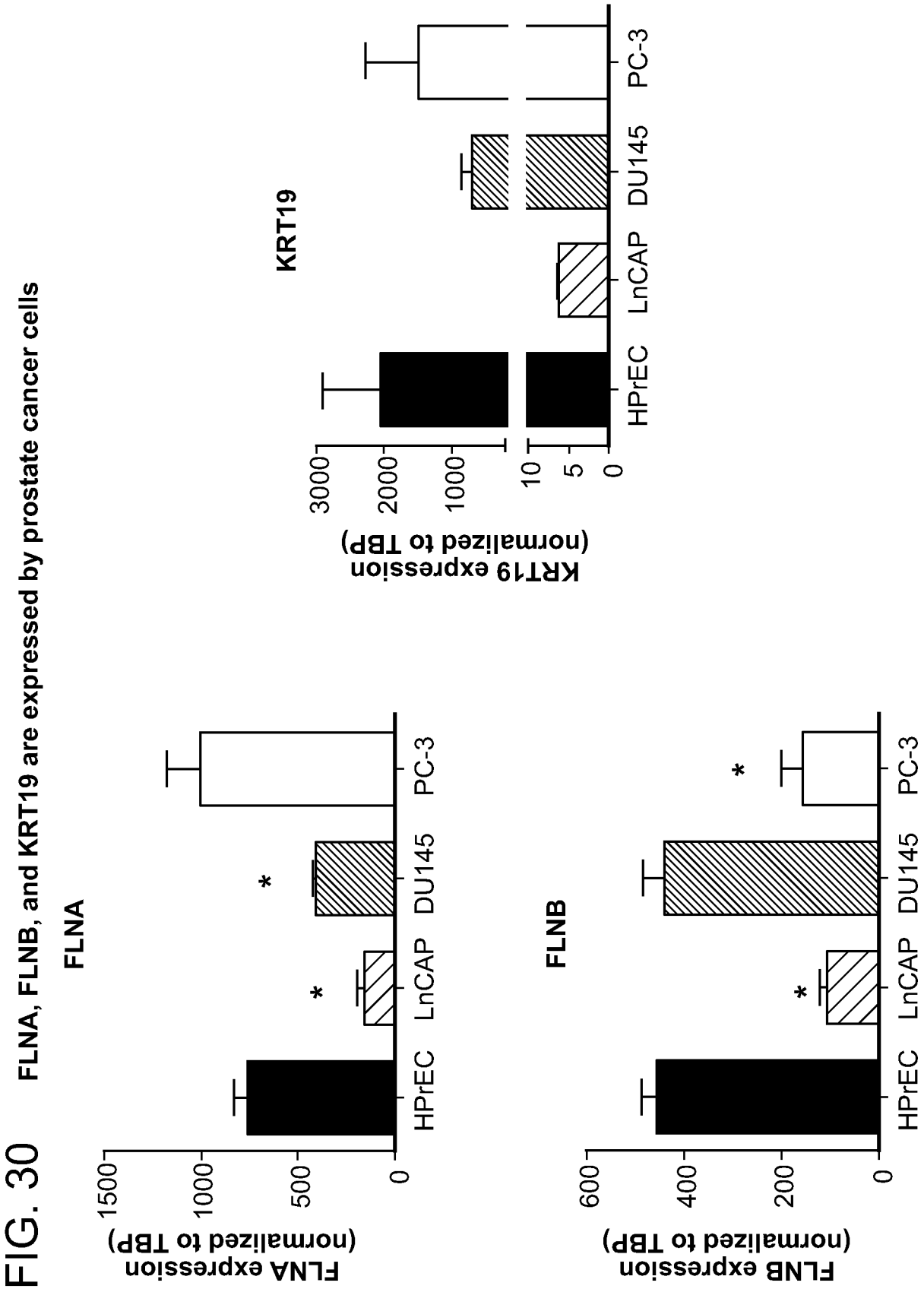

FLNA, FLNB, and KRT19 are expressed by prostate cancer cells
FLNA
FLNA expression (normalized to TBP)
1500
1000
500
0
*
*
HPrEC
LnCAP
DU145
PC-3
KRT19
KRT19 expression (normalized to TBP)
3000
2000
1000
10
5
0
FLNB
FLNB expression (normalized to TBP)
600
400
200
0

