



THE UNIVERSITY OF ARIZONA
Cancer Center

a Comprehensive Cancer Center designated by the National Cancer Institute



2016
**SHARED
RESOURCES**



CONTENTS

University of Arizona Cancer Center Shared Resources

| | |
|--|----|
| Analytical Chemistry | 4 |
| Behavioral Measurement | 6 |
| Bioinformatics | 8 |
| Biostatistics | 10 |
| Cancer Imaging | 11 |
| Centralized Cancer Clinical Trials Unit (C3) | 13 |
| Experimental Mouse | 15 |
| Flow Cytometry | 17 |
| Genomics | 19 |
| Proteomics | 21 |
| Tissue Acquisition and Cellular/Molecular Analysis | 23 |

Dear Colleague:

The University of Arizona Cancer Center wants to ensure that researchers have the full range of services needed to pursue promising areas of discovery to prevent and cure cancer. We are committed to supporting them with the latest technologies and expertise.

We are pleased to provide you with this overview of UACC-supported Shared Resources. It is our hope that this booklet will provide an orientation to the services available to UACC researchers and information about how to access them.

Sincerely,

Andrew S. Kraft, MD
Director, University of Arizona Cancer Center



ANALYTICAL CHEMISTRY

Co-Director: H-H. Sherry Chow, PhD
520-626-3358 • schow@email.arizona.edu

Senior Research Specialist: Wade Chew
520-626-2331 • wchew@email.arizona.edu

Location: Room 4965, University of Arizona Cancer Center

Website: <http://uacc.arizona.edu/research/shared-resources/acsr>

Description: The Analytical Chemistry Shared Resource (ACSR) provides Cancer Center investigators with centralized resources and expertise in performing analytical chemistry assays for small molecules and pharmacokinetic and pharmacodynamic data analysis and interpretation.

Services:

- Development, validation, and implementation of bioanalytical assays for quantification of cancer therapeutic and preventive agents, nutrients, carcinogens, endogenous biochemicals, and imaging agents in biospecimens
- Performance of quantitative and qualitative analysis of cancer therapeutic and preventive agents, nutrients, carcinogens, endogenous biochemicals, and imaging agents in support of clinical, translational, and basic research projects
- Consultation on pharmacokinetic study design and PK and PD data analysis and interpretation
- Performance of targeted metabolomic analysis and untargeted metabolomic profiling

The services provided by ACSR allow for measurement of the concentrations of cancer therapeutic and preventive agents, nutrients, and carcinogens for the assessment of drug/nutrient/carcinogen exposure and disposition. The services also support measurement of endogenous biochemicals as surrogate cancer-risk biomarkers and endpoint biomarkers to assess the effects of interventions. These services have supported preclinical and clinical evaluation of cancer therapeutic drugs and preventive interventions; assessment of biological, environmental, and lifestyle factors associated with cancer risk, morbidity, and mortality; and identification of potential targets for intervention.

Equipment/Instruments: State-of-the-art equipment and sophisticated analytical chemistry techniques are provided by the ACSR to cover a broad variety of needs. Personnel are trained experts in the operation and maintenance of this equipment. They have the expertise to develop and optimize the appropriate methods. Available equipment includes:

- Liquid Chromatography-Triple Quadrupole Mass Spectrometry (HPLC-MS)
- Gas Chromatography-Mass Spectrometry (GC-MS)
- Atomic Absorption Spectrophotometry (AAS)
- Ultra Performance Liquid Chromatography – Quadrupole/Time of Flight Mass Spectrometry (UPLC-QTOF)

Prices: Refer to the website or call 520-626-2331.

BEHAVIORAL MEASUREMENT AND INTERVENTIONS

Co-Director: Cynthia Thomson, PhD, RDN
520-626-1565 • cthomson@email.arizona.edu

Co-Director: Lois J. Loescher, PhD, RN, FAAN
520-626-6169 • loescher@email.arizona.edu

Coordinator: Angela Yung, RDN
520-626-8316 • ayung@email.arizona.edu

Location: 3950 S. Country Club Rd., Suite 330, Tucson

Website: [www.http://uacc.arizona.edu/research/shared-resources/bmsr](http://uacc.arizona.edu/research/shared-resources/bmsr)

Description: The Behavioral Measurement and Interventions Shared Resource (BMSR) has more than 25 years of experience as a national leader in providing support to researchers investigating human lifestyle behaviors associated with chronic disease risk such as:

- Diet
- Physical activity
- Tobacco exposure
- Quality of life
- Sun-safety
- Sexual practices
- Sleep

In addition, the Shared Resource provides expertise and resources for:

- Lifestyle coaching - Behavior change theory
- Anthropometric and body composition measurement
- Accelerometry
- Multimodal lifestyle behavior change support

The Shared Resource also develops EDCAP and QUALTRICS surveys for data capture and analysis.

