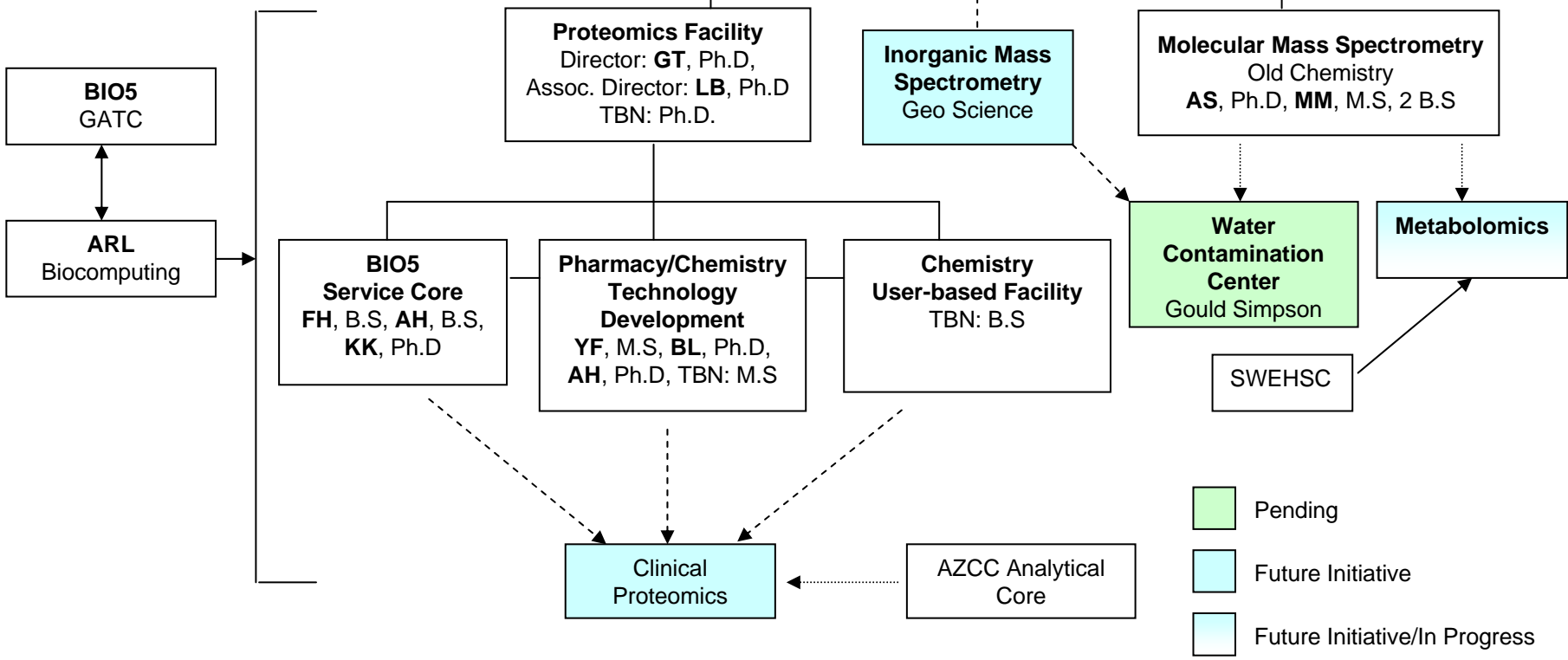




UA Mass Spectrometry Consortium
 Co-Directors: **S. Lau Ph.D** and **V. Wysocki Ph.D**
Sponsors: ARL, AZCC, BIO5, Chemistry, SWEHSC