FIG. 31

FLNA, FLNB, and KRT19 are expressed by prostate cancer cells

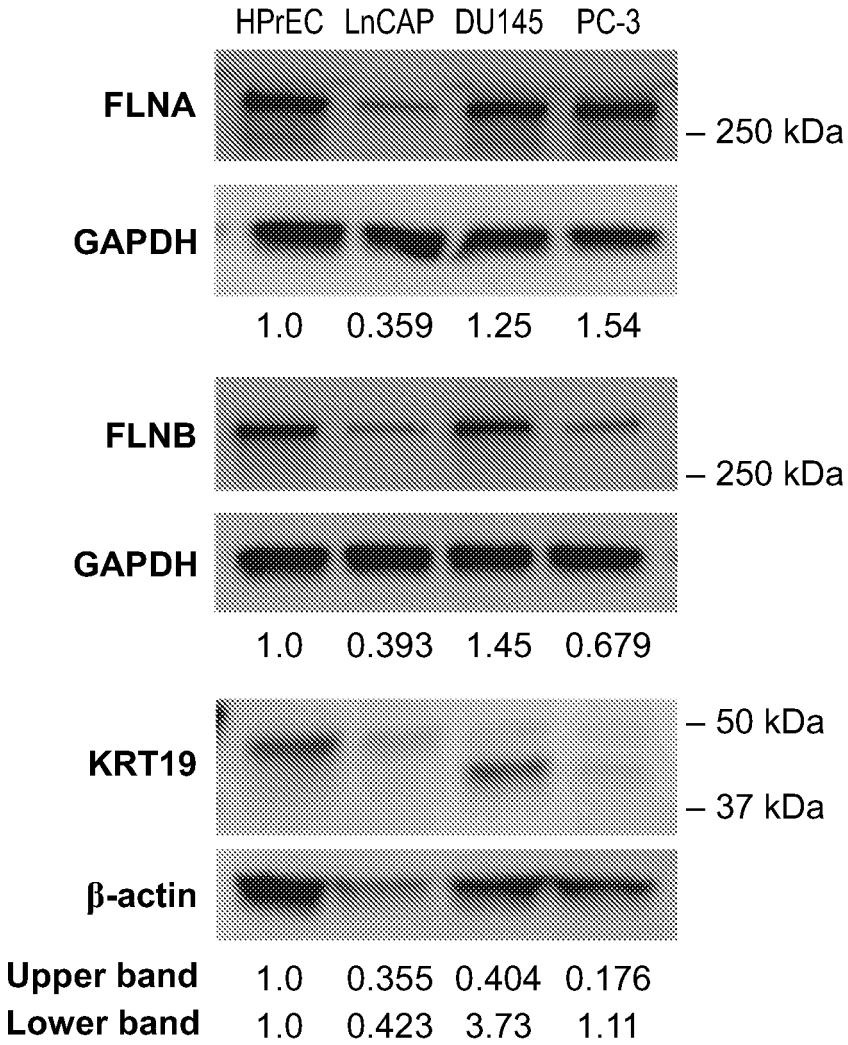


FIG. 32 FLNA, FLNB, and KRT19 are secreted from prostate cancer cells

