

WEBVTT

NOTE duration:"01:00:16"

NOTE recognizability:0.772

NOTE language:en-us

NOTE Confidence: 0.849264795

00:00:00.000 --> 00:00:03.760 All right, everyone, welcome,

NOTE Confidence: 0.849264795

00:00:03.760 --> 00:00:06.316 although he really needs no introduction.

NOTE Confidence: 0.849264795

00:00:06.320 --> 00:00:10.400 It is my honor, on behalf of the Pathology

NOTE Confidence: 0.849264795

00:00:10.400 --> 00:00:12.800 Department Grand Rounds Committee,

NOTE Confidence: 0.849264795

00:00:12.800 --> 00:00:14.676 to welcome our Grand Round speaker today,

NOTE Confidence: 0.849264795

00:00:14.680 --> 00:00:16.440 Doctor Ranjit Bindra.

NOTE Confidence: 0.849264795

00:00:16.440 --> 00:00:19.360 He is the Henry and Kate Cushing

NOTE Confidence: 0.849264795

00:00:19.360 --> 00:00:21.080 Professor of Therapeutic Radiology

NOTE Confidence: 0.849264795

00:00:21.080 --> 00:00:24.016 and of course professor of

NOTE Confidence: 0.849264795

00:00:24.016 --> 00:00:25.840 Pathology and also neurosurgery.

NOTE Confidence: 0.849264795

00:00:25.840 --> 00:00:28.840 He's also well known in our

NOTE Confidence: 0.849264795

00:00:28.840 --> 00:00:31.732 department as he's a graduate of

NOTE Confidence: 0.849264795

00:00:31.732 --> 00:00:33.828 our experimental pathology PhD

NOTE Confidence: 0.849264795

00:00:33.828 --> 00:00:36.600 program and Yale's MDPHD program.  
NOTE Confidence: 0.849264795

00:00:36.600 --> 00:00:40.700 He's obviously everyone is aware that  
NOTE Confidence: 0.849264795

00:00:40.700 --> 00:00:42.692 he's nationally and internationally  
NOTE Confidence: 0.849264795

00:00:42.692 --> 00:00:45.080 recognized for his discoveries on onco  
NOTE Confidence: 0.849264795

00:00:45.080 --> 00:00:47.205 metabolite induced dysregulation of  
NOTE Confidence: 0.849264795

00:00:47.205 --> 00:00:50.355 DNA damage response and repair and  
NOTE Confidence: 0.849264795

00:00:50.355 --> 00:00:54.600 how he's been able to exploit those  
NOTE Confidence: 0.849264795

00:00:54.600 --> 00:00:57.320 defects to for therapeutic gain.  
NOTE Confidence: 0.849264795

00:00:57.320 --> 00:01:02.280 And so maybe lesser known fact I have  
NOTE Confidence: 0.849264795

00:01:02.280 --> 00:01:04.942 on good authority that Ranjit is  
NOTE Confidence: 0.849264795

00:01:04.942 --> 00:01:06.994 actually an accomplished drummer as well.  
NOTE Confidence: 0.849264795

00:01:07.000 --> 00:01:11.110 He also won the the the Bio CT  
NOTE Confidence: 0.849264795

00:01:11.110 --> 00:01:12.833 award for Entrepreneur of the the  
NOTE Confidence: 0.849264795

00:01:12.833 --> 00:01:14.398 Year a few years back.  
NOTE Confidence: 0.849264795

00:01:14.400 --> 00:01:16.280 And so without further ado,  
NOTE Confidence: 0.849264795

00:01:16.280 --> 00:01:17.560 I'd like to welcome

NOTE Confidence: 0.63401803

00:01:17.560 --> 00:01:19.280 Ranjit. Great, thank you.

NOTE Confidence: 0.933675728333333

00:01:22.760 --> 00:01:24.518 OK, great. Well, thanks so much.

