WEBVTT

NOTE duration:"00:58:28.7360000"

NOTE language:en-us

NOTE Confidence: 0.87117267

00:00:00.000 --> 00:00:02.994 Thank you, thank you and welcome

NOTE Confidence: 0.87117267

00:00:02.994 --> 00:00:04.990 everyone to Cancer Center,

NOTE Confidence: 0.87117267

00:00:04.990 --> 00:00:08.525 grand rounds and really pleased with how

NOTE Confidence: 0.87117267

00:00:08.525 --> 00:00:11.903 we continue to innovate on formats in

NOTE Confidence: 0.87117267

00:00:11.903 --> 00:00:15.839 this new Zoom World of of the pandemic.

NOTE Confidence: 0.87117267

00:00:15.840 --> 00:00:19.046 And I think today's session is going

NOTE Confidence: 0.87117267

00:00:19.046 --> 00:00:21.913 to be interesting given the nature

NOTE Confidence: 0.87117267

00:00:21.913 --> 00:00:24.715 of of four speakers and various

NOTE Confidence: 0.87117267

00:00:24.715 --> 00:00:28.144 levels of their their training and

NOTE Confidence: 0.87117267

00:00:28.144 --> 00:00:30.444 professional development and are.

NOTE Confidence: 0.87117267

00:00:30.450 --> 00:00:32.970 Cancer Center in our University and

NOTE Confidence: 0.87117267

00:00:32.970 --> 00:00:35.380 health care system and you know,

NOTE Confidence: 0.87117267

00:00:35.380 --> 00:00:36.676 really focused on.

NOTE Confidence: 0.87117267

00:00:36.676 --> 00:00:39.700 The great work that's going on in

NOTE Confidence: 0.87117267

00:00:39.791 --> 00:00:42.051 radiology and biomedical imaging

NOTE Confidence: 0.87117267

00:00:42.051 --> 00:00:45.441 and the science associated with it,

NOTE Confidence: 0.87117267

00:00:45.450 --> 00:00:49.410 most notably in Interventional Oncology.

NOTE Confidence: 0.87117267

00:00:49.410 --> 00:00:51.804 Please introduce let us say the

NOTE Confidence: 0.87117267

00:00:51.804 --> 00:00:54.070 the leader for today's session.

NOTE Confidence: 0.87117267

00:00:54.070 --> 00:00:55.738 Doctor David Madoff is,

NOTE Confidence: 0.87117267

00:00:55.738 --> 00:00:58.740 as you may recall from last week,

NOTE Confidence: 0.87117267

00:00:58.740 --> 00:01:01.104 doctor Madoff is the Co director

NOTE Confidence: 0.87117267

00:01:01.104 --> 00:01:03.170 of Interventional Oncology of the

NOTE Confidence: 0.87117267

00:01:03.170 --> 00:01:04.870 Interventional and college research

NOTE Confidence: 0.87117267

00:01:04.870 --> 00:01:07.640 lab vice chair for clinical research,

NOTE Confidence: 0.87117267

00:01:07.640 --> 00:01:09.760 and the section chief for

NOTE Confidence: 0.87117267

00:01:09.760 --> 00:01:10.608 Interventional radiology.

NOTE Confidence: 0.87117267

00:01:10.610 --> 00:01:12.306 An Department of radiology

NOTE Confidence: 0.87117267

00:01:12.306 --> 00:01:13.578 and biomedical imaging,

NOTE Confidence: 0.87117267

00:01:13.580 --> 00:01:16.625 and David really has throughout his career

NOTE Confidence: 0.87117267

00:01:16.625 --> 00:01:19.918 have been an innovator in this space.

NOTE Confidence: 0.87117267

00:01:19.920 --> 00:01:22.170 And with his joining the faculty

NOTE Confidence: 0.87117267

00:01:22.170 --> 00:01:25.389 at Yale now a couple of years ago,

NOTE Confidence: 0.87117267

00:01:25.390 --> 00:01:28.630 I guess has really built out not only the

NOTE Confidence: 0.87117267

00:01:28.630 --> 00:01:30.870 capabilities in our clinical operations,

NOTE Confidence: 0.87117267

00:01:30.870 --> 00:01:32.434 but expanding research which

NOTE Confidence: 0.87117267

00:01:32.434 --> 00:01:33.607 is really exciting.

NOTE Confidence: 0.87117267

00:01:33.610 --> 00:01:36.680 And so David I turn it over to you to

NOTE Confidence: 0.87117267

00:01:36.764 --> 00:01:39.452 sort of introduce the other speakers

NOTE Confidence: 0.87117267

00:01:39.452 --> 00:01:42.990 and share with us all this great work.

NOTE Confidence: 0.8278826

00:01:43.890 --> 00:01:44.853 OK, thanks Charlie.

NOTE Confidence: 0.8278826

00:01:44.853 --> 00:01:47.720 So I'd like to again, thank you for giving

NOTE Confidence: 0.8278826

00:01:47.720 --> 00:01:49.990 me the opportunity to speak in Yelp,

NOTE Confidence: 0.8278826

00:01:49.990 --> 00:01:51.086 Cancer Center grand rounds.

NOTE Confidence: 0.8278826

00:01:51.086 --> 00:01:53.741 As you saw it last week I was part

NOTE Confidence: 0.8278826

00:01:53.741 --> 00:01:55.643 of a session on the multidisciplinary

NOTE Confidence: 0.8278826

00:01:55.643 --> 00:01:57.689 management of colorectal liver metastases.

NOTE Confidence: 0.8278826

00:01:57.690 --> 00:01:59.510 Today's session, as you stated it will

NOTE Confidence: 0.8278826

00:01:59.510 --> 00:02:01.549 be focused on Interventional oncology.

NOTE Confidence: 0.8278826

00:02:01.550 --> 00:02:04.262 What it is in some of the exciting

NOTE Confidence: 0.8278826

00:02:04.262 --> 00:02:06.678 research being done in our lab at Yale.

NOTE Confidence: 0.8278826

00:02:06.680 --> 00:02:08.654 Therefore, this program will focus on

NOTE Confidence: 0.8278826

00:02:08.654 --> 00:02:10.955 work being done by our trainees and

NOTE Confidence: 0.8278826

00:02:10.955 --> 00:02:13.097 not really on my own personal work.

NOTE Confidence: 0.8278826

00:02:13.100 --> 00:02:15.459 I will just be introducing the topics.

NOTE Confidence: 0.8278826

00:02:15.460 --> 00:02:18.316 And our vision and goals for the

NOTE Confidence: 0.8278826

00:02:18.316 --> 00:02:20.119 Interventional Oncology Program at Yale.

NOTE Confidence: 0.8278826

00:02:20.120 --> 00:02:22.829 So this session, as you may recall,

NOTE Confidence: 0.8278826

00:02:22.830 --> 00:02:25.014 was originally planned for March 10th

NOTE Confidence: 0.8278826

00:02:25.014 --> 00:02:28.258 and it was just after the kovid pandemic.

NOTE Confidence: 0.8278826

00:02:28.260 --> 00:02:29.445 So interesting, Lee,

NOTE Confidence: 0.8278826

00:02:29.445 --> 00:02:31.815 It's actually given us more time

NOTE Confidence: 0.8278826

00:02:31.815 --> 00:02:34.466 to make our data even more mature.

NOTE Confidence: 0.8278826

00:02:34.470 --> 00:02:36.798 So for the audience for today.

NOTE Confidence: 0.8278826

00:02:36.800 --> 00:02:39.896 So I'm really pleased. I think about that.

NOTE Confidence: 0.8278826

00:02:39.900 --> 00:02:42.455 So I'm going to start and then

NOTE Confidence: 0.8278826

00:02:42.455 --> 00:02:44.949 will be followed by Julia Shapiro,

NOTE Confidence: 0.8278826

00:02:44.950 --> 00:02:47.505 who happens to be the Co director

NOTE Confidence: 0.8278826

00:02:47.505 --> 00:02:49.220 of the intervention college.

NOTE Confidence: 0.8278826

00:02:49.220 --> 00:02:50.444 Live with me.

NOTE Confidence: 0.8278826

00:02:50.444 --> 00:02:52.484 He's actually an assistant professor

NOTE Confidence: 0.8278826

00:02:52.484 --> 00:02:54.860 of radiology and biomedical imaging,

NOTE Confidence: 0.8278826

00:02:54.860 --> 00:02:55.666 while actually,

NOTE Confidence: 0.8278826

00:02:55.666 --> 00:02:56.069 still,

NOTE Confidence: 0.8278826

00:02:56.069 --> 00:02:59.376 and I are resident so that shows you

NOTE Confidence: 0.8278826

00:02:59.376 --> 00:03:01.836 the level of achievement that some

NOTE Confidence: 0.8278826

00:03:01.836 --> 00:03:04.374 of our colleagues really have and

NOTE Confidence: 0.8278826

00:03:04.374 --> 00:03:06.834 then will be followed by Jessica

NOTE Confidence: 0.8278826

00:03:06.834 --> 00:03:09.398 Santana and tells Evie who are both

NOTE Confidence: 0.8278826

00:03:09.398 --> 00:03:11.559 graduate students in our lab and

NOTE Confidence: 0.8278826

00:03:11.559 --> 00:03:13.869 the work will all be talking about

NOTE Confidence: 0.8278826

00:03:13.869 --> 00:03:16.129 liver cancer and Interventional

NOTE Confidence: 0.8278826

00:03:16.129 --> 00:03:17.986 oncology related activities.

NOTE Confidence: 0.8278826

00:03:17.990 --> 00:03:20.874 So let me just share my screen.

NOTE Confidence: 0.9124253

00:03:27.170 --> 00:03:30.610 OK, so. Really,

NOTE Confidence: 0.9124253

00:03:30.610 --> 00:03:32.250 what is Interventional oncology?

NOTE Confidence: 0.9124253

00:03:32.250 --> 00:03:34.395 Well intermixed oncology is a

NOTE Confidence: 0.9124253

00:03:34.395 --> 00:03:35.682 subspecialty of Interventional

NOTE Confidence: 0.9124253

00:03:35.682 --> 00:03:37.419 radiology that utilizes minimally

NOTE Confidence: 0.9124253

00:03:37.419 --> 00:03:39.063 invasive image guided procedures

NOTE Confidence: 0.9124253

00:03:39.063 --> 00:03:41.491 to both diagnose and treat patients

NOTE Confidence: 0.9124253

00:03:41.491 --> 00:03:43.286 with various forms of cancer.

NOTE Confidence: 0.9124253

00:03:43.290 --> 00:03:45.195 The benefits of primary intervention

NOTE Confidence: 0.9124253

00:03:45.195 --> 00:03:46.719 oncology treatments or its

NOTE Confidence: 0.9124253

00:03:46.719 --> 00:03:48.199 immediate tumoricidal effects.

NOTE Confidence: 0.9124253

00:03:48.200 --> 00:03:50.648 As you I'm sure are aware,

NOTE Confidence: 0.9124253

00:03:50.650 --> 00:03:51.877 there minimally invasive,

NOTE Confidence: 0.9124253

00:03:51.877 --> 00:03:53.513 resulting in cost reductions

NOTE Confidence: 0.9124253

00:03:53.513 --> 00:03:54.740 and time Efficacy,

NOTE Confidence: 0.9124253

00:03:54.740 --> 00:03:57.547 as well as having minimal systemic side

NOTE Confidence: 0.9124253

00:03:57.547 --> 00:04:00.208 effects leading to an overall improved.

NOTE Confidence: 0.9124253

00:04:00.210 --> 00:04:01.350 Quality of life.

NOTE Confidence: 0.9124253

00:04:01.350 --> 00:04:04.508 The goal has been to make the case

NOTE Confidence: 0.9124253

00:04:04.508 --> 00:04:07.399 for us becoming the 4th pillar of

NOTE Confidence: 0.9124253

00:04:07.399 --> 00:04:09.798 cancer care and over the years

NOTE Confidence: 0.9124253

00:04:09.798 --> 00:04:12.424 I believe we have and this has

NOTE Confidence: 0.9124253

00:04:12.424 --> 00:04:14.788 been shown actually in many ways.

NOTE Confidence: 0.9124253

00:04:14.790 --> 00:04:17.030 These include having IO therapies

NOTE Confidence: 0.9124253

00:04:17.030 --> 00:04:18.822 incorporated into multiple NCCN

NOTE Confidence: 0.9124253

00:04:18.822 --> 00:04:20.778 guidelines which include you know

NOTE Confidence: 0.9124253

00:04:20.778 --> 00:04:21.858 colorectal metastases include

NOTE Confidence: 0.9124253

00:04:21.858 --> 00:04:24.240 HP be an even in renal cancer,

NOTE Confidence: 0.9124253

00:04:24.240 --> 00:04:27.026 having trials to assess the role of

NOTE Confidence: 0.9124253

00:04:27.026 --> 00:04:28.970 Percat Aneus management of cancer,

NOTE Confidence: 0.9124253

00:04:28.970 --> 00:04:31.945 and what I believe is most important.

NOTE Confidence: 0.9124253

00:04:31.950 --> 00:04:32.938 Is that,

NOTE Confidence: 0.9124253

00:04:32.938 --> 00:04:36.396 I believe now become a valued participator

NOTE Confidence: 0.9124253

00:04:36.396 --> 00:04:39.915 in most if not all of tumor boards.

NOTE Confidence: 0.9124253

00:04:39.920 --> 00:04:41.732 So what does it take to

NOTE Confidence: 0.9124253

00:04:41.732 --> 00:04:43.660 become a pillar of oncology?

NOTE Confidence: 0.9124253

00:04:43.660 --> 00:04:45.430 Clearly each clinical discipline needs

NOTE Confidence: 0.9124253

00:04:45.430 --> 00:04:47.739 to have a strong foundation in basic,

NOTE Confidence: 0.9124253

00:04:47.740 --> 00:04:49.184 translational and clinical research.

NOTE Confidence: 0.9124253

00:04:49.184 --> 00:04:52.499 We do have some work to do in this regard,

NOTE Confidence: 0.9124253

00:04:52.500 --> 00:04:54.845 but I must say I was really

NOTE Confidence: 0.9124253

00:04:54.845 --> 00:04:57.603 thrilled to see when I was in 2016

NOTE Confidence: 0.9124253

00:04:57.603 --> 00:04:59.979 as an invited faculty of Asco GI.

NOTE Confidence: 0.9124253

00:04:59.980 --> 00:05:02.220 My discipline next to my name was listed

NOTE Confidence: 0.9124253

00:05:02.220 --> 00:05:04.400 actually as an Interventional Oncologist,

NOTE Confidence: 0.9124253

00:05:04.400 --> 00:05:05.772 not an interventional radiologist,

NOTE Confidence: 0.9124253

00:05:05.772 --> 00:05:08.479 so I was really happy at that time,

NOTE Confidence: 0.9124253

00:05:08.480 --> 00:05:11.756 and I thought we actually made it.

NOTE Confidence: 0.9124253

00:05:11.760 --> 00:05:12.048 However,

NOTE Confidence: 0.9124253

00:05:12.048 --> 00:05:14.640 I really do believe that in terms of research

NOTE Confidence: 0.9124253

00:05:14.699 --> 00:05:16.729 and education of referring physicians,

NOTE Confidence: 0.9124253

00:05:16.730 --> 00:05:18.385 I think we're nearly there

NOTE Confidence: 0.9124253

00:05:18.385 --> 00:05:20.040 and on the right track,

NOTE Confidence: 0.9124253

00:05:20.040 --> 00:05:24.369 but I don't know if we've come there totally.

NOTE Confidence: 0.9124253

00:05:24.370 --> 00:05:28.249 So here you can see a long list of

NOTE Confidence: 0.9124253

00:05:28.249 --> 00:05:31.090 procedures that we do, and I owe.

NOTE Confidence: 0.9124253

00:05:31.090 --> 00:05:34.030 These can range from image guided biopsy,

NOTE Confidence: 0.9124253

00:05:34.030 --> 00:05:35.290 primary tumor therapy,

NOTE Confidence: 0.9124253

00:05:35.290 --> 00:05:36.130 palliative procedures,

NOTE Confidence: 0.9124253

00:05:36.130 --> 00:05:37.705 central venous access,

NOTE Confidence: 0.9124253

00:05:37.705 --> 00:05:40.330 an managing of complications that

NOTE Confidence: 0.9124253

00:05:40.330 --> 00:05:43.732 are either a result of cancer itself

NOTE Confidence: 0.9124253

00:05:43.732 --> 00:05:46.002 or related to cancer treatments.

NOTE Confidence: 0.9124253

00:05:46.010 --> 00:05:48.502 So I just wanted to highlight some

NOTE Confidence: 0.9124253

00:05:48.502 --> 00:05:50.908 challenging biopsies as this is one of

NOTE Confidence: 0.9124253

00:05:50.908 --> 00:05:53.070 the most important procedures that we do.

NOTE Confidence: 0.9124253

00:05:53.070 --> 00:05:55.457 Clearly it is difficult for Oncologist to

NOTE Confidence: 0.9124253

00:05:55.457 --> 00:05:58.106 treat patients in the absence of a diagnosis.

NOTE Confidence: 0.9124253

00:05:58.110 --> 00:05:58.658 That said,

NOTE Confidence: 0.9124253

00:05:58.658 --> 00:06:00.576 cases such as this one should be

NOTE Confidence: 0.9124253

00:06:00.576 --> 00:06:02.621 easily doable for any experienced

NOTE Confidence: 0.9124253

00:06:02.621 --> 00:06:03.479 interventional list,

NOTE Confidence: 0.9124253

00:06:03.480 --> 00:06:05.160 and as you can see,

NOTE Confidence: 0.9124253

00:06:05.160 --> 00:06:07.744 this patient has confirmed

NOTE Confidence: 0.9124253

00:06:07.744 --> 00:06:09.036 metastatic adenocarcinoma.

NOTE Confidence: 0.9124253

00:06:09.040 --> 00:06:10.846 So here is the second case,

NOTE Confidence: 0.9124253

00:06:10.850 --> 00:06:12.866 which I would say is much more

NOTE Confidence: 0.9124253

00:06:12.866 --> 00:06:14.692 challenging due to lack of any

NOTE Confidence: 0.9124253

00:06:14.692 --> 00:06:16.492 imaging finding on CT or ultrasound

NOTE Confidence: 0.9124253

00:06:16.492 --> 00:06:18.681 and you can see here it's closed

NOTE Confidence: 0.9124253

00:06:18.681 --> 00:06:19.901 proximity to the heart.

NOTE Confidence: 0.9124253

00:06:19.910 --> 00:06:22.160 Fortunately we were able to get

NOTE Confidence: 0.9124253

00:06:22.160 --> 00:06:24.148 adequate tissue sampling and help

NOTE Confidence: 0.9124253

00:06:24.148 --> 00:06:26.243 this patient get the appropriate

NOTE Confidence: 0.9124253

00:06:26.243 --> 00:06:28.548 chemotherapy that they needed to be on.

NOTE Confidence: 0.9124253

00:06:28.550 --> 00:06:30.622 So I just wanted to discuss a couple

NOTE Confidence: 0.9124253

00:06:30.622 --> 00:06:32.209 of primary intra interventional

NOTE Confidence: 0.9124253

00:06:32.209 --> 00:06:33.730 oncology tumor therapies,

NOTE Confidence: 0.9124253

00:06:33.730 --> 00:06:35.893 both of which will be discussed in

NOTE Confidence: 0.9124253

00:06:35.893 --> 00:06:37.833 research by our trainees later in

NOTE Confidence: 0.9124253

00:06:37.833 --> 00:06:40.038 the session here we have two more

NOTE Confidence: 0.7713822

00:06:40.108 --> 00:06:41.748 guided ablation or tumor

NOTE Confidence: 0.7713822

00:06:41.748 --> 00:06:43.388 image guided tumor ablation,

NOTE Confidence: 0.7713822

00:06:43.390 --> 00:06:45.734 so the goals of Ablation is to eradicate

NOTE Confidence: 0.7713822

00:06:45.734 --> 00:06:47.992 all valuable malignant cells and stem

NOTE Confidence: 0.7713822

00:06:47.992 --> 00:06:49.600 spare normal surrounding tissues,

NOTE Confidence: 0.7713822

00:06:49.600 --> 00:06:51.475 treat tissues with unfavorable location

NOTE Confidence: 0.7713822

00:06:51.475 --> 00:06:53.809 or pattern of distribution for resection

NOTE Confidence: 0.7713822

00:06:53.809 --> 00:06:55.819 and or have multiple comorbidities.

NOTE Confidence: 0.7713822

00:06:55.820 --> 00:06:57.773 These are the most often used in

NOTE Confidence: 0.7713822

00:06:57.773 --> 00:06:59.676 patients with low volume disease and

NOTE Confidence: 0.7713822

00:06:59.676 --> 00:07:01.351 required to bulking are typically

NOTE Confidence: 0.7713822

00:07:01.351 --> 00:07:03.717 done in an outpatient setting setting

NOTE Confidence: 0.7713822

00:07:03.717 --> 00:07:05.762 and these procedures are repeatable.

NOTE Confidence: 0.7713822

00:07:05.770 --> 00:07:08.266 So if we can see here we have

NOTE Confidence: 0.7713822

00:07:08.266 --> 00:07:09.706 radiofrequency ablation and microwave

NOTE Confidence: 0.7713822

00:07:09.706 --> 00:07:11.596 which are heat based therapies.

NOTE Confidence: 0.7713822

00:07:11.600 --> 00:07:13.832 We have Cryo Ablation which is a coal

NOTE Confidence: 0.7713822

00:07:13.832 --> 00:07:15.937 based therapy and we actually have

NOTE Confidence: 0.7713822

00:07:15.937 --> 00:07:17.053 irreversible electroporation which

NOTE Confidence: 0.7713822

00:07:17.053 --> 00:07:19.490 is really to electrocute the tumors.

NOTE Confidence: 0.7713822

00:07:19.490 --> 00:07:21.306 Believe it or not,

NOTE Confidence: 0.7713822

00:07:21.306 --> 00:07:23.576 by changing the ionic potentials

NOTE Confidence: 0.7713822

00:07:23.576 --> 00:07:26.120 between the between the membranes.

NOTE Confidence: 0.7713822

00:07:26.120 --> 00:07:28.170 So ablation of liver tumors,

NOTE Confidence: 0.7713822

00:07:28.170 --> 00:07:31.434 which is in this was its initial indication,

NOTE Confidence: 0.7713822

00:07:31.440 --> 00:07:32.684 as shown here in.