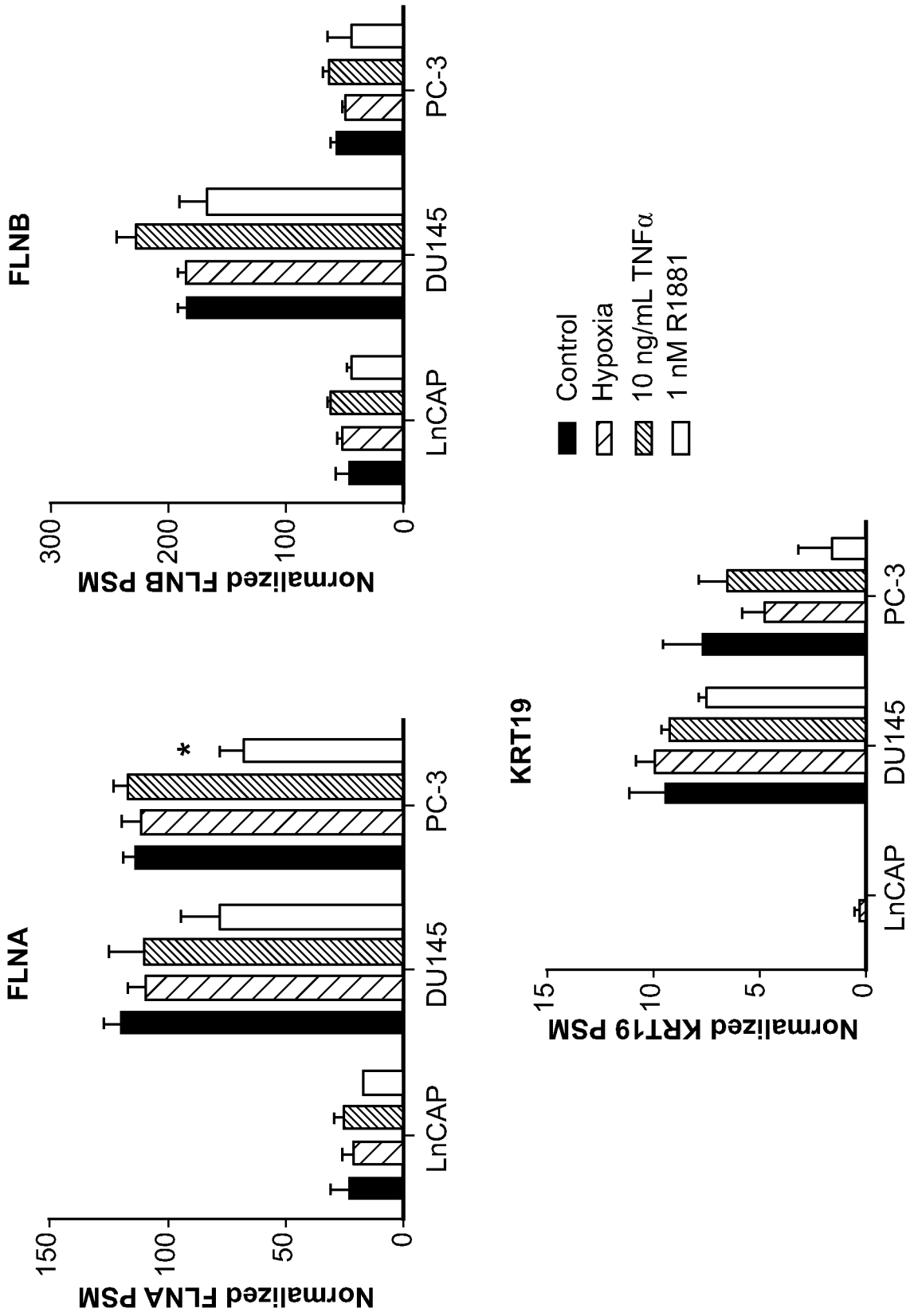


FIG. 33

Transcriptional regulation of FLNA, FLNB, and KRT19 expression differs from PSA: Hypoxia (1% oxygen).

