

**RESOURCES FOR POPULATION-BASED
RESEARCH ON RARE CANCERS:
NCI SEER
RESIDUAL TISSUE REPOSITORY**

Marsha E. Reichman, Ph.D.
Acting Chief, Cancer Statistics Branch
SRP, DCCPS
May 10, 2007

SEER Residual Tissue Repository

- Describe Residual Tissue Repository Program
- History
- Advantages and Limitations
- Local Projects at Participating SEER Registries
- Joint Projects

SEER Residual Tissue Repository

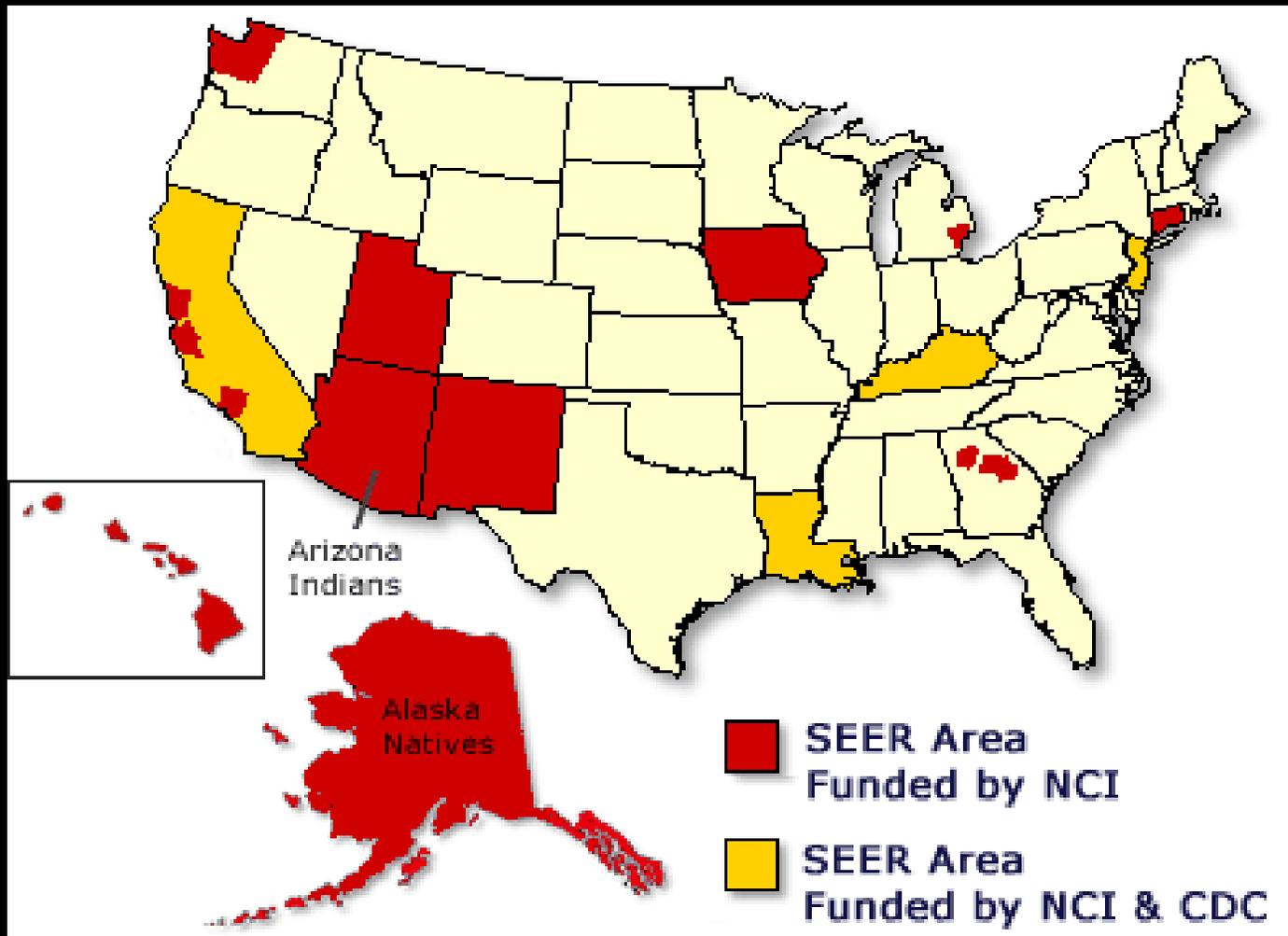
- Rationale: “Rescue” specimens associated with cancer cases in SEER Registries
- Participants:
 - Iowa
 - Los Angeles / USC
 - Hawaii