NOTE Confidence: 0.7713822

00:07:32.684 --> 00:07:35.514 This is 1 case of a patient with

NOTE Confidence: 0.7713822

00:07:35.514 --> 00:07:38.136 HTC that needed ablation as a

NOTE Confidence: 0.7713822

00:07:38.136 --> 00:07:40.030 bridge to transplant.

NOTE Confidence: 0.7713822

00:07:40.030 --> 00:07:43.294 As we can see, 2 1/2 years later,

NOTE Confidence: 0.7713822

00:07:43.300 --> 00:07:46.919 no tumor recurrence or any residual disease.

NOTE Confidence: 0.7713822

00:07:46.920 --> 00:07:49.251 Next was the case of an isolated

NOTE Confidence: 0.7713822

00:07:49.251 --> 00:07:50.250 colorectal liver metastasis.

NOTE Confidence: 0.7713822

00:07:50.250 --> 00:07:52.707 Who here you see a pet positive

NOTE Confidence: 0.7713822

00:07:52.707 --> 00:07:54.471 or hypermetabolic lesion in the

NOTE Confidence: 0.7713822

00:07:54.471 --> 00:07:56.711 right lobe of the liver who was

NOTE Confidence: 0.7713822

00:07:56.711 --> 00:07:58.040 successfully treated with Ablation

NOTE Confidence: 0.7713822

00:07:58.040 --> 00:08:00.573 and his team are free at one year?

NOTE Confidence: 0.7713822

00:08:00.573 --> 00:08:01.239 Follow up.

NOTE Confidence: 0.8226105

00:08:03.420 --> 00:08:05.080 This is a patient who,

NOTE Confidence: 0.8226105

00:08:05.080 --> 00:08:07.066 instead of having a liver lesion,

NOTE Confidence: 0.8226105

00:08:07.070 --> 00:08:08.206 has a lung nodule.

NOTE Confidence: 0.8226105

00:08:08.206 --> 00:08:10.378 Here we can see that based on

NOTE Confidence: 0.8226105

00:08:10.378 --> 00:08:12.378 having heat based thermal ablation,

NOTE Confidence: 0.8226105

00:08:12.380 --> 00:08:15.036 the patient did very well at seven months.

NOTE Confidence: 0.8226105

00:08:15.040 --> 00:08:17.343 As you can see, there's no residual

NOTE Confidence: 0.8226105

00:08:17.343 --> 00:08:20.812 tumor on the image Ng, and there was no

NOTE Confidence: 0.8226105

00:08:20.812 --> 00:08:23.500 local recurrence seen at three years.

NOTE Confidence: 0.8226105

00:08:23.500 --> 00:08:25.708 We can also treat bone metastasis.

NOTE Confidence: 0.8226105

00:08:25.710 --> 00:08:27.756 This is a patient with metastatic

NOTE Confidence: 0.8226105

00:08:27.756 --> 00:08:29.904 breast carcinoma with a focal right

NOTE Confidence: 0.8226105

00:08:29.904 --> 00:08:32.058 femoral and right hip pain limiting

NOTE Confidence: 0.8226105

00:08:32.058 --> 00:08:33.799 mobility for whatever reason,

NOTE Confidence: 0.8226105

00:08:33.800 --> 00:08:35.312 she refused radiation therapy

NOTE Confidence: 0.8226105

00:08:35.312 --> 00:08:37.580 and was treated with heat based

NOTE Confidence: 0.8226105

00:08:37.645 --> 00:08:39.081 thermal ablation and Samantha

NOTE Confidence: 0.8226105

00:08:39.081 --> 00:08:41.658 plasty is shown here and she had

NOTE Confidence: 0.8226105

00:08:41.658 --> 00:08:43.423 an immediate improvement in right

NOTE Confidence: 0.8226105

00:08:43.423 --> 00:08:46.680 femoral pain from 8 to 10 out of 10.

NOTE Confidence: 0.80972403

00:08:49.050 --> 00:08:51.514 This is a very interesting use of

NOTE Confidence: 0.80972403

00:08:51.514 --> 00:08:53.310 thermal ablation in this case,

NOTE Confidence: 0.80972403

00:08:53.310 --> 00:08:54.154 with cryoablation.

NOTE Confidence: 0.80972403

00:08:54.154 --> 00:08:56.264 This patient had metastatic Rectal

NOTE Confidence: 0.80972403

00:08:56.264 --> 00:08:58.138 Squamous Cell Carcinoma who had

NOTE Confidence: 0.80972403

00:08:58.138 --> 00:09:00.056 severe intractable 10 out of 10 pain,

NOTE Confidence: 0.80972403

00:09:00.060 --> 00:09:01.835 secondary to inoperable tumor recurrence

NOTE Confidence: 0.80972403

00:09:01.835 --> 00:09:03.960 infringing on the sacral nerve roots.

NOTE Confidence: 0.80972403

00:09:03.960 --> 00:09:05.875 She was successfully treated with

NOTE Confidence: 0.80972403

00:09:05.875 --> 00:09:08.139 partial cryo ablation of the bowel

NOTE Confidence: 0.80972403

00:09:08.139 --> 00:09:10.363 wall and you can see right here the

NOTE Confidence: 0.80972403

00:09:10.363 --> 00:09:12.659 low density ice she had immediate

NOTE Confidence: 0.80972403

00:09:12.659 --> 00:09:14.609 or should say complete resolution

NOTE Confidence: 0.80972403

00:09:14.610 --> 00:09:17.095 of her pain within about 3 days.

NOTE Confidence: 0.80972403

00:09:17.100 --> 00:09:19.150 So she had actually no.

NOTE Confidence: 0.80972403

00:09:19.150 --> 00:09:21.120 Team up until a year,

NOTE Confidence: 0.80972403

00:09:21.120 --> 00:09:23.424 at which time she actually died

NOTE Confidence: 0.80972403

00:09:23.424 --> 00:09:25.825 and then Lastly we were able

NOTE Confidence: 0.80972403

00:09:25.825 --> 00:09:28.183 to treat this liver tumor here.

NOTE Confidence: 0.80972403

00:09:28.190 --> 00:09:30.548 That was a budding the left

NOTE Confidence: 0.80972403

00:09:30.548 --> 00:09:31.727 hepatic bile duct.

NOTE Confidence: 0.80972403

00:09:31.730 --> 00:09:33.690 So we used Ayari again,

NOTE Confidence: 0.80972403

00:09:33.690 --> 00:09:34.869 that's basically electrocution,

NOTE Confidence: 0.80972403

00:09:34.869 --> 00:09:37.620 which is technically a non thermal ablation.

NOTE Confidence: 0.80972403

00:09:37.620 --> 00:09:41.001 So about nine months later the patient

NOTE Confidence: 0.80972403

00:09:41.001 --> 00:09:44.509 has no residual disease or recurrence.

NOTE Confidence: 0.80972403

00:09:44.510 --> 00:09:46.550 We also have more regional therapies

NOTE Confidence: 0.80972403

00:09:46.550 --> 00:09:47.910 such as transarterial embolization.

NOTE Confidence: 0.80972403

00:09:47.910 --> 00:09:49.896 In these cases are typically reserved

NOTE Confidence: 0.80972403

00:09:49.896 --> 00:09:51.970 for patients with higher tumor burdens

NOTE Confidence: 0.80972403

00:09:51.970 --> 00:09:53.690 or are in neoadjuvant settings,

NOTE Confidence: 0.80972403

00:09:53.690 --> 00:09:55.406 or in cases where resection or

NOTE Confidence: 0.80972403

00:09:55.406 --> 00:09:57.667 ablation is in a location considered

NOTE Confidence: 0.80972403

00:09:57.667 --> 00:09:59.775 terribly difficult or dangerous.

NOTE Confidence: 0.80972403

00:09:59.780 --> 00:10:03.460 He We see a case of a patient with HIV,

NOTE Confidence: 0.80972403

00:10:03.460 --> 00:10:05.650 cirrhosis and a 4.8 centimeters segment.

NOTE Confidence: 0.80972403

00:10:05.650 --> 00:10:07.360 8 HTC Embolization was performed

NOTE Confidence: 0.80972403

00:10:07.360 --> 00:10:09.540 to maintain the patient on the

NOTE Confidence: 0.80972403

00:10:09.540 --> 00:10:10.758 transplant waiting list.

NOTE Confidence: 0.80972403

00:10:10.760 --> 00:10:12.580 We see completing the Krosis,

NOTE Confidence: 0.80972403

00:10:12.580 --> 00:10:15.466 and she alternately underwent a transplant.

NOTE Confidence: 0.80972403

00:10:15.470 --> 00:10:18.095 This is a patient with compensated HTP,

NOTE Confidence: 0.80972403

00:10:18.100 --> 00:10:19.524 sarot sis, Anna Sala,

NOTE Confidence: 0.80972403

00:10:19.524 --> 00:10:22.507 Terry HTC and segment 8 and a platelet

NOTE Confidence: 0.80972403

00:10:22.507 --> 00:10:25.216 count of 57 who also needs treatment.

NOTE Confidence: 0.80972403

00:10:25.220 --> 00:10:27.100 There's a bridge to transplant.

NOTE Confidence: 0.80972403

00:10:27.100 --> 00:10:29.473 This tumor is shown here is in

NOTE Confidence: 0.80972403

00:10:29.473 --> 00:10:31.220 a very difficult location,

NOTE Confidence: 0.80972403

00:10:31.220 --> 00:10:32.720 and she successfully underwent

NOTE Confidence: 0.80972403

00:10:32.720 --> 00:10:34.595 embolization with no residual tumor,

NOTE Confidence: 0.80972403

00:10:34.600 --> 00:10:36.470 and this patient also underwent

NOTE Confidence: 0.80972403

00:10:36.470 --> 00:10:37.218 liver transplantation.

NOTE Confidence: 0.8185584

00:10:39.640 --> 00:10:42.529 Here we're able to see a patient that was

NOTE Confidence: 0.8185584

00:10:42.529 --> 00:10:45.083 treated in their 90s who has a large HTC.

NOTE Confidence: 0.8185584

00:10:45.090 --> 00:10:46.908 In this case, the ACC actually

NOTE Confidence: 0.8185584

00:10:46.908 --> 00:10:48.120 ruptured through the capsule,

NOTE Confidence: 0.8185584

00:10:48.120 --> 00:10:50.248 and as you probably are all aware,

NOTE Confidence: 0.8185584

00:10:50.250 --> 00:10:52.588 this is associated with poor, if not dismal,

NOTE Confidence: 0.8185584

00:10:52.588 --> 00:10:53.968 prognosis were able to successfully

NOTE Confidence: 0.8185584

00:10:53.968 --> 00:10:55.699 treat it with radio embolization,

NOTE Confidence: 0.8185584

00:10:55.700 --> 00:10:57.518 which was done as an outpatient,

NOTE Confidence: 0.8185584

00:10:57.520 --> 00:10:59.338 and this can be seen here.

NOTE Confidence: 0.8185584

00:10:59.340 --> 00:11:01.086 She had complete response and lived

NOTE Confidence: 0.8185584

00:11:01.086 --> 00:11:03.270 up to five after four years later,

NOTE Confidence: 0.8185584

00:11:03.270 --> 00:11:04.128 and then Lastly.

NOTE Confidence: 0.8185584

00:11:04.128 --> 00:11:07.448 This is a case of a patient that has BI lo

NOTE Confidence: 0.8185584

00:11:07.448 --> 00:11:09.780 or HTC with extensive portal vein tumor.

NOTE Confidence: 0.8185584

00:11:09.780 --> 00:11:11.976 Rambus, so typically this patient would

NOTE Confidence: 0.8185584

00:11:11.976 --> 00:11:14.459 have less than six months to live,

NOTE Confidence: 0.8185584

00:11:14.460 --> 00:11:16.945 but as expected, this is a relatively

NOTE Confidence: 0.8185584

00:11:16.945 --> 00:11:18.779 young patient with the family,

NOTE Confidence: 0.8185584

00:11:18.780 --> 00:11:20.136 small young children, etc.

NOTE Confidence: 0.8185584

00:11:20.136 --> 00:11:23.370 So we try to offer procedure to help this

NOTE Confidence: 0.8185584

00:11:23.370 --> 00:11:25.260 patient an we did Chemoembolization,

NOTE Confidence: 0.8185584

00:11:25.260 --> 00:11:28.194 and Fortunately we were successful in

NOTE Confidence: 0.8185584

00:11:28.194 --> 00:11:31.520 prolonging his life for about 16 months.

NOTE Confidence: 0.8185584

00:11:31.520 --> 00:11:32.416 So to wrap up,

NOTE Confidence: 0.8185584

00:11:32.416 --> 00:11:35.079 I just want to give you my five year of

NOTE Confidence: 0.8185584

00:11:35.079 --> 00:11:36.957 vision for a modern academic evidence

NOTE Confidence: 0.8185584

00:11:37.022 --> 00:11:39.267 based intervention on college program.

NOTE Confidence: 0.8185584

00:11:39.270 --> 00:11:41.258 First we want to increase the IO

NOTE Confidence: 0.8185584

00:11:41.258 --> 00:11:42.495 clinical research programs throughout

NOTE Confidence: 0.8185584

00:11:42.495 --> 00:11:44.155 the smilow cancer hospital and

NOTE Confidence: 0.8185584

00:11:44.155 --> 00:11:45.780 kiss centers throughout the area.

NOTE Confidence: 0.8185584

00:11:45.780 --> 00:11:46.083 Further,

NOTE Confidence: 0.8185584

00:11:46.083 --> 00:11:48.204 it will be important to improve the

NOTE Confidence: 0.8185584

00:11:48.204 --> 00:11:50.078 education for the community provider of

NOTE Confidence: 0.8185584

00:11:50.078 --> 00:11:52.266 the procedures that we offer and which

NOTE Confidence: 0.8185584

00:11:52.266 --> 00:11:54.144 patients are more likely to benefit.

NOTE Confidence: 0.8185584

00:11:54.150 --> 00:11:56.047 We also need better integration of care

NOTE Confidence: 0.8185584

00:11:56.047 --> 00:11:58.178 into current and future oncology workflows.

NOTE Confidence: 0.8185584

00:11:58.180 --> 00:12:00.812 We will be working on initiating some new

NOTE Confidence: 0.8185584

00:12:00.812 --> 00:12:03.029 clinical trials related to liver oncology.

NOTE Confidence: 0.8185584

00:12:03.030 --> 00:12:04.322 As discussed last week

NOTE Confidence: 0.8185584

00:12:04.322 --> 00:12:05.614 on liver generation was,

NOTE Confidence: 0.8185584

00:12:05.620 --> 00:12:07.240 which was dragging one study,

NOTE Confidence: 0.8185584

00:12:07.240 --> 00:12:09.382 but we also are going to be

NOTE Confidence: 0.8185584

00:12:09.382 --> 00:12:11.448 involved in the leap 012 study,

NOTE Confidence: 0.8185584

00:12:11.450 --> 00:12:13.704 which is going to be an immunotherapy

NOTE Confidence: 0.8185584

00:12:13.704 --> 00:12:15.354 chemo embolization plus or minus

NOTE Confidence: 0.8185584

00:12:15.354 --> 00:12:17.226 immunotherapy that we're going to be

NOTE Confidence: 0.8185584

00:12:17.226 --> 00:12:18.910 initiating or starting very soon.

NOTE Confidence: 0.8185584

00:12:18.910 --> 00:12:21.143 And then it's also going to be

NOTE Confidence: 0.8185584

00:12:21.143 --> 00:12:23.257 critical to have faculty who are

NOTE Confidence: 0.8185584

00:12:23.257 --> 00:12:25.417 sub specialized to be able to

NOTE Confidence: 0.8185584

00:12:25.417 --> 00:12:27.687 provide this level of advanced air.

NOTE Confidence: 0.8185584

00:12:27.690 --> 00:12:30.063 We also plan to make image guided

NOTE Confidence: 0.8185584

00:12:30.063 --> 00:12:31.902 biopsies more readily available and

NOTE Confidence: 0.8185584

00:12:31.902 --> 00:12:34.170 hoping to improve turn around time.

NOTE Confidence: 0.8185584

00:12:34.170 --> 00:12:36.085 There have been ongoing discussions

NOTE Confidence: 0.8185584

00:12:36.085 --> 00:12:38.715 with Doctor Chen Lu as you all

NOTE Confidence: 0.8185584

00:12:38.715 --> 00:12:40.647 know is the chair of pathology.

NOTE Confidence: 0.8185584

00:12:40.650 --> 00:12:43.778 To work on a by an image guided

NOTE Confidence: 0.8185584

00:12:43.778 --> 00:12:45.770 by over Pozza Tori.

NOTE Confidence: 0.8185584

00:12:45.770 --> 00:12:48.434 As will be seen from the next speakers,

NOTE Confidence: 0.8185584

00:12:48.440 --> 00:12:50.582 we are currently working on advanced

NOTE Confidence: 0.8185584

00:12:50.582 --> 00:12:51.653 preclinical and Translational

NOTE Confidence: 0.8185584

00:12:51.653 --> 00:12:53.555 research with a focus on molecular

NOTE Confidence: 0.8185584

00:12:53.555 --> 00:12:54.449 imaging immuno oncology.

NOTE Confidence: 0.8185584

00:12:54.450 --> 00:12:56.892 We're also very active in machine

NOTE Confidence: 0.8185584

00:12:56.892 --> 00:12:58.865 learning and artificial intelligence as

NOTE Confidence: 0.8185584

00:12:58.865 --> 00:13:00.818 it relates to liver cancer and based

NOTE Confidence: 0.8185584

00:13:00.818 --> 00:13:02.649 on these interesting topics we hope

NOTE Confidence: 0.8185584

00:13:02.649 --> 00:13:05.415 to be able to achieve and expand our funding.

NOTE Confidence: 0.8185584

00:13:05.415 --> 00:13:07.305 And Lastly we have a newly

NOTE Confidence: 0.8185584

00:13:07.305 --> 00:13:08.818 established IR residency program.

NOTE Confidence: 0.8185584

00:13:08.820 --> 00:13:11.772 In this we would like to develop an

NOTE Confidence: 0.8185584

00:13:11.772 --> 00:13:13.357 Interventional Oncology Fellowship and

NOTE Confidence: 0.8185584

00:13:13.357 --> 00:13:16.073 we are looking into the possibility of

NOTE Confidence: 0.8185584

00:13:16.073 --> 00:13:18.160 applying for a T32 training grants.

NOTE Confidence: 0.8185584

00:13:18.160 --> 00:13:19.198 So with that,

NOTE Confidence: 0.8185584

00:13:19.198 --> 00:13:21.620 these are visions and goals I'd like

NOTE Confidence: 0.8185584

00:13:21.689 --> 00:13:24.341 to then introduce my Co director

NOTE Confidence: 0.8185584

00:13:24.341 --> 00:13:26.109 for the Interventional Oncology

NOTE Confidence: 0.8185584

00:13:26.187 --> 00:13:27.639 Research Lab at Yale,

NOTE Confidence: 0.8185584

00:13:27.640 --> 00:13:29.220 who will be discussing

NOTE Confidence: 0.8185584

00:13:29.220 --> 00:13:30.010 quantitative biomarkers,

NOTE Confidence: 0.8402101

00:13:30.010 --> 00:13:31.975 molecular imaging in artificial intelligence

NOTE Confidence: 0.8402101

00:13:31.975 --> 00:13:34.749 to guide the therapy of liver cancer.

NOTE Confidence: 0.8402101

00:13:34.750 --> 00:13:37.120 So thank you for your attention.

NOTE Confidence: 0.8774969

00:13:46.380 --> 00:13:48.168 Alright, thank you very much everyone.

NOTE Confidence: 0.8774969

00:13:48.170 --> 00:13:50.347 I'm really excited to be presenting this

NOTE Confidence: 0.8774969

00:13:50.347 --> 00:13:52.631 topic on behalf of our lab and this is

NOTE Confidence: 0.8774969

00:13:52.631 --> 00:13:54.976 more of a vision presentation of what we've

NOTE Confidence: 0.8774969

00:13:54.976 --> 00:13:57.106 accomplished and a couple of thoughts

NOTE Confidence: 0.8774969

00:13:57.110 --> 00:13:59.486 that we put together over the last years.

NOTE Confidence: 0.8774969

00:13:59.490 --> 00:14:01.450 None of this would have been possible without

NOTE Confidence: 0.8774969

00:14:01.450 --> 00:14:03.370 really vast infrastructure of collaborators,

NOTE Confidence: 0.8774969

00:14:03.370 --> 00:14:04.855 which I'll be talking about

NOTE Confidence: 0.8774969

00:14:04.855 --> 00:14:06.043 a little bit later.

NOTE Confidence: 0.8774969

00:14:06.050 --> 00:14:08.795 I want to say that I very excited about.

NOTE Confidence: 0.8774969

00:14:08.800 --> 00:14:11.232 David joining the group here and really being

NOTE Confidence: 0.8774969

00:14:11.232 --> 00:14:13.847 our new leader and Interventional Ecology,

NOTE Confidence: 0.8774969

00:14:13.850 --> 00:14:15.896 and we all completely subscribed to

NOTE Confidence: 0.8774969

00:14:15.896 --> 00:14:18.190 the vision that she just provided.

NOTE Confidence: 0.8774969

00:14:18.190 --> 00:14:19.510 So as you know,

NOTE Confidence: 0.8774969

00:14:19.510 --> 00:14:22.878 I'm going to be focusing on the liver cancer,

NOTE Confidence: 0.8774969

00:14:22.880 --> 00:14:24.812 and primarily I'm going to start

NOTE Confidence: 0.8774969

00:14:24.812 --> 00:14:27.568 off with a BC else staging system.

NOTE Confidence: 0.8774969

00:14:27.570 --> 00:14:30.458 The most recent one was released in 2018,

NOTE Confidence: 0.8774969

00:14:30.460 --> 00:14:32.636 and even in that more recent addition to

NOTE Confidence: 0.8774969

00:14:32.636 --> 00:14:35.799 it we have seen a clear separation between

NOTE Confidence: 0.8774969

00:14:35.799 --> 00:14:38.040 intermediate station advanced stage disease,

NOTE Confidence: 0.8774969

00:14:38.040 --> 00:14:39.153 so they exist.

NOTE Confidence: 0.8774969

00:14:39.153 --> 00:14:41.008 Apparently in two separate planets,

NOTE Confidence: 0.8774969

00:14:41.010 --> 00:14:41.362 however,

NOTE Confidence: 0.8774969

00:14:41.362 --> 00:14:43.826 really in clinical practice and in signs,

NOTE Confidence: 0.8774969

00:14:43.830 --> 00:14:45.860 this is very transitional area where both

NOTE Confidence: 0.8774969

00:14:45.860 --> 00:14:48.398 seemed to be interacting quite extensively.

