



# Role of the Cancer Registry and Pathology Informatics in the Cancer Center



NAACCR Cancer Informatics Symposium:  
Essential Technologies & Methodologies for Registries  
Toronto, Canada; Sunday, June 9th, 2002

Michael J. Becich, MD PhD - [becich@pitt.edu](mailto:becich@pitt.edu)

Chairman of Pathology, UPMC-Shadyside & Hillman Cancer Center

Associate Professor of Pathology  
and Information Sciences & Telecommunications  
University of Pittsburgh School Medicine

Director, Center for Pathology Informatics

<http://path.upmc.edu/cpi>

Director, Benedum Oncology Informatics Center (Hillman Cancer Center)

<http://www.upci.upmc.edu/internet/benedum/index.html>

Advancing Pathology Informatics, Imaging and the Internet (APIII) -

<http://apiii.upmc.edu>

Association for Pathology Informatics (API) -

<http://www.pathologyinformatics.org>

Slide 1

Benedum Oncology Informatics Center / Center for Pathology Informatics





# Outline



- **Introduction to Oncology & Pathology Informatics Research at Hillman Cancer Center**
- **Linkages Between Pathology and Cancer Registries**
- **Research Use of Pathology Data and Cancer Registries**
  - **Comprehensive Prostate Cancer Tissue Resource (CPCTR) and Tissue Bank Information Systems [Clinical, Pathology & Cancer Registry Data]**
  - **The Shared Pathology Informatics Network (SPIN) - Cancer Registry and Anatomic Pathology Data**
- **Conclusions**
- **Future Directions - The Need for Electronic Communication Strategies**



Slide 2

Benedum Oncology Informatics Center / Center for Pathology Informatics





# Hillman Cancer Center



- **University of Pittsburgh Cancer Institute and UP MC Cancer Centers**
  - Comprehensive Cancer Center
  - **12** patient care centers, each focusing on a specific type or treatment of cancer
  - Nationally and Regionally Competitive
- **Institution size**
  - **600+** physicians/researchers
  - Number of new cancer patients per year: 10,000+
- **Participation in clinical trials**
  - **Number of open protocols by sponsor type**
    - **247** active protocols (**48** pharmaceutical, **28** cooperative group, **45** internal)
- **Number of patients accrued in 2001: 1028**



Slide 3

Benedum Oncology Informatics Center / Center for Pathology Informatics





# Hillman Cancer Center



- Pathology Informatics
  - 18 hospitals – one anatomic laboratory information system (LIS)
  - 12 of 18 hospitals on one clinical pathology LIS
  - One tissue banking plan (5 major tissue banks) and now linked to our Organ Specific Database program
- Oncology Informatics
  - 14 of 18 hospital on one Cancer Registry (ImPath, formerly MRS)
    - Number of new index cancer patients per year: 10,000+
  - Clinical Trials Information System (developed in house)
  - Organ Specific Databases (research information systems)



Slide 4

Benedum Oncology Informatics Center / Center for Pathology Informatics





# Outline



- Introduction to Oncology & Pathology Informatics Research at Hillman Cancer Center
- **Linkages Between Pathology and Cancer Registries**
- Research Use of Pathology Data and Cancer Registries
  - Comprehensive Prostate Cancer Tissue Resource (CPCTR) and Tissue Bank Information Systems [Clinical, Pathology & Cancer Registry Data]
  - The Shared Pathology Informatics Network (SPIN) - Cancer Registry and Anatomic Pathology Data
- Conclusions
- Future Directions – The Need for Electronic Communication Strategies

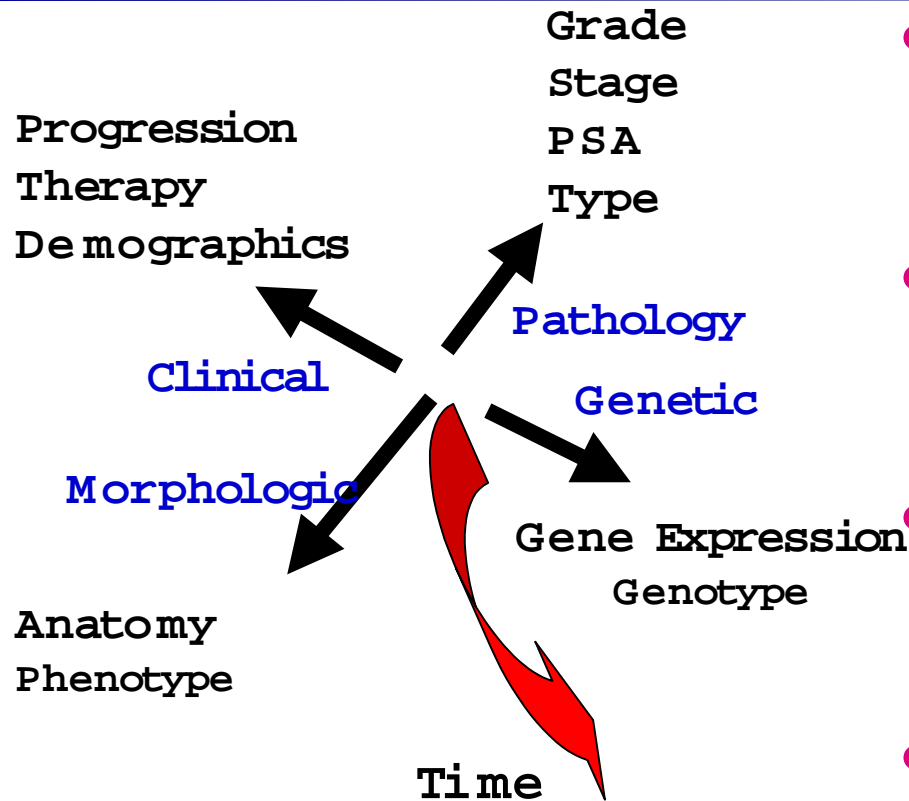


Slide 5

Benedum Oncology Informatics Center / Center for Pathology Informatics



# Pathology Informatics



- **Seventy percent** of the data in the UPMC Electronic Medical Record is Pathology Data
- **Eighty percent** of the data used by the UPMC decision support system is Pathology Data
- **Seventy-plus percent** of the queries against the UPMC EMR involve Pathology Data
- Pathologists analyze blood and tissue for the presence and nature of disease
- Much of this analysis is based or relies on morphology



Slide 6

Benedum Oncology Informatics Center / Center for Pathology Informatics





# Merging Pathology & Oncology Data for Value Creation



- **Pathology & Oncology Data and Value Creation:**
  - **Tissue In Based Archives**
    - » Paraffin – Tumor classification, staging & grading (stored in anatomic pathology lab info system or APLIS) are critical to the Molecular ReClassification (NCI Director's Challenge)
    - » Cancer Registry (CR) records treatment, progression and outcomes critical to research efforts (SPIN grant)
    - » Importance of research materials (tissues) for genomics
    - » Pathology + Outcomes + Tissue = unprecedented new value
  - **Clinical Data (and Serum) Archives**
    - » Chemistry profiles and tumor markers many times qualify a patient or define success or failure of therapeutic intervention in clinical trials (clinical pathology lab info system or CPLIS)
    - » Aggregates of longitudinal medical records in Oncology and for hospital systems (clinical information systems or CIS) has new perceived value for benchmarking change

Slide 7





# Component Technology – Pathology & Oncology Informatics



- Pathology Informatics
    - Anatomic Pathology
    - Clinical Pathology
    - Hematopathology & Molecular Diagnostics
    - LIMS for Genomics and Proteomics
    - Tissue Banking
    - Telepathology
    - Web Site Support
  - Oncology Informatics
    - Cancer Registry
    - Clinical Trials
    - Organ Specific Program Support
      - Prostate, Melanoma, etc..
    - Telemedicine (for oncology)
    - Web Site Support
    - E-Health
- Initiatives