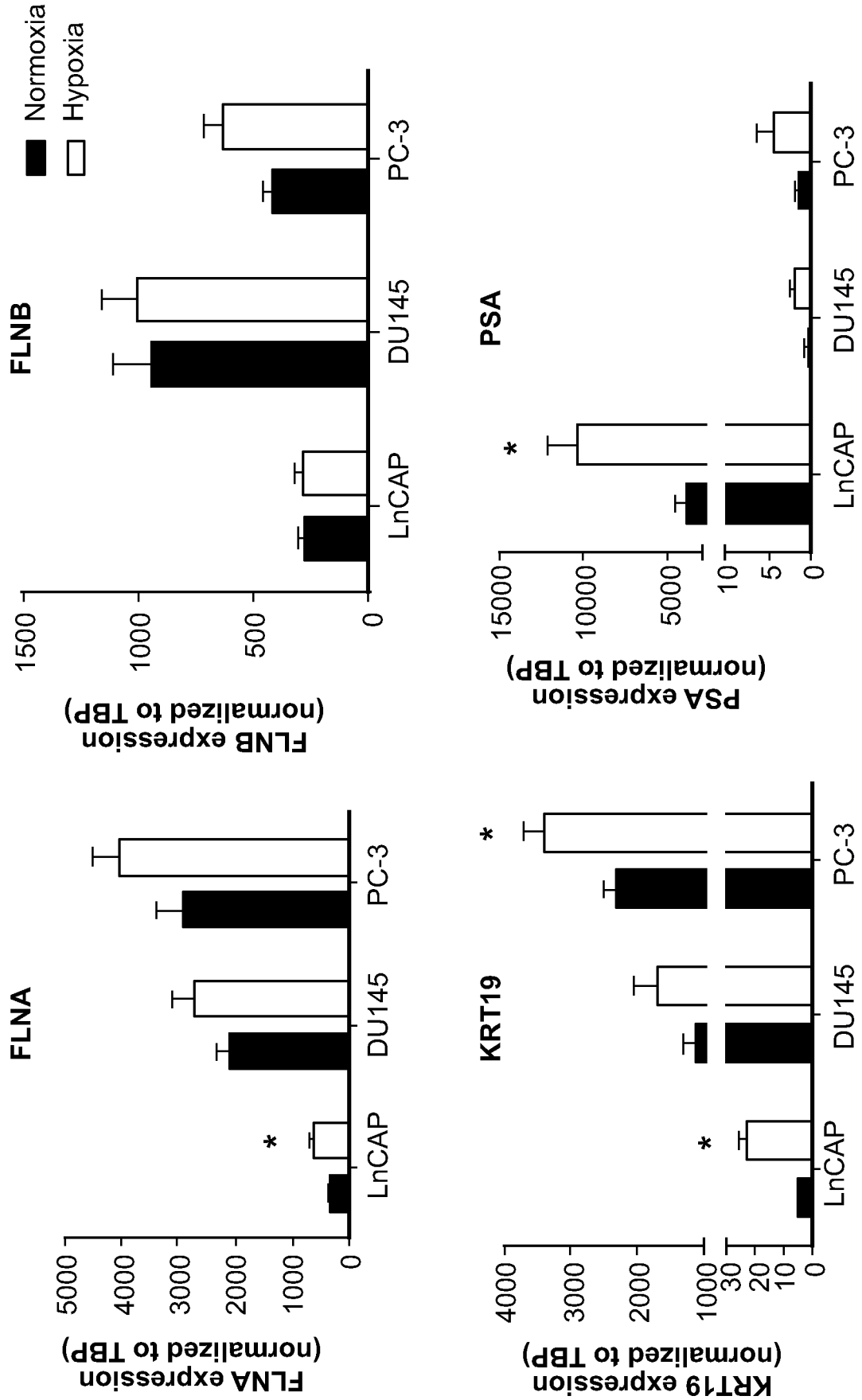


FIG. 34

Transcriptional regulation of FLNA, FLNB, and KRT19 expression differs from PSA: TNFα (10 ng/mL)