NOTE Confidence: 0.8774969

00:14:48.400 --> 00:14:50.703 We saw a lot of clinical trials

NOTE Confidence: 0.8774969

00:14:50.703 --> 00:14:52.978 focusing an overlap of those therapies,

NOTE Confidence: 0.8774969

00:14:52.980 --> 00:14:55.311 and this is exactly the realm where

NOTE Confidence: 0.8774969

00:14:55.311 --> 00:14:57.026 most patients are being diagnosed

NOTE Confidence: 0.8774969

00:14:57.026 --> 00:14:59.308 and also the realm where you know

NOTE Confidence: 0.8774969

00:14:59.308 --> 00:15:02.004 we think there is most room of

NOTE Confidence: 0.8774969

00:15:02.004 --> 00:15:03.536 improvement for patient outcomes,

NOTE Confidence: 0.8774969

00:15:03.540 --> 00:15:05.628 so systemic therapies for HTC then

NOTE Confidence: 0.8774969

00:15:05.628 --> 00:15:08.130 and now I borrowed the slides for

NOTE Confidence: 0.8774969

00:15:08.130 --> 00:15:09.896 from Agusan Abou Alfa, who's?

NOTE Confidence: 0.8774969

00:15:09.896 --> 00:15:11.776 Medical Oncologist at Memorial Sloan

NOTE Confidence: 0.8774969

00:15:11.776 --> 00:15:14.690 and this is how the market look like.

NOTE Confidence: 0.8774969

00:15:14.690 --> 00:15:17.082 Five years ago we just had one drug

NOTE Confidence: 0.8774969

00:15:17.082 --> 00:15:19.790 and this it's not even a complete view.

NOTE Confidence: 0.8774969

00:15:19.790 --> 00:15:22.016 This is where we are right now.

NOTE Confidence: 0.8774969

00:15:22.020 --> 00:15:23.940 So with him just five years,

NOTE Confidence: 0.8774969

00:15:23.940 --> 00:15:26.204 we have so many drugs being approved and

NOTE Confidence: 0.8774969

00:15:26.204 --> 00:15:28.717 most of 'em actually are very dedicated,

NOTE Confidence: 0.8774969

00:15:28.720 --> 00:15:29.680 specific targeted molecules

NOTE Confidence: 0.8774969

00:15:29.680 --> 00:15:30.640 and checkpoint inhibitors.

NOTE Confidence: 0.8774969

00:15:30.640 --> 00:15:32.638 So this flood of novel agents

NOTE Confidence: 0.8774969

00:15:32.638 --> 00:15:34.329 actually probably means the left

NOTE Confidence: 0.8774969

00:15:34.329 --> 00:15:36.373 ship of systemic therapy in the CL.

NOTE Confidence: 0.8774969

00:15:36.380 --> 00:15:38.277 See staging system and what we will

NOTE Confidence: 0.8774969

00:15:38.277 --> 00:15:40.849 witness is a greater overlap between local,

NOTE Confidence: 0.8774969

00:15:40.850 --> 00:15:42.062 regional and.

NOTE Confidence: 0.8774969

00:15:42.062 --> 00:15:44.486 Systemic therapies of immunotherapy.

NOTE Confidence: 0.8774969

00:15:44.490 --> 00:15:46.940 And this is where we come from.

NOTE Confidence: 0.8774969

00:15:46.940 --> 00:15:49.033 We focused now on the biomolecular mechanisms

NOTE Confidence: 0.8774969

00:15:49.033 --> 00:15:51.205 in the tumor micro environment behind

NOTE Confidence: 0.8774969

00:15:51.205 --> 00:15:53.235 those therapies and their combination.

NOTE Confidence: 0.8774969

00:15:53.240 --> 00:15:55.724 So we focus on two of the well known

NOTE Confidence: 0.8774969

00:15:55.724 --> 00:15:57.980 hallmarks of cancer that are particularly

NOTE Confidence: 0.8774969

00:15:57.980 --> 00:16:00.338 relevant for HTC specifically on its

NOTE Confidence: 0.8774969

00:16:00.338 --> 00:16:02.228 ability to avoid immune destruction

NOTE Confidence: 0.8774969

00:16:02.228 --> 00:16:04.090 and the deregulation of seller

NOTE Confidence: 0.8774969

00:16:04.090 --> 00:16:05.490 energetic into metabolic phenotype.

NOTE Confidence: 0.8774969

00:16:05.490 --> 00:16:08.640 So let's have a look at the HTC cell,

NOTE Confidence: 0.8774969

00:16:08.640 --> 00:16:11.440 so we now it has a very pronounced

NOTE Confidence: 0.8774969

00:16:11.440 --> 00:16:12.140 Warburg effect,

NOTE Confidence: 0.8774969

00:16:12.140 --> 00:16:14.312 and this is specifically a cell

NOTE Confidence: 0.8774969

00:16:14.312 --> 00:16:16.223 that is extremely dependent on

NOTE Confidence: 0.8774969

00:16:16.223 --> 00:16:17.420 the glucose metabolism.

NOTE Confidence: 0.8774969

00:16:17.420 --> 00:16:19.496 And so called the Arabic and

NOTE Confidence: 0.8774969

00:16:19.496 --> 00:16:20.866 anaerobic glycolysis, and well,

NOTE Confidence: 0.8774969

00:16:20.866 --> 00:16:23.990 the glucose is being taken up with that sell.

NOTE Confidence: 0.8774969

00:16:23.990 --> 00:16:25.010 It produces lactate.

NOTE Confidence: 0.8774969

00:16:25.010 --> 00:16:26.710 It is that essentially is

NOTE Confidence: 0.8774969

00:16:26.710 --> 00:16:28.840 D Cup from the Krebs cycle,

NOTE Confidence: 0.8774969

00:16:28.840 --> 00:16:29.779 and this lacked.

NOTE Confidence: 0.8774969

00:16:29.779 --> 00:16:31.657 It is then being flooded directly

NOTE Confidence: 0.8774969

00:16:31.657 --> 00:16:34.029 into the extra seller micro environment.

NOTE Confidence: 0.8774969

00:16:34.030 --> 00:16:35.824 And because of that there was

NOTE Confidence: 0.8774969

00:16:35.824 --> 00:16:37.508 dramatic acid ification of the

NOTE Confidence: 0.8774969

00:16:37.508 --> 00:16:39.220 surrounding tumor micro environment.

NOTE Confidence: 0.8167382

00:16:39.220 --> 00:16:41.988 And what does that really mean for us?

NOTE Confidence: 0.8167382

00:16:41.990 --> 00:16:44.060 The extracellular pH and liver cancer,

NOTE Confidence: 0.8167382

00:16:44.060 --> 00:16:45.444 especially aggressive age species

NOTE Confidence: 0.8167382

00:16:45.444 --> 00:16:47.382 known to be very, very low.

NOTE Confidence: 0.8167382

00:16:47.382 --> 00:16:50.122 And now finding say that this is a very

NOTE Confidence: 0.8167382

00:16:50.122 --> 00:16:52.427 important exclusion mechanism for four.

NOTE Confidence: 0.8167382

00:16:52.430 --> 00:16:54.400 Immune cells and the mechanism

NOTE Confidence: 0.8167382

00:16:54.400 --> 00:16:55.976 of immune cell exhaustion.

NOTE Confidence: 0.8167382

00:16:55.980 --> 00:16:57.834 So this has been previously reported

NOTE Confidence: 0.8167382

00:16:57.834 --> 00:17:00.748 and we now know more than ever that

NOTE Confidence: 0.8167382

00:17:00.748 --> 00:17:02.768 actually tumor infiltrating T lymphocytes

NOTE Confidence: 0.8167382

00:17:02.768 --> 00:17:05.546 depend extremely on extra seller acidity

NOTE Confidence: 0.8167382

00:17:05.546 --> 00:17:07.394 and competitive glucose deprivation,

NOTE Confidence: 0.8167382

00:17:07.400 --> 00:17:09.983 and that the reversal of this hostile

NOTE Confidence: 0.8167382

00:17:09.983 --> 00:17:11.989 tumor micro environment can actually

NOTE Confidence: 0.8167382

00:17:11.989 --> 00:17:14.485 improve their infiltration into the tumor.

NOTE Confidence: 0.8167382

00:17:14.490 --> 00:17:15.825 An immune response.

NOTE Confidence: 0.8167382

00:17:15.825 --> 00:17:18.050 So to sum it up,

NOTE Confidence: 0.8167382

00:17:18.050 --> 00:17:20.674 loads for seller pH is a marker of

NOTE Confidence: 0.8167382

00:17:20.674 --> 00:17:22.498 tumor aggressiveness and the presence

NOTE Confidence: 0.8167382

00:17:22.498 --> 00:17:24.712 of Protons and lactate really protects

NOTE Confidence: 0.8167382

00:17:24.712 --> 00:17:26.757 cancer against an immune response.

NOTE Confidence: 0.8167382

00:17:26.760 --> 00:17:28.320 It promotes new angiogenesis.

NOTE Confidence: 0.8167382

00:17:28.320 --> 00:17:30.660 The lactic acidosis plays in multifaceted

NOTE Confidence: 0.8167382

00:17:30.722 --> 00:17:32.913 role that is not fully understood for

NOTE Confidence: 0.8167382

00:17:32.913 --> 00:17:34.740 all variable immune cell subgroups,

NOTE Confidence: 0.8167382

00:17:34.740 --> 00:17:36.762 and the high lactic levels are

NOTE Confidence: 0.8167382

00:17:36.762 --> 00:17:38.110 actually strong predictors of

NOTE Confidence: 0.8167382

00:17:38.167 --> 00:17:40.187 metastatic disease and poor outcome.

NOTE Confidence: 0.8167382

00:17:40.190 --> 00:17:43.457 So where does all this fit in with taste?

NOTE Confidence: 0.8167382

00:17:43.460 --> 00:17:46.015 So theoretically this is an embolus therapy

NOTE Confidence: 0.8167382

00:17:46.015 --> 00:17:48.638 that changes the tumor micro environment.

NOTE Confidence: 0.8167382

00:17:48.640 --> 00:17:50.593 And what happens is that in theory

NOTE Confidence: 0.8167382

00:17:50.593 --> 00:17:51.885 tastes me potentially exacerbate

NOTE Confidence: 0.8167382

00:17:51.885 --> 00:17:53.880 a hostile tumor micro environment

NOTE Confidence: 0.8167382

00:17:53.880 --> 00:17:55.476 that attenuates treatment efficacy.

NOTE Confidence: 0.8167382

00:17:55.480 --> 00:17:56.844 Let's look at it.

NOTE Confidence: 0.8167382

00:17:56.844 --> 00:17:57.526 I mean,

NOTE Confidence: 0.8167382

00:17:57.530 --> 00:18:00.043 it induces a hypoxic injury that potentially

NOTE Confidence: 0.8167382

00:18:00.043 --> 00:18:02.320 may exacerbate the low pH even further.

NOTE Confidence: 0.8167382

00:18:02.320 --> 00:18:03.752 It potentially stimulates brand

NOTE Confidence: 0.8167382

00:18:03.752 --> 00:18:05.542 eugenic signaling and the embolization

NOTE Confidence: 0.8167382

00:18:05.542 --> 00:18:06.897 even might prevent delected

NOTE Confidence: 0.8167382

00:18:06.897 --> 00:18:08.477 transport away from the tumor.

NOTE Confidence: 0.8167382

00:18:08.480 --> 00:18:10.055 So postdates tumor marker environment

NOTE Confidence: 0.8167382

00:18:10.055 --> 00:18:12.240 was thought to be immune inhibitory,

NOTE Confidence: 0.8167382

00:18:12.240 --> 00:18:14.570 but is that really true?

NOTE Confidence: 0.8167382

00:18:14.570 --> 00:18:15.264 I mean,

NOTE Confidence: 0.8167382

00:18:15.264 --> 00:18:17.346 let's look at HTC in general,

NOTE Confidence: 0.8167382

00:18:17.350 --> 00:18:19.695 where it stands in terms of Genomic

NOTE Confidence: 0.8167382

00:18:19.695 --> 00:18:21.123 somatic mutations as opposed

NOTE Confidence: 0.8167382

00:18:21.123 --> 00:18:22.918 to Melanoma and lung cancer.

NOTE Confidence: 0.8167382

00:18:22.920 --> 00:18:25.356 Really, HTC is somewhere in the middle,

NOTE Confidence: 0.8167382

00:18:25.360 --> 00:18:27.872 so the idea of the Immuno and inoculation

NOTE Confidence: 0.8167382

00:18:27.872 --> 00:18:29.329 with locoregional therapies with

NOTE Confidence: 0.8167382

00:18:29.329 --> 00:18:31.264 initially discarded because of that.

NOTE Confidence: 0.8167382

00:18:31.270 --> 00:18:31.604 So,

NOTE Confidence: 0.8167382

00:18:31.604 --> 00:18:31.938 however,

NOTE Confidence: 0.8167382

00:18:31.938 --> 00:18:34.276 let's have a look at the pathology

NOTE Confidence: 0.8167382

00:18:34.276 --> 00:18:36.488 of a tumor treated with taste.

NOTE Confidence: 0.8167382

00:18:36.490 --> 00:18:38.578 This is a patient with HTC.

NOTE Confidence: 0.8167382

00:18:38.580 --> 00:18:40.694 Histology was taken 11 days post locoregional

NOTE Confidence: 0.8167382

00:18:40.694 --> 00:18:42.410 therapies that was transplantation.

NOTE Confidence: 0.8167382

00:18:42.410 --> 00:18:44.622 What we see we see in necrotic

NOTE Confidence: 0.8167382

00:18:44.622 --> 00:18:46.446 tumor packed with in this

NOTE Confidence: 0.8167382

00:18:46.446 --> 00:18:48.466 particular case drug eluting beads.

NOTE Confidence: 0.8167382

00:18:48.470 --> 00:18:50.507 And surrounding that we see a very

NOTE Confidence: 0.8167382

00:18:50.507 --> 00:18:51.830 dense immune infiltrate and if

NOTE Confidence: 0.8167382

00:18:51.830 --> 00:18:53.230 we zoom in We really almost see

NOTE Confidence: 0.8167382

00:18:53.230 --> 00:18:54.971 a secondary immune follicles and

NOTE Confidence: 0.8167382

00:18:54.971 --> 00:18:56.826 macrophages and T cells really

NOTE Confidence: 0.8167382

00:18:56.826 --> 00:18:58.160 accumulating the transitional zone.

NOTE Confidence: 0.8167382

00:18:58.160 --> 00:18:59.760 But they can't really penetrate

NOTE Confidence: 0.8167382

00:18:59.760 --> 00:19:01.716 into the necrotic areas of the tumor

NOTE Confidence: 0.8167382

00:19:01.716 --> 00:19:03.599 where all the good end to Jenison.

NOTE Confidence: 0.8167382

00:19:03.600 --> 00:19:04.485 Why is that?

NOTE Confidence: 0.8167382

00:19:04.485 --> 00:19:06.550 So our mission was at this point

NOTE Confidence: 0.8167382

00:19:06.617 --> 00:19:08.741 to really look at the underlying

NOTE Confidence: 0.8167382

00:19:08.741 --> 00:19:11.470 mechanisms and how do systemic therapies.

NOTE Confidence: 0.8167382

00:19:11.470 --> 00:19:13.661 How does in the immune system and

NOTE Confidence: 0.8167382

00:19:13.661 --> 00:19:15.140 local regional therapies interact?

NOTE Confidence: 0.8167382

00:19:15.140 --> 00:19:17.186 So we wanted to develop imaging

NOTE Confidence: 0.8167382

00:19:17.186 --> 00:19:18.550 instruments for noninvasive functional

NOTE Confidence: 0.8167382

00:19:18.602 --> 00:19:20.026 characterization monitoring of the

NOTE Confidence: 0.8167382

00:19:20.026 --> 00:19:22.162 tumor micro environment in the setting

NOTE Confidence: 0.8167382

00:19:22.211 --> 00:19:23.819 of the immune response and taste,

NOTE Confidence: 0.8167382

00:19:23.820 --> 00:19:25.668 and that was the mission of the

NOTE Confidence: 0.8167382

00:19:25.668 --> 00:19:27.406 lab that we essentially star

NOTE Confidence: 0.8167382

00:19:27.406 --> 00:19:29.166 started several years ago.

NOTE Confidence: 0.8167382

00:19:29.170 --> 00:19:31.410 So the one of the first projects that

NOTE Confidence: 0.8167382

00:19:31.410 --> 00:19:34.037 I'm going to talk about is recently

NOTE Confidence: 0.8167382

00:19:34.037 --> 00:19:36.037 published paper clinical Cancer Research.

NOTE Confidence: 0.8162481

00:19:36.040 --> 00:19:38.175 That focused on the development of an

NOTE Confidence: 0.8162481

00:19:38.175 --> 00:19:40.170 extracellular pH probe that demonstrates

NOTE Confidence: 0.8162481

00:19:40.170 --> 00:19:41.712 extracellular pH noninvasively

NOTE Confidence: 0.8162481

00:19:41.712 --> 00:19:43.254 using spectroscopic methodology,

NOTE Confidence: 0.8162481

00:19:43.260 --> 00:19:45.660 and I'm actually really appreciate it.

NOTE Confidence: 0.8162481

00:19:45.660 --> 00:19:47.928 'cause that partnered in design and

NOTE Confidence: 0.8162481

00:19:47.928 --> 00:19:50.698 work on the on this novel mechanism

NOTE Confidence: 0.8162481

00:19:50.698 --> 00:19:53.449 with Daniel Komen and if I meet

NOTE Confidence: 0.8162481

00:19:53.529 --> 00:19:56.025 higher from the Mr Research Center

NOTE Confidence: 0.8162481

00:19:56.025 --> 00:19:58.198 who have been really instrumental

NOTE Confidence: 0.8162481

00:19:58.198 --> 00:20:00.738 and great partners in developing.

NOTE Confidence: 0.8162481

00:20:00.740 --> 00:20:04.110 And we used to model of a rabbit liver tumor,

NOTE Confidence: 0.8162481

00:20:04.110 --> 00:20:06.837 which is so far the only moderate size animal

NOTE Confidence: 0.8162481

00:20:06.837 --> 00:20:09.166 model that has a faithful reproduction.

NOTE Confidence: 0.8162481

00:20:09.170 --> 00:20:10.665 Reproduction of an HTC tumor

NOTE Confidence: 0.8162481

00:20:10.665 --> 00:20:12.570 environment and the has a high

NOTE Confidence: 0.8162481

00:20:12.570 --> 00:20:14.315 clinical relevance because we can

NOTE Confidence: 0.8162481

00:20:14.315 --> 00:20:16.477 do the embolization also image those

NOTE Confidence: 0.8162481

00:20:16.477 --> 00:20:18.595 animals in real size clinical scanners.

NOTE Confidence: 0.8162481

00:20:18.600 --> 00:20:21.201 We do have a 3T MRI system for that

NOTE Confidence: 0.8162481

00:20:21.201 --> 00:20:23.620 and also cutting edge IR suite which

NOTE Confidence: 0.8162481

00:20:23.620 --> 00:20:26.887 we use in the white Rick with the help

NOTE Confidence: 0.8162481

00:20:26.887 --> 00:20:29.402 and support of Alston is this group.

NOTE Confidence: 0.8162481

00:20:29.402 --> 00:20:31.824 So this is an immuno competent host.

NOTE Confidence: 0.8162481

00:20:31.830 --> 00:20:33.630 Anna hyper glycolytic metabolic phenotype.

NOTE Confidence: 0.8162481

00:20:33.630 --> 00:20:35.420 An essentially those tumors have

NOTE Confidence: 0.8162481

00:20:35.420 --> 00:20:36.494 been characterized previously,

NOTE Confidence: 0.8162481

00:20:36.500 --> 00:20:38.690 is very reminiscent of the actual

NOTE Confidence: 0.8162481

00:20:38.690 --> 00:20:40.450 tumor marker environment of HTC.

NOTE Confidence: 0.8162481

00:20:40.450 --> 00:20:42.820 So what is a good way to image pH so

NOTE Confidence: 0.8162481

00:20:42.889 --> 00:20:45.654 their sensor jeans that you can use

NOTE Confidence: 0.8162481

00:20:45.654 --> 00:20:48.293 their luminescent probes that you can

NOTE Confidence: 0.8162481

00:20:48.293 --> 00:20:50.137 translate yourselves with reporters?

NOTE Confidence: 0.8162481

00:20:50.140 --> 00:20:52.316 But what we in radiology aim for is

NOTE Confidence: 0.8162481

00:20:52.316 --> 00:20:53.676 really the noninvasive measurement

NOTE Confidence: 0.8162481

00:20:53.676 --> 00:20:56.322 affects your seller pH and this is

NOTE Confidence: 0.8162481

00:20:56.322 --> 00:20:58.445 where our msit based spectroscopic

NOTE Confidence: 0.8162481

00:20:58.445 --> 00:21:00.545 birds methodology comes into place.

NOTE Confidence: 0.8162481

00:21:00.550 --> 00:21:02.435 This has been established previously

NOTE Confidence: 0.8162481

00:21:02.435 --> 00:21:04.320 in brain tumors by Daniel.

NOTE Confidence: 0.8162481

00:21:04.320 --> 00:21:05.955 And we have translated this

NOTE Confidence: 0.8162481

00:21:05.955 --> 00:21:06.936 essentially to deliver.

NOTE Confidence: 0.8162481

00:21:06.940 --> 00:21:08.296 This is NMR Spectra,

NOTE Confidence: 0.8162481

00:21:08.296 --> 00:21:09.991 scopic method that measures the

NOTE Confidence: 0.8162481

00:21:09.991 --> 00:21:11.609 redundant deviation of shifts and

NOTE Confidence: 0.8162481

00:21:11.609 --> 00:21:13.830 temperature in the region of the tumor,

NOTE Confidence: 0.8162481

00:21:13.830 --> 00:21:15.706 and we can generate the 3D extracellular

NOTE Confidence: 0.8162481

00:21:15.706 --> 00:21:17.975 pH map that provides us with essentially

NOTE Confidence: 0.8162481

00:21:17.975 --> 00:21:19.379 a very accurate characterization

NOTE Confidence: 0.8162481

00:21:19.379 --> 00:21:21.378 of the tumor micro environment.