SEER Residual Tissue Repository Participating Investigators

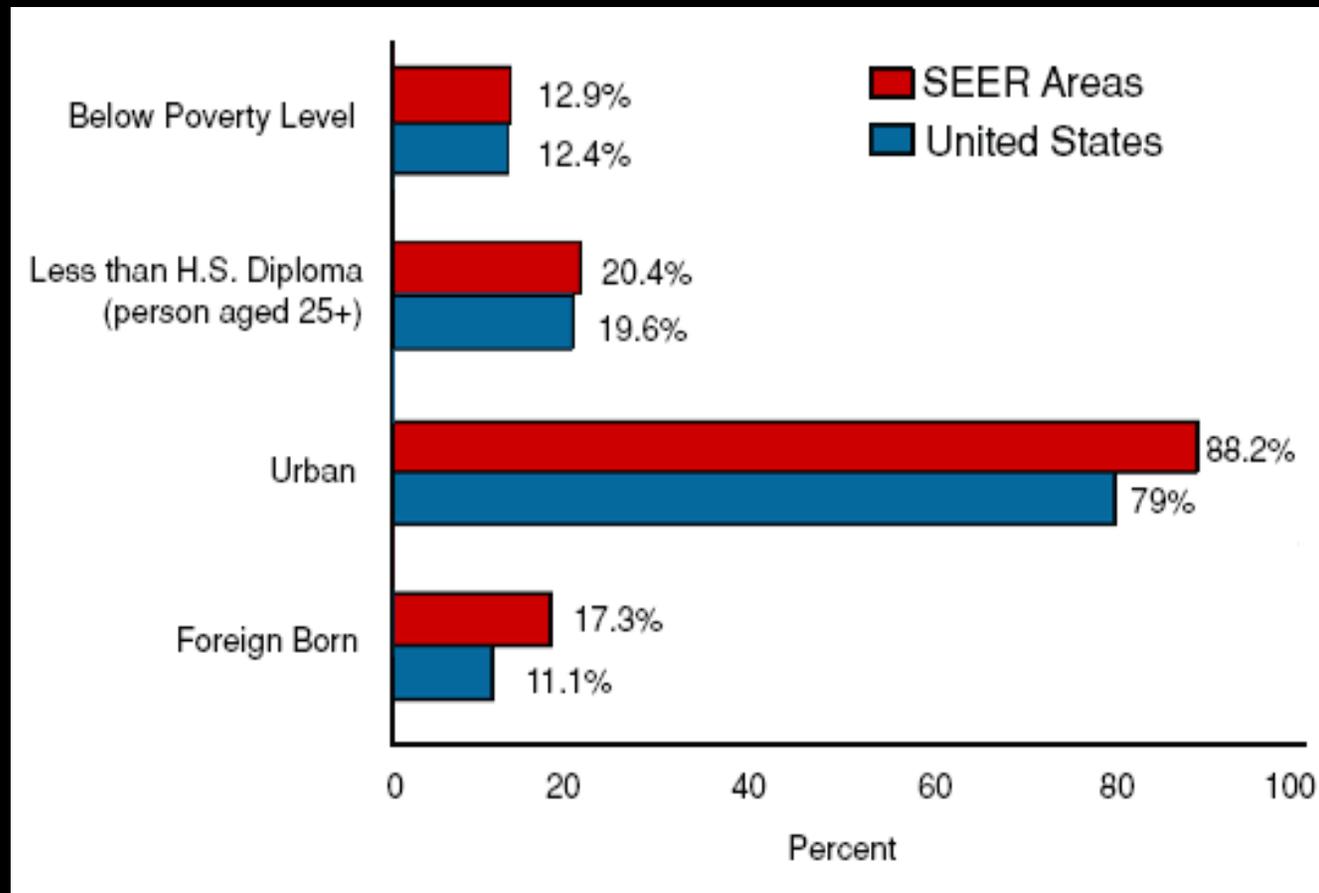
- Iowa
 - Charles Lynch, Harvey Diehl,
- Los Angeles
 - Wendy Cozen, Maria Sibug-Saber, Myles Cockburn
- Hawaii
 - Brenda Hernandez, Marc Goodman, Michael Green,
Catherine Ganderson, Hugh Luk
- NCI/SEER
 - Marsha Reichman, Marie-joseph Horner

