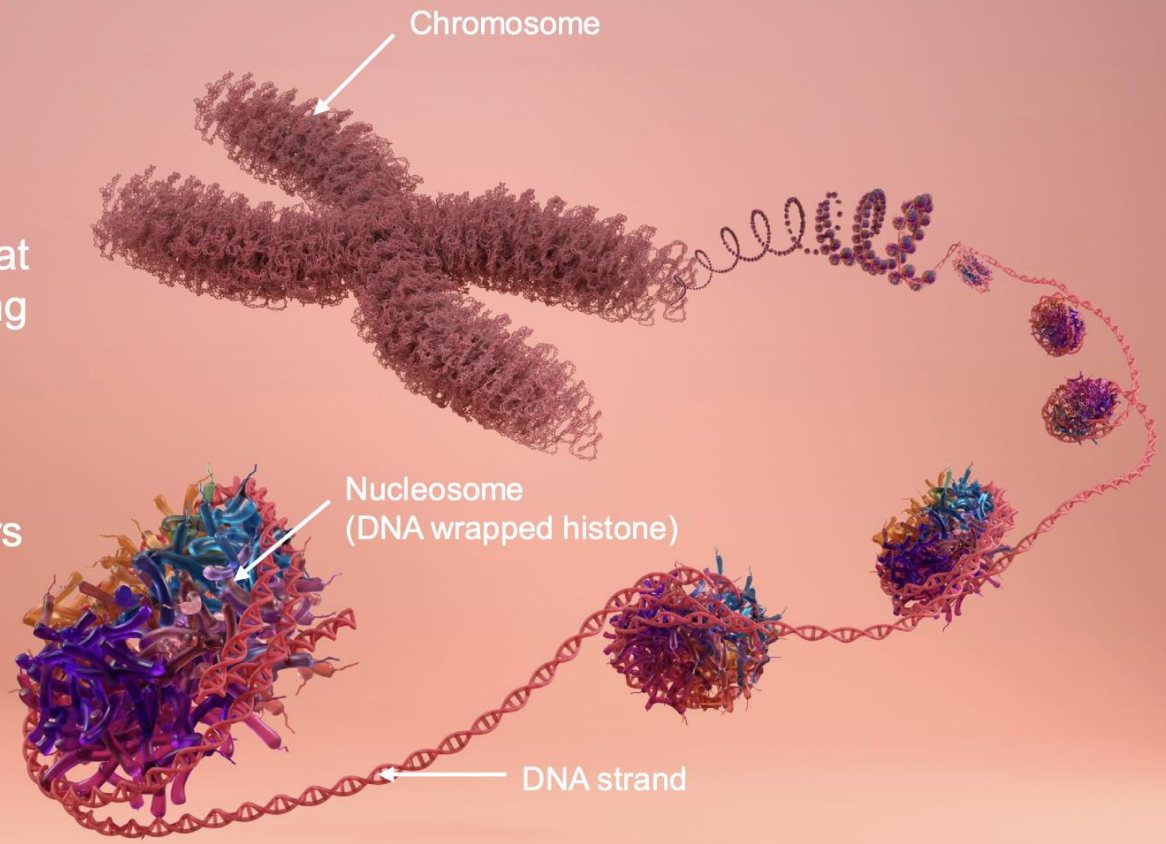
Plasma H3.1 nucleosome concentrations in dogs with various carcinomas

Wilson-Robles, H., Warry, E., Miller, T. Miller P. Guevara-Ledon, G., Guillen, A., Benoit, J., Ferro, L., Matsushita, M., Butera, T.

What is a nucleosome?

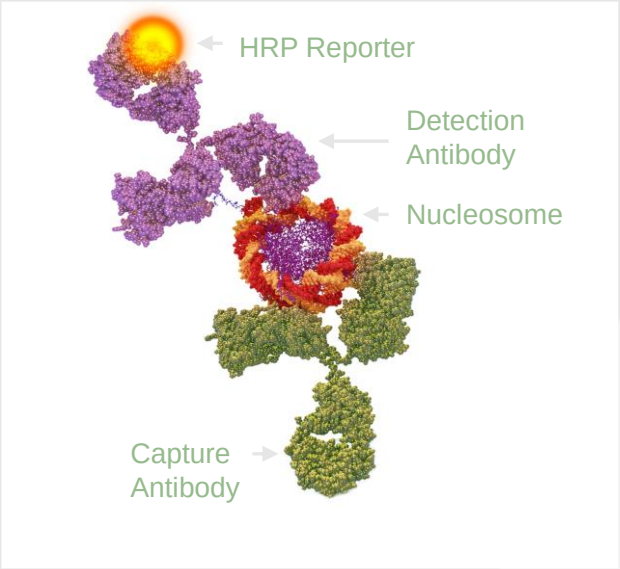
Volition Veterinary

- DNA found within cells is wound tightly around proteins in assemblies called nucleosomes
- Nucleosomes form structures that resemble beads on a string along each chromosome
- When a patient has cancer, nucleosomes from those cancers are released into the blood
- Can be measured using antibodies that are specific to nucleosomes