NOTE Confidence: 0.8162481

00:21:21.380 --> 00:21:23.702 So if we look at the tumor in by

NOTE Confidence: 0.8162481

00:21:23.702 --> 00:21:25.981 itself and measure it as compared

NOTE Confidence: 0.8162481

00:21:25.981 --> 00:21:27.931 to the surrounding liver tissue,

NOTE Confidence: 0.8162481

00:21:27.940 --> 00:21:30.076 we see that the tumor in by itself

NOTE Confidence: 0.8162481

00:21:30.076 --> 00:21:32.649 has much lower pH and baseline in an

NOTE Confidence: 0.8162481

00:21:32.649 --> 00:21:35.149 untreated fashion and the surrounding liver,

NOTE Confidence: 0.8162481

00:21:35.150 --> 00:21:36.092 and that's important.

NOTE Confidence: 0.8162481

00:21:36.092 --> 00:21:38.290 And we know that this is probably

NOTE Confidence: 0.8162481

00:21:38.351 --> 00:21:40.710 due to the overt Warburg effect and

NOTE Confidence: 0.8162481

00:21:40.710 --> 00:21:43.081 overexpression of glued one and lamb two

NOTE Confidence: 0.8162481

00:21:43.081 --> 00:21:45.031 as indicators for the micro environment.

NOTE Confidence: 0.8162481

00:21:45.040 --> 00:21:47.616 Now, what does taste actually do with it?

NOTE Confidence: 0.8162481

00:21:47.620 --> 00:21:49.600 And this is where the surprising

NOTE Confidence: 0.8162481

00:21:49.600 --> 00:21:51.480 result from our study came in.

NOTE Confidence: 0.8162481

00:21:51.480 --> 00:21:53.430 We looked at the effects of

NOTE Confidence: 0.8162481

00:21:53.430 --> 00:21:55.030 embolization with little one day,

NOTE Confidence: 0.8162481

00:21:55.030 --> 00:21:55.650 one week,

NOTE Confidence: 0.8162481

00:21:55.650 --> 00:21:57.510 and two weeks after we actually

NOTE Confidence: 0.8162481

00:21:57.510 --> 00:21:59.335 treat those tumors and measured the

NOTE Confidence: 0.8162481

00:21:59.335 --> 00:22:01.833 pH and as opposed to most of the

NOTE Confidence: 0.8162481

00:22:01.833 --> 00:22:03.975 assumptions that taste is going to

NOTE Confidence: 0.8162481

00:22:03.975 --> 00:22:06.106 actually exacerbate the The Anti.

NOTE Confidence: 0.8162481

00:22:06.106 --> 00:22:09.262 Yeah, I mean the logic, the immune,

NOTE Confidence: 0.8162481

00:22:09.262 --> 00:22:10.846 evasive tumor micro environment,

NOTE Confidence: 0.8162481

00:22:10.850 --> 00:22:12.830 it actually did the opposite.

NOTE Confidence: 0.8162481

00:22:12.830 --> 00:22:15.028 So what we see is a normalization

NOTE Confidence: 0.8162481

00:22:15.028 --> 00:22:17.608 of the tumor pH towards almost

NOTE Confidence: 0.8162481

00:22:17.608 --> 00:22:19.177 delivered background levels.

NOTE Confidence: 0.8162481

00:22:19.180 --> 00:22:20.281 Overtime after taste.

NOTE Confidence: 0.8162481

00:22:20.281 --> 00:22:22.483 And that is an important finding

NOTE Confidence: 0.8162481

00:22:22.483 --> 00:22:24.628 because that gives us an opportunity

NOTE Confidence: 0.8162481

00:22:24.628 --> 00:22:26.877 to use local regional therapy in

NOTE Confidence: 0.8162481

00:22:26.877 --> 00:22:28.749 preparation for successful anti

NOTE Confidence: 0.8162481

00:22:28.749 --> 00:22:30.153 checkpoint checkpoint inhibition

NOTE Confidence: 0.8162481

00:22:30.153 --> 00:22:32.161 therapy and we actually demonstrated

NOTE Confidence: 0.8162481

00:22:32.161 --> 00:22:34.660 this also with a more direct and

NOTE Confidence: 0.8515036

00:22:34.730 --> 00:22:36.704 exacerbated model. Where we.

NOTE Confidence: 0.8515036

00:22:36.704 --> 00:22:38.814 Eustace and actually injected bicarbonate

NOTE Confidence: 0.8515036

00:22:38.814 --> 00:22:41.089 directly with taste and what we

NOTE Confidence: 0.8515036

00:22:41.089 --> 00:22:42.979 demonstrated here is that on baseline

NOTE Confidence: 0.8515036

00:22:42.979 --> 00:22:45.258 you have an acidic tumor with taste.

NOTE Confidence: 0.8515036

00:22:45.260 --> 00:22:47.556 You have a minor improvement of pH towards

NOTE Confidence: 0.8515036

00:22:47.556 --> 00:22:49.359 normal over overnight essentially,

NOTE Confidence: 0.8515036

00:22:49.360 --> 00:22:51.579 but if you add bicarb you can

NOTE Confidence: 0.8515036

00:22:51.579 --> 00:22:53.290 immediately improve the pH almost

NOTE Confidence: 0.8515036

00:22:53.290 --> 00:22:55.372 essentially to normal and yellow and

NOTE Confidence: 0.8515036

00:22:55.372 --> 00:22:57.568 green means higher levels than blue.

NOTE Confidence: 0.8515036

00:22:57.570 --> 00:22:59.964 If we now look at, for example,

NOTE Confidence: 0.8515036

00:22:59.964 --> 00:23:02.016 H Lady are expression at baseline,

NOTE Confidence: 0.8515036

00:23:02.020 --> 00:23:04.660 we see immune cell exclusion were really see

NOTE Confidence: 0.8515036

00:23:04.660 --> 00:23:07.677 all the immune cells in the tumor periphery.

NOTE Confidence: 0.8515036

00:23:07.680 --> 00:23:09.300 And with with taste alone,

NOTE Confidence: 0.8515036

00:23:09.300 --> 00:23:11.554 immediately at least one day after therapy,

NOTE Confidence: 0.8515036

00:23:11.560 --> 00:23:13.170 you don't really see a

NOTE Confidence: 0.8515036

00:23:13.170 --> 00:23:14.458 lot of immune invasion,

NOTE Confidence: 0.8515036

00:23:14.460 --> 00:23:16.080 but with taste and bicarb,

NOTE Confidence: 0.8515036

00:23:16.080 --> 00:23:18.018 essentially improving and elevating a pH,

NOTE Confidence: 0.8515036

00:23:18.020 --> 00:23:19.308 you see massive intratumoral

NOTE Confidence: 0.8515036

00:23:19.308 --> 00:23:20.596 infiltration of immune cells,

NOTE Confidence: 0.8515036

00:23:20.600 --> 00:23:22.352 and that's an important finding that

NOTE Confidence: 0.8515036

00:23:22.352 --> 00:23:24.626 we made here in actually an important

NOTE Confidence: 0.8515036

00:23:24.626 --> 00:23:27.062 other thought that we should be thinking

NOTE Confidence: 0.8515036

00:23:27.126 --> 00:23:29.317 about as a group generally in oncology,

NOTE Confidence: 0.8515036

00:23:29.320 --> 00:23:31.574 and what kind of agents we use.

NOTE Confidence: 0.8515036

00:23:31.580 --> 00:23:34.487 So when we use a key mobilization with oil,

NOTE Confidence: 0.8515036

00:23:34.490 --> 00:23:36.100 which is Lupito, we achieved,

NOTE Confidence: 0.8515036

00:23:36.100 --> 00:23:37.775 achieves seemed to be achieving

NOTE Confidence: 0.8515036

00:23:37.775 --> 00:23:38.780 very different effects.

NOTE Confidence: 0.8515036

00:23:38.780 --> 00:23:39.390 Compared to,

NOTE Confidence: 0.8515036

00:23:39.390 --> 00:23:40.000 for example,

NOTE Confidence: 0.8515036

00:23:40.000 --> 00:23:42.220 using an cuisine beads or Lumi beads,

NOTE Confidence: 0.8515036

00:23:42.220 --> 00:23:44.014 which is another flavor of beads

NOTE Confidence: 0.8515036

00:23:44.014 --> 00:23:46.305 and that is important for us to

NOTE Confidence: 0.8515036

00:23:46.305 --> 00:23:47.681 understand because through the

NOTE Confidence: 0.8515036

00:23:47.681 --> 00:23:49.324 uncle logic community taste was

NOTE Confidence: 0.8515036

00:23:49.324 --> 00:23:50.986 taste for long period of time,

NOTE Confidence: 0.8515036

00:23:50.990 --> 00:23:52.862 but in reality it is not because we

NOTE Confidence: 0.8515036

00:23:52.862 --> 00:23:54.437 know that different embolic particles

NOTE Confidence: 0.8515036

00:23:54.437 --> 00:23:56.880 will induce very different in a logical

NOTE Confidence: 0.8515036

00:23:56.937 --> 00:23:58.657 effects in very different changes

NOTE Confidence: 0.8515036

00:23:58.657 --> 00:24:00.377 to the tumor marker environment.

NOTE Confidence: 0.8515036

00:24:00.380 --> 00:24:02.258 And that is something that we

NOTE Confidence: 0.8515036

00:24:02.258 --> 00:24:03.510 really need to study,

NOTE Confidence: 0.8515036

00:24:03.510 --> 00:24:05.624 especially if we want to combine the

NOTE Confidence: 0.8515036

00:24:05.624 --> 00:24:07.414 local regional therapies with systemic

NOTE Confidence: 0.8515036

00:24:07.414 --> 00:24:09.066 therapies and checkpoint inhibition.

NOTE Confidence: 0.8515036

00:24:09.070 --> 00:24:10.995 Now another level of investigation

NOTE Confidence: 0.8515036

00:24:10.995 --> 00:24:13.547 that we took to token published

NOTE Confidence: 0.8515036

00:24:13.547 --> 00:24:15.200 recently in radiology,

NOTE Confidence: 0.8515036

00:24:15.200 --> 00:24:17.128 again close collaboration with

NOTE Confidence: 0.8515036

00:24:17.128 --> 00:24:19.538 Daniel Komen Fahmideh Hyder but

NOTE Confidence: 0.8515036

00:24:19.538 --> 00:24:21.962 also other groups like rip Ocala's

NOTE Confidence: 0.8515036

00:24:21.962 --> 00:24:24.839 group and also want to mention Ruth,

NOTE Confidence: 0.8515036

00:24:24.840 --> 00:24:25.277 Montgomery,

NOTE Confidence: 0.8515036

00:24:25.277 --> 00:24:26.151 and Joshi,

NOTE Confidence: 0.8515036

00:24:26.151 --> 00:24:28.773 who helped us generate this research.

NOTE Confidence: 0.8515036

00:24:28.780 --> 00:24:30.530 Here we wanted to demonstrate

NOTE Confidence: 0.8515036

00:24:30.530 --> 00:24:32.859 that we can actually use molecular

NOTE Confidence: 0.8515036

00:24:32.859 --> 00:24:34.907 dedicated inmar probes nanoprobes

NOTE Confidence: 0.8515036

00:24:34.907 --> 00:24:36.955 labeled antibodies to visualize

NOTE Confidence: 0.8515036

00:24:36.955 --> 00:24:39.407 the immune system surrounding those

NOTE Confidence: 0.8515036

00:24:39.407 --> 00:24:41.747 tumors in vivo and noninvasively.

NOTE Confidence: 0.8515036

00:24:41.750 --> 00:24:44.117 So what we did is we use both iron

NOTE Confidence: 0.8515036

00:24:44.117 --> 00:24:46.286 oxide particles and the direct

NOTE Confidence: 0.8515036

00:24:46.286 --> 00:24:48.126 injection of gadolinium labeled

NOTE Confidence: 0.8515036

00:24:48.126 --> 00:24:50.396 antibodies to visualize those tumors

NOTE Confidence: 0.8515036

00:24:50.396 --> 00:24:52.958 and put those animals with those

NOTE Confidence: 0.8515036

00:24:52.958 --> 00:24:55.005 implanted tumors into them are what

NOTE Confidence: 0.8515036

00:24:55.005 --> 00:24:57.113 we demonstrated was that we were

NOTE Confidence: 0.8515036

00:24:57.113 --> 00:24:59.273 able to clearly delineate microfusion

NOTE Confidence: 0.8515036

00:24:59.273 --> 00:25:01.465 immune cell infiltration and macrophage

NOTE Confidence: 0.8515036

00:25:01.465 --> 00:25:03.445 and immune cell accumulation in

NOTE Confidence: 0.8515036

00:25:03.445 --> 00:25:05.418 the periphery of those tumors.

NOTE Confidence: 0.8515036

00:25:05.418 --> 00:25:06.970 On T2 MRI sequences,

NOTE Confidence: 0.8515036

00:25:06.970 --> 00:25:09.298 and that was proven in histologically

NOTE Confidence: 0.8515036

00:25:09.298 --> 00:25:10.850 with Prussian blue staining,

NOTE Confidence: 0.8515036

00:25:10.850 --> 00:25:12.438 which stands for iron.

NOTE Confidence: 0.8515036

00:25:12.438 --> 00:25:14.820 And we saw that the spines,

NOTE Confidence: 0.8515036

00:25:14.820 --> 00:25:17.055 the iron oxide particles really

NOTE Confidence: 0.8515036

00:25:17.055 --> 00:25:19.290 deposited and CD11B positive macrophages

NOTE Confidence: 0.8515036

00:25:19.360 --> 00:25:21.262 and we confirmed that later with

NOTE Confidence: 0.8515036

00:25:21.262 --> 00:25:23.581 CD 68 staining and the same thing

NOTE Confidence: 0.8515036

00:25:23.581 --> 00:25:25.555 is true for our induction injection

NOTE Confidence: 0.8515036

00:25:25.555 --> 00:25:26.982 of gadolinium labeled antibodies.

NOTE Confidence: 0.8515036

00:25:26.982 --> 00:25:29.166 You probably heard about this from

NOTE Confidence: 0.8515036

00:25:29.166 --> 00:25:31.059 the molecular imaging using pet,

NOTE Confidence: 0.8515036

00:25:31.060 --> 00:25:33.349 but here we have a much Marsh

NOTE Confidence: 0.8515036

00:25:33.349 --> 00:25:35.166 higher focal resolution where we

NOTE Confidence: 0.8515036

00:25:35.166 --> 00:25:36.698 label antibodies with gadolinium

NOTE Confidence: 0.8515036

00:25:36.698 --> 00:25:38.230 and then inject them

NOTE Confidence: 0.81775826

00:25:38.297 --> 00:25:40.613 directly into those tumors and through

NOTE Confidence: 0.81775826

00:25:40.613 --> 00:25:43.896 the artery, and we can see that there is

NOTE Confidence: 0.81775826

00:25:43.896 --> 00:25:45.890 very specific accumulation and staining.

NOTE Confidence: 0.81775826

00:25:45.890 --> 00:25:47.920 Of immune cells and perforate the tumor

NOTE Confidence: 0.81775826

00:25:47.920 --> 00:25:50.607 that we can now really locali characterize,

NOTE Confidence: 0.81775826

00:25:50.610 --> 00:25:52.857 and that's that's a big step forward

NOTE Confidence: 0.81775826

00:25:52.857 --> 00:25:55.780 because not only can we now image the tumor

NOTE Confidence: 0.81775826

00:25:55.780 --> 00:25:58.019 marker environment from a pH perspective,

NOTE Confidence: 0.81775826

00:25:58.020 --> 00:26:00.694 we can also images from a presence

NOTE Confidence: 0.81775826

00:26:00.694 --> 00:26:02.820 and functionality of immune cells.

NOTE Confidence: 0.81775826

00:26:02.820 --> 00:26:05.148 So for the first part of the conclusions

NOTE Confidence: 0.81775826

00:26:05.148 --> 00:26:07.280 are their appearance of, for example,

NOTE Confidence: 0.81775826

00:26:07.280 --> 00:26:09.290 more than five targeted agents to

NOTE Confidence: 0.81775826

00:26:09.290 --> 00:26:11.520 treat HTC will cause a left shift

NOTE Confidence: 0.81775826

00:26:11.520 --> 00:26:13.559 of systemic therapy in the BC else,

NOTE Confidence: 0.81775826

00:26:13.560 --> 00:26:16.088 and we really must do some heavy lifting.

NOTE Confidence: 0.81775826

00:26:16.090 --> 00:26:17.658 It's up to art actually to put

NOTE Confidence: 0.81775826

00:26:17.658 --> 00:26:19.194 to put the collaboration between

NOTE Confidence: 0.81775826

00:26:19.194 --> 00:26:21.214 the Interventional in college and

NOTE Confidence: 0.81775826

00:26:21.214 --> 00:26:23.358 Immuno Oncology on the right track.

NOTE Confidence: 0.81775826

00:26:23.360 --> 00:26:25.112 From a science perspective we must

NOTE Confidence: 0.81775826

00:26:25.112 --> 00:26:26.948 also work more on non invasive

NOTE Confidence: 0.81775826

00:26:26.948 --> 00:26:29.069 imaging modalities and we did so with

NOTE Confidence: 0.81775826

00:26:29.069 --> 00:26:30.852 the extracellular pH that revealed

NOTE Confidence: 0.81775826

00:26:30.852 --> 00:26:32.976 that ace actually is an inducer.

NOTE Confidence: 0.81775826

00:26:32.980 --> 00:26:35.075 Profound changes to tumor marker

NOTE Confidence: 0.81775826

00:26:35.075 --> 00:26:37.170 environment that may help immunotherapy

NOTE Confidence: 0.81775826

00:26:37.228 --> 00:26:38.448 to be more effective,

NOTE Confidence: 0.81775826

00:26:38.450 --> 00:26:41.578 and pH is key for us as marker,

NOTE Confidence: 0.81775826

00:26:41.580 --> 00:26:44.450 but the changes in pH depends on

NOTE Confidence: 0.81775826

00:26:44.450 --> 00:26:46.670 the embolic materials that we use.

NOTE Confidence: 0.81775826

00:26:46.670 --> 00:26:49.246 We also now know that C test would

NOTE Confidence: 0.81775826

00:26:49.246 --> 00:26:51.626 lipiodol may achieve a partial reversal

NOTE Confidence: 0.81775826

00:26:51.626 --> 00:26:54.128 of the immune evasive tumor marker

NOTE Confidence: 0.81775826

00:26:54.206 --> 00:26:57.216 environment on itself two weeks after taste,

NOTE Confidence: 0.81775826

00:26:57.220 --> 00:26:59.579 and that we can use them are

NOTE Confidence: 0.81775826

00:26:59.579 --> 00:27:01.604 instruments to actually detect immune

NOTE Confidence: 0.81775826

00:27:01.604 --> 00:27:03.964 cells directly surrounding the tumor.

NOTE Confidence: 0.81775826

00:27:03.970 --> 00:27:04.636 So in summary,

NOTE Confidence: 0.81775826

00:27:04.636 --> 00:27:06.627 the for the first part of my conclusion

NOTE Confidence: 0.81775826

00:27:06.627 --> 00:27:08.517 is that local regional therapy

NOTE Confidence: 0.81775826

00:27:08.517 --> 00:27:10.029 and intervention alone college.

NOTE Confidence: 0.81775826

00:27:10.030 --> 00:27:11.848 You must be established in combination

NOTE Confidence: 0.81775826

00:27:11.848 --> 00:27:12.757 with each other.

NOTE Confidence: 0.81775826

00:27:12.760 --> 00:27:14.664 We have to have a synergy between

NOTE Confidence: 0.81775826

00:27:14.664 --> 00:27:16.547 the two iOS interventional and Immuno

NOTE Confidence: 0.81775826

00:27:16.547 --> 00:27:19.728 Oncology and it's up to us to work on that.

NOTE Confidence: 0.81775826

00:27:19.730 --> 00:27:21.185 And that generates another bigger

NOTE Confidence: 0.81775826

00:27:21.185 --> 00:27:23.240 problem that we really workup on very

NOTE Confidence: 0.81775826

00:27:23.240 --> 00:27:24.878 closely with Jim Duncan and collaboration

NOTE Confidence: 0.81775826

00:27:24.878 --> 00:27:27.000 with that group and biomedical engineering.

NOTE Confidence: 0.81775826

00:27:27.000 --> 00:27:28.746 And this is the overwhelming growth

NOTE Confidence: 0.81775826

00:27:28.746 --> 00:27:30.900 of data and will be talking about

NOTE Confidence: 0.81775826

00:27:30.900 --> 00:27:32.144 this little bit later.

NOTE Confidence: 0.81775826

00:27:32.150 --> 00:27:34.566 Tall is going to be presenting on that,

NOTE Confidence: 0.81775826

00:27:34.570 --> 00:27:37.066 so we know that the data that we

NOTE Confidence: 0.81775826

00:27:37.066 --> 00:27:38.700 have specifically in imaging and.

NOTE Confidence: 0.81775826

00:27:38.700 --> 00:27:40.584 Cancer in general explode so we

NOTE Confidence: 0.81775826

00:27:40.584 --> 00:27:42.828 have more than 20 times more data

NOTE Confidence: 0.81775826

00:27:42.828 --> 00:27:44.664 today than we have in 2013,

NOTE Confidence: 0.81775826

00:27:44.670 --> 00:27:47.428 and so that is a huge challenge.

NOTE Confidence: 0.81775826

00:27:47.430 --> 00:27:49.240 Anne, it's David already presented.

NOTE Confidence: 0.81775826

00:27:49.240 --> 00:27:50.684 We have different flavors

NOTE Confidence: 0.81775826

00:27:50.684 --> 00:27:51.767 of chemo embolization,

NOTE Confidence: 0.81775826

00:27:51.770 --> 00:27:53.218 embolization with drug alluding

NOTE Confidence: 0.81775826

00:27:53.218 --> 00:27:54.304 Beatson Radio mobilization.

NOTE Confidence: 0.81775826

00:27:54.310 --> 00:27:56.356 We have a variety of different

NOTE Confidence: 0.81775826

00:27:56.356 --> 00:27:58.178 methodologies in ways how we

NOTE Confidence: 0.81775826

00:27:58.178 --> 00:27:59.738 can introduce tumor necrosis,

NOTE Confidence: 0.81775826

00:27:59.740 --> 00:28:00.370 cold heat,

NOTE Confidence: 0.81775826

00:28:00.370 --> 00:28:02.575 and electrocution in a way we have

NOTE Confidence: 0.81775826

00:28:02.575 --> 00:28:04.583 five different and more coming

NOTE Confidence: 0.81775826

00:28:04.583 --> 00:28:06.613 up with systemic therapy agents,

NOTE Confidence: 0.81775826

00:28:06.620 --> 00:28:08.540 all of which pose different changes

NOTE Confidence: 0.81775826

00:28:08.540 --> 00:28:10.600 to the tumor micro environment.