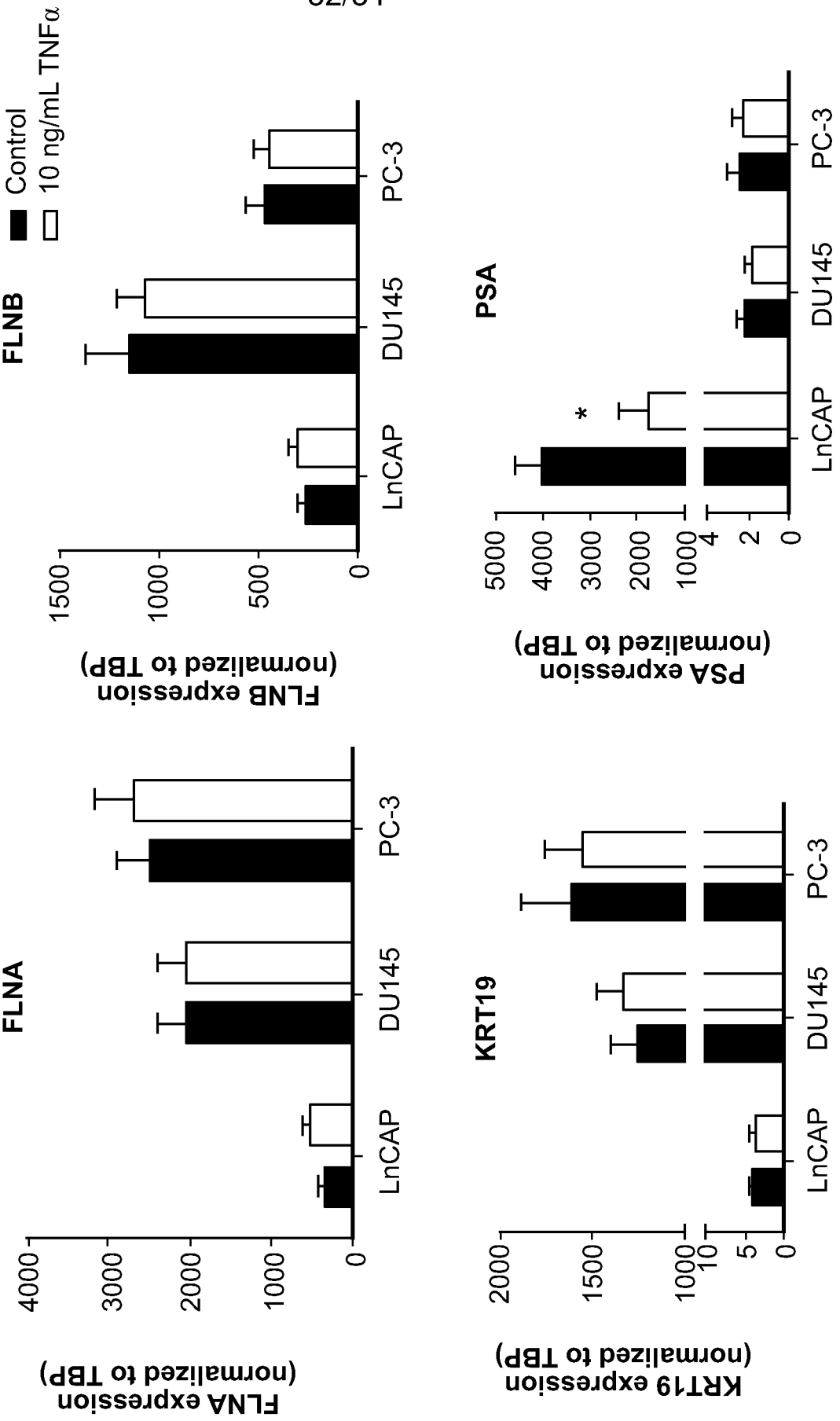


FIG. 35

Transcriptional regulation of FLNA, FLNB, and KRT19 expression differs from PSA: R1881 (1 nM)