Nu.Q® Technology

- Proprietary epigenetic immunoassay platform
- Determine levels of circulating nucleosomes
- Profiles nucleosome epitopes
  - Histone post translation modifications
  - Histone variants
  - DNA modifications
- Flexibility of platform and diversity of modifications may enable the development of disease specific panel



Materials and Methods

Study Design

- **Blood (K2-EDTA) was collected from dogs with various cytologically or histologically diagnosed carcinomas**
- Dogs were fasted a minimum of 4 hours
- All patients were naïve to treatment
- Males and females were recruited
- All stages of carcinomas were included
- Blood was immediately spun at 1600xg for 10 min before plasma was collected
- Samples were frozen at -80 until assessed in batches

Study Design

Multicenter prospective study collecting samples from:

- 97 samples in total
  - 5 from the Royal Veterinary College
  - 14 from Oncovet
  - 6 from UNAM
  - 72 from TAMU (2 with multiple carcinomas)

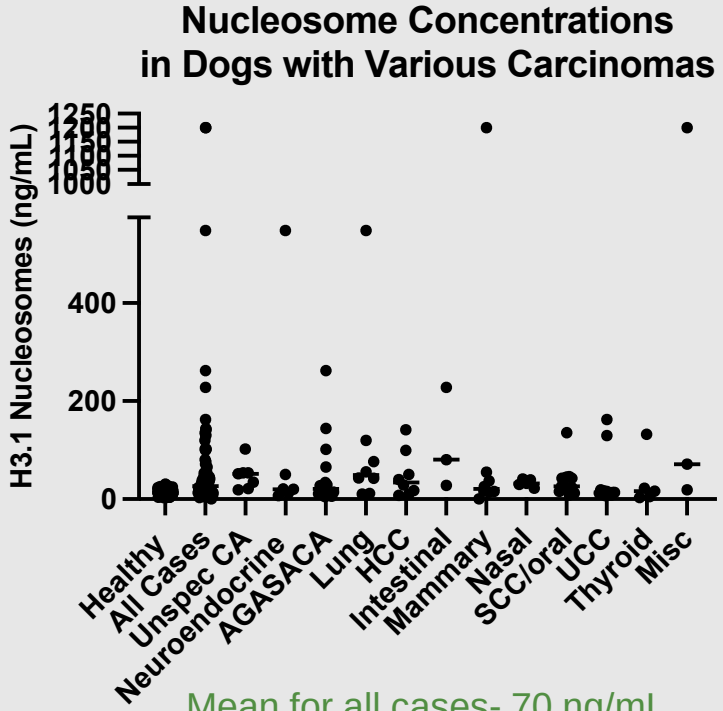
Results

Patient Demographics

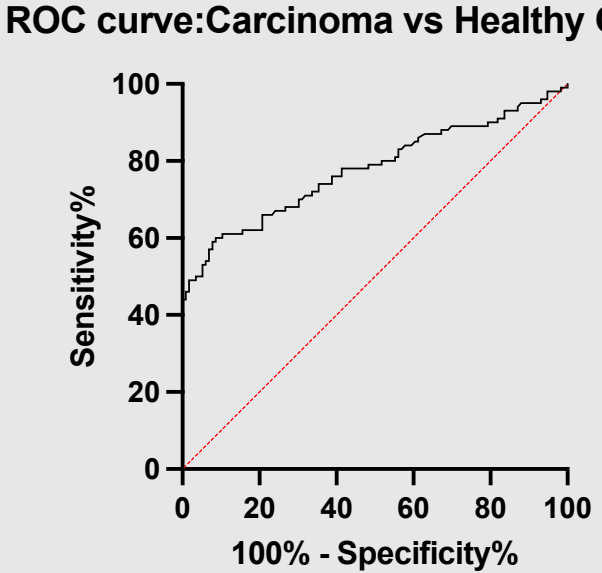
- **97 dogs in total**
- 46 Females
- 14 intact females
- 33 spayed females
- 51 Males
- 7 intact males
- 44 neutered males

- **Breeds**
- Mixed breeds
- Labrador Retrievers
- GSD, GSP, Chihuahua, small terriers
- **Age at Diagnosis**
- Mean 10.3 years
- Median 10 years
- **Body Weight**
- Mean 21.5 kgs
- Median 22.8 kgs