Advisory Committee
 TB, Ph.D, GTB, Ph.D, KD, Ph.D, DG, Ph.D, DV, Ph.D

TM, Ph.D – Staff Engineer Senior



Resources and Services

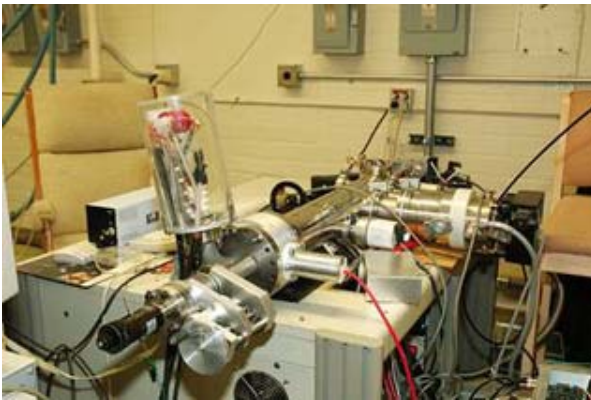


- LC-MS/MS and Mudpit (LC-LC-MS/MS) proteome profiling
- PTMs (SALSA, P-Mod, Xtandem)
- MALDI-TOF MS mapping
- 1D, 2D-SDS PAGE and DIGE Analysis
- LIMS & bioinformatics
- Technology Development & Instrument building



Technology Development

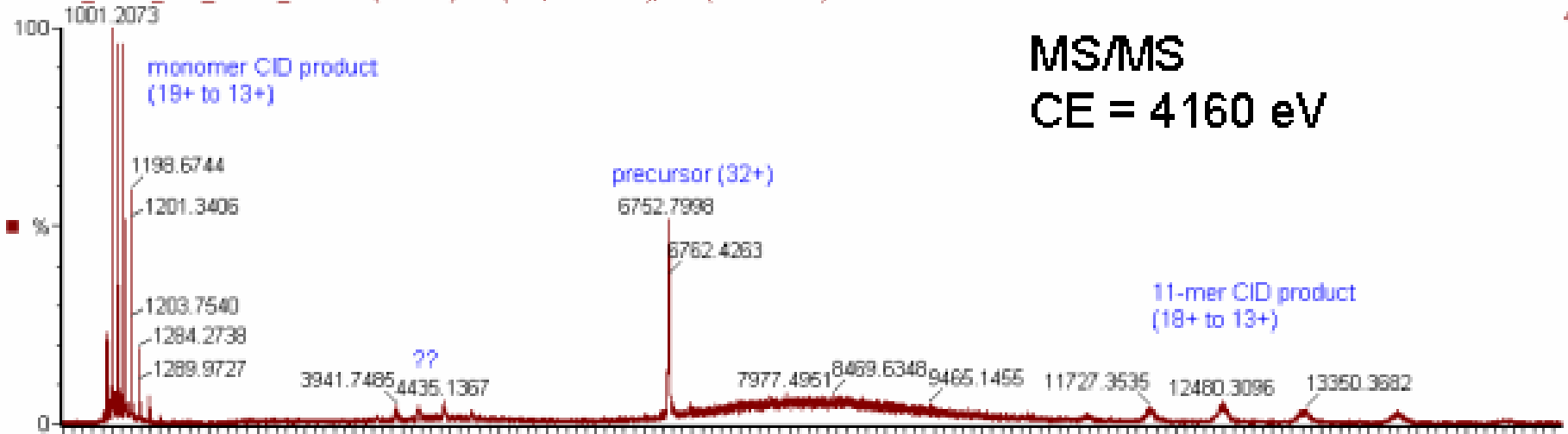
- Gas phase fragmentation; improve MS/MS sequencing algorithms
- Surface Induced Dissociation for whole protein complex characterization
- H/D exchange to probe peptide structure and protein-protein interactions
- Protein array development



051109_SHSP_181_MSMS_2 1184 (52.284) Sm (SG, 15x15.00); Cm (1044:1223)