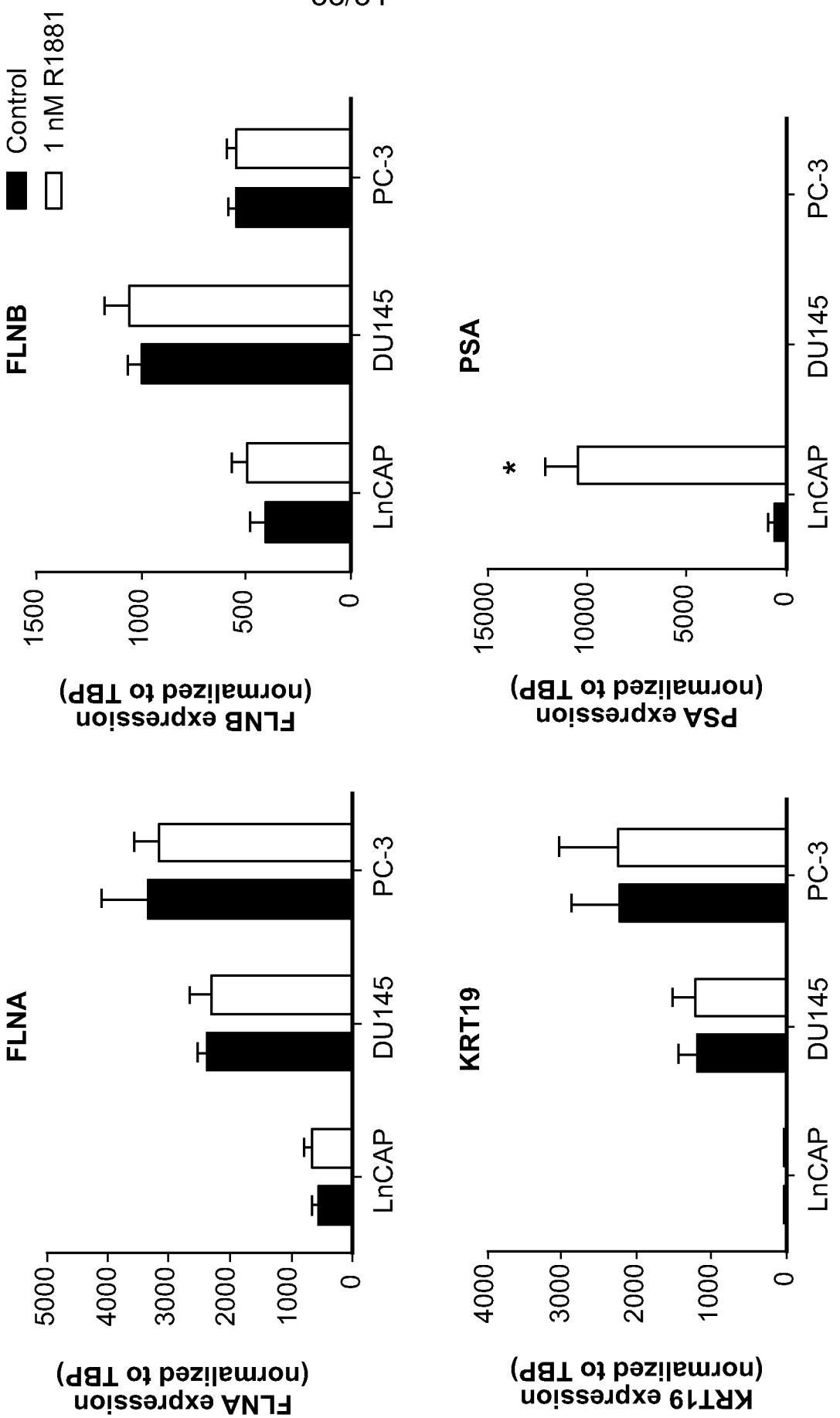


FIG. 36

FLNA and FLNB are detected in human plasma and have predictive power in identifying prostate cancer patients