Types of Carcinomas



Mean for all cases- 70 ng/mL
Median for all cases- 26.6 ng/mL
Range – 0-1200 ng/mL



32 of 86 (37.2%) cases were above the healthy dog range

ROC curve- AUC 77.2%
Sens 49.5%/Spec 97%

Types of Carcinomas Included

Type of CA	Number of Cases	Mean H3.1 Conc	Median H3.1 Conc	Range
All CA	100/102 carcinomas	69.97	26.64	0-1200
Unspecified CA	7	47.88	51.7	18.8-101.8
Neuroendocrine	6	109.8	20.34	6.8-548.5
AGASACA	19	45.82	25.1	4.67-262.2
Lung	8	113.3	49.07	9.9-548.5
HCC	8	49.3	34.09	7.5-141.3
Intestinal	3	112.1	80.35	27.9-228.2
Mammary	8	170.3	20.47	0-1200
Nasal	5	32.73	31.64	21.7-41.29
Oral/SCC	13	37.14	26.01	8.15-135.4
UCC	13	33.14	13.75	6.8-162.4
Thyroid	5	35.62	16.26	3.2-132.0
Misc	3	430.1	71.46	18.87-1200

Case Breakdown: By Nu.Q® Zone

High

All cases (19/100)
Unspecified Carcinomas (1/7)
Neuroendocrine tumors (1/6)
AGASACA (4/15)
Oral/SCC (1/13)

Grey Zone

All cases (26/100)
Unspecified Carcinomas (4/7)
Neuroendocrine tumors (1/6)
AGASACA (3/15)
Oral/SCC (5/13)

Low

All cases (55/100)
Unspecified Carcinomas (2/7)
Neuroendocrine tumors (4/6)
AGASACA (11/15)
Oral (7/13)

Case Breakdown: By Cancer Type

High

Lung (3/8)
Hepatocellular Carcinoma (2/8)
Intestinal Carcinoma (2/3)
Mammary Carcinoma (1/8)

Grey Zone

Lung (3/8)
Hepatocellular Carcinoma (2/8)
Intestinal Carcinoma (0/3)
Mammary Carcinoma (2/8)

Low

Lung (2/8)
Hepatocellular Carcinoma (4/8)
Intestinal Carcinoma (1/3)
Mammary Carcinoma (5/8)

Case Breakdown: By Cancer Type

High

Nasal (0/5)
UCC (2/13)
Thyroid (1/5)
Miscellaneous (2/3)