Our services support bilingual (English and Spanish) questionnaires and assessments. Several of our behavioral questionnaires are designed for use in Southwestern populations.

Services:

- Consultation for behavioral research design, implementation, and assessment
- Validated questionnaires; questionnaire development and validation study design
- Web questionnaire programming and management
- Interviewer training
- Diet data collection (24-hour dietary recalls)
- Accelerometer data collection and analysis
- SMS messaging for behavioral interventions
- Body composition assessment
- Consultation on use of existing health-related quality-of-life measures
- Statistical summaries, analysis, and reports of behavioral assessment data
- Collaboration for peer-reviewed manuscripts and abstracts
- Database creation and management

The BMSR provides technical support for the use of the questionnaires, including optical scanning technology (including image archiving and intelligent character recognition), nutrition assessment software, and light pen entry system for developmental instruments.

The BMSR has ActiGraph Accelerometers/Actigraphy for the collection of physical activity and sleep measures. The accelerometers are small and provide a minimally invasive tool for direct measure of physical activity. BMSR also has the ActiGraph software tools to analyze activity data collected with the devices.

BMSR has software platforms in place to deliver lifestyle coaching to study participants. Coaches trained in diet, physical activity, and tobacco cessation behavior change are available to support research. Software platforms can be modified to meet individual study requirements in collaboration with the Arizona Research Laboratory.

Prices: Contact the BMSR Research Coordinator, 520-626-8316.

BIOINFORMATICS

Director: Ritu Pandey, PhD
520-626-0391 • ritu@email.arizona.edu

Location: Room 1939, University of Arizona Cancer Center

Website: <http://uacc.arizona.edu/research/shared-resources/bisr>

Description: Informatics involves management of clinical and/or molecular data sets, while Bioinformatics involves the analysis of high throughput sequence and molecular data for study of cancer genomes. The Bioinformatics Shared Resource (BISR) provides comprehensive analysis of genomic data to UACC members in support of their research. This contribution can result in short or long term projects, ranging from one day to many months, depending on the nature and extent of the support required.

The areas of expertise include biological sequence analysis, genome analysis, advanced computational analysis of large data sets such as expression, next-gene sequencing, single nucleotide polymorphism (SNPs) and proteomics data. BISR provides analysis of high dimensional data that use molecular arrays, DNA and RNA sequencing and mined biomedical clinical variables.

The Shared Resource provides all levels of support, from experimental design to analysis and publication of these data. The goal is to provide assistance with data analysis that will lead to testable hypotheses and fundamentally important discoveries in cancer research.

The BISR specializes in the biological interpretation of data that may lead to a new understanding of cancer biology, and the discovery of new diagnostic markers, risk genetic markers and drug targets. The staff is well prepared to perform all of these types of analysis.

Services:

- Analysis of genome data (e.g. gene expression, non-coding RNAs, CGH, RNAi screens, genome and sequence analysis), genetic data

(SNP analysis), proteomics, and other types of molecular data sets of cancer cells and tissues.

- Analysis of large cancer molecular datasets and clinical annotated datasets from NIH consortiums, medical institutions or public resources. NIH-TCGA (Cancer Genome Atlas) project, Cosmic (Catalogue of somatic mutations in Cancer), CCLE (Cancer Cell Line Encyclopedia), NIH LINCS project (Library of Network-based Cellular Signatures) and NCBI GEO datasets.
- Biological interpretation of the above data, including pathway and ontology analysis, systems analysis, genetic vulnerabilities for drug targeting, predictive patterns for outcome, and data modeling.
- Bioinformatics support for Cancer Center projects and other shared services in the form of molecular databases, genome databases, and data sharing tools

Prices: Refer to the website or contact the BISR, 520-626-0391.