NOTE Confidence: 0.81775826

00:28:10.600 --> 00:28:12.740 So we went overwhelming burden of

NOTE Confidence: 0.81775826

00:28:12.740 --> 00:28:14.465 complex data that actually may

NOTE Confidence: 0.81775826

00:28:14.465 --> 00:28:16.030 impede effective clinical practice.

NOTE Confidence: 0.81775826

00:28:16.030 --> 00:28:18.040 We need to address that.

NOTE Confidence: 0.81775826

00:28:18.040 --> 00:28:18.682 And so,

NOTE Confidence: 0.81775826

00:28:18.682 --> 00:28:20.608 how do we transform the data

NOTE Confidence: 0.81775826

00:28:20.608 --> 00:28:21.930 from burden to value?

NOTE Confidence: 0.81775826

00:28:21.930 --> 00:28:24.837 We know that we have an increase in data.

NOTE Confidence: 0.81775826

00:28:24.840 --> 00:28:27.108 We have very complex medical health records.

NOTE Confidence: 0.81775826

00:28:27.110 --> 00:28:28.730 We have genomics sequencing information.

NOTE Confidence: 0.81775826

00:28:28.730 --> 00:28:30.614 We have the availability of complex

NOTE Confidence: 0.81775826

00:28:30.614 --> 00:28:31.870 computer based algorithms and

NOTE Confidence: 0.86596924

00:28:31.924 --> 00:28:33.590 now the availability, availability of

NOTE Confidence: 0.86596924

00:28:33.590 --> 00:28:35.540 computational power at a lower cost.

NOTE Confidence: 0.86596924

00:28:35.540 --> 00:28:37.544 And that is the space where

NOTE Confidence: 0.86596924

00:28:37.544 --> 00:28:39.100 artificial intelligence now comes in.

NOTE Confidence: 0.86596924

00:28:39.100 --> 00:28:41.038 And this is essentially data driven.

NOTE Confidence: 0.86596924

00:28:41.040 --> 00:28:42.912 Learning that deep down can be

NOTE Confidence: 0.86596924

00:28:42.912 --> 00:28:44.532 explained as machine learning that

NOTE Confidence: 0.86596924

00:28:44.532 --> 00:28:46.434 recognizes trends and objects in pre

NOTE Confidence: 0.86596924

00:28:46.434 --> 00:28:48.169 labeled patterns or deep learning,

NOTE Confidence: 0.86596924

00:28:48.170 --> 00:28:50.403 and tall is going to be talking

NOTE Confidence: 0.86596924

00:28:50.403 --> 00:28:51.840 more about that where?

NOTE Confidence: 0.86596924

00:28:51.840 --> 00:28:53.838 We use those networks to actually

NOTE Confidence: 0.86596924

00:28:53.838 --> 00:28:55.928 learn from data without pre labeling

NOTE Confidence: 0.86596924

00:28:55.928 --> 00:28:58.028 the outcome and that may hopefully

NOTE Confidence: 0.86596924

00:28:58.028 --> 00:28:59.960 increase the workflow efficiency,

NOTE Confidence: 0.86596924

00:28:59.960 --> 00:29:01.695 improve our diagnostic accuracy really

NOTE Confidence: 0.86596924

00:29:01.695 --> 00:29:02.736 enabled predictive recommendations

NOTE Confidence: 0.86596924

00:29:02.736 --> 00:29:04.248 for us Taylor Personalized

NOTE Confidence: 0.86596924

00:29:04.248 --> 00:29:05.792 Therapeutic recommendations and help

NOTE Confidence: 0.86596924

00:29:05.792 --> 00:29:07.336 us introduce Precision Medicine,

NOTE Confidence: 0.86596924

00:29:07.340 --> 00:29:09.993 but caution is still very important and

NOTE Confidence: 0.86596924

00:29:09.993 --> 00:29:13.133 AI is being hyped and I think we need

NOTE Confidence: 0.86596924

00:29:13.133 --> 00:29:15.830 to approach it in a gradual fashion.

NOTE Confidence: 0.86596924

00:29:15.830 --> 00:29:19.374 Really see what is doable and what's not.

NOTE Confidence: 0.86596924

00:29:19.380 --> 00:29:21.624 So how can this advanced data

NOTE Confidence: 0.86596924

00:29:21.624 --> 00:29:22.746 analysis help us?

NOTE Confidence: 0.86596924

00:29:22.750 --> 00:29:25.193 It can improve the diagnosis from automation

NOTE Confidence: 0.86596924

00:29:25.193 --> 00:29:27.229 and introduction of novel biomarkers.

NOTE Confidence: 0.86596924

00:29:27.230 --> 00:29:29.708 It can also help us make therapeutic

NOTE Confidence: 0.86596924

00:29:29.708 --> 00:29:31.618 decisions and probably introduce a

NOTE Confidence: 0.86596924

00:29:31.618 --> 00:29:33.588 level of better personalized care.

NOTE Confidence: 0.86596924

00:29:33.590 --> 00:29:36.082 Hopefully we will be able to ultimately

NOTE Confidence: 0.86596924

00:29:36.082 --> 00:29:37.710 improve Inter procedural guidance,

NOTE Confidence: 0.86596924

00:29:37.710 --> 00:29:39.580 especially with now with the

NOTE Confidence: 0.86596924

00:29:39.580 --> 00:29:41.450 introduction of robotics into IR,

NOTE Confidence: 0.86596924

00:29:41.450 --> 00:29:43.320 and specifically follow up imaging.

NOTE Confidence: 0.86596924

00:29:43.320 --> 00:29:45.576 We hope that in the realm of tumor

NOTE Confidence: 0.86596924

00:29:45.576 --> 00:29:47.644 response and patient patient outcome

NOTE Confidence: 0.86596924

00:29:47.644 --> 00:29:50.044 prediction directly after the therapies,

NOTE Confidence: 0.86596924

00:29:50.050 --> 00:29:51.738 those technologies will help

NOTE Confidence: 0.86596924

00:29:51.738 --> 00:29:54.270 us put all this data together.

NOTE Confidence: 0.86596924

00:29:54.270 --> 00:29:54.633 Now,

NOTE Confidence: 0.86596924

00:29:54.633 --> 00:29:56.448 prior to introducing the other

NOTE Confidence: 0.86596924

00:29:56.448 --> 00:29:58.550 speakers and talking and giving

NOTE Confidence: 0.86596924

00:29:58.550 --> 00:30:00.317 specific abstract presentations.

NOTE Confidence: 0.86596924

00:30:00.320 --> 00:30:02.546 The two larger topics that I presented.

NOTE Confidence: 0.86596924

00:30:02.550 --> 00:30:04.934 I want to really thank the sources of

NOTE Confidence: 0.86596924

00:30:04.934 --> 00:30:06.645 funding inspiration mentoring in our

NOTE Confidence: 0.86596924

00:30:06.645 --> 00:30:08.038 community. Already mentioned Drake.

NOTE Confidence: 0.86596924

00:30:08.038 --> 00:30:10.460 I wanted to thank Jim sincerely and

NOTE Confidence: 0.86596924

00:30:10.524 --> 00:30:12.716 Todd and and David who joined the lab.

NOTE Confidence: 0.86596924

00:30:12.720 --> 00:30:14.622 Also great partners of mine are

NOTE Confidence: 0.86596924

00:30:14.622 --> 00:30:16.539 Ruth and Nick and I really,

NOTE Confidence: 0.86596924

00:30:16.540 --> 00:30:17.808 really appreciate those collaborations

NOTE Confidence: 0.86596924

00:30:17.808 --> 00:30:19.076 that are increasingly interdisciplinary,

NOTE Confidence: 0.86596924

00:30:19.080 --> 00:30:20.976 but at the same time I wanted to

NOTE Confidence: 0.86596924

00:30:20.976 --> 00:30:22.825 also point out that mean radiology

NOTE Confidence: 0.86596924

00:30:22.825 --> 00:30:24.475 have a very large biomedical

NOTE Confidence: 0.86596924

00:30:24.475 --> 00:30:26.079 imaging collaborative network,

NOTE Confidence: 0.86596924

00:30:26.080 --> 00:30:28.618 and I want to thank from Eden, Daniel,

NOTE Confidence: 0.86596924

00:30:28.618 --> 00:30:30.844 and and Larry and everyone mentioned here.

NOTE Confidence: 0.86596924

00:30:30.850 --> 00:30:31.750 I'll say I'll.

NOTE Confidence: 0.86596924

00:30:31.750 --> 00:30:32.650 From White Rick,

NOTE Confidence: 0.86596924

00:30:32.650 --> 00:30:34.288 who have been instrumental over the last

NOTE Confidence: 0.86596924

00:30:34.288 --> 00:30:35.797 five years in my personal development

NOTE Confidence: 0.86596924

00:30:35.797 --> 00:30:37.780 and also in the development of the lab,

NOTE Confidence: 0.86596924

00:30:37.780 --> 00:30:39.488 and I think that is the environment

NOTE Confidence: 0.86596924

00:30:39.488 --> 00:30:41.548 that we need and we need to highlight

NOTE Confidence: 0.86596924

00:30:41.548 --> 00:30:43.093 that to the Cancer Center and

NOTE Confidence: 0.86596924

00:30:43.093 --> 00:30:44.605 introduce it to to all of you.

NOTE Confidence: 0.86596924

00:30:44.610 --> 00:30:46.554 And I'm very happy to do so here.

NOTE Confidence: 0.86596924

00:30:46.560 --> 00:30:46.769 And,

NOTE Confidence: 0.86596924

00:30:46.769 --> 00:30:47.187 you know,

NOTE Confidence: 0.86596924

00:30:47.187 --> 00:30:49.539 at this point I would like to thank on behalf

NOTE Confidence: 0.86596924

00:30:49.539 --> 00:30:51.219 of the Interventional College lab which

NOTE Confidence: 0.86596924

00:30:51.219 --> 00:30:53.175 I'm privileged to Co direct with David and

NOTE Confidence: 0.86596924

00:30:53.175 --> 00:30:55.100 all of our sponsors and really say that,

NOTE Confidence: 0.86596924

00:30:55.100 --> 00:30:55.586 you know,

NOTE Confidence: 0.86596924

00:30:55.586 --> 00:30:57.044 there's one thing across all this.

NOTE Confidence: 0.86596924

00:30:57.050 --> 00:30:58.758 There is a single light of science,

NOTE Confidence: 0.86596924

00:30:58.760 --> 00:30:59.980 then to brighten it anyways,

NOTE Confidence: 0.86596924

00:30:59.980 --> 00:31:01.020 to brighten it everywhere.

NOTE Confidence: 0.86596924

00:31:01.020 --> 00:31:03.270 This is our group model by Isaac Asimov.

NOTE Confidence: 0.86596924

00:31:03.270 --> 00:31:04.563 And with that,

NOTE Confidence: 0.86596924

00:31:04.563 --> 00:31:07.149 I'd like to introduce two or

NOTE Confidence: 0.86596924

00:31:07.149 --> 00:31:09.159 students that work with us.

NOTE Confidence: 0.86596924

00:31:09.160 --> 00:31:09.598 First,

NOTE Confidence: 0.86596924

00:31:09.598 --> 00:31:10.474 Jessica Santana.

NOTE Confidence: 0.86596924

00:31:10.474 --> 00:31:13.102 She's going to be talking about

NOTE Confidence: 0.86596924

00:31:13.102 --> 00:31:14.743 taking the molecular imaging

NOTE Confidence: 0.86596924

00:31:14.743 --> 00:31:17.368 really to next level in our new

NOTE Confidence: 0.8340251

00:31:17.439 --> 00:31:20.314 animal models, and tall is going to be

NOTE Confidence: 0.8340251

00:31:20.314 --> 00:31:22.635 talking about his role as Biomedical

NOTE Confidence: 0.8340251

00:31:22.635 --> 00:31:24.627 Engineering graduate student within

NOTE Confidence: 0.8340251

00:31:24.627 --> 00:31:27.563 the bio medical imaging Sciences on

NOTE Confidence: 0.8340251

00:31:27.563 --> 00:31:29.743 focusing on predicting outcome and

NOTE Confidence: 0.8340251

00:31:29.743 --> 00:31:31.940 recurrence of HTC after intervention.

NOTE Confidence: 0.8340251

00:31:31.940 --> 00:31:33.700 And I'd like to.

NOTE Confidence: 0.8340251

00:31:33.700 --> 00:31:35.386 And now the stop sharing the

NOTE Confidence: 0.8340251

00:31:35.386 --> 00:31:37.230 screen and give it to Jessica.

NOTE Confidence: 0.80341524

00:31:45.710 --> 00:31:47.226 Hi all, I'm Jessica.

NOTE Confidence: 0.80341524

00:31:47.226 --> 00:31:49.500 I am a master level demonologist

NOTE Confidence: 0.80341524

00:31:49.574 --> 00:31:51.864 Anna graduate student at the

NOTE Confidence: 0.80341524

00:31:51.864 --> 00:31:53.696 Yale Interventional College Lab

NOTE Confidence: 0.80341524

00:31:53.696 --> 00:31:56.130 and I'm very excited today to

NOTE Confidence: 0.80341524

00:31:56.130 --> 00:31:58.092 be presenting my work, titled,

NOTE Confidence: 0.80341524

00:31:58.092 --> 00:31:59.388 Noninvasive molecular imaging

NOTE Confidence: 0.80341524

00:31:59.388 --> 00:32:01.116 allows characterization of the

NOTE Confidence: 0.80341524

00:32:01.116 --> 00:32:02.792 immune response following hepatic

NOTE Confidence: 0.80341524

00:32:02.792 --> 00:32:05.066 radiofrequency Ablation in a mouse model.

NOTE Confidence: 0.84324324

00:32:07.350 --> 00:32:08.416 Nothing to disclose,

NOTE Confidence: 0.84324324

00:32:08.416 --> 00:32:10.504 so giving you a brief overview

NOTE Confidence: 0.84324324

00:32:10.504 --> 00:32:11.830 on hepatocellular carcinoma.

NOTE Confidence: 0.84324324

00:32:11.830 --> 00:32:14.750 So as we know, this is a classical

NOTE Confidence: 0.84324324

00:32:14.750 --> 00:32:16.191 inflammation associated Carcinoma and

NOTE Confidence: 0.84324324

00:32:16.191 --> 00:32:18.438 now is the third most common cause

NOTE Confidence: 0.84324324

00:32:18.438 --> 00:32:20.778 of cancer related death worldwide.

NOTE Confidence: 0.84324324

00:32:20.780 --> 00:32:23.078 With the majority of patients being

NOTE Confidence: 0.84324324

00:32:23.078 --> 00:32:25.022 treated with locoregional therapy as

NOTE Confidence: 0.84324324

00:32:25.022 --> 00:32:27.116 they may alternative option over surgery.

NOTE Confidence: 0.84324324

00:32:27.120 --> 00:32:29.365 However, the problem with locoregional

NOTE Confidence: 0.84324324

00:32:29.365 --> 00:32:32.043 therapy is that a significant fraction

NOTE Confidence: 0.84324324

00:32:32.043 --> 00:32:34.899 of patients they tend to recur and the

NOTE Confidence: 0.84324324

00:32:34.899 --> 00:32:37.305 causes for recurrence can vary a lot.

NOTE Confidence: 0.84324324

00:32:37.310 --> 00:32:40.268 And it has been suggested, for example,

NOTE Confidence: 0.84324324

00:32:40.268 --> 00:32:42.902 that the immune response to radiofrequency

NOTE Confidence: 0.84324324

00:32:42.902 --> 00:32:45.208 ablation can play both both roles.

NOTE Confidence: 0.84324324

00:32:45.210 --> 00:32:48.073 An Protogenic Side effects as well as

NOTE Confidence: 0.84324324

00:32:48.073 --> 00:32:51.034 abscopal effects that in turn can positively

NOTE Confidence: 0.84324324

00:32:51.034 --> 00:32:53.530 impact the immune response to cancer.

NOTE Confidence: 0.84324324

00:32:53.530 --> 00:32:54.002 However,

NOTE Confidence: 0.84324324

00:32:54.002 --> 00:32:56.834 we have currently no instruments that

NOTE Confidence: 0.84324324

00:32:56.834 --> 00:32:59.871 would allows us to non invasively

NOTE Confidence: 0.84324324

00:32:59.871 --> 00:33:01.919 monitor such immune response.

NOTE Confidence: 0.84324324

00:33:01.920 --> 00:33:04.280 So the purpose of this work is to

NOTE Confidence: 0.84324324

00:33:04.280 --> 00:33:06.556 develop a noninvasive molecular imaging

NOTE Confidence: 0.84324324

00:33:06.556 --> 00:33:09.236 instruments to visualize such immune

NOTE Confidence: 0.84324324

00:33:09.236 --> 00:33:12.380 response to thermal injury following RFA.

NOTE Confidence: 0.815851800000001

00:33:14.430 --> 00:33:16.880 So our group has built a translation

NOTE Confidence: 0.815851800000001

00:33:16.880 --> 00:33:18.881 of mouse model of radiofrequency

NOTE Confidence: 0.815851800000001

00:33:18.881 --> 00:33:21.954 ablation as a platform to develop and

NOTE Confidence: 0.815851800000001

00:33:21.954 --> 00:33:24.360 validate mirbase dimona probes for in

NOTE Confidence: 0.815851800000001

00:33:24.360 --> 00:33:26.790 vivo imaging of the immune system.

NOTE Confidence: 0.815851800000001

00:33:26.790 --> 00:33:29.490 And based on our findings,

NOTE Confidence: 0.815851800000001

00:33:29.490 --> 00:33:33.018 we have observed that there is a after

NOTE Confidence: 0.815851800000001

00:33:33.018 --> 00:33:35.188 radiofrequency ablation and normal liver.

NOTE Confidence: 0.815851800000001

00:33:35.190 --> 00:33:38.263 There is a strong time dependent local

NOTE Confidence: 0.815851800000001

00:33:38.263 --> 00:33:40.561 infiltration of immune cells that

NOTE Confidence: 0.815851800000001

00:33:40.561 --> 00:33:42.826 orchestrates the tissue healing process

NOTE Confidence: 0.815851800000001

00:33:42.826 --> 00:33:45.753 and there is an overtime transitional

NOTE Confidence: 0.815851800000001

00:33:45.753 --> 00:33:48.729 zone of those immune cell infiltrate.

NOTE Confidence: 0.815851800000001

00:33:48.730 --> 00:33:51.160 So having a specific cell population

NOTE Confidence: 0.815851800000001

00:33:51.160 --> 00:33:53.291 locally present at the transitional

NOTE Confidence: 0.815851800000001

00:33:53.291 --> 00:33:55.925 zone between the necrotic area and

NOTE Confidence: 0.815851800000001

00:33:55.925 --> 00:33:58.367 the normal liver parenchyma at a

NOTE Confidence: 0.815851800000001

00:33:58.367 --> 00:34:00.467 specific time point serves us as

NOTE Confidence: 0.815851800000001

00:34:00.467 --> 00:34:03.485 an illegal platform to build and

NOTE Confidence: 0.815851800000001

00:34:03.485 --> 00:34:06.150 validate our dedicated immune probes.

NOTE Confidence: 0.815851800000001

00:34:06.150 --> 00:34:08.175 So guiding you through our

NOTE Confidence: 0.815851800000001

00:34:08.175 --> 00:34:08.985 experimental design.

NOTE Confidence: 0.815851800000001

00:34:08.990 --> 00:34:13.040 We have a bladed and normal liver of a mouse,

NOTE Confidence: 0.815851800000001

00:34:13.040 --> 00:34:15.000 and after characterizing a large

NOTE Confidence: 0.815851800000001

00:34:15.000 --> 00:34:16.960 infiltration of a specific cell

NOTE Confidence: 0.815851800000001

00:34:17.025 --> 00:34:19.110 population is specific time point.

NOTE Confidence: 0.815851800000001

00:34:19.110 --> 00:34:21.425 We have established a dedicated

NOTE Confidence: 0.815851800000001

00:34:21.425 --> 00:34:23.740 gadolinium labeled antibody that was

NOTE Confidence: 0.815851800000001

00:34:23.817 --> 00:34:25.617 delivered systemically to target

NOTE Confidence: 0.815851800000001

00:34:25.617 --> 00:34:28.317 a specific cell population at the

NOTE Confidence: 0.815851800000001

00:34:28.387 --> 00:34:30.567 chosen time Point Post Ablation.

NOTE Confidence: 0.815851800000001

00:34:30.570 --> 00:34:33.202 And a second imuna probe also used

NOTE Confidence: 0.815851800000001

00:34:33.202 --> 00:34:34.330 in this study,

NOTE Confidence: 0.815851800000001

00:34:34.330 --> 00:34:36.586 is the small iron oxide particles,

NOTE Confidence: 0.815851800000001

00:34:36.590 --> 00:34:38.956 and we know that RN particles they

NOTE Confidence: 0.815851800000001

00:34:38.956 --> 00:34:41.474 have been largely used in the clinical

NOTE Confidence: 0.815851800000001

00:34:41.474 --> 00:34:44.135 setting as the dark contrast agent and

NOTE Confidence: 0.815851800000001

00:34:44.135 --> 00:34:46.360 once they are delivered systemically,

NOTE Confidence: 0.815851800000001

00:34:46.360 --> 00:34:49.300 they are able to be phagocytosed by

NOTE Confidence: 0.815851800000001

00:34:49.300 --> 00:34:51.352 circulating phagocytes that once they

NOTE Confidence: 0.815851800000001

00:34:51.352 --> 00:34:53.512 migrate to the site of inflammation

NOTE Confidence: 0.815851800000001

00:34:53.512 --> 00:34:55.635 they can cause a local deposition

NOTE Confidence: 0.815851800000001

00:34:55.635 --> 00:34:58.023 of Iran and this study we have

NOTE Confidence: 0.815851800000001

00:34:58.023 --> 00:34:59.555 demonstrated that both gadolinium

NOTE Confidence: 0.815851800000001

00:34:59.555 --> 00:35:01.087 labeled antibodies inspire probes.

NOTE Confidence: 0.815851800000001

00:35:01.090 --> 00:35:05.330 They were able to be imaged using a

NOTE Confidence: 0.815851800000001

00:35:05.330 --> 00:35:08.298 higher resolution Mr animal scanner.

NOTE Confidence: 0.815851800000001

00:35:08.300 --> 00:35:11.051 So in our first setting of experiments

NOTE Confidence: 0.815851800000001

00:35:11.051 --> 00:35:13.003 we have demonstrated that the

NOTE Confidence: 0.815851800000001

00:35:13.003 --> 00:35:15.121 ablation zone itself can be easily

NOTE Confidence: 0.815851800000001

00:35:15.121 --> 00:35:17.158 imaged on a 9.4 Tesla Burger.