Slide 8

Benedum Oncology Informatics Center / Center for Pathology Informatics



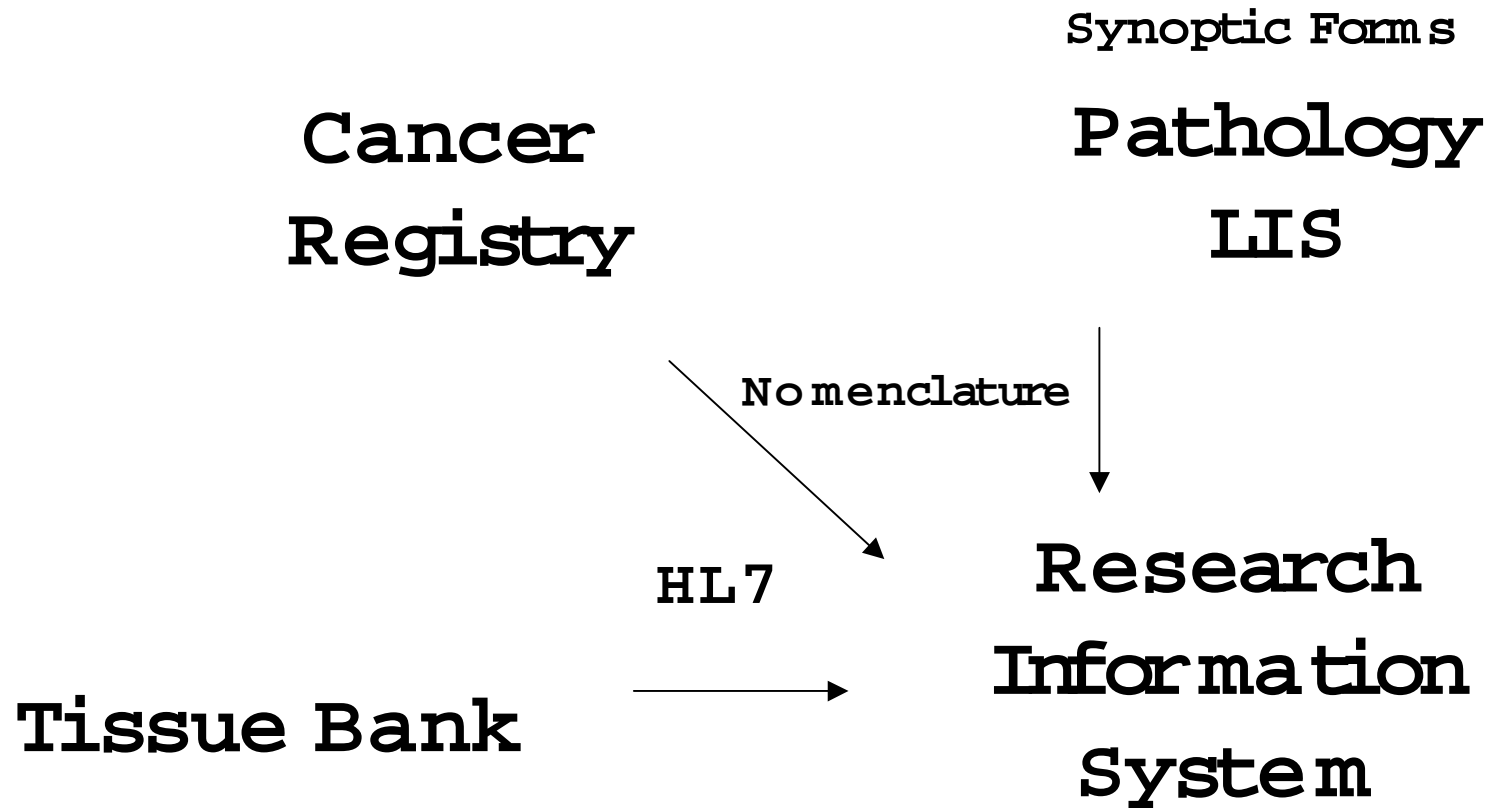




# Proposed Information Relationships



Version 1.0



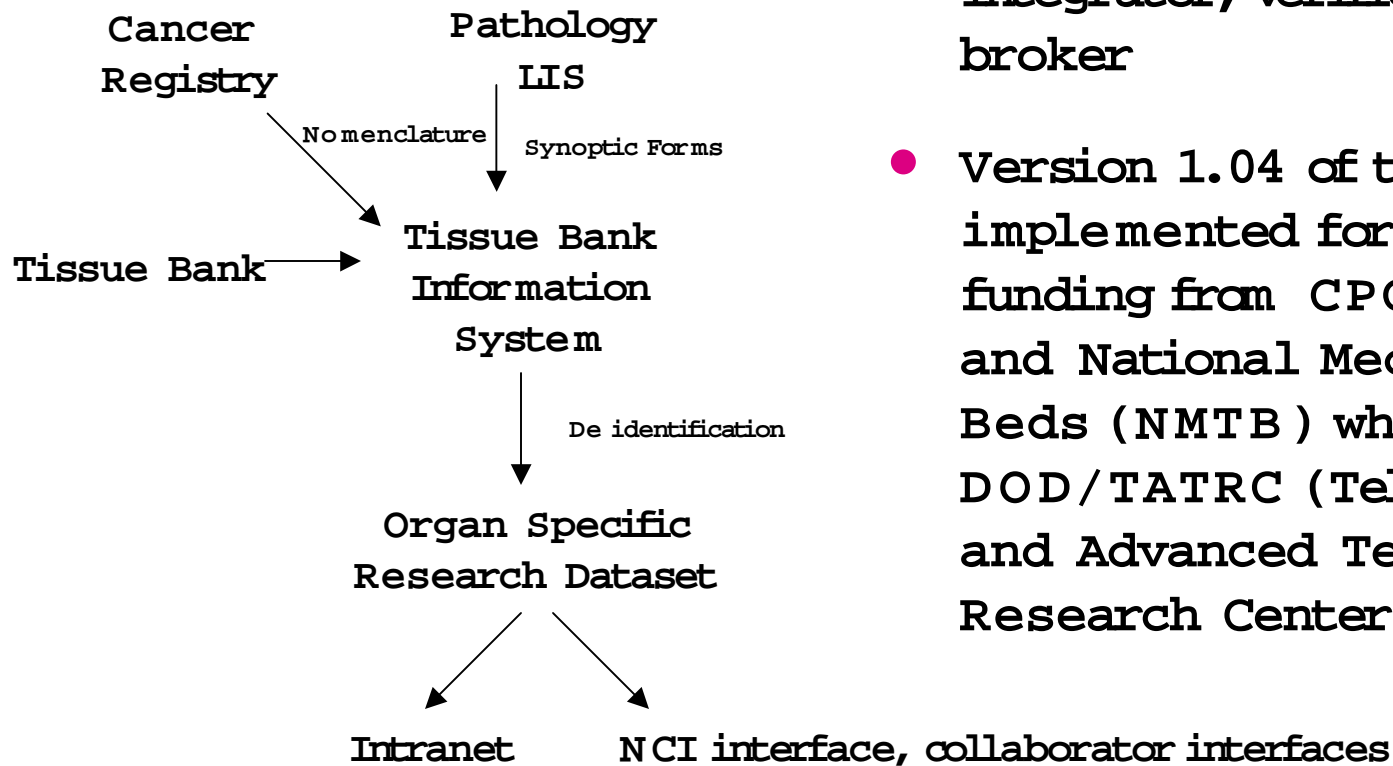
Slide 9

Benedum Oncology Informatics Center / Center for Pathology Informatics





# Research Information System



- This system acts as an integrator, verifier and honest broker
- Version 1.04 of this system is implemented for prostate with funding from CPCTR, CaPCURE and National Medical Test Beds (NMTB) which is a DOD/TATRC (Telemedicine and Advanced Technology Research Center) funded effort.

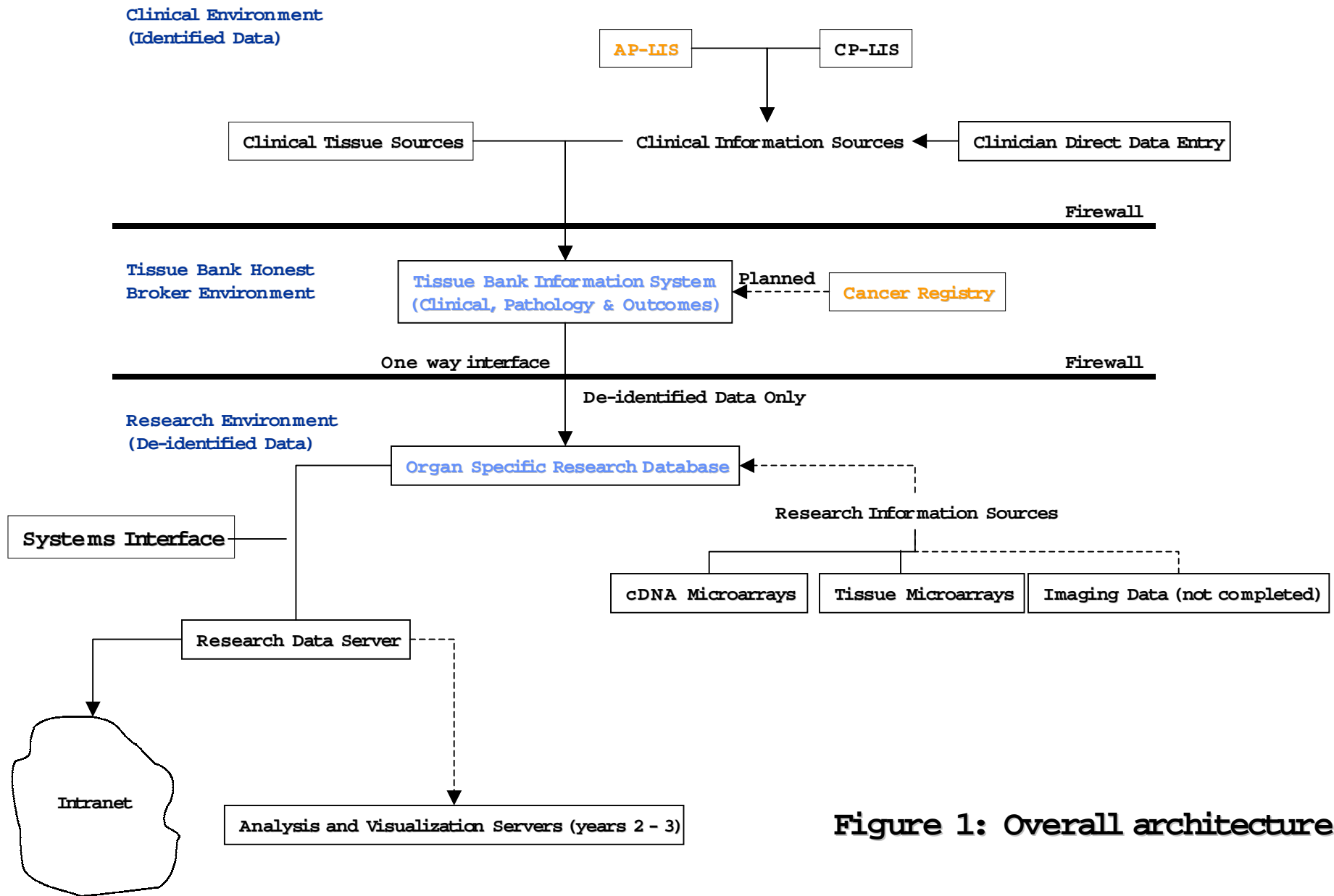


Figure 1: Overall architecture



# Outline



- Introduction to Oncology & Pathology Informatics Research at Hillman Cancer Center
- Linkages Between Pathology and Cancer Registries
- Research Use of Pathology Data and Cancer Registries
  - Comprehensive Prostate Cancer Tissue Resource (CPCTR) and Tissue Bank Information Systems [Clinical, Pathology & Cancer Registry Data]
  - The Shared Pathology Informatics Network (SPIN) – Cancer Registry and Anatomic Pathology Data
- Conclusions
- Future Directions – The Need for Electronic Communication Strategies



Slide 12

Benedum Oncology Informatics Center / Center for Pathology Informatics



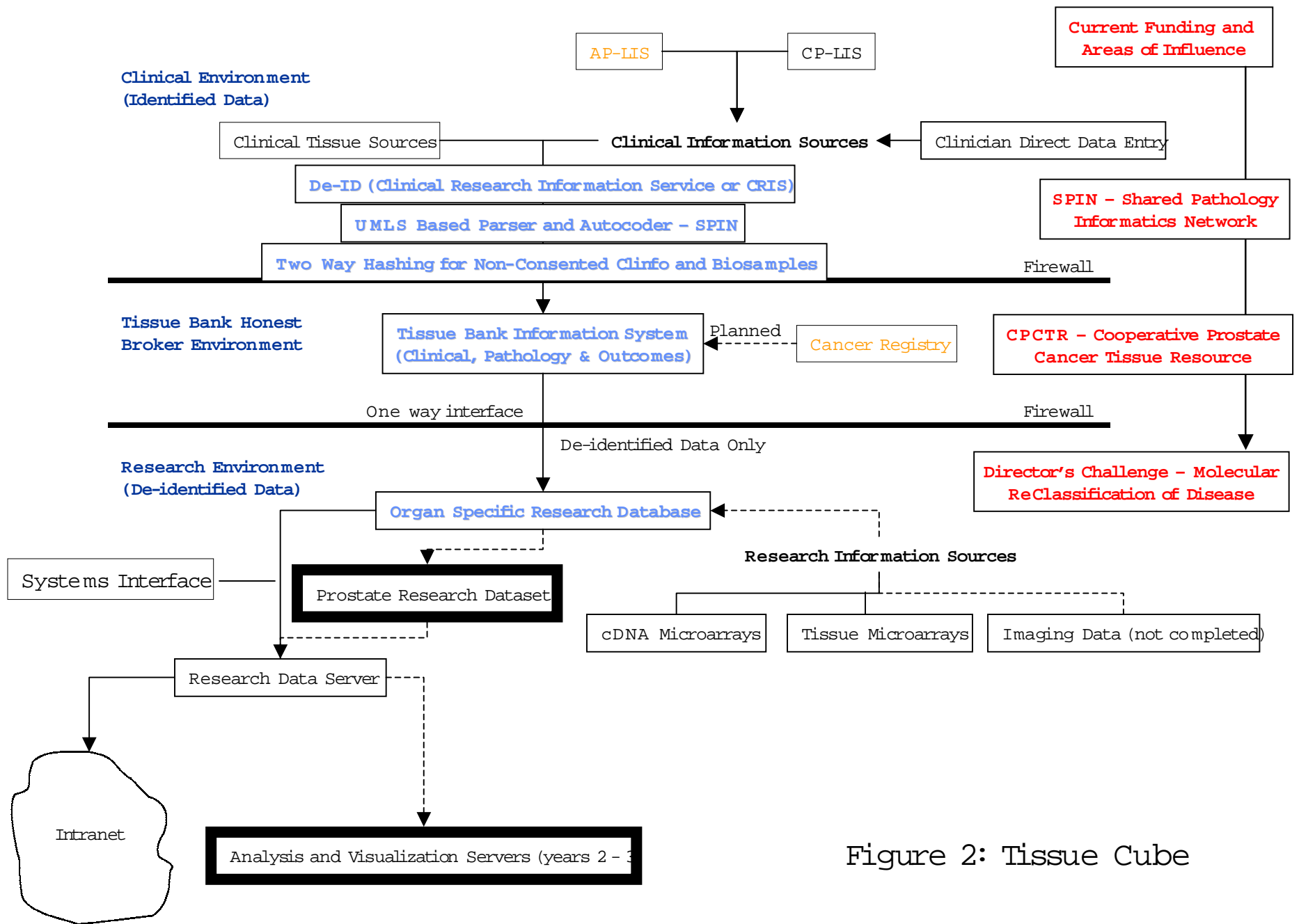


Figure 2: Tissue Cube



# Director's Challenge – Molecular ReClassification of Cancer



- NCI Sponsored U01 (Collaborative Consortium)
- See <http://grants.nih.gov/grants/guide/rfa-files/RFA-CA-98-027.html>
  - Grand Genomic and Proteomic “Fishing Expeditions” funded by NCI
  - Ours is focused on (you guessed it) Prostate Cancer
  - Requirement: High level of clinical annotation on tissue samples and interesting clinical cohorts (age, race, aggressiveness, etc...)
  - Affymetrix platform RNA expression data
  - Collaborations with Ken Buetow to share data publicly at NCICB’s (NCI Center for Bioinformatics) Gene Expression Data Portal  
<http://gedp.nci.nih.gov/dc/>
  - Basis for our Organ Specific Data Program