US Cancer Registries

SEER 9: 1975-2002 (10% pop)
SEER 13: 1992-2002 (14% pop)
SEER 17: 2000-2002 (26% pop)



Characteristics of the SEER Population Compared with the Total United States Population



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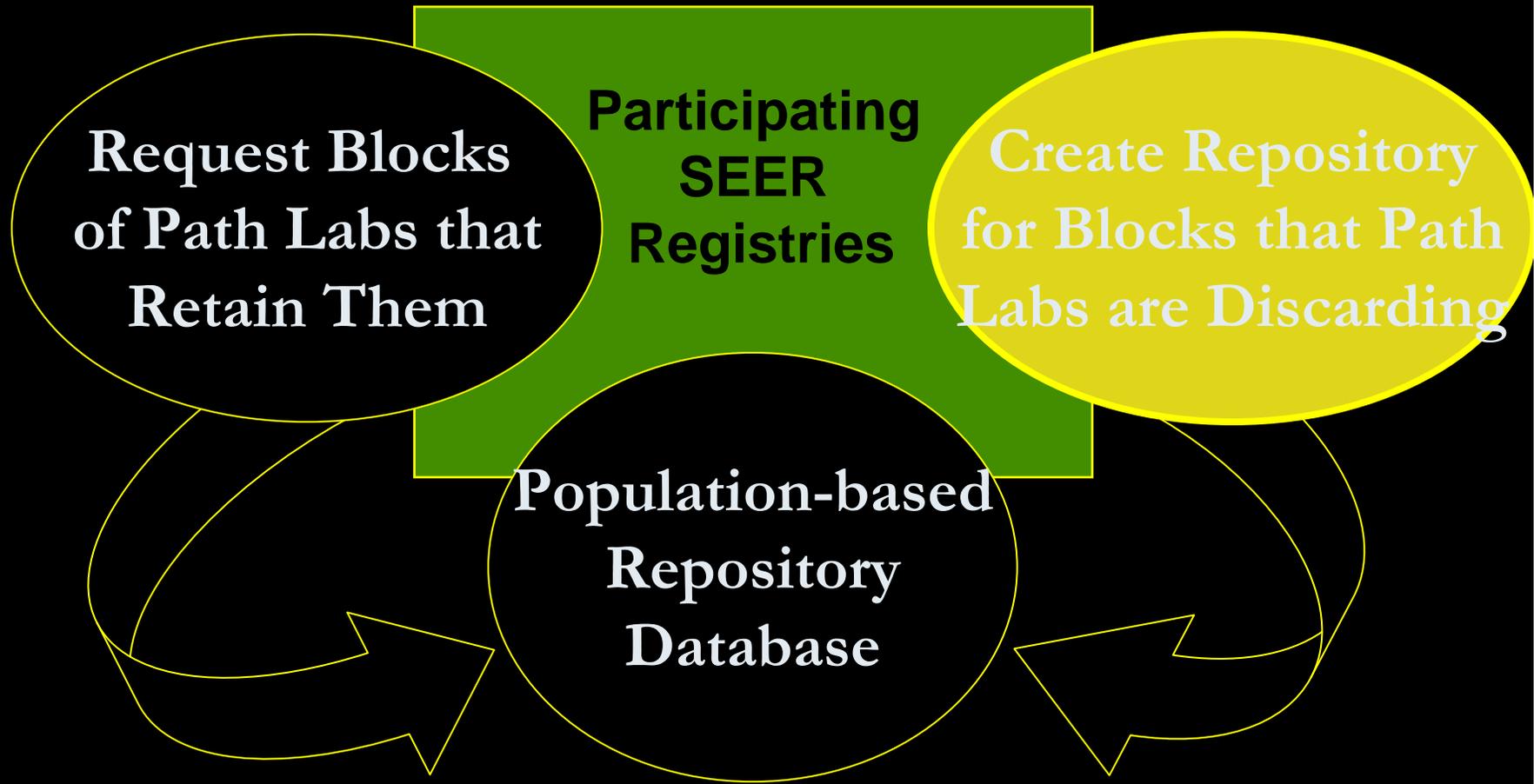
RESIDUAL VS VIRTUAL REPOSITORY