BIostatISTICS

Director: Denise Roe, DrPH
520-626-2281 • droe@email.arizona.edu

Location: Room 1933, University of Arizona Cancer Center

Website: <http://aucc.arizona.edu/research/shared-resources/bsr>

Description: The Biostatistics Shared Resource (BSR) provides expertise in biostatistics, clinical trials, epidemiology, applied mathematics, statistical computing, and database applications.

BSR personnel have wide-ranging involvement across Cancer Center research activities, including clinical, translational, basic, and population-based research. Biostatistical collaboration and consultation have been provided for investigators in each of the Cancer Center Scientific Programs. The BSR is active in all phases of study design, operation, data management, statistical analysis, and manuscript preparation.

BSR ensures excellent and timely biostatistical support in the design and protocol development of laboratory, translational, clinical, and population-based anti-cancer research studies, and provides appropriate state-of-the-art statistical analysis, interpretation, and reporting. It supports UACC clinical trials by serving on the Scientific Review Committee and the UACC Data and Safety Monitoring Board.

Services:

- Clinical protocol development
- Statistical database applications
- Data analysis and reporting
- Statistical consultation and collaboration
- Statistical support for development of funding applications

Prices: Contact Angela Wakeham, 520-626-2077.

CANCER IMAGING

Director: Ron Lynch, PhD
520-626-2472 rlynch@u.arizona.edu

Co-Director: Andrew Rouse, PhD
520-626-5894 rouse@email.arizona.edu

Co-Director: Jean Philippe Galons, PhD
520-626-8719 jgalons@email.arizona.edu

Location: Room 111, Medical Research Building, 1656 E. Mabel St.

Website: <http://uacc.arizona.edu/research/shared-resources/cisr>

Description:

The Cancer Imaging Shared Resource (CISR) provides access to turnkey optical image acquisition and analysis technologies.

The CISR offers a developmental component to evaluate and initiate new research projects, and provides access to a range of small animal imaging approaches, including bioluminescence imaging (ISS Lago X), PET/SPECT, and microCT (Siemens) systems. An image analysis facility acts as a central clearinghouse to consolidate and standardize state-of-the-art image processing and analysis routines. The Core also provides experimental design and operator expertise for small animal cancer imaging and spectroscopy on a 7T Bruker magnet owned and maintained by the University of Arizona.

Services:

- Bioluminescence: Spectral Instruments Imaging Lago X
- Confocal microscopy: Leica SP5-II Resonance Scanning Confocal Microscope
- MicroCT imaging: Siemens Inveon
- Image analysis: Siemens MicroCT, Definiens, Custom Clinical MR on IDL

Equipment:

The LagoX Bioluminescence/Fluorescence Imaging System 14 excitation wavelengths (from 360-805 nm) and 20 emission filters (from 490-870 nm), with a field-of-view from 6x6 cm to 25x25 cm

Contact: Contact: Brenda Baggett, baggett@email.arizona.edu; or Craig Weber, 520-626-2499, cweber@email.arizona.edu

- Leica SP5-II resonant scanner confocal microscope (located in UACC room 0960)

Contact: Doug Cromey, MS, 626-2824, dcromey@email.arizona.edu;

- The Inveon microCT with a variable focus X-ray source

Contact: Brenda Baggett, baggett@email.arizona.edu; or Andy Rouse, rouse@email.arizona.edu

- Image Analysis Facility
- Definiens Tissue Studio ver 5.0, custom software development

Contact: JP Galons, PhD, 520-626-8719, jgalons@email.arizona.edu or Andy Rouse, rouse@email.arizona.edu

Prices: See website or contact individuals listed for each modality.

CENTRALIZED CANCER CLINICAL TRIALS OFFICE (CTO)

Medical Director: Dan Persky, MD
520-626-8908 • mpersky@uacc.arizona.edu

Administrative Director: Meredith Mullins, JD, MBA
520-626-3383 • mmullins@uacc.arizona.edu

Assistant Director: Chad Adams, MPH
520-694-9042 • cadams@uacc.arizona.edu

Location: Room 1922, University of Arizona Cancer Center

Website: <http://uacc.arizona.edu/research/shared-resources/centralized-cancer-clinical-trials-unit>

Description: The centralized cancer Clinical Trials Office (CTO) provides centralized infrastructure support for clinical trials conducted by the University of Arizona Cancer Center (UACC). CTO is synonymous with the Clinical Protocol and Data Management Program (CPDM) component of the UACC National Cancer Institute (NCI) Cancer Center Support Grant (CCSG).