NOTE Confidence: 0.933675728333333

00:01:24.520 --> 00:01:25.880 I'm really excited to be

NOTE Confidence: 0.933675728333333

00:01:25.880 --> 00:01:27.240 speaking in a live audience,

NOTE Confidence: 0.933675728333333

00:01:27.240 --> 00:01:28.640 not just a zoom meeting.

NOTE Confidence: 0.933675728333333

00:01:28.640 --> 00:01:30.440 So this is great to hear.

NOTE Confidence: 0.933675728333333

00:01:30.440 --> 00:01:31.920 My disclosures only be focusing

NOTE Confidence: 0.933675728333333

00:01:31.920 --> 00:01:33.718 on the last company that modified

NOTE Confidence: 0.933675728333333

00:01:33.718 --> 00:01:35.560 bio just at the very, very end.

NOTE Confidence: 0.933675728333333

00:01:35.560 --> 00:01:37.120 But we're going to make this

NOTE Confidence: 0.933675728333333

00:01:37.120 --> 00:01:38.400 very academic and obviously,

NOTE Confidence: 0.933675728333333

00:01:38.400 --> 00:01:41.040 so topics that we'll cover today,

NOTE Confidence: 0.933675728333333

00:01:41.040 --> 00:01:43.088 we'll start off sort of our quest to

NOTE Confidence: 0.933675728333333

00:01:43.088 --> 00:01:44.958 translate work from bench to the bedside.

NOTE Confidence: 0.933675728333333

00:01:44.960 --> 00:01:45.803 Some key concepts,

NOTE Confidence: 0.933675728333333

00:01:45.803 --> 00:01:47.489 progress and learnings for those who've  
NOTE Confidence: 0.933675728333333

00:01:47.489 --> 00:01:49.480 seen these intro slides have changed them.  
NOTE Confidence: 0.933675728333333

00:01:49.480 --> 00:01:51.800 So they're updated this year.  
NOTE Confidence: 0.933675728333333

00:01:51.800 --> 00:01:54.040 And then we'll move on to our recent  
NOTE Confidence: 0.933675728333333

00:01:54.040 --> 00:01:55.865 discovery of DNA modifiers and how  
NOTE Confidence: 0.933675728333333

00:01:55.865 --> 00:01:57.677 we're trying to exploit loss of  
NOTE Confidence: 0.933675728333333

00:01:57.743 --> 00:01:59.712 MGMT and glioma and then sort of  
NOTE Confidence: 0.933675728333333

00:01:59.712 --> 00:02:01.380 deviate a little bit further into  
NOTE Confidence: 0.933675728333333

00:02:01.444 --> 00:02:03.226 the horizon and what we're actually  
NOTE Confidence: 0.933675728333333

00:02:03.226 --> 00:02:04.876 trying to do outside of glioma.  
NOTE Confidence: 0.933675728333333

00:02:04.876 --> 00:02:06.640 And sort of in a bigger picture,  
NOTE Confidence: 0.933675728333333

00:02:06.640 --> 00:02:07.760 what directions were going on?  
NOTE Confidence: 0.933675728333333

00:02:07.760 --> 00:02:09.596 And then we'll sort of have an epilogue of,  
NOTE Confidence: 0.933675728333333

00:02:09.600 --> 00:02:11.960 you know where do we go from here.  
NOTE Confidence: 0.933675728333333

00:02:11.960 --> 00:02:13.560 So just to get started,  
NOTE Confidence: 0.933675728333333