- **Virtual repository**
 - Specimens housed at pathology facilities
 - Essentially all SEER registries have virtual tissue repositories
 - Specimens obtained for use in special studies
- **Residual repository**
 - Specimens housed by participating SEER registries
 - SEER registries in Iowa, Hawaii, Los Angeles
 - In many cases residual tissue repository specimens can be used without further permissions as long as they are deidentified



Residual Tissue Repository

Research using Archival (paraffin) Tissue Blocks



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BENEFITS AND ADVANTAGES

- Population-Based Nature of Specimens
- Wealth of SEER Data on Each Cancer
- Diversity of Registries
- Long History of SEER Registries

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Population-Based Nature of Specimens

- Evaluate representativeness of available specimens
- Determine any biases in selection of specimens and evaluate importance of biases
- Potential to obtain approximations to population distributions of biomarkers
- Particularly valuable for validation studies

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Wealth of SEER Data on Each Cancer

- Demographic
- Tumor Characteristics
- Limited Treatment Data
- Ecological SES Data
- Outcome Data - Survival
- Possibility of Updating Survival

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Diversity of Registries

- Race/Ethnicity
- Geographic, urban/rural

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Long History of SEER Registries

- Trends
- Correlations with Other Data Sources over Time
- Accumulate Larger Numbers of Rare Cancers

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HISTORY

Initial Survey (approx 1999-2000, all SEER registries)

- Determine interest and provide capability estimate

Popblocks Pilot (2000 – 2002, 4 registries)

Residual Tissue Repository funded at three SEER registries

(July, 2003)

- Hawaii
- Los Angeles
- Iowa

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HISTORY

Popblocks Pilot:

- Relationships with pathology facilities enabling periodic collection of specimens otherwise to be discarded
- Pathologist performing quality control, evaluation of specimens, liaison functions, and selection of specimens for specific research projects
- Physical capacity to store specimens
- Database to maintain repository information and ability to link repository data to registry database
- Logistics system for periodically contacting pathology facilities, and for collecting and sorting tissue blocks
- Demonstrated ability to collect and manage specimens (report numbers for various cancer sites)
- Demonstrated use of specimens in research projects

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STATUS TO DATE

Hawai'i

- Production of tissue microarrays (TMA) for colorectal cancer and breast cancer
- Soy consumption and breast tissue proliferation
- Germ cell tumor project
- CK20 and CK7 protein expression in colorectal cancer (TMA)

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STATUS TO DATE

Iowa

- Epidemiology of cancer in a cohort of older women – candidate genes for breast cancer
- Epstein Barr virus and post-menopausal breast cancer
- Obesity and renal cell carcinoma
- Molecular epidemiology of colorectal cancer subjects

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STATUS TO DATE

Los Angeles

- Production of melanoma tissue microarray
- Differential Wnt5a expression: potential prognostic indicator and future screening tool for ident. of high risk melanoma
- LA county germ cell tumor and tissue bank resource at USC
- Genomic analysis of prostate cancer
- Identification and detection of somatic mutations in breast cancer tumors
- Causes of testicular cancer and cryptorchidism

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Population Based Molecular Portrait of Breast Cancers

- **Examines molecular subtypes through gene expression profiling**
- **Hawai'i (HTR) breast cancer TMA**
- **Imputation methodology to assign values to all HTR cases.**

Acknowledgements

- NCI/DCEG & DCCPS:
 - W Anderson, M Sherman, N Chatterjee, S Luo, M Reichman
- Hawaii SEER Tumor Registry:
 - M Goodman, B Hernandez, H Luk, M Green
- IMS:
 - W Ricker
- Hartford Hospital:
 - R Cartun
- UNC:
 - C Perou