CTO partners with UACC investigators to provide experienced and consistent human and material resources to support the institution's clinical research mission, while ensuring that clinical research is conducted in a safe and ethical manner in compliance with applicable rules and regulations.

The UACC CTO unit oversees institutionally sponsored, externally peer-reviewed, national group, and industry-sponsored clinical trials. The UACC is a member of several National Clinical Trial Network (NCTN) cooperative groups, including the Southwest Oncology Group (SWOG; full member), NRG Oncology (Breast Alliance, Radiation Therapy,

and Gynecologic oncology; affiliate member), and Children's Oncology Group (COG; full member). CTO serves members of all colleges, schools, or departments of the University of Arizona performing cancer-related clinical research.

Services:

- Investigator-Initiated Trial (IIT) development
- Data and Safety Monitoring Board (DSMB) administration
- Quality Assurance and Quality Control (QA/QC)
- Protocol Review and Monitoring System (PRMS) administration
- Budget management
- Regulatory activities
- Operations
- Clinical trial informatics
- Cooperative group administration

EXPERIMENTAL MOUSE

Co-Director: Natalia Ignatenko, PhD
THE RODENT EXPERIMENTATION UNIT
520-626-9017 • nai@email.arizona.edu

Co-Director: Thomas Doetschman, PhD
THE UACC GENETICALLY ENGINEERED MOUNSE PRODUCTION UNIT
520-626-4901 • tdoetsch@u.arizona.edu

Manager: Gillian Paine-Murrieta
520-626-7401 • gillian@email.arizona.edu

Location: Room 0948, University of Arizona Cancer Center

Genetically Engineered Mouse Models (GEMM), Room 231, BIO5 Institute, Keating Building, 1657 E Helen St.

Websites: <http://uacc.arizona.edu/research/shared-resources/emsr>
<http://gemmcore.bio5.org/>

Description:

The Experimental Mouse Shared Resource (EMSR) offers a continuum of services ranging from consultations about in vivo experimental approaches, Genetically Engineered Mouse (GEM) design, production and maintenance to mouse experimentation and data analysis. The EMSR enables the investigator to generate and use mouse models of human cancer to their fullest potential and take advantage of the extensive knowledge and expertise at competitive pricing.

The EMSR is a full-service facility, which performs preclinical experiments in a wide variety of in vivo and in vitro cancer models. The team provides

technical and scientific expertise in modeling of cancer disease and assists in developing efficient, cost effective, and clinically relevant drug therapies.

Services provided by the GEM Production Unit:

- Vector design and construction for both transgenic and gene-targeted mice
- Gene-targeting in ES cells,
- Screening for targeted ES cells,
- CRISPR/Cas9-based genome editing,
- Pronuclear and cytoplasmic zygote injections and blastocyst injection,
- Screening for founder, germline chimeric and genome edited mice, and breeding for speed congenics,
- Consultation on GEM colony management
- Sperm cryopreservation, IVF, and embryo rederivation

Prices: Refer to the website or call 520-626-4901.

Services provided by the RODENT EXPERIMENTATION UNIT:

- Animal techniques (drug testing, rodent acute toxicity and pharmacokinetics)
- Patient-derived xenograft (PDX models)
- Surgeries (orthotopic injections, ovariectomy, window chambers, etc.)
- Mouse colonies maintenance
- Cell culture
- Xenograft and GEM models tissue bank
- IACUC protocol support

Prices: Refer to the website or call 520-626-7401.

FLOW CYTOMETRY

Director: Amanda Baker, PharmD, PhD
520-626-0301 • abaker@uacc.arizona.edu

Manager: Paula Campbell
520-621-2047 • paulac@email.arizona.edu

Location: Room 0935, University of Arizona Cancer Center

Website: <http://uacc.arizona.edu/research/shared-resources/fcsr>

Description: Flow Cytometry is a powerful tool that measures the functional and structural characteristics of heterogeneous mixtures of cells and particles in suspension based on their ability to scatter light. The cell sorting function separates these cells physically into their different classes.

Researchers have the capability to analyze and sort cells by differences in physiology, metabolism, morphology, and other characteristics. The ability to distinguish different cell types is limited only by the ability to attach specific fluorescent markers to the cells.