Slide 14

Benedum Oncology Informatics Center / Center for Pathology Informatics

go back





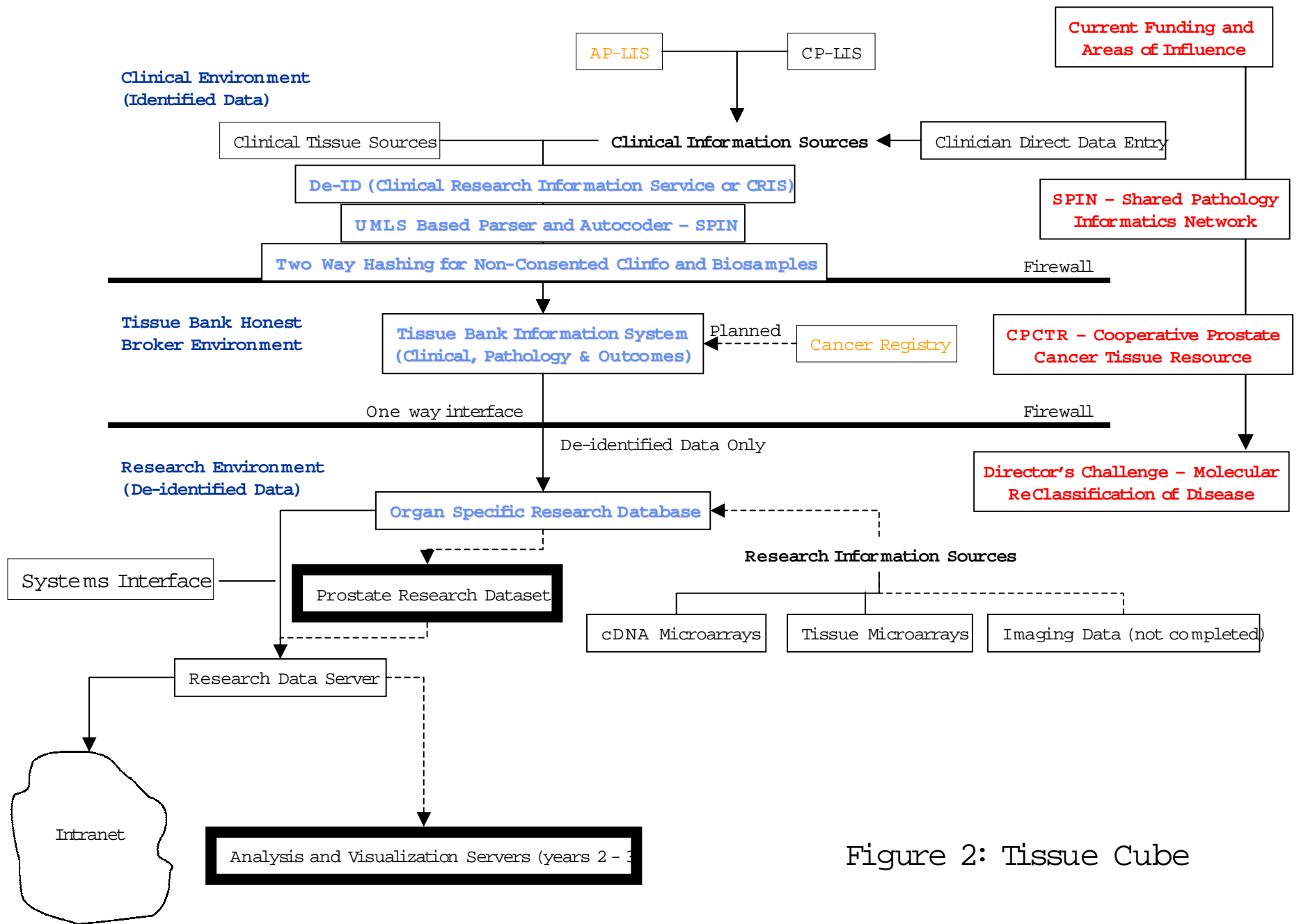


Figure 2: Tissue Cube



# Outline



- Introduction to Oncology & Pathology Informatics Research at Hillman Cancer Center
- Linkages Between Pathology and Cancer Registries
- Research Use of Pathology Data and Cancer Registries
  - Comprehensive Prostate Cancer Tissue Resource (CPCTR) and Tissue Bank Information Systems [Clinical, Pathology & Cancer Registry Data]
  - The Shared Pathology Informatics Network (SPIN) - Cancer Registry and Anatomic Pathology Data
- Conclusions
- Future Directions - The Need for Electronic Communication Strategies



Slide 16

Benedum Oncology Informatics Center / Center for Pathology Informatics





# Tissue Banking Information System (TBIS)

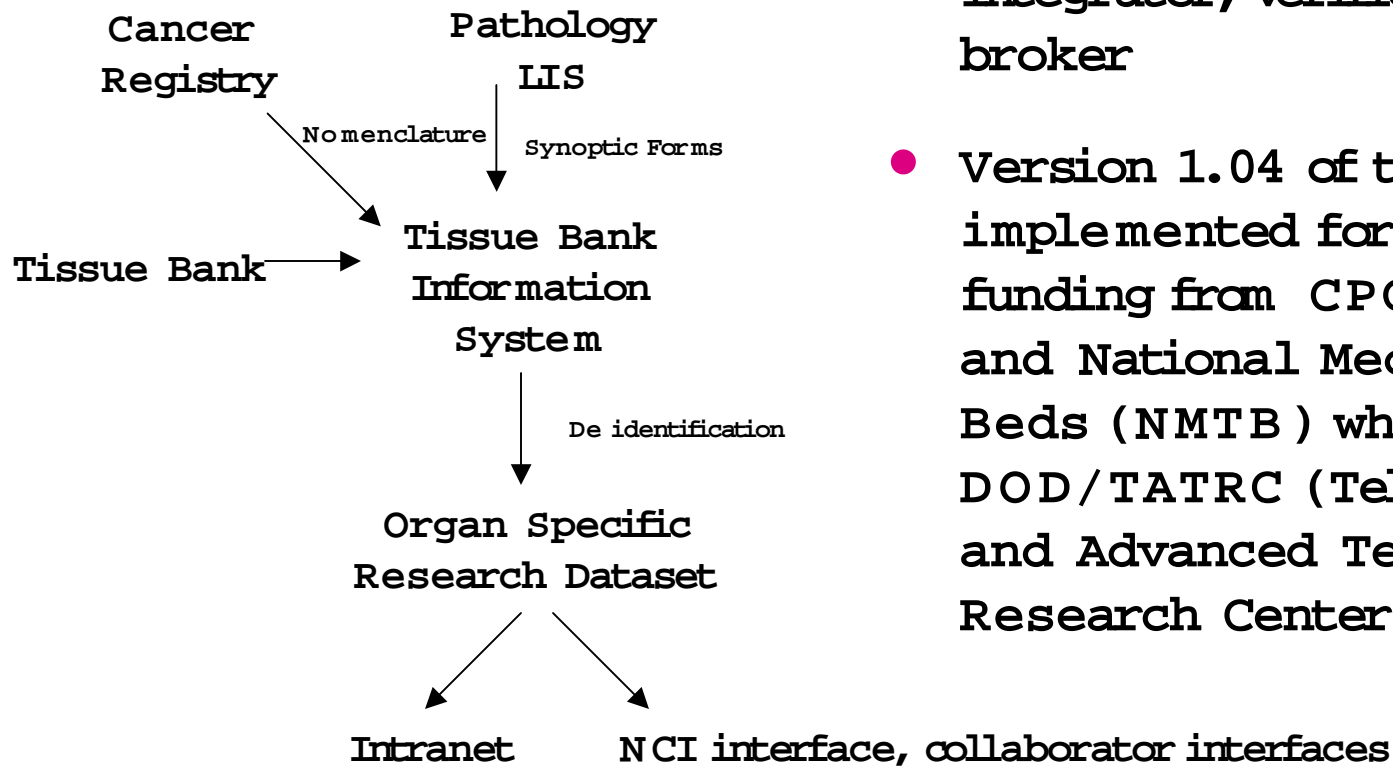


*Table 5. Total Paraffin Archived Prostate Specimens Available from the PA GU TB to the Resource*

Banked Specimen Type	Actual		Projected Accrual at UPMC-HS					Totals
	1991-8/99	9/99-12/99	2000	2001	2002	2003	2004	
Universal Consent PUH Prostates	736	31	92	92	92	92	92	1227
Universal Consent PUH Prostate Biopsies	1000	41	125	125	125	125	125	1666
Routine PUH Surgical Prostate Biopsies	1100	277	553	553	553	553	553	4142
Outreach Prostates			148	148	148	148	148	740
Outreach Prostate Biopsies			495	495	495	495	495	2475
1982-98 PUH Archived Prostates	1760							1760
1982-98 PUH Archived Prostate Biopsies	8800							8800
1982-98 Outreach Prostate Archives	2368							2368
1982-98 Outreach Prostate Biopsy Archives	9472							9472
Total Prostates	4864	31	240	240	240	240	240	6095
Total Prostate Biopsies	20372	318	1173	1173	1173	1173	1173	26555
Total Prostate Specimens	25236	348	1413	1413	1413	1413	1413	32649



# Research Information System



- This system acts as an integrator, verifier and honest broker
- Version 1.04 of this system is implemented for prostate with funding from CPCTR, CaPCURE and National Medical Test Beds (NMTB) which is a DOD/TATRC (Telemedicine and Advanced Technology Research Center) funded effort.