Algorithm for Molecular Subtypes of Breast Cancer According to IHC Staining

Signature	ER	PR	HER2	HER1(EGFR)	CK5+
Luminal A	Positive	Positive	Negative	Any	Any
Luminal B	Positive	Positive	Positive	Any	Any
HER2+	Negative	Negative	Positive	Any	Any
Basal	Negative	Negative	Negative	positive	Positive

Hawaii SEER Tumor Registry Breast Tissue Microarray (TMA), 357 out of 697 cases dx'ed in 1995

- University of Virginia
- Each case has a maximum of 4 tissue cores (0.6 mm in diameter)
- Complete breast cancer TMAs set n=1428 cores (357 X 4) on four microscopic slides
- TMA cases are identified with a TMA map

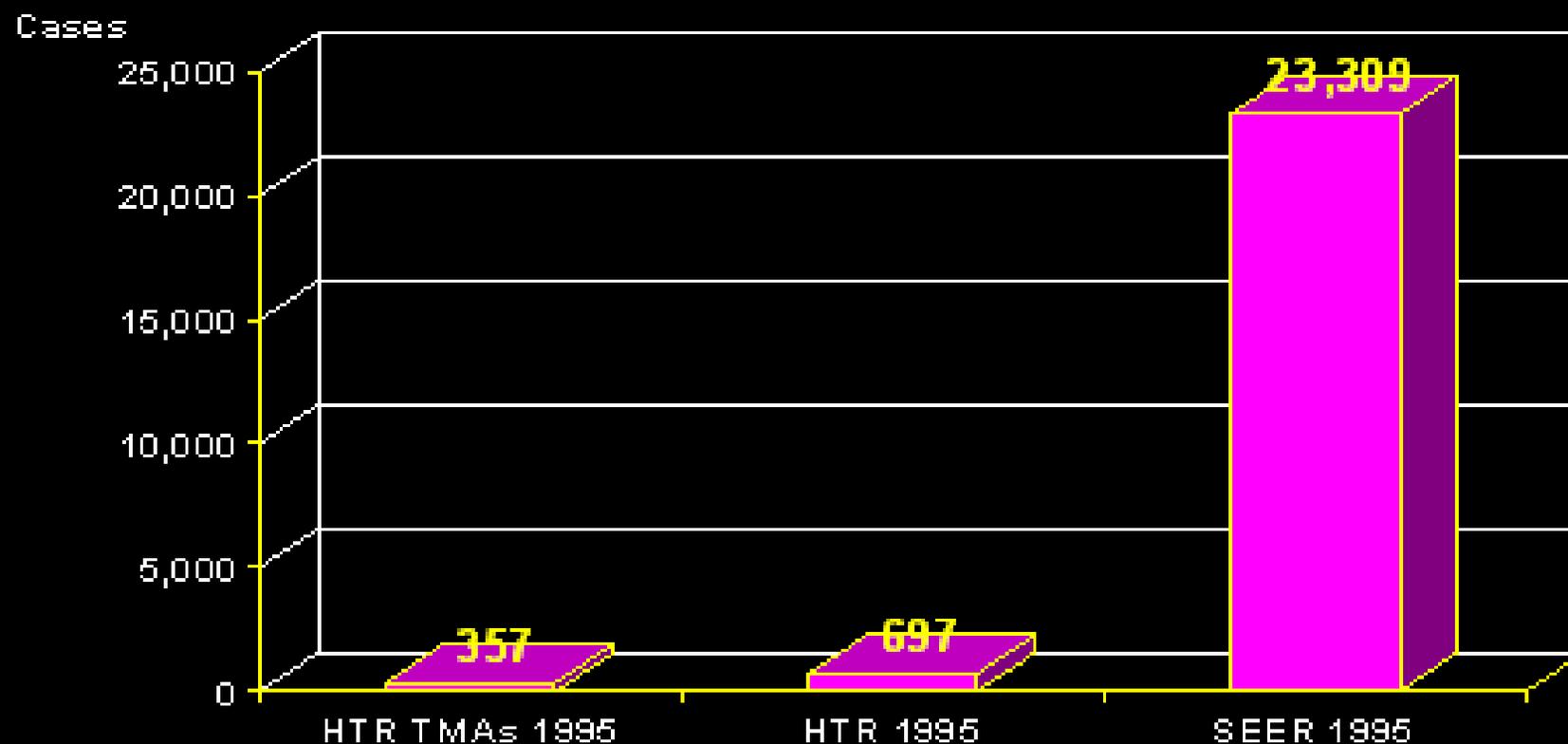


Table 3
Microarray Name: UHBR2005-1

SLICE #1	KEY	CoreID	Missing Tissue	No Tissue																							
X	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
Y mm	0	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	8.8	9.6	10.4	11.2	12.0	12.8	13.6	14.4	15.2	16.0	16.8	17.6	18.4	19.2	20.0	
1 0.8																											
2 1.6	A1480	A1480	A1480	A1483	A2363	A2366	A2369	A2366	A1903	A1825	A1903	A1803	A2729	A2730	A2729	A2728	A2730	A2728	A2729								
3 2.4	A863	A866	A863	A862	A2183	A2180	A2180	A2186	A2849	A2845	A2849	A2849	A2872	A2870	A2873												
4 3.2	A2396	A2396	A2396	A2392	A2392	A2396	A2396	A2396	A2873	A2873	A2873	A2873	A4190														
5 4.0	A1480	A1900	A1900	A1803	A870	A870	A870	A870	A1530	A1430	A1430	A1430	A1190														
6 4.8	A1153	A1100	A1100	A1100	A4283	A4280	A4280	A4280	A1590	A1950	A1590	A1590	A4293														
7 5.6	A2236	A2236	A2236	A2233	A700	A700	A700	A700	A1580	A1830	A1580	A1830	A2800														
8 6.4	A2800	A2800	A2800	A2803	A1163	A1180	A1180	A1180	A4400	A4400	A4400	A4400	A2800														
9 7.2																											
10 8.0																											
11 8.8																											
12 9.6	A2850	A2860	A2860	A2863	A1900	A1890	A1900	A1890	A2870																		