TOF MSMS 6752.00ES+
44.1

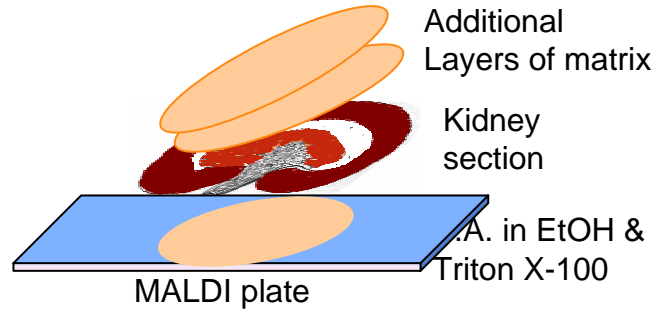
MS/MS
CE = 4160 eV



Tissue preparation & image acquisition



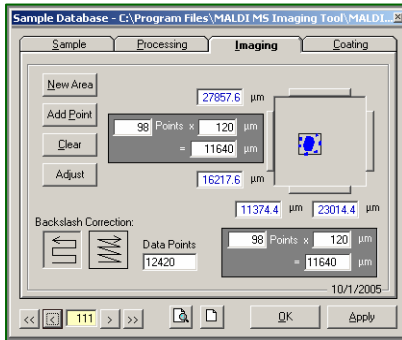
1. A Leica CM 1480 cryostat was used to cut 14 μ m sections from snap frozen tissue.



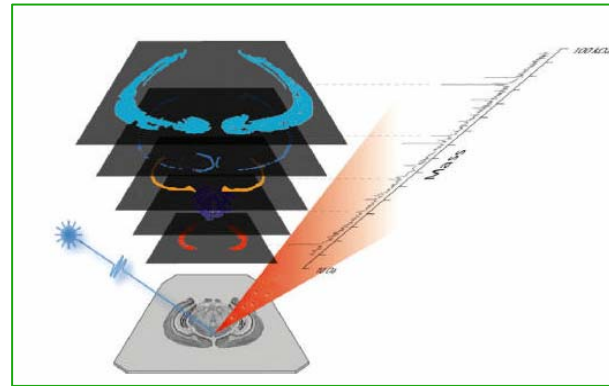
2. 14 μ m tissue sections are positioned on top of sinapinic acid in EtOH. Additional layers of sinapinic acid in 50% acetonitrile are placed on top.



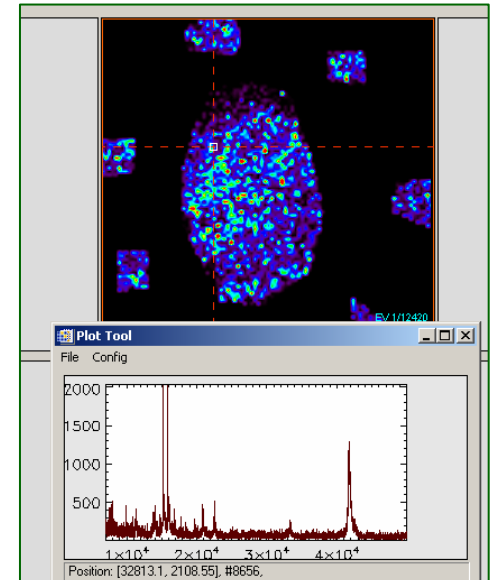
3. An Applied Biosystems Voyager-DE was used to acquire data



4. MMSIT was used to acquire spectra. In this example, spectra were acquired every 120 μ m along both the X and Y, shaded blue, calibration spots.



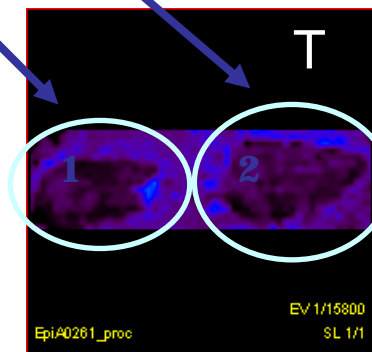
5. The MALDI laser fired 25 shots at each pixel in a grid as determined in the setup protocol. Each pixel contains a spectrum. This collection of spectra is exported as an image file that is imported into BioMAP.