CPCTR # 5789305179 UPNC # 172206811 PU SSN # 172-20-6811

George Klotzbaugh

PATIENT

ID: 2001078

ALIVE

PATIENT | CLINICAL | PSA | TREATMENT | PROGRESSION | PROSTATECTOMY | BIOPSY | OTHER\_BIOPSY | FLUID

## CASE INFORMATION

Accession # S89-11426 Research # PR-45020 Date 12-SEP-1989  
Prstctmy Type UNKNOWN  
Reviewer BEICH Reviewed 05-MAR-2001

## TISSUE AVAILABLE

Paraffin 24 Location MAB  
Frozen UNKNOWN Location W.I.T(min)  
Fluids UNKNOWN Location

## OSC ?

OSC Accession #  
OSC Institute  
Examined 0 Returned 0 Archived 0

## PATHOLOGIC STAGING

T3a EXTRACAPSULAR EXTENSION(UNILATERAL OR BILATERAL)  
N0 NO REGIONAL LYMPH NODE METASTASIS  
MX DISTANT METASTASIS CANNOT BE ASSESSED  
GX GRADE CANNOT BE ASSESSED

Metastasis Locns UNKNOWN  
Protocol Name AJCC/UICC V6

## REMARKS

## BLOCK DETAILS

PROSTATE		PROCESSING				GLEASON GRADE					TISSUE ATTRIBUTES										Status	Project	REMARK
Blk #	Label	PF	BF	OCT	OTH	Histology	Size	Prm	Sec	Diff	PCA	PNI	ALI	ECI	SVI	SMI	PIN	BPH	CP				
3B	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ADENOCARCINOMA NOS (AK	2.8	3	4	MOD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OPEN	NONE		
3H	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ADENOCARCINOMA NOS (AK	0.2	3	4	MOD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OPEN	NONE		
3C	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ADENOCARCINOMA NOS (AK	2.7	3	4	MOD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OPEN	NONE		
3D	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ADENOCARCINOMA NOS (AK	2.8	3	4	MOD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OPEN	NONE		
3A	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ADENOCARCINOMA NOS (AK	2.1	3	4	MOD	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OPEN	NONE		
3LSV	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BENIGN	-1.0	N/A	N/A	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OPEN	NONE	SV and prostate	
4	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BENIGN	-1.0	N/A	N/A	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OPEN	NONE	only SV	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				

LYMPH NODES		PROCESSING		Histology	Diff	Size	PCA	ECI	Status	Project	REMARK
Blk #	Block Label	PF	BF	OCT	OTH						
	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		0.1	<input checked="" type="checkbox"/>	OPEN	NONE	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>			
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>			

OTHER TISSUE		PROCESSING		Histology	Organ	PCA	Status	Project	REMARK
Blk #	Block Label	PF	BF	OCT	OTH				
	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	OPEN	NONE	
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			

ASSOCIATED FLUID							
Fluid #	Fluid Type	Volume	# Aliquots	Status	Project	REMARK	
		0.00	0	OPEN	NONE		





**Tissue Bank Information System**

**CaP CURE** Welcome GILBERTSONJR

CPCTR # 5789305179 UPNC # 172206811 PU SSN # 172-20-6811

PATIENT | CLINICAL | PSA | TREATMENT | PROGRESSION | **PROSTATECTOMY** | BI

**CASE INFORMATION**

Accession #	S89-11426	Research #	PR-45020	Date	12-SEP-1989
Prstctmy Type	UNKNOWN				
Reviewer	BECICH	Reviewed	05-MAR-2001		

**TISSUE AVAILABLE**

Paraffin	24	Location	MAB	W.I.T(min)	
Frozen	UNKNOWN	Location			
Fluids	UNKNOWN	Location			

**OSC ?**

OSC Accession #					
OSC Institute					
Examined	0	Returned	0	Archived	0

**PATHOLOGIC STAGING**

T	T3a	EXTRACAPSULAR EXTENSION(UNILATERAL OR BILATERAL)
N	N0	NO REGIONAL LYMPH NODE METASTASIS
M	MX	DISTANT METASTASIS CANNOT BE ASSESSED
G	GX	GRADE CANNOT BE ASSESSED

Metastasis Locns	UNKNOWN
Protocol Name	AJCC/UICC V6



Slide 20

Benedum Oncology Informatics Center / Center for Pathology Informatics







# Tissue Bank Information System



PATIENT

ID: 2001078

ALIVE

OTHER_BIOPSY		FLUID		
A T T R I B U T E S				
<b>GENERAL</b>	Prostate Wt (gms)	60.0		
<b>TUMOR</b>	Carcinoma Prsnt	YES		
	Histologic Primary	ADENOCARCINOMA NOS (AKA ACINAR)		
	Histologic Secondary	ADENOCARCINOMA NOS (AKA ACINAR)		
	Gleason	3	+	4 = 7 4/5 % 65
	Differentiation	MOD		
	Laterality	TWO		
	Multifocal	YES		
	Tumor Size (cm)	2.8		
	Tumor %	25% TO <50%		
	High Grade PIN	YES - MULTIFOCAL		
	Perineural Invasion	YES		
	Angiolymphatic Inv	NO		
	Extracapsular Extn	YES - MULTIFOCAL		
	Seminal Vesicle Inv	NO		
<b>BENIGN</b>	Surgical Margins Inv	YES - FOCAL		
	B P H	UNKNOWN		
<b>OTHERS</b>	Chronic Prostatitis	UNKNOWN		
	Ploidy Analysis / FISH	NO		
<b>LYMPH NODES</b>				
Nodes Examined		10		
Nodes Positive		0		
Accession #				



Slide 21

Benedum Oncology Informatics Center / Center for Pathology Informatics





# Tissue Bank Information System



BLOCK DETAILS										
PROSTATE		PROCESSING				GLEASON GRAD				
Blk #	Label	PF	BF	OCT	OTH	Histology	Size	Prm	Sec	
3B	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ADENOCARCINOMA NOS (AK	2.8	3	4	
3H	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ADENOCARCINOMA NOS (AK	0.2	3	4	
3C	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ADENOCARCINOMA NOS (AK	2.7	3	4	
3D	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ADENOCARCINOMA NOS (AK	2.8	3	4	
3A	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	ADENOCARCINOMA NOS (AK	2.1	3	4	
3LSV	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BENIGN	-1.0	N/A	N/A	
4	UNKNOWN	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BENIGN	-1.0	N/A	N/A	

TISSUE ATTRIBUTES										
PCA	PNI	ALI	ECI	SVI	SMI	PIN	BPH	CP	Status	Project
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	OPEN	NONE
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	OPEN	NONE
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	OPEN	NONE
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	OPEN	NONE
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	OPEN	NONE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	OPEN	NONE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	OPEN	NONE
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		



CaP CURE University Of Pittsburgh Tissue Bank

SignOut ContactUs Help

SET CRITERIA SHOW RESULTS reset

Case Report

DEMOGRAPHICS		PROGRESSION	
Donor / Patient	PATIENT <input type="checkbox"/> DONOR <input type="checkbox"/>	Vital Status	ALIVE <input type="checkbox"/> DEAD <input type="checkbox"/> Unknown <input type="checkbox"/>
Age at Diagnosis	01-39 <input type="checkbox"/> 40-49 <input type="checkbox"/> 50-59 <input type="checkbox"/> 60-69 <input type="checkbox"/> 70-79 <input type="checkbox"/> 80-100 <input type="checkbox"/>	Years Disease Free	2yrs <input type="checkbox"/> 4yrs <input type="checkbox"/> 5yrs <input type="checkbox"/> 6yrs <input type="checkbox"/> 8yrs <input type="checkbox"/> 10yrs <input type="checkbox"/> >10yrs <input type="checkbox"/>
Race	CAUCASIAN <input type="checkbox"/> AFRICAN AMERICAN <input type="checkbox"/>	Recurrence Status	NO KNOWN RECURRENCE <input type="checkbox"/> NEVER DISEASE FREE <input type="checkbox"/>
History of Non-Prostate Cancer	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>	Years To First Recurrence	2yrs <input type="checkbox"/> 4yrs <input type="checkbox"/> 5yrs <input type="checkbox"/> 6yrs <input type="checkbox"/> 8yrs <input type="checkbox"/> 10yrs <input type="checkbox"/> >10yrs <input type="checkbox"/>
Smoking	NEVER <input type="checkbox"/> PAST <input type="checkbox"/>	Metastasis Locations	REGIONAL LYMPH NODES <input type="checkbox"/> DISTANT LYMPH NODES <input type="checkbox"/>
Family History of Prostate Cancer	Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown <input type="checkbox"/>		
PROSTATECTOMY		BLOCKS	
Cancer Present	Yes <input type="checkbox"/> No <input type="checkbox"/> HGPIN Only <input type="checkbox"/> Unknown <input type="checkbox"/>	Processing	Paraffin Fixed <input type="checkbox"/> Bulk Frozen <input type="checkbox"/> OCT Froze <input type="checkbox"/> Other <input type="checkbox"/>
Staging : pT stage	TX <input type="checkbox"/> T0 <input type="checkbox"/> T1 <input type="checkbox"/> T1a <input type="checkbox"/> T1b <input type="checkbox"/> T1c <input type="checkbox"/> T2 <input type="checkbox"/> T2a <input type="checkbox"/> T2b <input type="checkbox"/> T3 <input type="checkbox"/> T3a <input type="checkbox"/> T3b <input type="checkbox"/> T4 <input type="checkbox"/> T4a <input type="checkbox"/> T4b <input type="checkbox"/>	Blocks of Interest	Prostate <input type="checkbox"/> Lymph Node <input type="checkbox"/> Other <input type="checkbox"/>
pN stage	NX <input type="checkbox"/> N0 <input type="checkbox"/> N1 <input type="checkbox"/>	Histology	ADENOCARCINOMA NOS (AKA ACINAR) <input type="checkbox"/> DUCTAL ADENOCARCINOMA <input type="checkbox"/>
pM stage	MX <input type="checkbox"/> M0 <input type="checkbox"/> M1 <input type="checkbox"/> M1a <input type="checkbox"/> M1b <input type="checkbox"/> M1c <input type="checkbox"/>	Gleason Primary Grade	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> Unknown/NA <input type="checkbox"/>
Primary Histology	ADENOCARCINOMA NOS (AKA ACINAR) <input type="checkbox"/> DUCTAL ADENOCARCINOMA <input type="checkbox"/>	Size of Tumor	<0.5cm <input type="checkbox"/> 0.6-1cm <input type="checkbox"/> 1.1-2cm <input type="checkbox"/> > 2cm <input type="checkbox"/>
Gleason Primary Grade	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> Unknown/NA <input type="checkbox"/>	Tumor Attributes	HGPIN <input type="checkbox"/> PNI <input type="checkbox"/> ALI <input type="checkbox"/> SVI <input type="checkbox"/> SMI <input type="checkbox"/> ECI <input type="checkbox"/>
Gleason Sum Score	2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/> Unknown/NA <input type="checkbox"/>	Benign Attributes	BPH <input type="checkbox"/> CP <input type="checkbox"/>
Tumor Percentage	< 5% <input type="checkbox"/> 5-24% <input type="checkbox"/> 25-49% <input type="checkbox"/> 50-74% <input type="checkbox"/> 75-100% <input type="checkbox"/> Unknown/NA <input type="checkbox"/>	Status	Open <input type="checkbox"/> Reserved <input type="checkbox"/> Close <input type="checkbox"/>
Tumor Attributes	HGPIN <input type="checkbox"/> PNI <input type="checkbox"/> ALI <input type="checkbox"/> SVI <input type="checkbox"/> SMI <input type="checkbox"/> ECI <input type="checkbox"/>	Project	MCD <input type="checkbox"/>
Benign Attributes	BPH <input type="checkbox"/> CP <input type="checkbox"/>		
Frozen Tissue Available	Yes <input type="checkbox"/> No <input type="checkbox"/>		
Fluid Available	Yes <input type="checkbox"/> No <input type="checkbox"/>		
BIOPSY (Available)		PSA (Available)	
Pre-diagnostic Biopsy	Yes <input type="checkbox"/> No <input type="checkbox"/>	Diagnostic PSA data	Yes <input type="checkbox"/> No <input type="checkbox"/>