13 10.4	A2270	A2270	A2270	A2270	A2843	A2840	A2840	A2840	A2870	A2870	A2870	A2870	A1980														
14 11.2	A1710	A1710	A1710	A1710	A2803	A2800	A2800	A2800	A1580	A1850	A1580	A1850	A1143	A1140	A1143												
15 12.0	A1190	A1043	A1043	A1043					A2780	A2780	A2780	A2780															
16 12.8																											
17 13.6	A4270	A4270	A4270	A4270	A3470	A3470	A3470	A3470	A670	A670	A670	A670	A4300														
18 14.4	A1230	A1250	A1250	A1253	A2803	A2800																					
19 15.2	A3700	A3700	A3700	A3703	A2710	A2710	A2710	A2710	A1580	A1850	A1580	A1850	A4800														
20 16.0	A170	A170	A170	A170					A820	A820	A820	A820															
21 16.8																											
22 17.6	A80	A80	A80	A80	A2110	A2110	A2110	A2110	A1980	A1980	A1980	A1980	A4800														
23 18.4	A140	A190	A190	A190	A4283	A4280	A4280	A4280	A1480	A1480	A1480	A1480	A800														
24 19.2	A70	A70	A70	A70	A2870	A2870	A2870	A2870	A310	A210	A310	A210	A2740														
25 20.0																											
26 20.8																											
27 21.6	A1280	A1280	A1280	A1283	A3420	A3420	A3420	A3420	A1980	A1850	A1980	A1850	A1980														
28 22.4	A2130	A2130	A2130	A2133	A2870	A2870	A2870	A2870	A3170	A2170	A3170	A2170	A270	A570	A270												
29 23.2	A2800	A2800	A2800	A2803	A4220	A4220	A4220	A4220	A2800	A2800	A2800	A2800	A4800														
30 24.0	A2840	A2840	A2840	A2843	A2240	A2240	A2240	A2240	A2840	A2840	A2840	A2840	A800														
31 24.8																											
32 25.6																											
33 26.4																											
34 27.2																											
35 28.0																											
36 28.8																											
37 29.6																											
mm	0	0.8	1.6	2.4	3.2	4.0	4.8	5.6	6.4	7.2	8.0	8.8	9.6	10.4	11.2	12.0	12.8	13.6	14.4	15.2	16.0	16.8	17.6	18.4	19.2	20.0	