00:02:13.560 --> 00:02:15.520 So synthetic lethality therapeutic index,

NOTE Confidence: 0.933675728333333  
00:02:15.520 --> 00:02:16.530 I think this audience doesn't  
NOTE Confidence: 0.933675728333333  
00:02:16.530 --> 00:02:17.879 need much of a background on that.  
NOTE Confidence: 0.933675728333333  
00:02:17.880 --> 00:02:20.211 You have two pathways A&B that are  
NOTE Confidence: 0.933675728333333  
00:02:20.211 --> 00:02:22.360 somewhat relevant or parallel pathways.  
NOTE Confidence: 0.933675728333333  
00:02:22.360 --> 00:02:23.746 You knock one out and the other  
NOTE Confidence: 0.933675728333333  
00:02:23.746 --> 00:02:25.078 ones out in the tumor cell,  
NOTE Confidence: 0.933675728333333  
00:02:25.080 --> 00:02:27.380 then you have a selective targeting  
NOTE Confidence: 0.933675728333333  
00:02:27.380 --> 00:02:30.040 of the tumor over the normal tissue.  
NOTE Confidence: 0.933675728333333  
00:02:30.040 --> 00:02:31.120 And I've always been fascinated.  
NOTE Confidence: 0.933675728333333  
00:02:31.120 --> 00:02:32.272 I always give credit to David  
NOTE Confidence: 0.933675728333333  
00:02:32.272 --> 00:02:33.160 Stern because he and I,  
NOTE Confidence: 0.933675728333333  
00:02:33.160 --> 00:02:34.240 when I was a graduate student,  
NOTE Confidence: 0.933675728333333  
00:02:34.240 --> 00:02:35.955 asked to ask him the question said,  
NOTE Confidence: 0.933675728333333  
00:02:35.960 --> 00:02:36.216 well,  
NOTE Confidence: 0.933675728333333  
00:02:36.216 --> 00:02:37.752 let's let's talk about the history  
NOTE Confidence: 0.933675728333333

00:02:37.752 --> 00:02:39.598 and maybe look up this old paper from  
NOTE Confidence: 0.9336757283333333

00:02:39.600 --> 00:02:41.685 1945 where the original Drosophila  
NOTE Confidence: 0.9336757283333333

00:02:41.685 --> 00:02:43.353 work were synthetically valid,  
NOTE Confidence: 0.9336757283333333

00:02:43.360 --> 00:02:45.216 meant you could never see it in a  
NOTE Confidence: 0.9336757283333333

00:02:45.216 --> 00:02:46.605 screen because you both knocking  
NOTE Confidence: 0.9336757283333333

00:02:46.605 --> 00:02:47.475 out both pathways,  
NOTE Confidence: 0.9336757283333333

00:02:47.480 --> 00:02:49.034 you wouldn't actually see it pop up.  
NOTE Confidence: 0.9336757283333333

00:02:49.040 --> 00:02:51.794 You'd have to engineer it for it to happen.  
NOTE Confidence: 0.9336757283333333

00:02:51.800 --> 00:02:54.800 And it wasn't until 1997 that Lee Hartwell,  
NOTE Confidence: 0.9336757283333333

00:02:54.800 --> 00:02:56.300 Steve Friend and colleagues  
NOTE Confidence: 0.9336757283333333

00:02:56.300 --> 00:02:58.090 published the SEMOL paper 1997,  
NOTE Confidence: 0.9336757283333333

00:02:58.090 --> 00:03:00.120 which are in the late 90s rather  
NOTE Confidence: 0.9336757283333333

00:03:00.120 --> 00:03:01.480 where they actually talked about  
NOTE Confidence: 0.9336757283333333

00:03:01.480 --> 00:03:02.840 this concept of synthetic lethality.  
NOTE Confidence: 0.9336757283333333

00:03:02.840 --> 00:03:04.215 It was fascinating because at  
NOTE Confidence: 0.9336757283333333