# Tissue Bank Information System



TBIS SEARCH - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Refresh Home Search Favorites History Mail Print Edit RealGuide Offline

Address http://128.147.173.140/TBISPROSTATE/html/HomePageFrame.htm

**CaP CURE** University Of Pittsburgh Tissue Bank

[SignOut](#) [ContactUs](#) [Help](#)

**SET CRITERIA** **SHOW RESULTS** Button

View Demographics

Results: 41-60 of 95

	CASE #	DONOR(Y/N)	Age at Diagnosis	RACE	History of Non Prostate Cancer	Smoking	Family History of Prostate Cancer
41	<a href="#">20010855</a>	No	56	Caucasian	No	Current	Unknown
42	<a href="#">20010856</a>	No	73	Caucasian	Yes	Past	Unknown
43	<a href="#">20010857</a>	No	73	Caucasian	Unknown	Unknown	Unknown
44	<a href="#">20010858</a>	No	67	Caucasian	Unknown	Unknown	Unknown
45	<a href="#">20010859</a>	No	65	Caucasian	Unknown	Unknown	Unknown
46	<a href="#">20010860</a>	No	55	Caucasian	Unknown	Unknown	Unknown
47	<a href="#">20010861</a>	No	66	Caucasian	Unknown	Past	Unknown
48	<a href="#">20010862</a>	No	66	Caucasian	No	Past	Unknown
49	<a href="#">20010863</a>	No	62	Caucasian	Unknown	Unknown	Unknown
50	<a href="#">20010864</a>	No	61	Caucasian	No	Unknown	Unknown
51	<a href="#">20010865</a>	No	69	Caucasian	Unknown	Unknown	Unknown
52	<a href="#">20010866</a>	No	68	Caucasian	No	Unknown	No
53	<a href="#">20010867</a>	No	58	Caucasian	No	Past	No
54	<a href="#">20010868</a>	No	72	Caucasian	No	Smoker Nos	Unknown
55	<a href="#">20010869</a>	No	69	Caucasian	No	Never	Unknown
56	<a href="#">20010870</a>	No	70	Caucasian	Yes	Past	No
57	<a href="#">20010871</a>	No	65	Caucasian	No	Never	No
58	<a href="#">20010872</a>	No	73	Caucasian	Unknown	Smoker Nos	Unknown
59	<a href="#">20010873</a>	No	60	Caucasian	Unknown	Unknown	Unknown
60	<a href="#">20010874</a>	No	70	Caucasian	No	Past	Unknown

Internet



Slide 24

Benedum Oncology Informatics Center / Center for Pathology Informatics







# Tissue Bank Information System



CaP CURE University Of Pittsburgh Tissue Bank

[SignOut](#) [ContactUs](#) [Help](#)

[SET CRITERIA](#) [SHOW RESULTS](#) [Button](#)

View:

Results: 61-80 of 95

CASE #	Clinical Staging	Pathological Staging	Months Disease Free	First Recurrence (Month)	Distant Metastasis	Vital Status (Months from Dx)
61 <a href="#">20010875</a>		T3a MX NO	121	121	None(121)	Alive()
62 <a href="#">20010876</a>	T2b MO NO	T2b MX NO	16	16	Unknown(16)	Dead(17)
63 <a href="#">20010877</a>	T3a MX NO	T3a MX NO	77	77	None(77)	Alive()
64 <a href="#">20010878</a>		T3b MX NO		38	Unknown(38)	Dead(38)
65 <a href="#">20010879</a>		T3b MO N1	35	1	Other(1)	Alive()
66 <a href="#">20010880</a>	T1a MO NO	T1a MX NO	6	6	None(6)	Dead(40)
67 <a href="#">20010881</a>	T2b MO NO	T2b MX NO	5	5	None(5)	Dead(100)
68 <a href="#">20010882</a>		T3a MO NO	76	76	Unknown(76)	Unknown()
69 <a href="#">20010883</a>		T2 MO NO	103	103	None(103)	Alive()
70 <a href="#">20010884</a>		T3b MX N1		3	Other(3)	Alive()
71 <a href="#">20010885</a>	T2b MO N1	T2b MX N1		97	Regional Lymph Nodes(97)	Alive()
72 <a href="#">20010886</a>	T2b MO NO	T2b MX NO	106	106	None(106)	Alive()
73 <a href="#">20010887</a>	T2b MO NO	T2b MX NO		60	None(60)	Alive()
74 <a href="#">20010888</a>	T2b MO NO	T2b MX NO	1	1	Unknown(1)	Dead(33)
75 <a href="#">20010889</a>	T2b MO NO	T2b MX NO	86	86	None(86)	Alive()
76 <a href="#">20010890</a>	T3a MX NO	T3a MX NO	106	106	Unknown(106)	Alive()
77 <a href="#">20010891</a>	T2a MO NO	T2a MX NO	3	3	Unknown(3)	Alive()
78 <a href="#">20010892</a>	T2b MO NO	T2b MX NO	100	100	None(100)	Alive()
79 <a href="#">20010893</a>	T2b MO NO	T2b MX NO	97	97	None(97)	Alive()
80 <a href="#">20010894</a>		T2a MO NO		76	Unknown(76)	Alive()



Slide 25

Benedum Oncology Informatics Center / Center for Pathology Informatics



SET CRITERIA

SHOW RESULTS

Button

View Prostatectomy Tumor

Results: 1-20 of 95



CASE DESCRIPTION

1	CASE #	2001075	Histologic Diagnosis	Adenocarcinoma Nos (Aka Acinar)
		<b>Multifocal</b>	Yes	<b>HGP111</b> Yes - Multifocal
		<b>Gleason Grade</b>	4+5=9	<b>P111</b> Yes
		<b>Lymph Nodes</b>	Total Examined:15 Positive:0	<b>ALI</b> No
		<b>pT</b>	T3a-Extracapsular Extension(Unilateral Or Bilateral)	<b>ECI</b> Yes - Multifocal
		<b>pN</b>	N0-No Regional Lymph Node Metastasis	<b>SVI</b> No
		<b>pM</b>	MX-Distant Metastasis Cannot Be Assessed	<b>SMI</b> Yes - Extensive
2	CASE #	2001076	Histologic Diagnosis	Adenocarcinoma Nos (Aka Acinar)
		<b>Multifocal</b>	Yes	<b>HGP111</b> Yes - Multifocal
		<b>Gleason Grade</b>	4+5=9	<b>P111</b> Yes
		<b>Lymph Nodes</b>	Total Examined:22 Positive:5	<b>ALI</b> No
		<b>pT</b>	T3a-Extracapsular Extension(Unilateral Or Bilateral)	<b>ECI</b> Yes - Focal
		<b>pN</b>	N1-Metastasis In Regional Lymph Node Or Nodes	<b>SVI</b> No
		<b>pM</b>	MX-Distant Metastasis Cannot Be Assessed	<b>SMI</b> Yes - Extensive
3	CASE #	2001078	Histologic Diagnosis	Adenocarcinoma Nos (Aka Acinar)
		<b>Multifocal</b>	Yes	<b>HGP111</b> Yes - Multifocal
		<b>Gleason Grade</b>	3+4=7(65%)	<b>P111</b> Yes
		<b>Lymph Nodes</b>	Total Examined:10 Positive:0	<b>ALI</b> No
		<b>pT</b>	T3a-Extracapsular Extension(Unilateral Or Bilateral)	<b>ECI</b> Yes - Multifocal
		<b>pN</b>	N0-No Regional Lymph Node Metastasis	<b>SVI</b> No
		<b>pM</b>	MX-Distant Metastasis Cannot Be Assessed	<b>SMI</b> Yes - Focal
4	CASE #	2001079	Histologic Diagnosis	Adenocarcinoma Nos (Aka Acinar)
		<b>Multifocal</b>	Yes	<b>HGP111</b> No
		<b>Gleason Grade</b>	3+4=7(50%)	<b>P111</b> No
		<b>Lymph Nodes</b>	Total Examined:12 Positive:0	<b>ALI</b> No
		<b>pT</b>	T2b-Tumor Involves Both Lobes	<b>ECI</b> No
		<b>pN</b>	N0-No Regional Lymph Node Metastasis	<b>SVI</b> No
		<b>pM</b>	MX-Distant Metastasis Cannot Be Assessed	<b>SMI</b> No
5	CASE #	20010711	Histologic Diagnosis	Adenocarcinoma Nos (Aka Acinar)





# Tissue Banking Information System (TBIS)



## Data Warehouse Query Results

Prostatectomy Speciman Information									
								SEARCH AGAIN	SHOW BLOCKS HIDE BLOCKS
1.	2000081234	PATIENT: Age Of Diagnosis = 1, Yrs Follow up = x, RECURRENT: x, Yrs after Diagnosis = x,location PSA: Prostatectomy = NNNN, Most Recent 01/01/01 = nnnn PROSTATECTOMY: Nerve Sparing Radical TUMOR PRESENT = 1, Mild Differentiated Histologic Type 1 (Histologic T) TUMOR EXTENT: Right LOBES, Single focus,1mm, 1 of specimen. ATTRIBUTES: PIN=Focality Unknown, ALI=YES, ECI=YES, SVI=YES, SMI=YES, CP=YES, BPH=Epithelial NODES: Examined=1, Positive=1 STAGING: 1, 1, 1, 1 BIOPSIES: ?????? GLEASON: 1+1=1 (1)							
2.	2000089999	PATIENT: Age Of Diagnosis = 2, Yrs Follow up = x, RECURRENT: x, Yrs after Diagnosis = x,location PSA: Prostatectomy = NNNN, Most Recent 01/01/01 = nnnn PROSTATECTOMY: Donor TUMOR PRESENT = 2, Moderate Differentiated Histologic Type 2 (Histologic Type 2) TUMOR EXTENT: Left LOBES, Single focus,2mm, 2 of specimen. ATTRIBUTES: PIN=Focal, ALI=NO, ECI=NO, SVI=NO, SMI=NO, CP=NO, BPH=Stromal NODES: Examined=2, Positive=2 STAGING: 2, 2, 2, 2 BIOPSIES: ?????? GLEASON: 2+2=2 (2)							

Prostatectomy Block Information									
Blk #	ORGAN	LABEL	Histologic	Differentiation	Size	Prm	Sec	4/5%	EXTREME Attr
1.	Bladder	Base	Histologic Type 2	Moderate	2	2	2	2	Bladder



TBIS SEARCH - Microsoft Internet Explorer

File Edit View Favorites Tools Help

**CaP CURE** University Of Pittsburgh Tissue Bank

**SET CRITERIA** **SHOW RESULTS** Button

View Demographics

**CASE #2001076** **Date 09-03-2001**

**Demographics** **Progression**

Donor ?	No	Clinical Staging	T3a MX N1
Age at Diagnosis	59	Pathological Staging	T3a MX N1
Race	Caucasian	Considered Disease Free	
Hispanic	No	Recurrence Status	No Known Recurrence
Other Cancers	Unknown	Distant Metastasis	Unknown(140)
Smoking	Unknown	Vital status	Alive()
Family History of CaP	Unknown	PCA status @ Death	
Treatment			

**PSA** **Biopsy**

Diagnostic PSA		Pre-diagnostic Biopsy	NO
Post Prostatectomy PSA		Diagnostic biopsy	NO
Post Diagnostic PSA		Post diagnostic	NO
		Non Prostate(Other) Tissue	NO