6. Image analysis by BioMAP

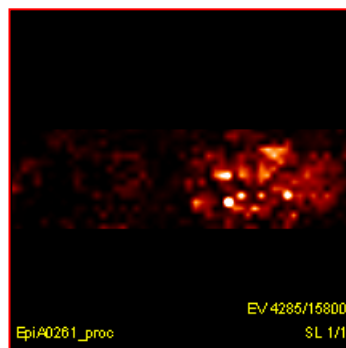
MALDI-TOF-MS-Based Tissue Imaging and Protein Profiling

**Eker rat
OSOM
kidney areas**

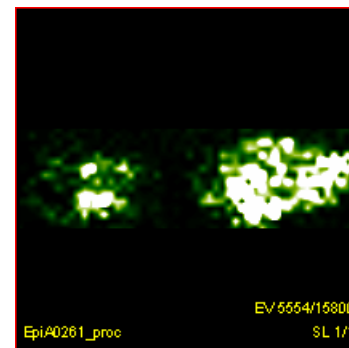


**Tissue Image
ion density map
2-53 kDa**

validation



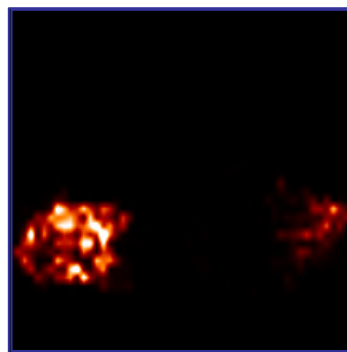
**Ion density map IP-10
8673 Da
Increases in tumors, 12.3x**



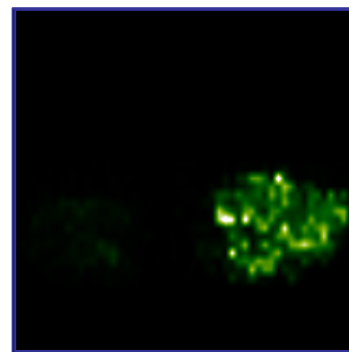
**Ion density map thioredoxin
11542 Da
No reported change**