00:03:04.215 --> 00:03:05.959 that time they didn't really know

NOTE Confidence: 0.933675728333333  
00:03:05.959 --> 00:03:06.919 about BRACA mutations.  
NOTE Confidence: 0.933675728333333  
00:03:06.920 --> 00:03:09.034 They had not been fully discovered and  
NOTE Confidence: 0.933675728333333  
00:03:09.034 --> 00:03:11.238 they thought this could have a potential.  
NOTE Confidence: 0.933675728333333  
00:03:11.240 --> 00:03:14.070 But soon after it was in 2005 that we  
NOTE Confidence: 0.933675728333333  
00:03:14.070 --> 00:03:15.520 had the back-to-back Nature papers  
NOTE Confidence: 0.933675728333333  
00:03:15.520 --> 00:03:17.720 when I was a graduate student in the  
NOTE Confidence: 0.933675728333333  
00:03:17.720 --> 00:03:20.720 Xpath program showing that Olaparib  
NOTE Confidence: 0.933675728333333  
00:03:20.720 --> 00:03:23.720 was active against Braca mutant  
NOTE Confidence: 0.933675728333333  
00:03:23.813 --> 00:03:26.360 cancers and that really opened up a  
NOTE Confidence: 0.933675728333333  
00:03:26.360 --> 00:03:28.279 PARP inhibitor bracket synthetic without it,  
NOTE Confidence: 0.933675728333333  
00:03:28.280 --> 00:03:30.723 which became the first sort of case  
NOTE Confidence: 0.933675728333333  
00:03:30.723 --> 00:03:33.079 or poster child for this approach.  
NOTE Confidence: 0.933675728333333  
00:03:33.080 --> 00:03:34.420 I still remember this.  
NOTE Confidence: 0.933675728333333  
00:03:34.420 --> 00:03:36.880 This is back in 2005 or so when I  
NOTE Confidence: 0.933675728333333  
00:03:36.880 --> 00:03:38.560 actually got a vial of the drug.  
NOTE Confidence: 0.933675728333333

00:03:38.560 --> 00:03:39.988 I'd met one of the lead authors  
NOTE Confidence: 0.933675728333333

00:03:39.988 --> 00:03:41.637 on a plane to a Gordon conference  
NOTE Confidence: 0.933675728333333

00:03:41.637 --> 00:03:43.380 and he actually mailed it to me  
NOTE Confidence: 0.933675728333333

00:03:43.380 --> 00:03:44.831 without an MTA and actually tested  
NOTE Confidence: 0.933675728333333

00:03:44.831 --> 00:03:46.770 it in VCA Braca wall type mutants  
NOTE Confidence: 0.933675728333333

00:03:46.832 --> 00:03:48.624 in Peter Glaser's lab and you can  
NOTE Confidence: 0.933675728333333

00:03:48.624 --> 00:03:49.392 see the effects  
NOTE Confidence: 0.655826725

00:03:49.453 --> 00:03:51.360 quite striking. And now we have  
NOTE Confidence: 0.655826725

00:03:51.360 --> 00:03:52.760 4 FDA approved PARP inhibitors.  
NOTE Confidence: 0.655826725

00:03:52.760 --> 00:03:54.194 So we've been making a lot  
NOTE Confidence: 0.655826725

00:03:54.194 --> 00:03:55.520 of progress in this space.  
NOTE Confidence: 0.655826725

00:03:55.520 --> 00:03:56.600 What I think is fascinating is,  
NOTE Confidence: 0.655826725

00:03:56.600 --> 00:03:58.480 you know, monotherapy PARP inhibitors,  
NOTE Confidence: 0.655826725

00:03:58.480 --> 00:03:59.548 obviously, FDA approved,  
NOTE Confidence: 0.655826725

00:03:59.548 --> 00:04:02.040 It's a synthetic without a success story.  
NOTE Confidence: 0.655826725

00:04:02.040 --> 00:04:04.256 But we see this both in the academic

NOTE Confidence: 0.655826725

00:04:04.256 --> 00:04:06.318 realm and in the biotech VC realm.

NOTE Confidence: 0.655826725

00:04:06.320 --> 00:04:08.312 This is really only successful example

NOTE Confidence: 0.655826725

00:04:08.312 --> 00:04:10.519 that we've seen of this approach.

NOTE Confidence: 0.655826725

00:04:10.520 --> 00:04:11.840 There's a lot being tested,

NOTE Confidence: 0.655826725

00:04:11.840 --> 00:04:14.960 but we haven't seen this fully bear fruit.

NOTE Confidence: 0.655826725

00:04:14.960 --> 00:04:16.115 And so just some thoughts on this.