**Prostatectomy** **Accession # :20010719**

Cancer Present	Yes	High Grade Pin	Yes - Multifocal
Primary Histology	Adenocarcinoma Nos (Aka Acinar)	Perineural Invasion	Yes
Secondary Histology	Adenocarcinoma Nos (Aka Acinar)	Angiolymphatic Inv	No
Gleason	4+5=9	Extracapsular Inv	Yes - Focal
Differentiation	Poor	Seminal Vesicle Inv	No
Laterality	Two	Surgical Margins	Yes - Extensive
Multi focal	Yes	BPH	Unknown
Tumor Size	3.2	Chronic Prostatitis	Unknown
Tumor Percent	25% To <50%	Ploidy Analysis / FISH	No
Nodes Examined	22		
Nodes Positive	5		

**BLOCK Summary:**

Total Block :	21	Warm Ischemia Time:		Fluids Available :	
Frozen Available:					

**PROSTATE Blocks:**

Block /Processing	Histology	Size(cms)	Gleason Grade	Attributes
5B-Unknown[PFx]	Benign	-1	N/A+N/A	
5F-Unknown[PFx]	Adenocarcinoma Nos (Aka Acinar)	3.2	4+5	HGPIN,PNI,SMI,ECI
5H-Unknown[PFx]	Adenocarcinoma Nos (Aka Acinar)	3.1	4+5	HGPIN,PNI,SMI
5I-Unknown[PFx]	Adenocarcinoma Nos (Aka Acinar)	2.6	4+5	HGPIN,SMI
5L-Unknown[PFx]	Benign	-1	N/A+N/A	
5M-Unknown[PFx]	Adenocarcinoma Nos (Aka Acinar)	3.2	5+4	PNI,SMI

Internet





# Outline



- Introduction to Oncology & Pathology Informatics Research at Hillman Cancer Center
- Linkages Between Pathology and Cancer Registries
- Research Use of Pathology Data and Cancer Registries
  - Comprehensive Prostate Cancer Tissue Resource (CPCTR) and Tissue Bank Information Systems [Clinical, Pathology & Cancer Registry Data]
  - The Shared Pathology Informatics Network (SPIN) – Cancer Registry and Anatomic Pathology Data
- Conclusions
- Future Directions – The Need for Electronic Communication Strategies



Slide 29

Benedum Oncology Informatics Center / Center for Pathology Informatics



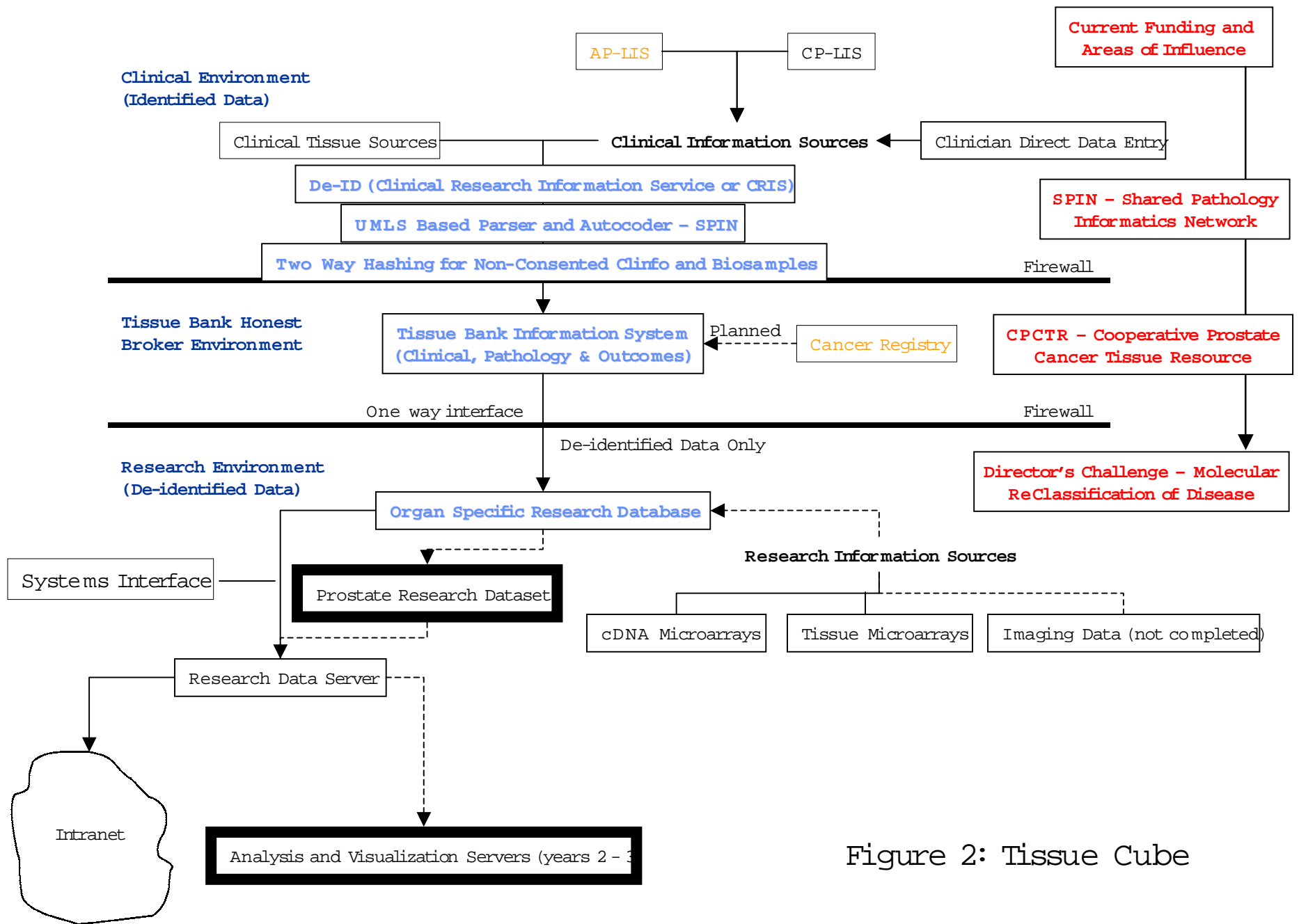


Figure 2: Tissue Cube



# SPIN – Shared Pathology Informatics Network



- NCI Sponsored U01 (Collaborative Consortium)
- See <http://grants.nih.gov/grants/guide/rfa-files/RFA-CA-01-006.html>
  - Data Mining Software Development for Laboratory Information Systems (LIS) and Cancer Registries (CR).
    - » To transform free text into de-identified, coded data that can be searched, mined
    - » The pipeline consists of the Laboratory Information System or Cancer Registry, De-identification Engine, Parser, Autocoder, and Data Mining Software
  - Critical Needs:
    - » De-Identification Software
    - » Autocoding and Parsing “Chunks” of Textual Data
    - » Two Way Hashing for “Linked” De-Identified Data
  - Based on Minimal Essential Data Elements
- Role of the Cancer Registry
  - Supply critical staging, treatment, progression and outcome data
  - Coupled with pathology data is a very powerful tool
  - Add “lead” Cancer Registrars to focus on key areas – breast, colon, lung, melanoma and head & neck







# Outline



- Introduction to Oncology & Pathology Informatics Research at Hillman Cancer Center
- Linkages Between Pathology and Cancer Registries
- Research Use of Pathology Data and Cancer Registries
  - Comprehensive Prostate Cancer Tissue Resource (CPCTR) and Tissue Bank Information Systems [Clinical, Pathology & Cancer Registry Data]
  - The Shared Pathology Informatics Network (SPIN) - Cancer Registry and Anatomic Pathology Data
- **Conclusions**
- Future Directions - The Need for Electronic Communication Strategies