NOTE Confidence: 0.815851800000001

00:35:17.160 --> 00:35:19.701 So here on your left you have

NOTE Confidence: 0.815851800000001

00:35:19.701 --> 00:35:21.617 the pictures taken seconds after

NOTE Confidence: 0.815851800000001

00:35:21.617 --> 00:35:24.585 ablation to show you or give you an

NOTE Confidence: 0.815851800000001

00:35:24.666 --> 00:35:27.158 idea of how the ablation site looks

NOTE Confidence: 0.815851800000001

00:35:27.158 --> 00:35:29.541 like an one week post Ablation,

NOTE Confidence: 0.815851800000001

00:35:29.541 --> 00:35:32.163 and we have delivered pure gadolinium

NOTE Confidence: 0.815851800000001

00:35:32.163 --> 00:35:34.041 systemically and we ran a T1

NOTE Confidence: 0.815851800000001

00:35:34.041 --> 00:35:35.890 weighted MRI sequence and we could

NOTE Confidence: 0.815851800000001

00:35:35.890 --> 00:35:37.538 see precisely the Ablation.

NOTE Confidence: 0.815851800000001

00:35:37.540 --> 00:35:39.853 Side and on your right we have an ex

NOTE Confidence: 0.815851800000001

00:35:39.853 --> 00:35:42.439 vivo confirmation of what we see on them,

NOTE Confidence: 0.815851800000001

00:35:42.440 --> 00:35:44.240 right?

NOTE Confidence: 0.815851800000001

00:35:44.240 --> 00:35:46.160 But you might have been wondering

NOTE Confidence: 0.815851800000001

00:35:46.160 --> 00:35:48.369 why exactly 7 days post ablation.

NOTE Confidence: 0.815851800000001

00:35:48.370 --> 00:35:50.778 So to the best of our knowledge,

NOTE Confidence: 0.815851800000001

00:35:50.780 --> 00:35:53.188 we know that our our thing doost

NOTE Confidence: 0.815851800000001

00:35:53.188 --> 00:35:54.220 thermal tissue injury,

NOTE Confidence: 0.815851800000001

00:35:54.220 --> 00:35:56.746 largely contributes to a strong time

NOTE Confidence: 0.815851800000001

00:35:56.746 --> 00:35:58.806 dependent innate immune response at

NOTE Confidence: 0.815851800000001

00:35:58.806 --> 00:36:00.684 the margins of the necrotic zone.

NOTE Confidence: 0.815851800000001

00:36:00.690 --> 00:36:02.770 And according to our findings,

NOTE Confidence: 0.815851800000001

00:36:02.770 --> 00:36:04.685 we have observed the largest

NOTE Confidence: 0.815851800000001

00:36:04.685 --> 00:36:06.600 accumulation of city 68 positive

NOTE Confidence: 0.815851800000001

00:36:06.665 --> 00:36:08.990 macrophages in the transitional zone,

NOTE Confidence: 0.815851800000001

00:36:08.990 --> 00:36:11.070 precisely seven days post ablation.

NOTE Confidence: 0.815851800000001

00:36:11.070 --> 00:36:15.062 So this is the time point we decided

NOTE Confidence: 0.815851800000001

00:36:15.062 --> 00:36:18.329 to base our experiments on.

NOTE Confidence: 0.815851800000001

00:36:18.330 --> 00:36:21.445 So we have decided to deliver systemically.

NOTE Confidence: 0.815851800000001

00:36:21.450 --> 00:36:23.306 Those aren't oxide particles.

NOTE Confidence: 0.815851800000001

00:36:23.306 --> 00:36:26.090 Seven days post Ablation and we

NOTE Confidence: 0.815851800000001

00:36:26.170 --> 00:36:29.152 have confirmed that there is a local

NOTE Confidence: 0.815851800000001

00:36:29.152 --> 00:36:31.558 deposition of those iron oxide

NOTE Confidence: 0.815851800000001

00:36:31.558 --> 00:36:34.178 particles exactly 24 hours after

NOTE Confidence: 0.815851800000001

00:36:34.178 --> 00:36:36.502 systemic delivery. At the transitional zone.

NOTE Confidence: 0.815851800000001

00:36:36.502 --> 00:36:39.431 So here we have an ex Vivo Prussian

NOTE Confidence: 0.815851800000001

00:36:39.431 --> 00:36:40.379 blue staining,

NOTE Confidence: 0.77417207

00:36:40.380 --> 00:36:42.220 although one week post ablation,

NOTE Confidence: 0.77417207

00:36:42.220 --> 00:36:44.060 mouse liver 24 hours after

NOTE Confidence: 0.77417207

00:36:44.060 --> 00:36:45.900 systemic delivery of Spions and

NOTE Confidence: 0.77417207

00:36:45.963 --> 00:36:47.738 when we image those animals,

NOTE Confidence: 0.77417207

00:36:47.740 --> 00:36:49.954 we could demonstrate any Viva local

NOTE Confidence: 0.77417207

00:36:49.954 --> 00:36:51.430 deposition of those phagocytes

NOTE Confidence: 0.77417207

00:36:51.491 --> 00:36:52.887 at the transitional zone.

NOTE Confidence: 0.77417207

00:36:52.890 --> 00:36:56.229 So here on your left you have a teacher

NOTE Confidence: 0.77417207

00:36:56.229 --> 00:36:59.148 weighted MRI of a one week post Ablation,

NOTE Confidence: 0.77417207

00:36:59.150 --> 00:37:00.760 24 hours after systemic delivery

NOTE Confidence: 0.77417207

00:37:00.760 --> 00:37:02.857 of Spions and as a Redpath

NOTE Confidence: 0.77417207

00:37:02.857 --> 00:37:05.395 correlation we confirm the ex vivo

NOTE Confidence: 0.77417207

00:37:05.395 --> 00:37:07.360 specifically position of the spine.

NOTE Confidence: 0.77417207

00:37:07.360 --> 00:37:08.900 At the transitional zone,

NOTE Confidence: 0.77417207

00:37:08.900 --> 00:37:10.440 3 min inflorescence and

NOTE Confidence: 0.77417207

00:37:10.440 --> 00:37:11.830 Prussian blue staining.

NOTE Confidence: 0.7773221

00:37:14.230 --> 00:37:16.600 And As for our gadolinium based

NOTE Confidence: 0.7773221

00:37:16.600 --> 00:37:19.460 immuno probes, we have used a anti CD

NOTE Confidence: 0.7773221

00:37:19.460 --> 00:37:21.740 68 antibody tagged with gadolinium.

NOTE Confidence: 0.7773221

00:37:21.740 --> 00:37:24.351 So after XP will observing a massive

NOTE Confidence: 0.7773221

00:37:24.351 --> 00:37:26.361 infiltration of city 60 positive

NOTE Confidence: 0.7773221

00:37:26.361 --> 00:37:28.421 macrophages in the prohibition of

NOTE Confidence: 0.7773221

00:37:28.421 --> 00:37:30.499 zone we delivered gadolinium tagged

NOTE Confidence: 0.7773221

00:37:30.499 --> 00:37:32.815 with city 68 systemically and was

NOTE Confidence: 0.7773221

00:37:32.815 --> 00:37:35.665 able to see a specific position of

NOTE Confidence: 0.7773221

00:37:35.665 --> 00:37:38.330 those cells in the Prohibition of rim.

NOTE Confidence: 0.7773221

00:37:38.330 --> 00:37:43.046 So here on your left you have the Ablation.

NOTE Confidence: 0.7773221

00:37:43.050 --> 00:37:45.726 Cite the picture taking seconds after

NOTE Confidence: 0.7773221

00:37:45.726 --> 00:37:47.910 ablation showing the ablation site.

NOTE Confidence: 0.7773221

00:37:47.910 --> 00:37:51.114 And we also have 81 way to MRI when

NOTE Confidence: 0.7773221

00:37:51.114 --> 00:37:55.052 we post Ablation After 24 hours with

NOTE Confidence: 0.7773221

00:37:55.052 --> 00:37:58.690 gadolinium city 68 delivered systemically.

NOTE Confidence: 0.7773221

00:37:58.690 --> 00:38:02.092 And on your left you have the picture taken,

NOTE Confidence: 0.7773221

00:38:02.100 --> 00:38:04.932 ex Vivo confirming of what we're

NOTE Confidence: 0.7773221

00:38:04.932 --> 00:38:06.820 seeing on the MRI.

NOTE Confidence: 0.7773221

00:38:06.820 --> 00:38:09.610 And to confirm that this parable

NOTE Confidence: 0.7773221

00:38:09.610 --> 00:38:12.124 itional darkroom is seen precisely

NOTE Confidence: 0.7773221

00:38:12.124 --> 00:38:14.979 in animals receiving those city,

NOTE Confidence: 0.7773221

00:38:14.980 --> 00:38:18.040 68 tagged to 68 antibodies tagged

NOTE Confidence: 0.7773221

00:38:18.040 --> 00:38:19.060 with gadolinium.

NOTE Confidence: 0.7773221

00:38:19.060 --> 00:38:23.155 We also ran T1 weighted MRI with

NOTE Confidence: 0.7773221

00:38:23.155 --> 00:38:24.325 pure gadolinium.

NOTE Confidence: 0.7773221

00:38:24.330 --> 00:38:27.434 So on your lap to have the baseline

NOTE Confidence: 0.7773221

00:38:27.434 --> 00:38:29.320 and it comparison,

NOTE Confidence: 0.7773221

00:38:29.320 --> 00:38:32.648 we have a T1 weighted MRI with pure

NOTE Confidence: 0.7773221

00:38:32.648 --> 00:38:35.454 gallium injected and we have confirmed

NOTE Confidence: 0.7773221

00:38:35.454 --> 00:38:38.286 that only with animals receiving city

NOTE Confidence: 0.7773221

00:38:38.373 --> 00:38:41.565 68 tagged with get alignment we have

NOTE Confidence: 0.7773221

00:38:41.565 --> 00:38:43.888 this precise parable itional rim

NOTE Confidence: 0.7773221

00:38:43.888 --> 00:38:46.732 showing a local infiltration of CD

NOTE Confidence: 0.7773221

00:38:46.732 --> 00:38:49.490 16 positive macrophages and therefore

NOTE Confidence: 0.7773221

00:38:49.490 --> 00:38:52.928 in vivo visualization of those cells.

NOTE Confidence: 0.7773221

00:38:52.930 --> 00:38:55.478 We have also confirmed the ex vivo

NOTE Confidence: 0.7773221

00:38:55.478 --> 00:38:57.808 a specific labeling of immune cells

NOTE Confidence: 0.7773221

00:38:57.808 --> 00:38:59.748 using imaging mass atama tree.

NOTE Confidence: 0.7773221

00:38:59.750 --> 00:39:02.030 So he ran on your left.

NOTE Confidence: 0.7773221

00:39:02.030 --> 00:39:04.094 We have the T1 weighted MRI of one

NOTE Confidence: 0.7773221

00:39:04.094 --> 00:39:06.382 week post ablation after gadolinium

NOTE Confidence: 0.7773221

00:39:06.382 --> 00:39:08.086 labeled antibody administration,

NOTE Confidence: 0.7773221

00:39:08.090 --> 00:39:10.962 where you can see the rim of the

NOTE Confidence: 0.7773221

00:39:10.962 --> 00:39:12.939 local deposition of the infiltrating

NOTE Confidence: 0.7773221

00:39:12.939 --> 00:39:14.909 cells an on your right.

NOTE Confidence: 0.7773221

00:39:14.910 --> 00:39:17.493 We have the X visual confirmation with

NOTE Confidence: 0.7773221

00:39:17.493 --> 00:39:20.062 the image Ng Masama tree of local

NOTE Confidence: 0.7773221

00:39:20.062 --> 00:39:23.090 deposition of the sea to 68 macrophages.

NOTE Confidence: 0.7773221

00:39:23.090 --> 00:39:25.890 In the transitional zone.

NOTE Confidence: 0.7773221

00:39:25.890 --> 00:39:27.555 So as the main conclusions

NOTE Confidence: 0.7773221

00:39:27.555 --> 00:39:29.220 and findings of this study,

NOTE Confidence: 0.7773221

00:39:29.220 --> 00:39:31.285 it tells us that both spines and

NOTE Confidence: 0.7773221

00:39:31.285 --> 00:39:32.598 Catalina based molecular imaging

NOTE Confidence: 0.7773221

00:39:32.598 --> 00:39:34.074 allows for specific labeling

NOTE Confidence: 0.7773221

00:39:34.074 --> 00:39:35.550 of local immune infiltrate,

NOTE Confidence: 0.7773221

00:39:35.550 --> 00:39:37.734 and this is also a translation of

NOTE Confidence: 0.7773221

00:39:37.734 --> 00:39:39.834 study with the proof of principle

NOTE Confidence: 0.7773221

00:39:39.834 --> 00:39:42.382 for the visibility of the MRI imaging

NOTE Confidence: 0.7773221

00:39:42.455 --> 00:39:44.534 for of macrophages on a 9 point.

NOTE Confidence: 0.7773221

00:39:44.540 --> 00:39:46.236 For Tesla MRI scanners.

NOTE Confidence: 0.7773221

00:39:46.236 --> 00:39:48.780 And also tells us that noninvasive

NOTE Confidence: 0.7773221

00:39:48.858 --> 00:39:51.228 in vivo detection of the immune

NOTE Confidence: 0.7773221

00:39:51.228 --> 00:39:53.433 system can be achieved using

NOTE Confidence: 0.7773221

00:39:53.433 --> 00:39:55.080 dedicated immune probes.

NOTE Confidence: 0.7773221

00:39:55.080 --> 00:39:58.620 An ask for our future perspective

NOTE Confidence: 0.7773221

00:39:58.620 --> 00:40:00.390 and clinical application.

NOTE Confidence: 0.7773221

00:40:00.390 --> 00:40:03.117 We can have this as a useful tool to

NOTE Confidence: 0.7773221

00:40:03.117 --> 00:40:05.512 study and characterize the interplay

NOTE Confidence: 0.7773221

00:40:05.512 --> 00:40:08.037 between the tumor micro environment

NOTE Confidence: 0.7773221

00:40:08.037 --> 00:40:10.559 and the cell opinion selectivity in

NOTE Confidence: 0.7773221

00:40:10.559 --> 00:40:13.310 vivo and also gives us the possibility

NOTE Confidence: 0.7773221

00:40:13.310 --> 00:40:14.910 to integrate complimentary molecular

NOTE Confidence: 0.7773221

00:40:14.910 --> 00:40:17.360 MRI imaging of the immune system.

NOTE Confidence: 0.7773221

00:40:17.360 --> 00:40:19.496 And let's say the extrasolar pH

NOTE Confidence: 0.7773221

00:40:19.496 --> 00:40:21.536 liver cancer model for simultaneous

NOTE Confidence: 0.7773221

00:40:21.536 --> 00:40:23.712 characterization of this immuno

NOTE Confidence: 0.7773221

00:40:23.712 --> 00:40:25.344 metabolic cross dock.

NOTE Confidence: 0.7773221

00:40:25.350 --> 00:40:28.158 This also serves us as a platform to

NOTE Confidence: 0.7773221

00:40:28.158 --> 00:40:30.248 study strategies for local modulation

NOTE Confidence: 0.7773221

00:40:30.248 --> 00:40:32.000 of the immune microenvironment

NOTE Confidence: 0.7773221

00:40:32.000 --> 00:40:34.084 towards a moon are permissive

NOTE Confidence: 0.7773221

00:40:34.084 --> 00:40:36.541 phenotype and can also serves us as

NOTE Confidence: 0.7773221

00:40:36.541 --> 00:40:39.500 if they were gnostic immunotherapy.

NOTE Confidence: 0.7773221

00:40:39.500 --> 00:40:41.804 So I'd like to thank you for the

NOTE Confidence: 0.7773221

00:40:41.804 --> 00:40:43.359 opportunity to present this work

NOTE Confidence: 0.7773221

00:40:43.359 --> 00:40:45.501 as well as the yield bio medical

NOTE Confidence: 0.8746653

00:40:45.566 --> 00:40:48.482 imaging Department. And now I'll give

NOTE Confidence: 0.8746653

00:40:48.482 --> 00:40:51.550 you the word to my friend, tall.

NOTE Confidence: 0.81832206

00:40:58.420 --> 00:41:00.760 Hello everyone, my name is Charles

NOTE Confidence: 0.81832206

00:41:00.760 --> 00:41:03.246 early and I'm graduate student in

NOTE Confidence: 0.81832206

00:41:03.246 --> 00:41:04.946 the Biomedical Engineering program

NOTE Confidence: 0.81832206

00:41:04.946 --> 00:41:08.699 here at Yale and I'm a member of the

NOTE Confidence: 0.81832206

00:41:08.699 --> 00:41:10.684 Interventional Oncology lab since 2018

NOTE Confidence: 0.81832206

00:41:10.690 --> 00:41:13.280 and today I'm going to be presenting

NOTE Confidence: 0.81832206

00:41:13.280 --> 00:41:16.238 our project on deep learning use to

NOTE Confidence: 0.81832206

00:41:16.238 --> 00:41:18.453 predict disease recurrence of HTC,

NOTE Confidence: 0.81832206

00:41:18.460 --> 00:41:20.100 based on NMR imaging.

NOTE Confidence: 0.82661027

00:41:22.860 --> 00:41:24.966 So a little bit about ATC,

NOTE Confidence: 0.82661027

00:41:24.970 --> 00:41:27.770 so HTC is the primary tumor of delivered.

NOTE Confidence: 0.82661027

00:41:27.770 --> 00:41:29.525 It usually develops in the

NOTE Confidence: 0.82661027

00:41:29.525 --> 00:41:31.280 setting of chronic liver disease,

NOTE Confidence: 0.82661027

00:41:31.280 --> 00:41:33.194 and while the diagnosis of ATC

NOTE Confidence: 0.82661027

00:41:33.194 --> 00:41:35.499 could be made by imaging alone,

NOTE Confidence: 0.82661027

00:41:35.500 --> 00:41:38.110 sometimes a biopsy may be required

NOTE Confidence: 0.82661027

00:41:38.110 --> 00:41:39.850 to support this diagnosis.

NOTE Confidence: 0.82661027

00:41:39.850 --> 00:41:44.135 A little bit statistics every 40 seconds at

NOTE Confidence: 0.82661027

00:41:44.135 --> 00:41:47.890 patient diagnosed with ATC in 2020 alone,

NOTE Confidence: 0.82661027

00:41:47.890 --> 00:41:50.565 the death rate is approximately

NOTE Confidence: 0.82661027

00:41:50.565 --> 00:41:52.705 the 800,000 deaths worldwide.

NOTE Confidence: 0.82661027

00:41:52.710 --> 00:41:56.448 ATC may recur and there is no

NOTE Confidence: 0.82661027

00:41:56.448 --> 00:41:58.796 significant imaging biomarker or

NOTE Confidence: 0.82661027

00:41:58.796 --> 00:42:02.056 clinical biomarkers to reliably predict

NOTE Confidence: 0.82661027

00:42:02.056 --> 00:42:05.660 recurrence before location to treatment.

NOTE Confidence: 0.82661027

00:42:05.660 --> 00:42:07.560 One of the treatment is

NOTE Confidence: 0.82661027

00:42:07.560 --> 00:42:08.320 liver transplantation.

NOTE Confidence: 0.82661027

00:42:08.320 --> 00:42:10.220 It helps to decrease the

NOTE Confidence: 0.82661027

00:42:10.220 --> 00:42:11.740 chance of disease recurrence.

NOTE Confidence: 0.82661027

00:42:11.740 --> 00:42:12.120 However,

NOTE Confidence: 0.82661027

00:42:12.120 --> 00:42:15.540 we are all aware to the shortness of organs.

NOTE Confidence: 0.82661027

00:42:15.540 --> 00:42:17.060 Therefore, 2 criterias of

NOTE Confidence: 0.82661027

00:42:17.060 --> 00:42:19.340 allocations of levers are being used.

NOTE Confidence: 0.82661027

00:42:19.340 --> 00:42:22.000 One of them is the Milan criteria,

NOTE Confidence: 0.82661027

00:42:22.000 --> 00:42:23.938 which was presented in 1996 and

NOTE Confidence: 0.82661027

00:42:23.938 --> 00:42:26.228 the other one was presented by

NOTE Confidence: 0.82661027

00:42:26.228 --> 00:42:28.076 the University of California,

NOTE Confidence: 0.82661027

00:42:28.080 --> 00:42:29.980 San Francisco on 2001 basically

NOTE Confidence: 0.82661027

00:42:29.980 --> 00:42:31.500 extended this Milan criteria.

NOTE Confidence: 0.82661027

00:42:31.500 --> 00:42:34.384 Both of them are based on low

NOTE Confidence: 0.82661027

00:42:34.384 --> 00:42:36.432 level handcrafted features such as

NOTE Confidence: 0.82661027

00:42:36.432 --> 00:42:38.640 tumor size and number of tumors.

NOTE Confidence: 0.82661027

00:42:38.640 --> 00:42:40.080 Ann even dog.

NOTE Confidence: 0.82661027

00:42:40.080 --> 00:42:41.520 Using these criteria,

NOTE Confidence: 0.82661027

00:42:41.520 --> 00:42:44.614 we are seeing 15 to 20% of transplanted

NOTE Confidence: 0.82661027

00:42:44.614 --> 00:42:48.470 patient to occur within the 1st five years.

NOTE Confidence: 0.82661027

00:42:48.470 --> 00:42:49.970 So as I said,

NOTE Confidence: 0.82661027

00:42:49.970 --> 00:42:51.845 these two criterias location criterias

NOTE Confidence: 0.82661027

00:42:51.845 --> 00:42:54.308 has suffered from false positives,

NOTE Confidence: 0.82661027

00:42:54.310 --> 00:42:57.198 and our hypothesis is that there is more

NOTE Confidence: 0.82661027

00:42:57.198 --> 00:42:59.310 information in radiological images,

NOTE Confidence: 0.82661027

00:42:59.310 --> 00:43:00.978 specifically MRI that correlate

NOTE Confidence: 0.82661027

00:43:00.978 --> 00:43:02.229 with HTC recurrence.