NOTE Confidence: 0.655826725

00:04:16.120 --> 00:04:16.870 And so why,

NOTE Confidence: 0.655826725

00:04:16.870 --> 00:04:18.816 you know why is that we come back

NOTE Confidence: 0.655826725

00:04:18.816 --> 00:04:19.976 to our therapeutic index curves

NOTE Confidence: 0.655826725

00:04:19.976 --> 00:04:21.479 that know those who know me well,

NOTE Confidence: 0.655826725

00:04:21.480 --> 00:04:22.888 we present this a lot of, you know,

NOTE Confidence: 0.655826725

00:04:22.888 --> 00:04:23.440 it's very simple.

NOTE Confidence: 0.655826725

00:04:23.440 --> 00:04:24.688 We need to separate the red

NOTE Confidence: 0.655826725

00:04:24.688 --> 00:04:25.520 and the green curves.

NOTE Confidence: 0.655826725

00:04:25.520 --> 00:04:27.501 You need a therapy that's going to

NOTE Confidence: 0.655826725

00:04:27.501 --> 00:04:29.318 selectively target tumor over normal tissue.

NOTE Confidence: 0.655826725

00:04:29.320 --> 00:04:30.657 I always go back to my other

NOTE Confidence: 0.655826725

00:04:30.657 --> 00:04:31.560 mentors like Simon Powell,

NOTE Confidence: 0.655826725

00:04:31.560 --> 00:04:33.438 Chair of Radiation Oncology and Sloan.

NOTE Confidence: 0.655826725

00:04:33.440 --> 00:04:34.904 During my residency you said you

NOTE Confidence: 0.655826725

00:04:34.904 --> 00:04:35.880 know without tumor selectivity,

NOTE Confidence: 0.655826725

00:04:35.880 --> 00:04:37.655 if you're trying to develop

NOTE Confidence: 0.655826725

00:04:37.655 --> 00:04:38.720 a radio sensitizer,

NOTE Confidence: 0.655826725

00:04:38.720 --> 00:04:40.115 you might as well just give 10 more Gray,

NOTE Confidence: 0.655826725

00:04:40.120 --> 00:04:41.632 add that to your prescription and

NOTE Confidence: 0.655826725

00:04:41.632 --> 00:04:43.229 that's always sort of resonated with

NOTE Confidence: 0.655826725

00:04:43.229 --> 00:04:45.119 me when I first started my laboratory.

NOTE Confidence: 0.655826725

00:04:45.120 --> 00:04:46.848 And so a couple of reasons I think

NOTE Confidence: 0.655826725

00:04:46.848 --> 00:04:48.265 we're we're stumbling a little bit

NOTE Confidence: 0.655826725

00:04:48.265 --> 00:04:50.155 and we still have more work to do is

NOTE Confidence: 0.655826725

00:04:50.155 --> 00:04:51.520 I think even though this is obvious,

NOTE Confidence: 0.655826725

00:04:51.520 --> 00:04:54.635 we need a molecular tumor specific biomarker,

NOTE Confidence: 0.655826725

00:04:54.640 --> 00:04:56.004 something that's homogeneously expressed

NOTE Confidence: 0.655826725

00:04:56.004 --> 00:04:58.688 in the tumor cells and not in the

NOTE Confidence: 0.655826725

00:04:58.688 --> 00:05:00.428 normal tissues and something we can

NOTE Confidence: 0.655826725

00:05:00.428 --> 00:05:02.239 readily detect and that's that's real.

NOTE Confidence: 0.655826725

00:05:02.240 --> 00:05:03.962 This is something that Mark O'Connor

NOTE Confidence: 0.655826725

00:05:03.962 --> 00:05:05.600 who discovered elaporib a good friend

NOTE Confidence: 0.655826725

00:05:05.600 --> 00:05:07.852 of mine who noticed who notes that you

NOTE Confidence: 0.655826725

00:05:07.852 --> 00:05:10.200 need to have well separated curves.