The Flow Cytometry Shared Resource (FCSR) supports the research needs of all Cancer Center members by providing state-of-the-art instrumentation for data acquisition, analysis, and cell sorting, and the technical expertise to interpret results and develop methods. The Shared Resource offers information about new techniques and applications of flow cytometry through workshops and seminars, and provides training to interested facility users who wish to run their own samples. Individual consultation services are available to discuss the specifics of each project. The Shared Resource is operated and administered as a partnership between the UA Cancer Center and Arizona Research Laboratories.

Equipment:

- The FACScanto II (BD Biosciences, San Jose, CA) is an analyzer capable of acquiring and analyzing data from six fluorescence parameters and has two lasers: 488nm and 640nm.
- The FACSAria (BD Biosciences) is a cell sorter equipped with three lasers: 488nm, 407nm, and 633nm, and offers nine fluorescence detectors. The sorting function of this instrument enables the researcher to physically separate the individual cells and particles from a mixed population. Viable cells can be recovered for further study or culture.
- The LSRII (BD Biosciences) is an analyzer capable of acquiring and analyzing data from 16 fluorescence parameters and has five lasers: 355nm, 405nm, 488nm, 532nm, and 640nm.

Prices: Contact the manager (520-621-2074) or the University of Arizona-based Arizona Research Laboratories (ARL) business office (520-621-4064).

GENOMICS

Co-Director: Bernard Futscher, PhD
520-626-4646 • bfutscher@uacc.arizona.edu

Co-Director: Michael Hammer, MSc, PhD
520-626-0404 • mfh@email.arizona.edu

Technical Director: George Watts, PhD
520-626-4724 • gwatts@email.arizona.edu

Location: Room 3922, University of Arizona Cancer Center

Website: <http://uacc.arizona.edu/research/shared-resources/gsr>

Description: The Genomics Shared Resource (GSR) is co-sponsored by The UA Cancer Center and the Southwest Environmental Health Science Center. The Shared Resource serves members of the funding centers by providing genomics services based on microarray, next-generation sequencing, and polymerase chain reaction (PCR) technology platforms. Applications include transcriptome expression profiling, exome sequencing, re-sequencing panels, epigenetic analysis, and quantitative real time PCR applications.

As part of the commitment to providing high quality genomics service, the Shared Resource has qualified as a member of the Ion Torrent Certified Service Provider Program. The staff of the GSR has extensive experience working with nucleic acids and can assist researchers with nearly any experiment based on analysis of DNA or RNA. In addition to performing analyses, the GSR can assist with sample isolation, quality control, experimental design, and analysis.

Services:

- Sample quality control
- Experiment design and analysis

- Sequence analysis
- DNA analysis
- RNA expression
- RNA regulation

Equipment:

- Agilent Bioanalyzer/Nandrop
- Ion Torrent PGM and Proton Sequencers
- Affymetrix GeneChips
- Agilent Arrays
- Real-Time PCR and RT-PCR

Prices: Visit the GSR website of Contact the GSR, 520-626-4646.

PROTEOMICS

Director: George Tsaprailis, PhD
520-626-5461 • tsaprailis@pharmacy.arizona.edu

Location: Room 106, BIO5 Keating Bioresearch Building, 1657 E. Helen St.

Website: <http://uacc.arizona.edu/research/shared-resources/psr>

Description: The Proteomics Shared Resource (PSR) provides University of Arizona Cancer Center (UACC) investigators with a dedicated facility and expertise in analyzing proteins for their identity, quantity, and function via state-of-the art modern mass spectrometry and peripheral analytical instrumentation.

Services: A variety of gel-based and solution-based proteomics services are offered at competitive rates to UACC members.

- Gel electrophoresis (achieves separation of proteins in a gel matrix)
- Protein MW determination
- LC-MS/MS
- LC-LC-MS/MS
- Abundant protein depletion
- Protein purification
- Phosphopeptide enrichment (user provides necessary reagents)
- Biomolecular interactions by surface plasmon resonance
- Sample concentration and clean-up
- Aid with experimental design and data/results interpretation

Equipment: The latest mass spectrophotometers provide improved sensitivity and are listed below along with their analysis type and funding source. The available instrumentation provides good coverage of current proteomic standard technologies, including 20 a la carte services at competitive rates.