discovery

**Differentially expressed
proteins localized**

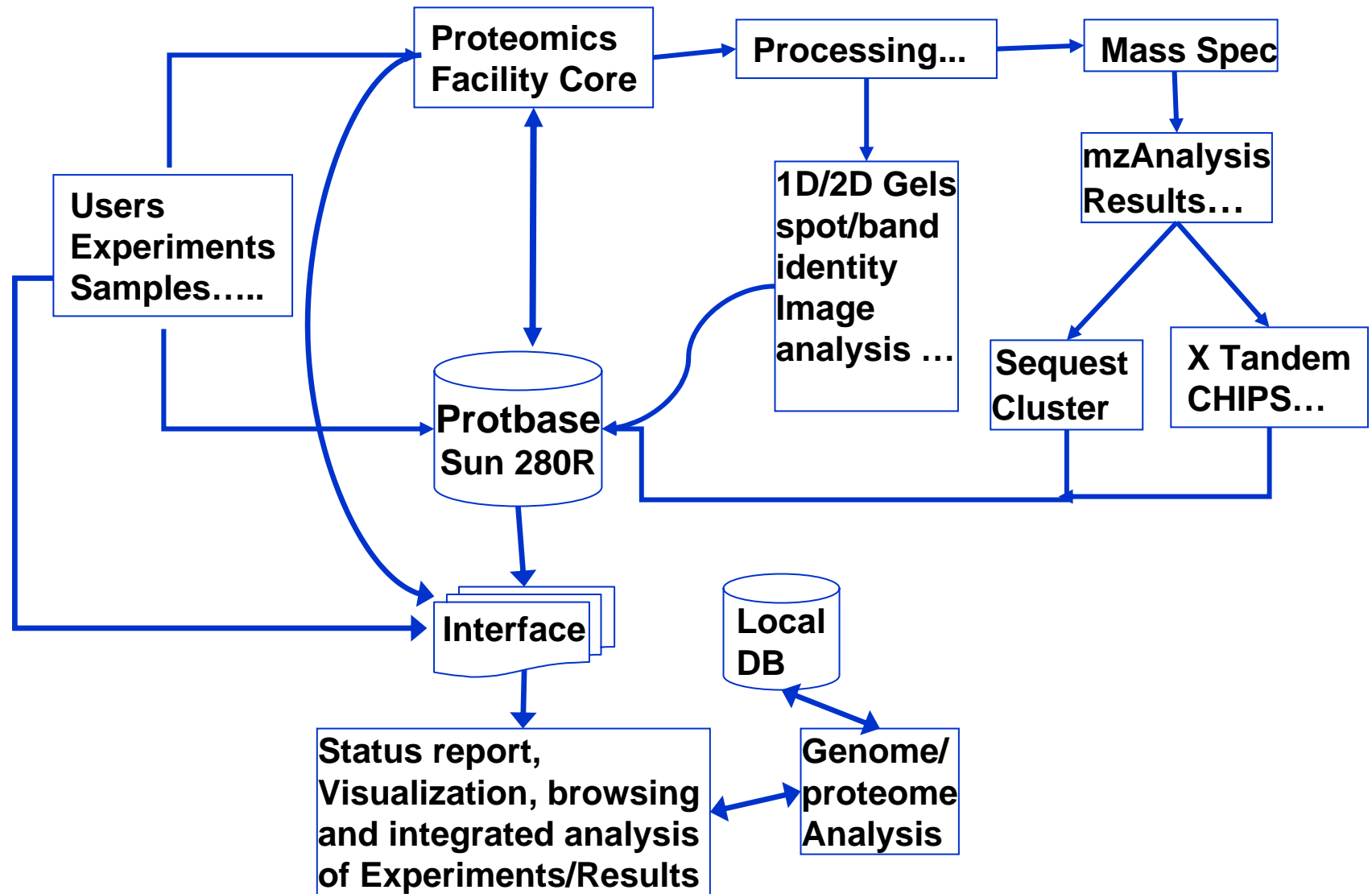


**Ion density map
9580 Da**



**Ion density map
8720 Da**

Data Flow and Data Storage based on MIAPE (Minimum Information About Proteomics Experiment) Protocol



Annexin II Expression in *Tsc-2^{EK/+}*

Tsc-2^{EK/+}, control

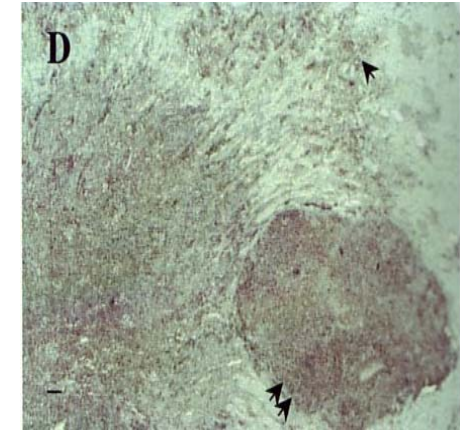
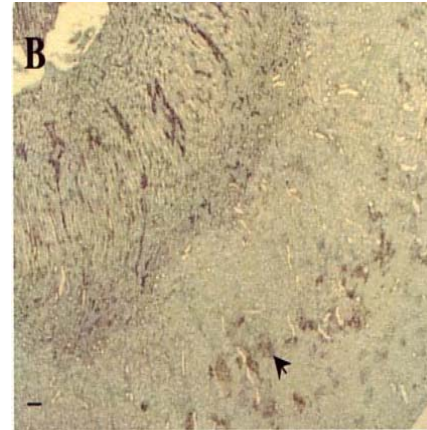
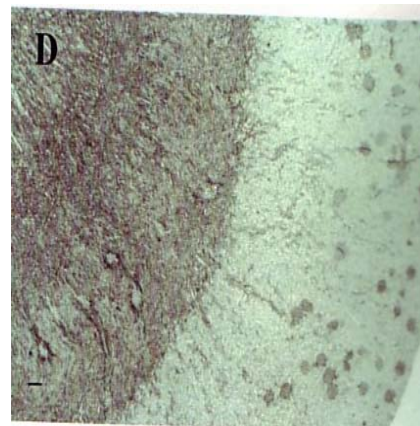
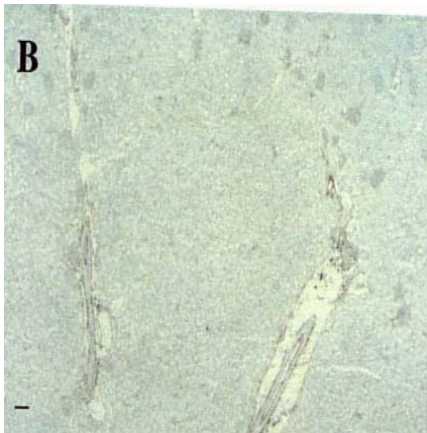
Tsc-2^{EK/+}, TGHQ