NOTE Confidence: 0.655826725

00:05:10.200 --> 00:05:12.475 You need to have on a clonogenic

NOTE Confidence: 0.655826725

00:05:12.475 --> 00:05:14.600 survival assay log skill differences

NOTE Confidence: 0.655826725

00:05:14.600 --> 00:05:17.496 to see to see this translate into a

NOTE Confidence: 0.655826725

00:05:17.496 --> 00:05:19.502 heavily appreciated population in a

NOTE Confidence: 0.655826725

00:05:19.502 --> 00:05:21.920 phase one clinic clinical trial setting

NOTE Confidence: 0.655826725

00:05:21.920 --> 00:05:23.012 2nd 1/3 which something we've been

NOTE Confidence: 0.655826725

00:05:23.012 --> 00:05:24.519 doing a lot is combination therapy.  
NOTE Confidence: 0.655826725

00:05:24.520 --> 00:05:26.900 Often monotherapy is not enough and so  
NOTE Confidence: 0.655826725

00:05:26.900 --> 00:05:29.474 you need to add another drug but you  
NOTE Confidence: 0.655826725

00:05:29.474 --> 00:05:30.853 have to be very careful because you  
NOTE Confidence: 0.655826725

00:05:30.853 --> 00:05:32.276 shift that red curve over but you're  
NOTE Confidence: 0.655826725

00:05:32.276 --> 00:05:33.674 going to drive the green curve over  
NOTE Confidence: 0.655826725

00:05:33.674 --> 00:05:35.305 and you need to make sure that you  
NOTE Confidence: 0.655826725

00:05:35.305 --> 00:05:37.135 don't equally shift them because you're  
NOTE Confidence: 0.655826725

00:05:37.135 --> 00:05:39.238 doing no better than the single agent.  
NOTE Confidence: 0.655826725

00:05:39.240 --> 00:05:40.179 And then finally,  
NOTE Confidence: 0.655826725

00:05:40.179 --> 00:05:41.118 I would also,  
NOTE Confidence: 0.655826725

00:05:41.120 --> 00:05:42.640 we don't have time to go too much into this,  
NOTE Confidence: 0.655826725

00:05:42.640 --> 00:05:44.435 but you need model systems  
NOTE Confidence: 0.655826725

00:05:44.435 --> 00:05:46.230 that will accurately model the  
NOTE Confidence: 0.655826725

00:05:46.302 --> 00:05:47.880 normal tissue toxicities.  
NOTE Confidence: 0.655826725

00:05:47.880 --> 00:05:50.015 The best example is looking at things

NOTE Confidence: 0.655826725  
00:05:50.015 --> 00:05:51.902 like PARP inhibitors combined with  
NOTE Confidence: 0.655826725  
00:05:51.902 --> 00:05:53.508 chemotherapy in that heme toxicity.  
NOTE Confidence: 0.655826725  
00:05:53.508 --> 00:05:55.709 You don't see that in a mouse  
NOTE Confidence: 0.655826725  
00:05:55.709 --> 00:05:57.936 because mice actually don't use HR,  
NOTE Confidence: 0.655826725  
00:05:57.936 --> 00:05:59.015 believe it or not,  
NOTE Confidence: 0.655826725  
00:05:59.015 --> 00:06:00.305 they use anonymous end jointing in  
NOTE Confidence: 0.655826725  
00:06:00.305 --> 00:06:01.883 their bone marrow and you have to  
NOTE Confidence: 0.655826725  
00:06:01.883 --> 00:06:02.993 actually do rat tolerability studies.  
NOTE Confidence: 0.655826725  
00:06:03.000 --> 00:06:04.372 So you actually get fooled that you  
NOTE Confidence: 0.655826725  
00:06:04.372 --> 00:06:05.962 can do a combination therapy that  
NOTE Confidence: 0.655826725  
00:06:05.962 --> 00:06:08.376 you can't actually get to the doses  
NOTE Confidence: 0.655826725  
00:06:08.376 --> 00:06:10.560 you need to in clinical trials.  
NOTE Confidence: 0.833701692  
00:06:10.560 --> 00:06:11.808 So those are just some of the the  
NOTE Confidence: 0.833701692  
00:06:11.808 --> 00:06:13.080 quick learnings. As a background,  
NOTE Confidence: 0.833701692  
00:06:13.080 --> 00:06:15.000 obviously some of our earlier work  
NOTE Confidence: 0.833701692