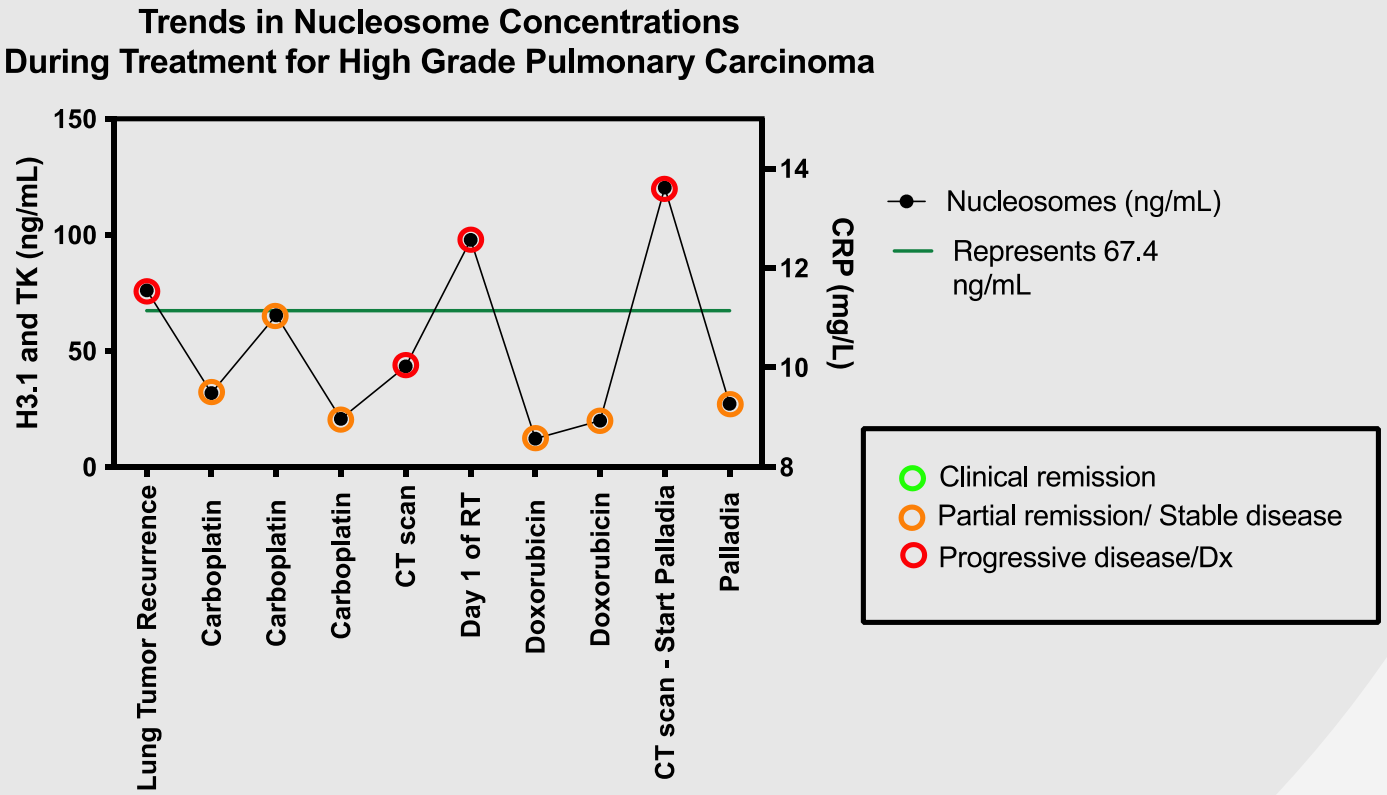
Grey Zone

Nasal (3/5)
UCC (0/13)
Thyroid (0/5)
Miscellaneous (0/3)

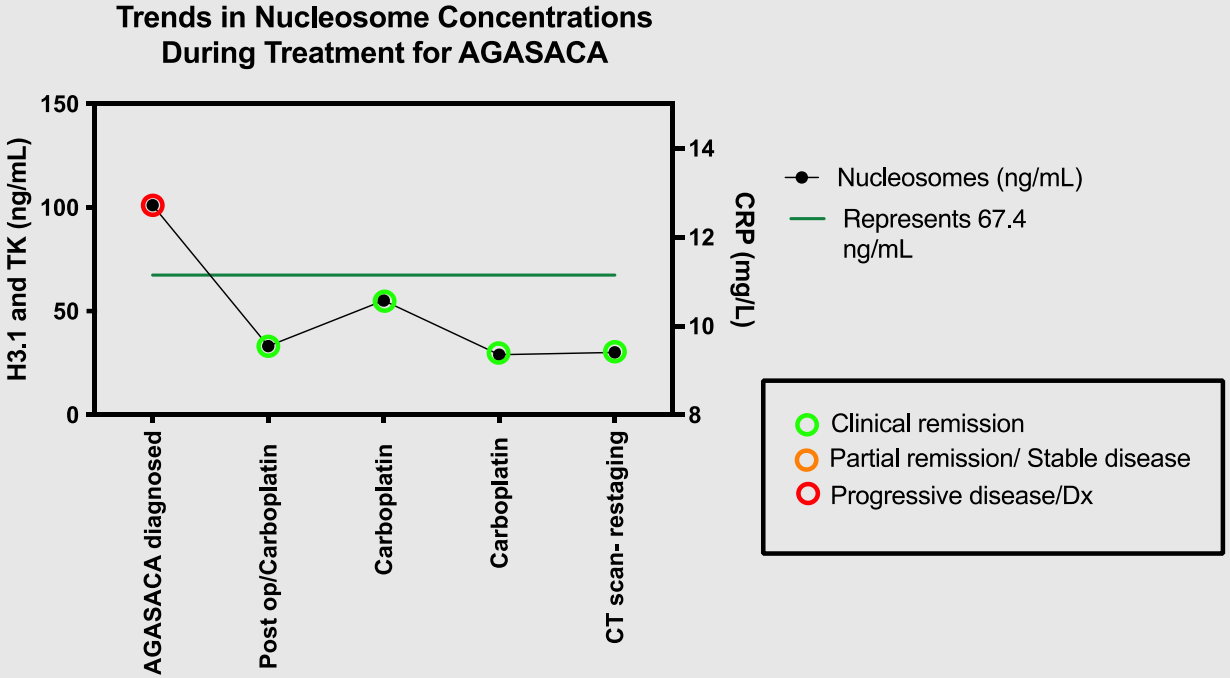
Low

Nasal (2/5)
UCC (11/13)
Thyroid (4/5)
Miscellaneous (1/3)

Disease Monitoring



Disease Monitoring



Thank you for your time

Questions?