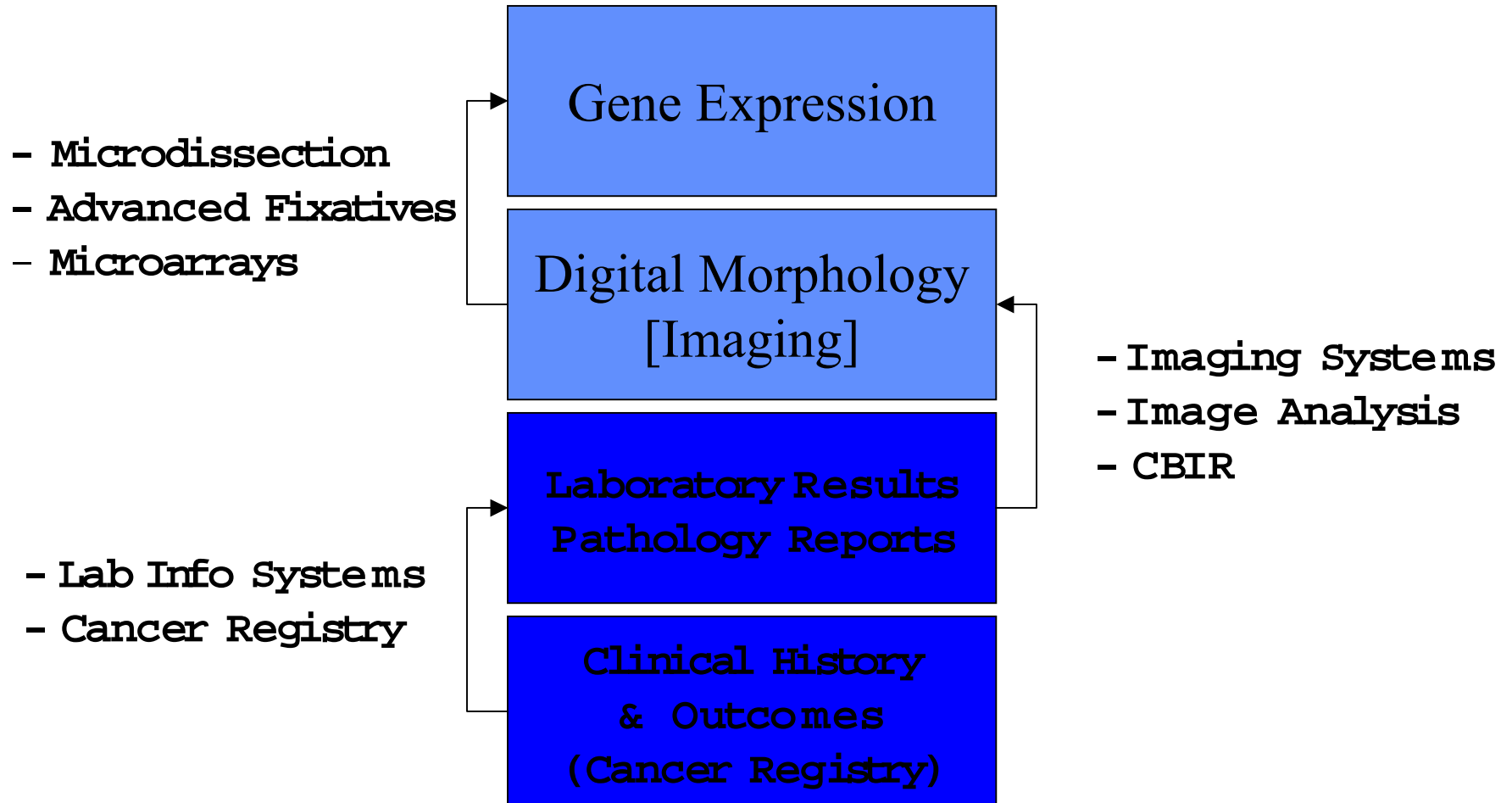
Slide 32

Benedum Oncology Informatics Center / Center for Pathology Informatics





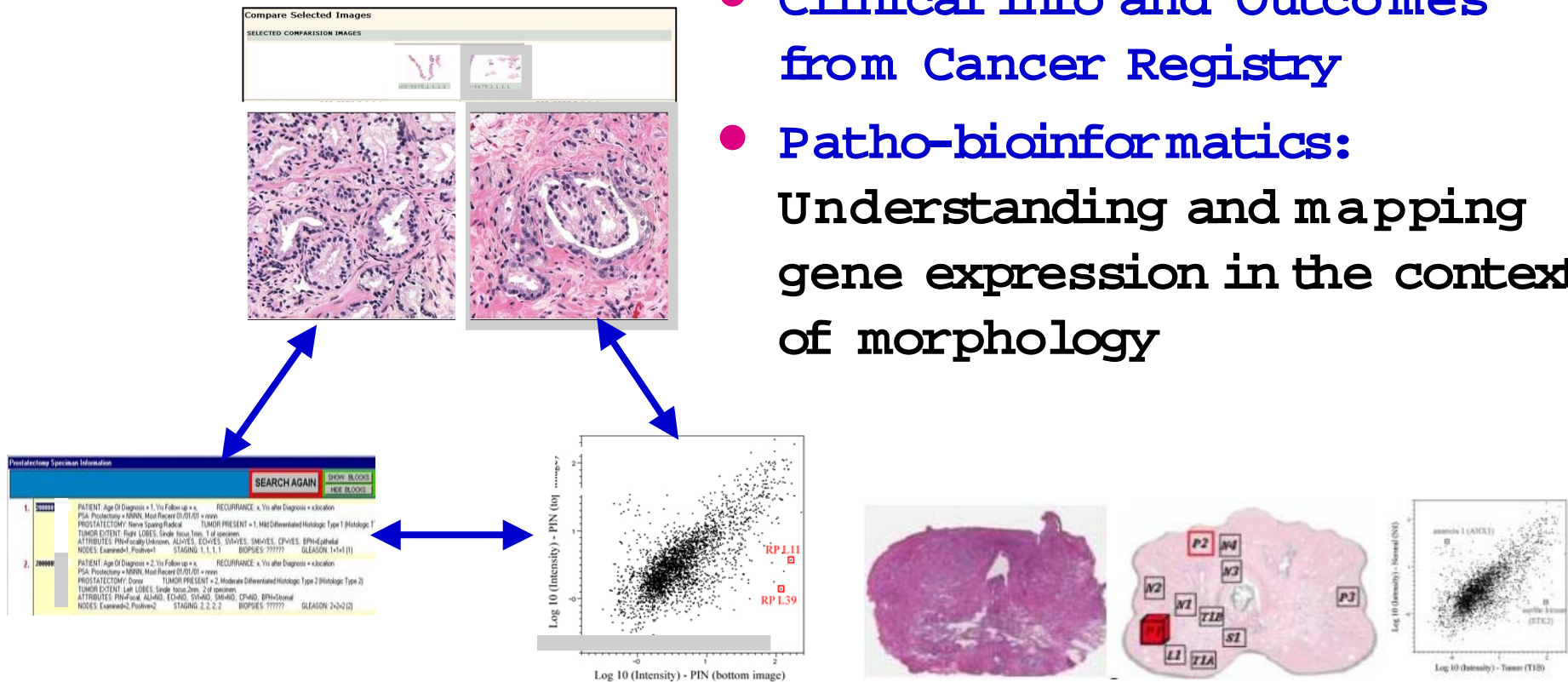
# Maintaining the Cancer Registry, Pathologic and Morphologic Data in the Context of Gene Expression



# Pathology, Oncology, Imaging and the Future



- Genomics and Proteomics
- Clinical Info and Outcomes from Cancer Registry
- Patho-bioinformatics: Understanding and mapping gene expression in the context of morphology





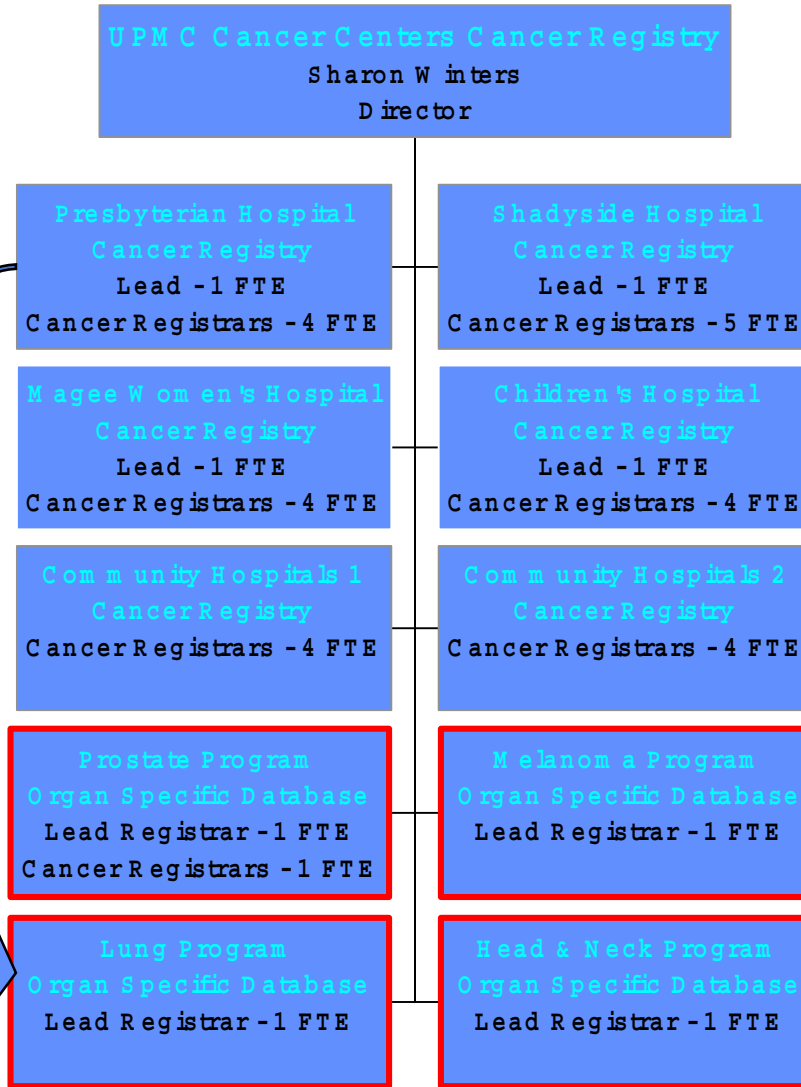


# UPMC Cancer Centers Registry Growth Through Research



**Before:**  
1 Director  
4 Leads  
25 Registrars  
Total FTE = 30

**Before:**  
Isolation  
Cost Center  
6-12 mos. lag



**After:**  
1 Director  
8 Leads  
26 Registrars  
Total FTE = 35  
Increase = 17 %

**Benefits:**  
Better Visibility  
Career Ladder  
New Funding  
Coordination  
Better Care  
Delivery



Slide 36

Benedum Oncology Informatics Center / Center for Pathology Informatics





# Outline



- Introduction to Oncology & Pathology Informatics Research at Hillman Cancer Center
- Linkages Between Pathology and Cancer Registries
- Research Use of Pathology Data and Cancer Registries
  - Comprehensive Prostate Cancer Tissue Resource (CPCTR) and Tissue Bank Information Systems [Clinical, Pathology & Cancer Registry Data]
  - The Shared Pathology Informatics Network (SPIN) - Cancer Registry and Anatomic Pathology Data
- Conclusions
- Future Directions – The Need for Electronic Communication Strategies



Slide 37

Benedum Oncology Informatics Center / Center for Pathology Informatics







# The Need for Electronic Communication Strategies



- Cancer Registry software companies need to be able to use HL7
  - ImPath (formerly MRS) looking for alpha partners...little action to date
  - Cnet, RMS, Others ???
  - City of Hope Initiative to link Clinical Trials & NCCN Outcomes is very important
- Anatomic Pathology LIS Companies need to message to Cancer Registries
  - CoPath (Cerner formerly DHTI) has a forms based relational data mapping tool (called synoptic reports)
    - » To transform free text into coded data that can be searched, mined
  - Critical Needs:
    - » Data Warehouse and Data Mining Tools Based on Minimal Essential Data Elements
    - » Linkage of imaging data to textual data (beyond the scope of this lecture), but visit [APIII](#) (see subsequent slide)
- Clinical Trials, Outcomes Research and Bioinformatics Initiatives will supply the funding for doubling your Cancer Registry staff.



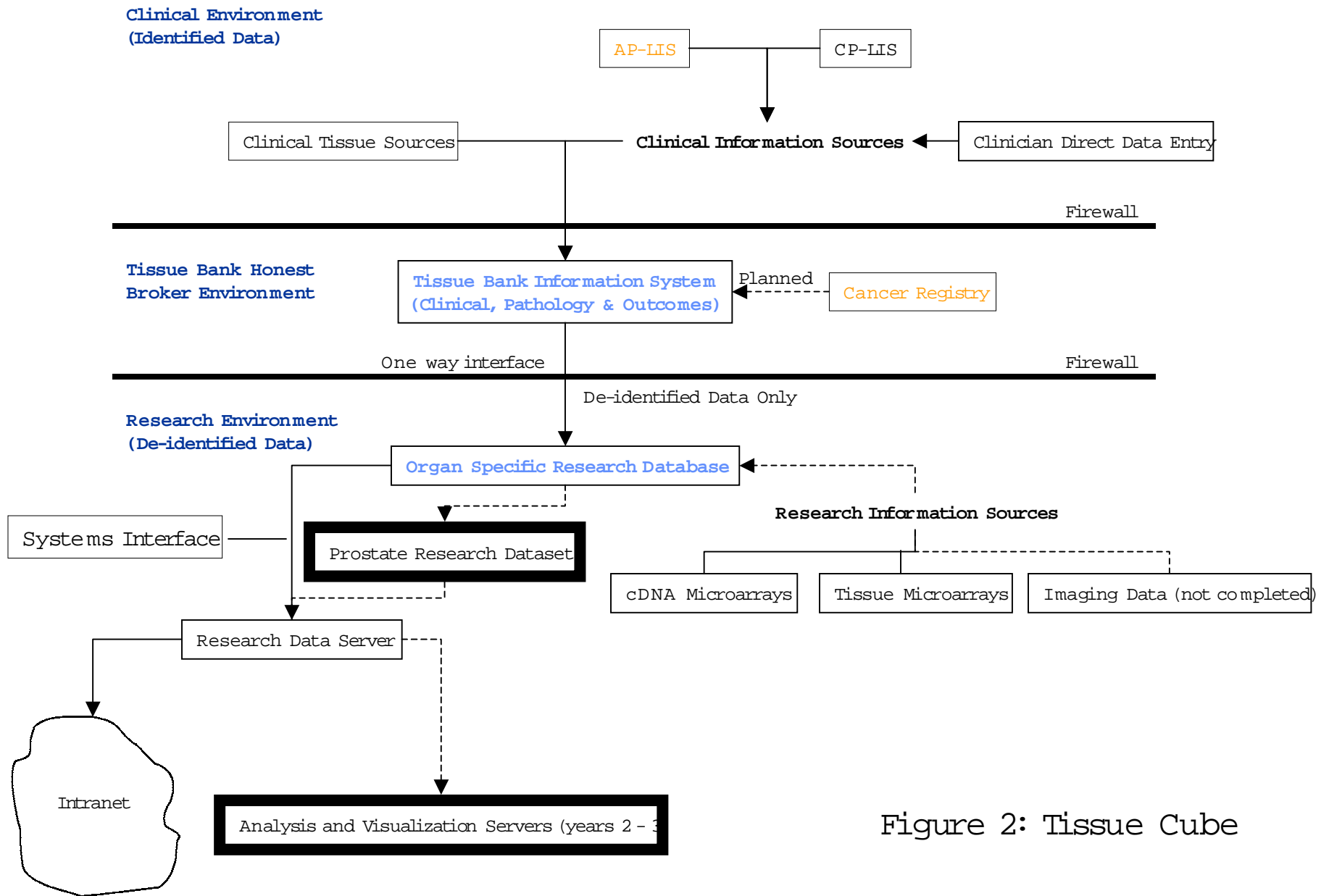
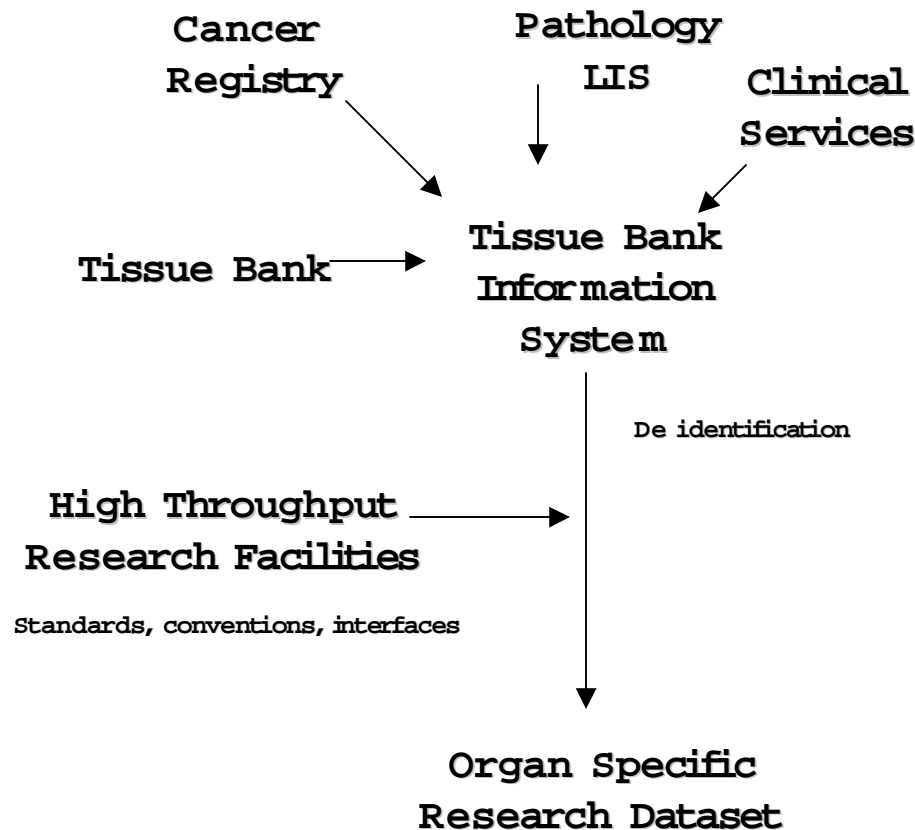