00:06:15.000 --> 00:06:17.497 in 2017 was focused on a very unique  
NOTE Confidence: 0.833701692

00:06:17.497 --> 00:06:18.944 discovery of synthetic lethality  
NOTE Confidence: 0.833701692

00:06:18.944 --> 00:06:20.768 of Brachanus phenotype between  
NOTE Confidence: 0.833701692

00:06:20.768 --> 00:06:22.592 onca metabolite producing tumors.  
NOTE Confidence: 0.833701692

00:06:22.600 --> 00:06:25.444 Those are tumors that have IDH one and IDH  
NOTE Confidence: 0.833701692

00:06:25.444 --> 00:06:27.837 mutations interaction with PARP inhibitors,  
NOTE Confidence: 0.833701692

00:06:27.840 --> 00:06:30.283 lot like the Bracha story for breast  
NOTE Confidence: 0.833701692

00:06:30.283 --> 00:06:32.160 and ovarian cancer in elaporim.  
NOTE Confidence: 0.833701692

00:06:32.160 --> 00:06:33.840 We published that story a while back.  
NOTE Confidence: 0.833701692

00:06:33.840 --> 00:06:35.768 We moved that on about a year later  
NOTE Confidence: 0.833701692

00:06:35.768 --> 00:06:37.319 into other ONCA metabolites in  
NOTE Confidence: 0.833701692

00:06:37.319 --> 00:06:39.335 the citric acid cycle like femuric  
NOTE Confidence: 0.833701692

00:06:39.335 --> 00:06:41.198 hydratase and succinate dehydrogenase.  
NOTE Confidence: 0.833701692

00:06:41.200 --> 00:06:42.919 And then we actually spent a lot of time,  
NOTE Confidence: 0.833701692

00:06:42.920 --> 00:06:44.796 this is work with Peter Glazer's lab,  
NOTE Confidence: 0.833701692

00:06:44.800 --> 00:06:46.060 which is great to sort of join

NOTE Confidence: 0.833701692

00:06:46.060 --> 00:06:46.600 forces with him.

NOTE Confidence: 0.833701692

00:06:46.600 --> 00:06:48.994 Again in 2020, we broke the mechanism.

NOTE Confidence: 0.833701692

00:06:49.000 --> 00:06:51.124 We were able to show exactly

NOTE Confidence: 0.833701692

00:06:51.124 --> 00:06:52.503 how that interaction occurred.

NOTE Confidence: 0.833701692

00:06:52.503 --> 00:06:55.120 And then in in the years following we,

NOTE Confidence: 0.833701692

00:06:55.120 --> 00:06:56.814 we tested a lot of interesting ideas

NOTE Confidence: 0.833701692

00:06:56.814 --> 00:06:58.257 of looking at combination therapies

NOTE Confidence: 0.833701692

00:06:58.257 --> 00:07:00.616 as I've alluded to earlier that may be

NOTE Confidence: 0.833701692

00:07:00.616 --> 00:07:02.240 the key for some of these interactions,

NOTE Confidence: 0.833701692

00:07:02.240 --> 00:07:03.575 PARP inhibitors and ATR inhibitors

NOTE Confidence: 0.833701692

00:07:03.575 --> 00:07:05.719 and then looking at a lot of different

NOTE Confidence: 0.833701692

00:07:05.720 --> 00:07:07.598 tumor types like AML for instance,

NOTE Confidence: 0.833701692

00:07:07.600 --> 00:07:10.640 which we reported on 20/22.