Invasive breast cancer cases: Hawaii Tumor Registry (HTR) TMA 1995; HTR 1995; SEER 13 areas 1995



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Joint Projects

- Emphasize tissue microarrays (TMAs)
- Procedures to address confidentiality (HIPAA), human subjects (IRB) and collaborative (MTA) issues
- Anticipate description of resource on web site and application process.
- Collaboration with Steven Hewitt of NCI TARP Lab to generate a pancreatic cancer TMA
- Considering other projects emphasizing validation studies

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Pancreatic Cancer Tissue Microarray

- Joint project pooling specimens from:
 - Hawaii, Iowa, Los Angeles
- Collaboration with NCI TARP Laboratory
 - Stephen Hewitt

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Pancreatic Cancer Tissue Microarray

Specimens from 163 Tumors:

- 77 pancreatic surgical resections
- 15 tumor in omentum at resection
- 3 tumor metastatic to gallbladder
- 3 tumor metastatic to skin
- 1 tumor metastatic to adrenal gland
- 15 tumor metastatic to liver
- 19 tumor metastatic to lymph nodes at resection or biopsy
- 6 tumor metastatic to omentum at diagnostic biopsy
- 24 pancreas biopsy

SEER Pancreatic Cancer Array

	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
mm	0.00	1.20	2.40	3.60	4.80	6.00	7.20	8.40	9.60	10.80	12.00	13.20	14.40	15.60	16.80	18.00	mm
0	0.00	Liver Core															0.00
1	1.20	2110000	2110002	2110003	2110004	2110005		3530088	3530100	2110024	2110034	2220097		2110063	2110095	2110102	1.20
2	2.40	2110006	2110008	2110009	2110011	2110013		2110048	2110055	2110079	2110158	2220022		2110107	2110157	2220031	2.40
3	3.60	2110014	2110016	2110018	2110020	2110021		2220105	3530000	3530002	3530008	3530018		2220037	2220038	3530024	3.60
4	4.80	2110022	2110023	2110025	2110030	2110040		3530026	3530031	3530057	3530072	3530074		3530032	3530035	3530075	4.80
5	6.00	2110043	2110053	2110060	2110062	2110064		2110052	2110057	2110059	2220011			3530077	3530091	3530101	6.00
6	7.20																7.20
7	8.40	2110065	2110068	2110070	2110080	2110082		2110010	2110027	2110041	2110047	2110130		Kidney	Muscle	Liver	8.40
8	9.60	2110087	2110091	2110092	2110093	2110098		2220018	2220017	2220071	2220102	3530005		Salivary Gland	Colon	Tonsil	9.60
9	10.80	2110099	2110101	2110103	2110104	2110110		3530085	3530089	3530079	3530089	3530093		Testis	Lung	Adrenal	10.80
10	12.00	2110111	2110112	2110113	2110114	2110115		2220039	3530013	3530034	3530083	2110069		esophagus	Skin	Prostate	12.00
11	13.20	2110116	2110117	2110118	2110131	2110163		2110174	3530039	3530042	3530086	3530087		Liver	Muscle	Kidney	13.20
12	14.40																14.40
13	15.60	2110184	2110188	2220002	2220004	2220008		2110028	2110049	2110084	2110106	2110123		2110009	2110024	2110039	15.60
14	16.80	2220009	2220014	2220023	2220025	2220034		2110126	2110148	2110154	2110155	2110169		2110052	2110064	210065	16.80
15	18.00	2220040	2220046	2220054	2220070	2220082		2110172	2110173	2220029	2220030	2220063		210067	2110098	2110105	18.00
16	19.20	2220089	2220090	2220098	2220103	3530003		2220066	2220075	2220092	2220096	3530038		2220002	2220096	2220090	19.20
17	20.40	3530038	3530037	3530060	3530062	3530062		3530090	3530092	3530094	3530096			3530014	3530015	3530100	20.40
18	21.60																21.60
mm	0.00	1.20	2.40	3.60	4.80	6.00	7.20	8.40	9.60	10.80	12.00	13.20	14.40	15.60	16.80	18.00	mm

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Contact Information

Marsha E. Reichman

ReichmaM@mail.nih.gov