- LTQ Orbitrap Velos (Thermo); 2009 NIH NCRR HEI; Proxeon Nano-HPLC, ESI source (Advion), CID, ETD; Proteomic Profiling, PTM identification
- QTOF Premier (Waters); 2008 NIEHS and UA match; Waters Nano-HPLC, CID; label-free quantification, ion-accounting software
- 9.4t Apex FT-ICR (Bruker); 2008 NIH NCRR HEI; ESI, nano-ESI, MALDI; CID, ECD, IRMPD; high-resolution MS (available for use in CBC Mass Spectrometry Facility)
- Ultraflex III MALDI TOF-TOF (Bruker); 2008 NIH NCRR HEI; high-energy MS/MS, high-mass protein measurements (available for use in CBC Mass Spectrometry Facility)
- 4000 QTRAP (ABI); 2006 NIH NCRR SIG; HPLC, Advion nano-HPLC, nano-ESI source (Advion), CID; PTM, targeted quantification of peptides and metabolites via MRM/SRM capabilities
- LTQ (Thermo) 2006 Ventana Medical; nano-HPLC, CID; protein identification
- Biacore T100 SPR Biosensor; 2008 donation; molecular interactions
- Gel separation and analyses: 1D and 2D gel stations, Propic II Gel Imager, two digestion robots, two plate readers
- Off-line LC separation: AKTA FPLC; Michrom Paradigm LC

Prices: Refer to the website or call 520-626-4161.

TISSUE ACQUISITION AND CELLULAR/ MOLECULAR ANALYSIS

Director: Achyut Bhattacharyya, MD

520-626-6097 • abhattac@email.arizona.edu

Assoc. Director: Ghassan Mouneimne, PhD

520-626-4616 • gmouneimne@email.arizona.edu

Lab Manager: Doug Cromey, MS

520-626-2824 • dcromey@email.arizona.edu

Location: Room 0914, University of Arizona Cancer Center

Website: <http://azcc.arizona.edu/research/shared-resources/tacmasr>

Description: The Tissue Acquisition and Cellular/Molecular Analysis Shared Resource (TACMASR) provides technical support and pathology-related services to University of Arizona Cancer Center (UACC) and University of Arizona (UA) researchers on a fee-for-service basis. We strive to maximize research dollars through customized, cost-effective, and quality-controlled services.

The Shared Resource's director is a board-certified anatomic pathologist with many years of clinical and experimental research experience.

Services: TACMASR offers five primary types of services to UACC and UA research investigators:

- Biorepository - procurement, storage, clinical & pathological annotation, and retrieval of Cancer biorepository specimens as well as assistance with locating sample cohorts and access to other special collections.

- Histology - paraffin & frozen samples, routine & special stains, Tissue MicroArrays (TMA).
- Immunostaining - Immunohistochemistry (IHC), In Situ Hybridization (ISH) using validated antibody staining protocols on automated platforms.
- Pathology - experimental advice, quality control, and scoring.
- Microscopy - brightfield slide scanning, brightfield and widefield fluorescence microscopic image capture, Leica SP5 confocal microscope (with live cell imaging capabilities), as well as assistance in accessing and using other microscopy techniques on campus.

Key Equipment:

- DiscoveryXT – Allows for customizable staining parameters; stains up to 30 slides at a time with the same protocol; enables IHC and in situ hybridization.
- BenchmarkXT – For human tissue staining in FDA-approved protocols only.
- DiscoveryULTRA (purchased 12/2014) – Allows for customizable staining parameters; capable of running multiple independent procedures simultaneously; enables IHC, IFA, and in situ hybridization; able to perform multiplexing (more than one color stain per slide).

Additional Equipment:

- Leica SP5-II spectral confocal microscope (Leica Microsystems)
- iScan Coreo AU brightfield microscope slide scanner (now Ventana/Roche)
- Olympus BX50 upright microscope w/ DP72 color camera (Olympus America)
- Leica DMI6000B inverted microscope with Hamamatsu Flash 4.0 greyscale and DSP450 color cameras (Leica Microsystems)
- TIRF fluorescence microscope (Mouneimne Laboratory)
- XLight spinning disk confocal microscope (Mouneimne Laboratory)

Prices: Refer to the website or call 520-626-7319.





THE UNIVERSITY OF ARIZONA
Cancer Center

a Comprehensive Cancer Center designated by the National Cancer Institute