NOTE Confidence: 0.82661027

00:43:02.230 --> 00:43:04.498 Then the naked eye could detect

NOTE Confidence: 0.82661027

00:43:04.498 --> 00:43:07.571 and the way we're going to try to

NOTE Confidence: 0.82661027

00:43:07.571 --> 00:43:09.791 test this hypothesis is by using

NOTE Confidence: 0.82661027

00:43:09.875 --> 00:43:12.305 deep learning algorithm to extract

NOTE Confidence: 0.82661027

00:43:12.305 --> 00:43:15.804 features from MRI images and try to

NOTE Confidence: 0.82661027

00:43:15.804 --> 00:43:20.060 use them to correlate to ATC re occurrence.

NOTE Confidence: 0.82661027

00:43:20.060 --> 00:43:22.083 And a little bit before I start

NOTE Confidence: 0.82661027

00:43:22.083 --> 00:43:23.720 talking about our methodology,

NOTE Confidence: 0.82661027

00:43:23.720 --> 00:43:25.814 I will talk about about data

NOTE Confidence: 0.82661027

00:43:25.814 --> 00:43:27.210 driven predictive modeling and

NOTE Confidence: 0.82661027

00:43:27.273 --> 00:43:29.049 a little bit of deep learning.

NOTE Confidence: 0.82661027

00:43:29.050 --> 00:43:31.048 So when we talk about data

NOTE Confidence: 0.82661027

00:43:31.048 --> 00:43:32.047 driven predictive model,

NOTE Confidence: 0.82661027

00:43:32.050 --> 00:43:34.374 we usually refer to two different variables,

NOTE Confidence: 0.82661027

00:43:34.380 --> 00:43:36.100 the Explanatory variable and explain

NOTE Confidence: 0.82661027

00:43:36.100 --> 00:43:38.866 part of our target and we want to

NOTE Confidence: 0.82661027

00:43:38.866 --> 00:43:40.174 take these explanatory variables

NOTE Confidence: 0.82661027

00:43:40.174 --> 00:43:42.160 to feed them into predicted model

NOTE Confidence: 0.82661027

00:43:42.160 --> 00:43:44.365 which will give up the outcome of

NOTE Confidence: 0.82661027

00:43:44.370 --> 00:43:46.035 our target building which could

NOTE Confidence: 0.82661027

00:43:46.035 --> 00:43:47.367 be recurrent or not.

NOTE Confidence: 0.82661027

00:43:47.370 --> 00:43:48.842 And this predictive models

NOTE Confidence: 0.82661027

00:43:48.842 --> 00:43:49.946 has different shapes.

NOTE Confidence: 0.82661027

00:43:49.950 --> 00:43:52.236 And algorithms which you may hurt.

NOTE Confidence: 0.82661027

00:43:52.240 --> 00:43:54.520 For example your networks this season.

NOTE Confidence: 0.82661027

00:43:54.520 --> 00:43:55.663 Trees as VM's.

NOTE Confidence: 0.82661027

00:43:55.663 --> 00:43:56.806 All in all,

NOTE Confidence: 0.82661027

00:43:56.810 --> 00:43:59.323 these algorithms that try to do the

NOTE Confidence: 0.82661027

00:43:59.323 --> 00:44:02.489 same thing they try to create or to

NOTE Confidence: 0.82661027

00:44:02.489 --> 00:44:04.499 estimate a mathematical function that

NOTE Confidence: 0.82661027

00:44:04.572 --> 00:44:06.897 correlated this input into doubt.

NOTE Confidence: 0.82661027

00:44:06.900 --> 00:44:09.114 And there are two main elements

NOTE Confidence: 0.82661027

00:44:09.114 --> 00:44:10.590 of this estimation process.

NOTE Confidence: 0.82661027

00:44:10.590 --> 00:44:12.270 One of them were trying to see

NOTE Confidence: 0.82661027

00:44:12.270 --> 00:44:14.034 what is the mathematical element

NOTE Confidence: 0.82661027

00:44:14.034 --> 00:44:16.002 interaction between our features

NOTE Confidence: 0.82661027

00:44:16.002 --> 00:44:17.970 and the mathematical operations.

NOTE Confidence: 0.82661027

00:44:17.970 --> 00:44:19.810 That's going to be incorporated

NOTE Confidence: 0.82661027

00:44:19.810 --> 00:44:21.282 within these mathematical function.

NOTE Confidence: 0.82661027

00:44:21.290 --> 00:44:21.912 For example,

NOTE Confidence: 0.82661027

00:44:21.912 --> 00:44:23.778 the multiplication of X1 and X2

NOTE Confidence: 0.82661027

00:44:23.778 --> 00:44:25.831 and the second thing we're trying

NOTE Confidence: 0.82661027

00:44:25.831 --> 00:44:27.877 to estimate the weight of these

NOTE Confidence: 0.82661027

00:44:27.943 --> 00:44:30.518 mathematical elements within this function,

NOTE Confidence: 0.82661027

00:44:30.520 --> 00:44:33.464 which could be seen here as better 0,

NOTE Confidence: 0.82661027

00:44:33.470 --> 00:44:35.690 better one, etc.

NOTE Confidence: 0.82661027

00:44:35.690 --> 00:44:37.867 And I'll give a short and very

NOTE Confidence: 0.82661027

00:44:37.867 --> 00:44:39.271 simplistic example of these

NOTE Confidence: 0.82661027

00:44:39.271 --> 00:44:40.899 data driven predicted model.

NOTE Confidence: 0.82661027

00:44:40.900 --> 00:44:42.200 So here we are,

NOTE Confidence: 0.82661027

00:44:42.200 --> 00:44:44.150 having having only one variable Explanatory

NOTE Confidence: 0.84268486

00:44:44.213 --> 00:44:46.789 Variable, which is the age and we are

NOTE Confidence: 0.84268486

00:44:46.789 --> 00:44:48.920 trying to predict the disease patient

NOTE Confidence: 0.84268486

00:44:48.920 --> 00:44:51.650 is positive or negative to the disease.

NOTE Confidence: 0.84268486

00:44:51.650 --> 00:44:53.426 So for example in the right

NOTE Confidence: 0.84268486

00:44:53.426 --> 00:44:55.940 side of the screen you can see

NOTE Confidence: 0.84268486

00:44:55.940 --> 00:44:57.197 this mathematical function.

NOTE Confidence: 0.84268486

00:44:57.200 --> 00:44:59.640 Why would be considered positive if the age

NOTE Confidence: 0.84268486

00:44:59.640 --> 00:45:02.060 is greater than better otherwise negative?

NOTE Confidence: 0.84268486

00:45:02.060 --> 00:45:04.214 And as we get more and

NOTE Confidence: 0.84268486

00:45:04.214 --> 00:45:05.650 more examples we could.

NOTE Confidence: 0.84268486

00:45:05.650 --> 00:45:07.030 Estimate this better.

NOTE Confidence: 0.84268486

00:45:07.030 --> 00:45:07.950 For example,

NOTE Confidence: 0.84268486

00:45:07.950 --> 00:45:11.614 here we are estimating better to be 60,

NOTE Confidence: 0.84268486

00:45:11.620 --> 00:45:15.430 but as more data comes we

NOTE Confidence: 0.84268486

00:45:15.430 --> 00:45:17.335 can update modifier.

NOTE Confidence: 0.84268486

00:45:17.340 --> 00:45:20.538 Wait and basically change our function.

NOTE Confidence: 0.84268486

00:45:20.540 --> 00:45:22.542 Ann everything is OK till we have

NOTE Confidence: 0.84268486

00:45:22.542 --> 00:45:24.852 a data example that prevent us from

NOTE Confidence: 0.84268486

00:45:24.852 --> 00:45:26.928 creating one to use this mathematical

NOTE Confidence: 0.84268486

00:45:26.995 --> 00:45:28.845 function to a separate between

NOTE Confidence: 0.84268486

00:45:28.845 --> 00:45:30.695 between these these two groups.

NOTE Confidence: 0.84268486

00:45:30.700 --> 00:45:33.526 So here we need to incorporate a new feature,

NOTE Confidence: 0.84268486

00:45:33.530 --> 00:45:36.050 for example wait when we are doing that.

NOTE Confidence: 0.84268486

00:45:36.050 --> 00:45:38.730 We can create a more complex function to

NOTE Confidence: 0.84268486

00:45:38.730 --> 00:45:40.726 separate these two groups and basically

NOTE Confidence: 0.84268486

00:45:40.726 --> 00:45:43.300 this is what we're going to try to do.

NOTE Confidence: 0.84268486

00:45:43.300 --> 00:45:45.924 Today we're going to try to find the

NOTE Confidence: 0.84268486

00:45:45.924 --> 00:45:48.790 features that will allow us to separate

NOTE Confidence: 0.84268486

00:45:48.790 --> 00:45:50.925 between the recurrence in Nonrecurring.

NOTE Confidence: 0.84268486

00:45:50.930 --> 00:45:53.050 When we're talking about deep

NOTE Confidence: 0.84268486

00:45:53.050 --> 00:45:54.746 learning where basically usually

NOTE Confidence: 0.84268486

00:45:54.746 --> 00:45:56.420 refer to neural networks,

NOTE Confidence: 0.84268486

00:45:56.420 --> 00:45:58.940 and you run networks is again an

NOTE Confidence: 0.84268486

00:45:58.940 --> 00:46:01.514 algorithm that allows us to approximate

NOTE Confidence: 0.84268486

00:46:01.514 --> 00:46:03.410 almost any mathematical function

NOTE Confidence: 0.84268486

00:46:03.410 --> 00:46:05.699 that correlate input into output,

NOTE Confidence: 0.84268486

00:46:05.700 --> 00:46:09.486 and it does that by finding

NOTE Confidence: 0.84268486

00:46:09.486 --> 00:46:11.379 interaction between features.

NOTE Confidence: 0.84268486

00:46:11.380 --> 00:46:13.080 Convolutional neural network allow

NOTE Confidence: 0.84268486

00:46:13.080 --> 00:46:15.630 us to search for petitive patterns

NOTE Confidence: 0.84268486

00:46:15.699 --> 00:46:17.655 within an image and then correlate

NOTE Confidence: 0.84268486

00:46:17.655 --> 00:46:20.011 them to the output variable so it

NOTE Confidence: 0.84268486

00:46:20.011 --> 00:46:22.300 tries to find high level features such

NOTE Confidence: 0.84268486

00:46:22.300 --> 00:46:25.204 as edges and the more deeper we go,

NOTE Confidence: 0.84268486

00:46:25.210 --> 00:46:27.664 the more complex the feature become

NOTE Confidence: 0.84268486

00:46:27.664 --> 00:46:30.855 and allow us to separate between the

NOTE Confidence: 0.84268486

00:46:30.855 --> 00:46:33.795 groups that were trying to suffer.

NOTE Confidence: 0.84268486

00:46:33.800 --> 00:46:36.146 A little bit of our data,

NOTE Confidence: 0.84268486

00:46:36.150 --> 00:46:40.070 so we had 120 patients 18 years old or older,

NOTE Confidence: 0.84268486

00:46:40.070 --> 00:46:42.030 88 minutes and 32 females.

NOTE Confidence: 0.84268486

00:46:42.030 --> 00:46:44.772 All of them were diagnosed with

NOTE Confidence: 0.84268486

00:46:44.772 --> 00:46:47.839 HTC between there is 2005 to 2018.

NOTE Confidence: 0.84268486

00:46:47.840 --> 00:46:51.564 So the patient went into MRI imaging,

NOTE Confidence: 0.84268486

00:46:51.570 --> 00:46:54.486 then were diagnosed with HTC and

NOTE Confidence: 0.84268486

00:46:54.486 --> 00:46:57.430 then got treatment 29 oblations,

NOTE Confidence: 0.84268486

00:46:57.430 --> 00:47:01.250 32 receptions and 5:59 presentations.

NOTE Confidence: 0.84268486

00:47:01.250 --> 00:47:03.778 An time went by, some of them recur,

NOTE Confidence: 0.84268486

00:47:03.780 --> 00:47:06.812 and some of them stop their follow which

NOTE Confidence: 0.84268486

00:47:06.812 --> 00:47:09.188 we considered to be non recurrences.

NOTE Confidence: 0.84268486

00:47:09.190 --> 00:47:11.094 To this time that I can call time

NOTE Confidence: 0.84268486

00:47:11.094 --> 00:47:12.816 to recurrence and this would be

NOTE Confidence: 0.84268486

00:47:12.816 --> 00:47:13.707 our explained variable,

NOTE Confidence: 0.84268486

00:47:13.710 --> 00:47:15.900 the variable that we're going

NOTE Confidence: 0.84268486

00:47:15.900 --> 00:47:17.652 to try to predict.

NOTE Confidence: 0.84268486

00:47:17.660 --> 00:47:19.850 With respect to our input data,

NOTE Confidence: 0.84268486

00:47:19.850 --> 00:47:22.216 we're going to use conference enhanced multi

NOTE Confidence: 0.84268486

00:47:22.216 --> 00:47:24.229 phase liver magnetic resonance imaging,

NOTE Confidence: 0.84268486

00:47:24.230 --> 00:47:24.579 MRI,

NOTE Confidence: 0.84268486

00:47:24.579 --> 00:47:26.673 and we're going to use three

NOTE Confidence: 0.84268486

00:47:26.673 --> 00:47:28.609 different phases that the arterial,

NOTE Confidence: 0.84268486

00:47:28.610 --> 00:47:30.800 the portal venous and the delay.

NOTE Confidence: 0.81049764

00:47:32.900 --> 00:47:34.724 So the question that we're trying

NOTE Confidence: 0.81049764

00:47:34.724 --> 00:47:37.598 to answer here is can we predict ATC

NOTE Confidence: 0.81049764

00:47:37.598 --> 00:47:39.588 recurrence using pretreatment MRI images?

NOTE Confidence: 0.81049764

00:47:39.590 --> 00:47:41.552 In other words, are they visual

NOTE Confidence: 0.81049764

00:47:41.552 --> 00:47:43.674 features in free treatment MRI that

NOTE Confidence: 0.81049764

00:47:43.674 --> 00:47:45.564 correlate with HTC disease recurrence?

NOTE Confidence: 0.81049764

00:47:45.570 --> 00:47:47.532 So to visualize that we're going

NOTE Confidence: 0.81049764

00:47:47.532 --> 00:47:49.854 to use the input MRI input data

NOTE Confidence: 0.81049764

00:47:49.854 --> 00:47:52.052 as an input data to freedom into

NOTE Confidence: 0.81049764

00:47:52.120 --> 00:47:54.526 a predictive model which will be

NOTE Confidence: 0.81049764

00:47:54.526 --> 00:47:56.822 convolution on your network and to

NOTE Confidence: 0.81049764

00:47:56.822 --> 00:47:58.552 predict whether the patient will

NOTE Confidence: 0.81049764

00:47:58.552 --> 00:48:00.712 reoccur within one year two years

NOTE Confidence: 0.81049764

00:48:00.712 --> 00:48:02.467 after six years after treatment.

NOTE Confidence: 0.8456857

00:48:04.660 --> 00:48:06.510 So here are the results.

NOTE Confidence: 0.8456857

00:48:06.510 --> 00:48:08.730 Here we can see the results

NOTE Confidence: 0.8456857

00:48:08.730 --> 00:48:10.950 for these 6 * 6 timeframe.

NOTE Confidence: 0.8456857

00:48:10.950 --> 00:48:12.800 So one year for occurrence,

NOTE Confidence: 0.8456857

00:48:12.800 --> 00:48:15.760 two years of free France up to 6,

NOTE Confidence: 0.8456857

00:48:15.760 --> 00:48:18.334 zero for occurrence and this figure

NOTE Confidence: 0.8456857

00:48:18.334 --> 00:48:20.050 present the relationship between

NOTE Confidence: 0.8456857

00:48:20.123 --> 00:48:22.091 the true positive rate to the

NOTE Confidence: 0.8456857

00:48:22.091 --> 00:48:24.124 false positive rate on our test

NOTE Confidence: 0.8456857

00:48:24.124 --> 00:48:26.120 cohort and seeing these 45% curve,

NOTE Confidence: 0.8456857

00:48:26.120 --> 00:48:27.230 which represents basically

NOTE Confidence: 0.8456857

00:48:27.230 --> 00:48:29.080 a random chance to predict,

NOTE Confidence: 0.8456857

00:48:29.080 --> 00:48:31.572 we can see that all of our

NOTE Confidence: 0.8456857

00:48:31.572 --> 00:48:33.150 curves is above that.

NOTE Confidence: 0.8456857

00:48:33.150 --> 00:48:35.000 Which means that our model

NOTE Confidence: 0.8456857

00:48:35.000 --> 00:48:36.110 has prediction power.

NOTE Confidence: 0.7972218

00:48:39.330 --> 00:48:41.232 Another analysis that we did we

NOTE Confidence: 0.7972218

00:48:41.232 --> 00:48:44.174 did was to try to use Kaplan Meier

NOTE Confidence: 0.7972218

00:48:44.174 --> 00:48:46.174 curves and our predictions to

NOTE Confidence: 0.7972218

00:48:46.174 --> 00:48:48.577 separate our cohort into risk groups.

NOTE Confidence: 0.7972218

00:48:48.580 --> 00:48:50.525 Soloist group to recurrence in

NOTE Confidence: 0.7972218

00:48:50.525 --> 00:48:52.946 high risk to recurrence and we

NOTE Confidence: 0.7972218

00:48:52.946 --> 00:48:54.991 got significant results for your

NOTE Confidence: 0.7972218

00:48:54.991 --> 00:48:56.985 current free survival for four

NOTE Confidence: 0.7972218

00:48:56.985 --> 00:48:59.305 out of the six times you can here,

NOTE Confidence: 0.7972218

00:48:59.310 --> 00:49:02.614 you can see the six different figures

NOTE Confidence: 0.7972218

00:49:02.614 --> 00:49:06.488 each for one time for each time frame.

NOTE Confidence: 0.7972218

00:49:06.490 --> 00:49:07.582 So to summarize,

NOTE Confidence: 0.7972218

00:49:07.582 --> 00:49:10.130 the current state of the art criteria

NOTE Confidence: 0.7972218

00:49:10.201 --> 00:49:12.426 based on low level handcrafted

NOTE Confidence: 0.7972218

00:49:12.426 --> 00:49:15.060 radiological features such as tumor size,

NOTE Confidence: 0.7972218

00:49:15.060 --> 00:49:17.136 number of tumors and this study

NOTE Confidence: 0.7972218

00:49:17.136 --> 00:49:19.586 showed that there are still unknown

NOTE Confidence: 0.7972218

00:49:19.586 --> 00:49:21.586 visual features in pretreatment.

NOTE Confidence: 0.7972218

00:49:21.590 --> 00:49:24.439 MRI does correlate with recurrence of ATC.

NOTE Confidence: 0.7972218

00:49:24.440 --> 00:49:24.833 Secondly,

NOTE Confidence: 0.7972218

00:49:24.833 --> 00:49:27.584 the current state of the art selection

NOTE Confidence: 0.7972218

00:49:27.584 --> 00:49:29.675 criteria suffers from false positives

NOTE Confidence: 0.7972218

00:49:29.675 --> 00:49:31.735 and we showed by incorporating

NOTE Confidence: 0.7972218

00:49:31.735 --> 00:49:33.432 machine learning based algorithms

NOTE Confidence: 0.7972218

00:49:33.432 --> 00:49:35.462 we could potentially improve the

NOTE Confidence: 0.7972218

00:49:35.462 --> 00:49:37.261 prediction of AGC recurrence.

NOTE Confidence: 0.7972218

00:49:37.261 --> 00:49:39.585 Little bit of limitations

NOTE Confidence: 0.7972218

00:49:39.585 --> 00:49:41.328 and future research.

NOTE Confidence: 0.7972218

00:49:41.330 --> 00:49:44.126 We used a single site cohort

NOTE Confidence: 0.7972218

00:49:44.126 --> 00:49:45.524 from Yale Hospital,

NOTE Confidence: 0.7972218

00:49:45.530 --> 00:49:47.860 which was small 120 patient,

NOTE Confidence: 0.7972218

00:49:47.860 --> 00:49:50.734 which has the limitation of generalize

NOTE Confidence: 0.7972218

00:49:50.734 --> 00:49:53.646 the results for other sites and

NOTE Confidence: 0.7972218

00:49:53.646 --> 00:49:55.921 therefore will need to increase

NOTE Confidence: 0.7972218

00:49:55.921 --> 00:49:58.571 our sample size or incorporating

NOTE Confidence: 0.7972218

00:49:58.571 --> 00:50:00.967 patient from different side.

NOTE Confidence: 0.7972218

00:50:00.970 --> 00:50:03.360 And maybe single data modality,

NOTE Confidence: 0.7972218

00:50:03.360 --> 00:50:04.608 maybe not enough,

NOTE Confidence: 0.7972218

00:50:04.608 --> 00:50:07.104 so in future research we recommend

NOTE Confidence: 0.7972218

00:50:07.104 --> 00:50:09.252 to test interaction between

NOTE Confidence: 0.7972218

00:50:09.252 --> 00:50:11.456 imaging and clinical data,

NOTE Confidence: 0.7972218

00:50:11.460 --> 00:50:15.040 even incorporating more imaging modalities.

NOTE Confidence: 0.7972218

00:50:15.040 --> 00:50:15.988 Thank you very much.

NOTE Confidence: 0.8563696

00:50:23.210 --> 00:50:25.376 So, so that was really great.

NOTE Confidence: 0.8563696

00:50:25.380 --> 00:50:27.810 Hope you all were able to

NOTE Confidence: 0.8563696

00:50:27.810 --> 00:50:29.940 see what exciting work word.

NOTE Confidence: 0.8563696

00:50:29.940 --> 00:50:32.340 You know, doing in this lab?

NOTE Confidence: 0.8563696

00:50:32.340 --> 00:50:34.340 Does anybody have any questions?

NOTE Confidence: 0.83548236

00:50:35.410 --> 00:50:37.022 And individuals can certainly

NOTE Confidence: 0.83548236

00:50:37.022 --> 00:50:39.037 submit their questions on chat,

NOTE Confidence: 0.83548236

00:50:39.040 --> 00:50:41.176 but we did receive one which

NOTE Confidence: 0.83548236

00:50:41.176 --> 00:50:43.618 David you took the Liberty of

NOTE Confidence: 0.83548236

00:50:43.618 --> 00:50:45.490 at least answering online.

NOTE Confidence: 0.83548236

00:50:45.490 --> 00:50:48.706 But let me for the benefit of all.

NOTE Confidence: 0.83548236

00:50:48.710 --> 00:50:51.531 Let me just toss this out so

NOTE Confidence: 0.83548236

00:50:51.531 --> 00:50:53.730 Joseph Cam asked, you know,

NOTE Confidence: 0.83548236

00:50:53.730 --> 00:50:56.205 essentially, how do you decide?