Figure 2: Tissue Cube



- It is increasingly clear that high throughput research facilities will become operationalized and therefore should be able to provide very useful data to this system
- Facilities include Affymetrix Facility, Tissue Microarray, High Throughput Imaging
- These facilities will likely be power users of the OSRD
- Clinical investigators may also want to include their own data elements.



# Association for Pathology Informatics

<http://www.pathologyinformatics.org>



## Officers:

- President - Mike Becich
- President Elect - Bruce Friedman
- VP - Ron Weinstein
- Secy/Treasurer - Joel Saltz
- Membership - Mark Tuthill

## Mission:

- Support research, education, scientific meetings through electronic and printed communications.
- Develop standards for reporting, transferring, storing, and merging confidential and other pathology-related information.
- Play active role in legal, ethical, social, regulatory, and governmental issues related to pathology informatics.
- Develop relationships with other professional societies and industry partners.



Mission Statement

Bylaws

Charter Officers

Committees

Membership

Join Us

Publication

Meeting & Events

Related Links

Contact Us

Welcome to

Association for Pathology Informatics (API)

### Mission Statement

The Mission of the Association for Pathology Informatics (API) is to promote the field of pathology informatics as an academic and a clinical subspecialty of pathology.

#### Definition:

Pathology Informatics involves collecting, examining, reporting, and storing large complex sets of data derived from tests performed in clinical laboratories, anatomic pathology laboratories, or research laboratories in order to improve patient care and enhance our understanding of disease-related processes. Pathology Informaticians seek to:

- continuously improve existing laboratory information technology and enhance the value of existing laboratory test data, and
- develop computational algorithms and models aimed at deriving clinical value from new data sources.

#### Specific Aims:

The data sets used in pathology informatics include clinical tests, anatomic pathology reports, image files, telepathology data, and large scale experiments including gene, proteomic and tissue array studies. The Association will support advances in the field of Pathology Informatics through research, education, scientific meetings, and through electronic and printed communications. The Association will develop standards for reporting, transferring, storing, and merging confidential and other pathology-related information. The Association will play an active role in legal, ethical, social, regulatory, and governmental issues related to pathology informatics, and this will also seek to develop relationships with other professional societies and industry partners that share similar interests and goals.

#### Latest Updates

API Membership  
Application Form  
(in PDF Format)



Slide 41

Benedum Oncology Informatics Center / Center for Pathology Informatics





<http://apiii.upmc.edu>

27 Scientific Abstracts-Peer Reviewed 50  
Electronic Posters - Live Demos  
Published in Arch Pathol Lab Med



This Year's Meeting (October 2-4th, 2002)

will have focus sessions discussing:

- Leveraging the Value of AP Data Warehousing
- The Role of Pathology in the Post-Genome Era -  
Tissue and cDNA Microarrays in Diagnostics
- Recent Advances in Pathology Informatics -  
Wireless/Handhelds in Pathology Practice
- New Opportunities for Academic Pathology -  
Tissue Banking and Bioinformatics
- Confidentiality, HIPAA and Post-Genome Era  
Breakout Sessions will include:
  - War Stories -Handheld/ Wireless Devices
  - Telepathology/Reporting on the W W W
  - Cost Effectiveness and Outcomes Research
  - Virtual Glass Slide and Robotic Technology
  - New Career Opportunities in Pathology
  - "Boot Camp" for Residents including a  
Pathology Informatics Training Track

Featuring: (Courtesy Cisco, Compaq, Dell and Verizon)  
**OC3 Backbone and 100 Networked Devices**



1996- 2002 APIII site 3.5 M Hits & 375,000 Users

Slide 42

Benedum Oncology Informatics Center / Center for Pathology Informatics

The Fifth Annual Conference

## Advancing Pathology Informatics, Imaging, and the Internet

Previous APIII Sites and Links

### Programs

**UPDATED** Deadline for hotel reservations at the Marriott was October 5, 2000  
After October 5, call the [Westin William Penn](#) at 1-800-937-8461.  
Mention you are attending APIII to receive the reduced rate of \$107 per night plus tax.

APIII 2000  
SCHEDULE OF EVENTS

**TUESDAY, OCTOBER 24**

- 12:00pm - **Pre-conference Setup Workshop**

**WEDNESDAY, OCTOBER 25 (Full Schedule)**

- 09:00am - **Pre-conference Setup Workshop**
- 09:00am - **APIII Boot Camp** **UPDATED**
- FULL - CLOSED TO REGISTRATION AS OF 10/02/00**
- 02:00pm - **City Tour** **NEW**
- 05:30pm - Registration Opens
- 05:30pm - Preconference Mixer and Pizza Party
- 07:00pm - **Association for Pathology Informatics (API) Membership Meeting** **NEW**

**THURSDAY, OCTOBER 26 (Full Schedule)**

- 07:00am - Registration and continental breakfast
- 08:00am - Scientific sessions and breakout sessions
- 11:30am - Lunch, exhibitor displays and e-poster presentations
- 01:30pm - **CAP Today/CAP Focus Session**
- Leveraging Pathology Information in the New Age of Medicine**
- 04:45pm - Adjournment
- 05:00pm - **Exhibitor Workshop**
- 06:30pm - Buses leave for Carnegie Science Center
- 07:00pm - Carnegie Science Center: dinner and a movie - **"Alaska"**
- 09:30am - Buses leave Carnegie Science Center for Marriott City Center





## Recent Publications by our Team in the Areas of Tissue Banking and Prostate Genomics



- Becich, M.J. The role of the Pathologist as tissue refiner and data miner: The impact of functional genomics on the modern pathology laboratory and the critical roles of Pathology Informatics and Bioinformatics. *Molec Diag.* 5(4):287-299, 2000.
- Landman A, Yagi Y, Gilbertson J, Dawson R, Marchevsky A, Becich M.J. Prototype web-based continuing medical education using FlashPix images. *Proc AMIA Symp.* 2000; 462-6.
- Yu, Y.P.; Lin, F.; Dhir, R.; Krill, D.; Becich, M.J.; Luo, J.H. Linear Amplification of Gene-Specific cDNA ends to Isolate Full-length of a cDNA. *Anal Biochem.* May 15;292(2):297-301, 2001.
- Yu, Y.P.; Lin, F.; Bisceglia, M.; Krill, D.; Dhir, R.; Becich, M.; Luo, J-H. Short Communication: Identification of a novel gene with increasing rate of suppression in high grade prostate cancers. *Am J Pathol* Jan;158(1):19-24, 2001.
- Krill, D., Thomas, A., Wu, S-P., Dhir, R., Becich, M.J. E-cadherin expression and PSZ secretion in human prostate epithelial cells. *Urol Res.* Aug 29(4):287-92; 2001.
- Krill, D.; DeFlavia P.; Dhir, R.; Luo, J.; Becich, M.J.; Lehman, E.; Getzenberg, R. Expression patterns of Vitamin D Receptor in Human Prostate. *J Cell Biochem.* 82(4):566-72, 2001.
- Lin, F.; Yu, Y.P.; Woods, J.; Cieply, K.; Gooding, W, I Finkelstein, P.; Dhir, R.; Krill, D.; Becich, M.J.; Michalopoulos, G.; Finkelstein S.; Luo, J.H. Myopodin, a novel synaptopodin homologue, is frequently deleted in invasive prostate cancers. *Am. J. Pathol*, Nov; 159(5):1603-12, 2001.
- Luo, J.H.; Yu, Y.P.; Cieply, K.; Lin, F.; DeFlavia, P.; Dhir, R.; Finkelstein, S.; Michalopoulos, G.; Becich, M.J.. Gene Expression Analysis of Prostate Cancers. *Mol. Carcinog*, Jan;33(1): 25-35 2002.
- Zheng. L., Wetzel, A., Gilbertson, J., Becich, M.J.; Design and Analysis of a Content-Based Pathology Image Retrieval System, *IEEE* January 3, 2002
- Schubert, E., Gross, W., Gilbertson, J., Harrison, J., Becich, M.J. Anatomic Pathology Laboratory Information Systems. (in press, *Mod Surg Pathol*)
- Becich, M.J. Information Management: Moving from Test Results to Clinical Information. 2000. *Clinical Lab Management Review* (in press).



Slide 43

Benedum Oncology Informatics Center / Center for Pathology Informatics







**End of Talk – e-mail me at [becich@pitt.edu](mailto:becich@pitt.edu) if you have questions/clarifications not covered in the discussion.**

**Thank you for the invitation to this NAACCR  
Cancer Informatics Symposium.**

Slide 44

**Benedum Oncology Informatics Center / Center for Pathology Informatics**