2 months

8 months

2 months

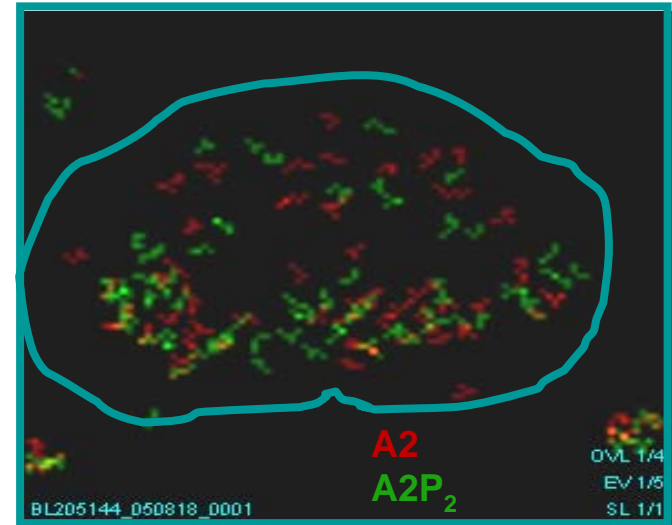
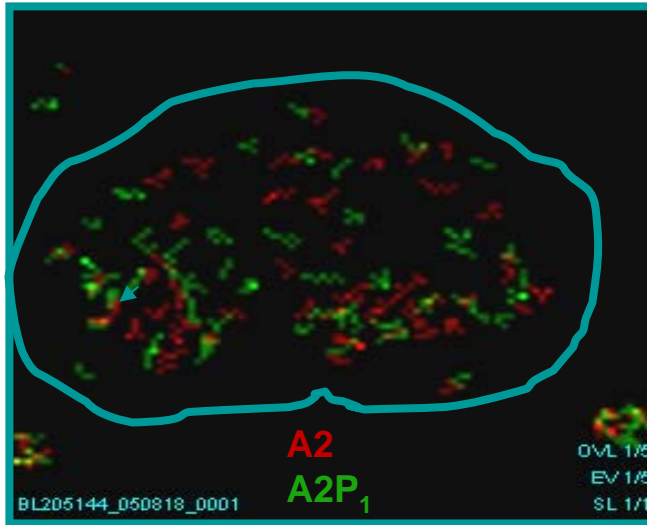
8 months



The expression of annexin II in one, two, six, and eight-month vehicle (saline) and TGHQ-treated *Tsc-2^{EK/+}* rat kidney. The expression of annexin II in the OSOM region was increased as time increasing of treatment with TGHQ. A tumor was observed in the OSOM region of eight-month TGHQ-treated *Tsc-2^{EK/+}* rat kidney. Bar = 200 μ m. Arrows highlight changes in annexin II expression.

Annexin II Phosphorylation

control



TGHQ