NOTE Confidence: 0.83548236

00:50:56.210 --> 00:50:59.006 On the specific procedure be RFA,

NOTE Confidence: 0.83548236

00:50:59.010 --> 00:50:59.942 thermal abrasion,

NOTE Confidence: 0.83548236

00:50:59.942 --> 00:51:00.874 ablation, cryoablation,

NOTE Confidence: 0.83548236

00:51:00.874 --> 00:51:03.670 and and also relative to contraindications.

NOTE Confidence: 0.83548236

00:51:03.670 --> 00:51:06.460 How do you make those choices?

NOTE Confidence: 0.83871114

00:51:08.480 --> 00:51:11.360 Yeah, so so. I guess I gave a

NOTE Confidence: 0.83871114

00:51:11.360 --> 00:51:13.659 pretty long email for a chat,

NOTE Confidence: 0.83871114

00:51:13.660 --> 00:51:17.320 but are more common for chat, but.

NOTE Confidence: 0.83871114

00:51:17.320 --> 00:51:20.864 Each ablation modality has its pros and cons,

NOTE Confidence: 0.83871114

00:51:20.870 --> 00:51:23.537 and clearly my goal for today was

NOTE Confidence: 0.83871114

00:51:23.537 --> 00:51:26.858 not to go into my own personal

NOTE Confidence: 0.83871114

00:51:26.858 --> 00:51:30.084 research and discuss a lot of this

NOTE Confidence: 0.83871114

00:51:30.084 --> 00:51:32.406 stuff in depth because I really

NOTE Confidence: 0.83871114

00:51:32.406 --> 00:51:35.080 wanted to highlight our trainees.

NOTE Confidence: 0.83871114

00:51:35.080 --> 00:51:36.836 But basically you know,

NOTE Confidence: 0.83871114

00:51:36.836 --> 00:51:39.983 for liver it's pretty much understood that

NOTE Confidence: 0.83871114

00:51:39.983 --> 00:51:43.063 heat ablation is actually what is preferred,

NOTE Confidence: 0.83871114

00:51:43.070 --> 00:51:46.178 and that's because over the years well,

NOTE Confidence: 0.83871114

00:51:46.180 --> 00:51:48.928 first of all it's very effective.

NOTE Confidence: 0.83871114

00:51:48.930 --> 00:51:50.650 But over the years,

NOTE Confidence: 0.83871114

00:51:50.650 --> 00:51:53.764 there's been concerns with Cryo Ablation on

NOTE Confidence: 0.83871114

00:51:53.764 --> 00:51:56.524 what's called something called Cryo shock.

NOTE Confidence: 0.83871114

00:51:56.530 --> 00:51:59.206 There's questions about fracturing the liver.

NOTE Confidence: 0.83871114

00:51:59.210 --> 00:52:02.078 There's no way of really cauterizing

NOTE Confidence: 0.83871114

00:52:02.078 --> 00:52:05.686 any bleed that you can do with microwave

NOTE Confidence: 0.83871114

00:52:05.686 --> 00:52:09.049 or RFA and a whole bunch of others.

NOTE Confidence: 0.83871114

00:52:09.050 --> 00:52:11.785 So it's really the complications

NOTE Confidence: 0.83871114

00:52:11.785 --> 00:52:15.596 in this in this setting that makes

NOTE Confidence: 0.83871114

00:52:15.596 --> 00:52:18.036 it less ideal than four.

NOTE Confidence: 0.83871114

00:52:18.040 --> 00:52:19.964 For the Heat base,

NOTE Confidence: 0.83871114

00:52:19.964 --> 00:52:23.330 now the one positive thing is we

NOTE Confidence: 0.83871114

00:52:23.330 --> 00:52:26.669 shown in some of the in one of the

NOTE Confidence: 0.83871114

00:52:26.773 --> 00:52:30.221 cases is that you do get the ice

NOTE Confidence: 0.83871114

00:52:30.221 --> 00:52:33.335 ball which has low density ice and

NOTE Confidence: 0.83871114

00:52:33.335 --> 00:52:35.580 that actually allows the operator

NOTE Confidence: 0.83871114

00:52:35.661 --> 00:52:38.115 to really sculpt the margins where

NOTE Confidence: 0.83871114

00:52:38.115 --> 00:52:41.099 you want to treat in other organs.

NOTE Confidence: 0.83871114

00:52:41.100 --> 00:52:43.848 Systems like the lung and kidney

NOTE Confidence: 0.83871114

00:52:43.848 --> 00:52:47.124 is really a dealers choice so that

NOTE Confidence: 0.83871114

00:52:47.124 --> 00:52:49.824 there have been papers on both.

NOTE Confidence: 0.83871114

00:52:49.830 --> 00:52:52.296 In terms of using cryoablation or

NOTE Confidence: 0.83871114

00:52:52.296 --> 00:52:55.006 heat ablation for those that we were

NOTE Confidence: 0.83871114

00:52:55.006 --> 00:52:57.323 just involved in a study that was

NOTE Confidence: 0.83871114

00:52:57.403 --> 00:52:59.878 recently published in the Journal

NOTE Confidence: 0.83871114

00:52:59.878 --> 00:53:01.363 of thoracic oncology,

NOTE Confidence: 0.83871114

00:53:01.370 --> 00:53:04.080 which was a prospective clinical

NOTE Confidence: 0.83871114

00:53:04.080 --> 00:53:06.248 trial called solstice that.

NOTE Confidence: 0.83871114

00:53:06.250 --> 00:53:08.420 Did show benefits of cold,

NOTE Confidence: 0.83871114

00:53:08.420 --> 00:53:09.290 you know,

NOTE Confidence: 0.83871114

00:53:09.290 --> 00:53:12.335 for for lung nodules and then I

NOTE Confidence: 0.83871114

00:53:12.335 --> 00:53:14.910 already as I kind of explained,

NOTE Confidence: 0.83871114

00:53:14.910 --> 00:53:17.508 it's kind of a niche application.

NOTE Confidence: 0.83871114

00:53:17.510 --> 00:53:19.562 Mostly used in pancreas,

NOTE Confidence: 0.83871114

00:53:19.562 --> 00:53:23.362 but it's in an area where it's

NOTE Confidence: 0.83871114

00:53:23.362 --> 00:53:25.210 difficult to treat.

NOTE Confidence: 0.83871114

00:53:25.210 --> 00:53:27.415 Areas which have vital structures

NOTE Confidence: 0.83871114

00:53:27.415 --> 00:53:28.738 in your body,

NOTE Confidence: 0.83871114

00:53:28.740 --> 00:53:31.386 so that's the I guess summary

NOTE Confidence: 0.83871114

00:53:31.386 --> 00:53:33.150 of that so thanks.

NOTE Confidence: 0.8708769

00:53:35.320 --> 00:53:38.371 So let me ask a follow up question 'cause

NOTE Confidence: 0.8708769

00:53:38.371 --> 00:53:41.942 you great deal of the work is really

NOTE Confidence: 0.8708769

00:53:41.942 --> 00:53:44.390 advancing understanding the nature of

NOTE Confidence: 0.8708769

00:53:44.390 --> 00:53:46.915 the immune infiltrate post procedure.

NOTE Confidence: 0.8708769

00:53:46.920 --> 00:53:49.734 And Moreover, how to address how to

NOTE Confidence: 0.8708769

00:53:49.734 --> 00:53:52.160 make the environment more hospitable?

NOTE Confidence: 0.8708769

00:53:52.160 --> 00:53:54.460 Two immune cells, Sony aspid,

NOTE Confidence: 0.8708769

00:53:54.460 --> 00:53:58.156 be both with regard to the imaging

NOTE Confidence: 0.8708769

00:53:58.156 --> 00:54:00.405 techniques monitoring techniques and

NOTE Confidence: 0.8708769

00:54:00.405 --> 00:54:03.295 perhaps the introduction of bicarbonate.

NOTE Confidence: 0.8708769

00:54:03.300 --> 00:54:06.513 How much you leverage all of this to think

NOTE Confidence: 0.8708769

00:54:06.513 --> 00:54:09.302 about combining these approaches with

NOTE Confidence: 0.8708769

00:54:09.302 --> 00:54:11.654 ongoing immunotherapy immuno therapies

NOTE Confidence: 0.8708769

00:54:11.654 --> 00:54:14.768 that are under development in HTC?

NOTE Confidence: 0.85417795

00:54:15.780 --> 00:54:17.598 Right, I mean that's a really

NOTE Confidence: 0.85417795

00:54:17.598 --> 00:54:18.810 important question that we're

NOTE Confidence: 0.85417795

00:54:18.868 --> 00:54:20.718 actually trying to answer ourselves.

NOTE Confidence: 0.85417795

00:54:20.720 --> 00:54:21.704 As David mentioned,

NOTE Confidence: 0.85417795

00:54:21.704 --> 00:54:23.353 I mean, we're right now.

NOTE Confidence: 0.85417795

00:54:23.353 --> 00:54:25.008 Actually submitting one or an

NOTE Confidence: 0.85417795

00:54:25.008 --> 00:54:26.351 application after the other

NOTE Confidence: 0.85417795

00:54:26.351 --> 00:54:27.926 because we want to investigate

NOTE Confidence: 0.85417795

00:54:27.926 --> 00:54:29.600 exactly those points we generated.

NOTE Confidence: 0.85417795

00:54:29.600 --> 00:54:30.431 This preliminary data.

NOTE Confidence: 0.85417795

00:54:30.431 --> 00:54:32.803 Now we want to take it to the

NOTE Confidence: 0.85417795

00:54:32.803 --> 00:54:34.678 clinical perspective and do also

NOTE Confidence: 0.85417795

00:54:34.678 --> 00:54:36.178 trials and immediate future.

NOTE Confidence: 0.85417795

00:54:36.180 --> 00:54:38.732 So I think there is a couple of

NOTE Confidence: 0.85417795

00:54:38.732 --> 00:54:41.109 limitations that we first need to address,

NOTE Confidence: 0.85417795

00:54:41.110 --> 00:54:43.090 and for the pH Image Ng,

NOTE Confidence: 0.85417795

00:54:43.090 --> 00:54:45.058 this is certainly the contrast agent,

NOTE Confidence: 0.85417795

00:54:45.060 --> 00:54:46.950 which is not done yet.

NOTE Confidence: 0.85417795

00:54:46.950 --> 00:54:48.816 Applied and in the human scenario,

NOTE Confidence: 0.85417795

00:54:48.820 --> 00:54:51.052 so we need to make sure that we

NOTE Confidence: 0.85417795

00:54:51.052 --> 00:54:53.218 can do that safely, you know.

NOTE Confidence: 0.85417795

00:54:53.218 --> 00:54:53.542 Secondly,

NOTE Confidence: 0.85417795

00:54:53.542 --> 00:54:56.161 I think you know the imaging of the

NOTE Confidence: 0.85417795

00:54:56.161 --> 00:54:58.401 immune system is a very hot topic and

NOTE Confidence: 0.85417795

00:54:58.401 --> 00:55:00.336 is being hotly discussed and worked

NOTE Confidence: 0.85417795

00:55:00.336 --> 00:55:02.552 up on both by the nuclear medicine

NOTE Confidence: 0.85417795

00:55:02.552 --> 00:55:04.729 community as well as you know us,

NOTE Confidence: 0.85417795

00:55:04.730 --> 00:55:06.428 and I think that both approaches

NOTE Confidence: 0.85417795

00:55:06.428 --> 00:55:08.479 have their merits in their drawbacks,

NOTE Confidence: 0.85417795

00:55:08.480 --> 00:55:10.286 and I think that this will

NOTE Confidence: 0.85417795

00:55:10.286 --> 00:55:11.490 definitely bring a breakthrough

NOTE Confidence: 0.85417795

00:55:11.548 --> 00:55:13.158 in terms of imaging biomarkers.

NOTE Confidence: 0.85417795

00:55:13.160 --> 00:55:15.962 As we know in HC see only 20% of

NOTE Confidence: 0.85417795

00:55:15.962 --> 00:55:17.541 the patients at Prof. Roundabout.

NOTE Confidence: 0.85417795

00:55:17.541 --> 00:55:18.534 Respond to immunotherapy.

NOTE Confidence: 0.85417795

00:55:18.534 --> 00:55:21.309 But we treat a lot of them with it,

NOTE Confidence: 0.85417795

00:55:21.310 --> 00:55:23.659 and so we want to make sure we choose

NOTE Confidence: 0.85417795

00:55:23.659 --> 00:55:26.227 their right patients for the right therapy.

NOTE Confidence: 0.85417795

00:55:26.230 --> 00:55:27.770 And that's the whole goal.

NOTE Confidence: 0.85417795

00:55:27.770 --> 00:55:28.517 As for you,

NOTE Confidence: 0.85417795

00:55:28.517 --> 00:55:30.260 As for the As for the real

NOTE Confidence: 0.85417795

00:55:30.334 --> 00:55:31.780 application of bicarb,

NOTE Confidence: 0.85417795

00:55:31.780 --> 00:55:33.887 that is an approach that could be

NOTE Confidence: 0.85417795

00:55:33.887 --> 00:55:35.778 translated into clinical trial very easily.

NOTE Confidence: 0.85417795

00:55:35.780 --> 00:55:36.396 I mean,

NOTE Confidence: 0.85417795

00:55:36.396 --> 00:55:38.244 bicarbonate is not a harmful substance.

NOTE Confidence: 0.85417795

00:55:38.250 --> 00:55:40.224 It could be used in just used

NOTE Confidence: 0.85417795

00:55:40.224 --> 00:55:42.248 in a clinical trial with taste,

NOTE Confidence: 0.85417795

00:55:42.250 --> 00:55:44.280 and I think we need to really

NOTE Confidence: 0.85417795

00:55:44.280 --> 00:55:46.230 think about using using that as

NOTE Confidence: 0.85417795

00:55:46.230 --> 00:55:47.925 an addition and an additional.

NOTE Confidence: 0.85417795

00:55:47.930 --> 00:55:48.227 Arm,

NOTE Confidence: 0.85417795

00:55:48.227 --> 00:55:50.009 possibly in one of the clinical

NOTE Confidence: 0.85417795

00:55:50.009 --> 00:55:51.828 trials that David is bringing on

NOTE Confidence: 0.85417795

00:55:51.828 --> 00:55:53.574 board to use taste in combination

NOTE Confidence: 0.85417795

00:55:53.574 --> 00:55:55.080 with the immuno therapies.

NOTE Confidence: 0.85417795

00:55:55.080 --> 00:55:56.808 And I think that that would

NOTE Confidence: 0.85417795

00:55:56.808 --> 00:55:58.819 be a very simple initial fix.

NOTE Confidence: 0.85417795

00:55:58.820 --> 00:55:59.753 To do that.

NOTE Confidence: 0.85417795

00:55:59.753 --> 00:56:01.930 I mean there is very little Harmon.

NOTE Confidence: 0.85417795

00:56:01.930 --> 00:56:03.475 Probably you know some major

NOTE Confidence: 0.85417795

00:56:03.475 --> 00:56:05.660 benefit that we could get from that.

NOTE Confidence: 0.85417795

00:56:05.660 --> 00:56:07.452 So we need clinical trials in this

NOTE Confidence: 0.85417795

00:56:07.452 --> 00:56:09.393 respect and we need more translational

NOTE Confidence: 0.85417795

00:56:09.393 --> 00:56:11.253 contrast agent and more research.

NOTE Confidence: 0.85417795

00:56:11.260 --> 00:56:13.661 And I think we do have an

NOTE Confidence: 0.85417795

00:56:13.661 --> 00:56:15.085 amazing infrastructure with RMR

NOTE Confidence: 0.85417795

00:56:15.085 --> 00:56:17.029 Research Center here and the Pet

NOTE Confidence: 0.85417795

00:56:17.029 --> 00:56:18.910 Center on the other hand 2.

NOTE Confidence: 0.85417795

00:56:18.910 --> 00:56:20.408 To actually do that kind of research.

NOTE Confidence: 0.8901477

00:56:21.330 --> 00:56:23.226 And so let me as a follow up.

NOTE Confidence: 0.8901477

00:56:23.230 --> 00:56:25.211 So let me ask, given what you're

NOTE Confidence: 0.8901477

00:56:25.211 --> 00:56:27.308 describing in the nature of the immune.

NOTE Confidence: 0.8901477

00:56:27.310 --> 00:56:29.470 Response, immune environment,

NOTE Confidence: 0.8901477

00:56:29.470 --> 00:56:33.790 fear after procedures such as these.

NOTE Confidence: 0.8901477

00:56:33.790 --> 00:56:36.355 Desert potentially suggests that any

NOTE Confidence: 0.8901477

00:56:36.355 --> 00:56:40.048 efforts right now to combine a checkpoint

NOTE Confidence: 0.8901477

00:56:40.048 --> 00:56:43.174 inhibitor with tastes or other ablation

NOTE Confidence: 0.8901477

00:56:43.174 --> 00:56:45.960 procedure may not be yet optimized.

NOTE Confidence: 0.8901477

00:56:45.960 --> 00:56:48.140 Turn to really achieve what we

NOTE Confidence: 0.8901477

00:56:48.140 --> 00:56:50.170 hope they would achieve because of

NOTE Confidence: 0.83878195

00:56:50.170 --> 00:56:52.276 the nature of the environment absolutely,

NOTE Confidence: 0.83878195

00:56:52.280 --> 00:56:54.737 and this is exactly what I showed.

NOTE Confidence: 0.83878195

00:56:54.740 --> 00:56:57.099 If you remember one of the slides

NOTE Confidence: 0.83878195

00:56:57.099 --> 00:56:58.600 had different embolic agents,

NOTE Confidence: 0.83878195

00:56:58.600 --> 00:57:01.050 and so we're using various symbolic agents,

NOTE Confidence: 0.83878195

00:57:01.050 --> 00:57:01.752 various agents.

NOTE Confidence: 0.83878195

00:57:01.752 --> 00:57:03.858 If we inject into the tumor,

NOTE Confidence: 0.83878195

00:57:03.860 --> 00:57:06.317 that may be pro or anti inflammatory.

NOTE Confidence: 0.83878195

00:57:06.320 --> 00:57:08.474 We then also combine taste and

NOTE Confidence: 0.83878195

00:57:08.474 --> 00:57:10.303 checkpoint inhibition in tumors that

NOTE Confidence: 0.83878195

00:57:10.303 --> 00:57:12.289 may be hot or immunologically cold.

NOTE Confidence: 0.83878195

00:57:12.290 --> 00:57:14.481 So essentially you know a lot of

NOTE Confidence: 0.83878195

00:57:14.481 --> 00:57:16.320 these trials will probably have

NOTE Confidence: 0.83878195

00:57:16.320 --> 00:57:17.976 very non significant results

NOTE Confidence: 0.83878195

00:57:17.976 --> 00:57:20.200 and probably will never achieve.

NOTE Confidence: 0.83878195

00:57:20.200 --> 00:57:22.461 Yeah, it is certain level of clinical

NOTE Confidence: 0.83878195

00:57:22.461 --> 00:57:24.000 translation that we hope for.

NOTE Confidence: 0.83878195

00:57:24.000 --> 00:57:26.536 Just because we don't know what we're doing.

NOTE Confidence: 0.83878195

00:57:26.540 --> 00:57:28.358 Essentially so when we combine Interventional

NOTE Confidence: 0.83878195

00:57:28.358 --> 00:57:30.030 in college and Immuno Oncology,

NOTE Confidence: 0.83878195

00:57:30.030 --> 00:57:32.649 we just go about it and say one size

NOTE Confidence: 0.83878195

00:57:32.649 --> 00:57:35.244 fits all and that is something that I

NOTE Confidence: 0.83878195

00:57:35.244 --> 00:57:37.905 feel like is is the major key point

NOTE Confidence: 0.83878195

00:57:37.905 --> 00:57:40.485 that we need to address and one of

NOTE Confidence: 0.83878195

00:57:40.485 --> 00:57:42.375 these issues is that in Interventional

NOTE Confidence: 0.83878195

00:57:42.375 --> 00:57:44.347 Ecology Community would just did not

NOTE Confidence: 0.83878195

00:57:44.347 --> 00:57:46.313 have the academic culture and you

NOTE Confidence: 0.83878195

00:57:46.313 --> 00:57:48.137 know research environment so far and

NOTE Confidence: 0.83878195

00:57:48.137 --> 00:57:49.760 this is across multiple institutions

NOTE Confidence: 0.83878195

00:57:49.760 --> 00:57:51.180 across our entire community.

NOTE Confidence: 0.83878195

00:57:51.180 --> 00:57:52.830 To actually tackle those topics,

NOTE Confidence: 0.83878195

00:57:52.830 --> 00:57:54.822 and I think now we as we more

NOTE Confidence: 0.83878195

00:57:54.822 --> 00:57:56.544 understand that our therapies are

NOTE Confidence: 0.83878195

00:57:56.544 --> 00:57:58.096 necessary in our increasingly

NOTE Confidence: 0.83878195

00:57:58.096 --> 00:57:59.760 combined with systemic therapy,

NOTE Confidence: 0.83878195

00:57:59.760 --> 00:58:01.410 we need to investigate that,

NOTE Confidence: 0.83878195

00:58:01.410 --> 00:58:03.818 and I think that we're going to

NOTE Confidence: 0.83878195

00:58:03.818 --> 00:58:05.370 have major breakthroughs in the

NOTE Confidence: 0.84226775

00:58:05.370 --> 00:58:07.662 next three to five years. Thank you.

NOTE Confidence: 0.84226775

00:58:07.662 --> 00:58:10.980 Well, I know where at the top of the hour,

NOTE Confidence: 0.84226775

00:58:10.980 --> 00:58:13.220 and I want to thank Jessica and tile

NOTE Confidence: 0.84226775

00:58:13.220 --> 00:58:15.223 and Julius and David for really

NOTE Confidence: 0.84226775

00:58:15.223 --> 00:58:16.603 a remarkably stimulating body

NOTE Confidence: 0.84226775

00:58:16.603 --> 00:58:19.116 of work and Bradley bring to our

NOTE Confidence: 0.84226775

00:58:19.116 --> 00:58:21.255 attention what can be accomplished in

NOTE Confidence: 0.84226775

00:58:21.255 --> 00:58:23.130 Interventional Onkologie So you know,

NOTE Confidence: 0.84226775

00:58:23.130 --> 00:58:24.972 thank you for this continued education

NOTE Confidence: 0.84226775

00:58:24.972 --> 00:58:26.867 for the great work you're doing

NOTE Confidence: 0.84226775

00:58:26.867 --> 00:58:28.736 and everyone on line. Thank you.