NOTE Confidence: 0.833701692

00:07:10.640 --> 00:07:11.822 But then we wanted to really

NOTE Confidence: 0.833701692

00:07:11.822 --> 00:07:12.920 translate this into the clinic.

NOTE Confidence: 0.833701692

00:07:12.920 --> 00:07:14.520 And before I get to our main story,  
NOTE Confidence: 0.833701692

00:07:14.520 --> 00:07:15.915 kind of want to give you an update on  
NOTE Confidence: 0.833701692

00:07:15.915 --> 00:07:17.496 where we are since we made that discovery  
NOTE Confidence: 0.833701692

00:07:17.496 --> 00:07:18.998 because we've still been working hard at it,  
NOTE Confidence: 0.833701692

00:07:19.000 --> 00:07:21.600 but it's been a long slog what  
NOTE Confidence: 0.833701692

00:07:21.600 --> 00:07:22.800 we what we thought is,  
NOTE Confidence: 0.833701692

00:07:22.800 --> 00:07:23.096 well,  
NOTE Confidence: 0.833701692

00:07:23.096 --> 00:07:24.872 there's a number of different tumor  
NOTE Confidence: 0.833701692

00:07:24.872 --> 00:07:27.047 types here that we go after with  
NOTE Confidence: 0.833701692

00:07:27.047 --> 00:07:28.275 Alka metabolite producing phenotypes  
NOTE Confidence: 0.833701692

00:07:28.275 --> 00:07:30.398 or or citric acid cycle mutations.  
NOTE Confidence: 0.833701692

00:07:30.400 --> 00:07:32.199 We spent a fair amount of time.  
NOTE Confidence: 0.833701692

00:07:32.200 --> 00:07:34.630 We wrote about 7 clinical trials  
NOTE Confidence: 0.833701692

00:07:34.630 --> 00:07:36.832 from about 2018 to about 2022.  
NOTE Confidence: 0.833701692

00:07:36.832 --> 00:07:39.791 I served as either Co I or Co  
NOTE Confidence: 0.833701692

00:07:39.791 --> 00:07:41.756 Pi or collaborator on these.

NOTE Confidence: 0.833701692

00:07:41.760 --> 00:07:43.776 And we obviously won't go into all these

NOTE Confidence: 0.833701692

00:07:43.776 --> 00:07:45.527 studies but I want to tell you that

NOTE Confidence: 0.833701692

00:07:45.527 --> 00:07:47.440 we are learning a lot from these trials.

NOTE Confidence: 0.833701692

00:07:47.440 --> 00:07:48.920 Paul Leader and colleagues,

NOTE Confidence: 0.833701692

00:07:48.920 --> 00:07:51.140 we we published an initial case

NOTE Confidence: 0.833701692

00:07:51.209 --> 00:07:53.219 series looking at IDH mutant

NOTE Confidence: 0.833701692

00:07:53.219 --> 00:07:55.229 ZINCOMAL sarcomas where we actually

NOTE Confidence: 0.833701692

00:07:55.292 --> 00:07:56.765 saw about three or four patients

NOTE Confidence: 0.833701692

00:07:56.765 --> 00:07:57.793 that were exceptional responders.

NOTE Confidence: 0.833701692

00:07:57.800 --> 00:07:59.990 We amended an existing protocol that

NOTE Confidence: 0.833701692

00:07:59.990 --> 00:08:02.700 he had to use Olaprip for BRAC and

NOTE Confidence: 0.833701692

00:08:02.700 --> 00:08:05.000 his tumors without BRAC and mutations.

NOTE Confidence: 0.833701692

00:08:05.000 --> 00:08:07.160 And as you can see here a very

NOTE Confidence: 0.833701692

00:08:07.160 --> 00:08:09.590 nice we had a a 14 month sustained

NOTE Confidence: 0.833701692

00:08:09.590 --> 00:08:11.352 near PR for this patient.

NOTE Confidence: 0.833701692

00:08:11.352 --> 00:08:13.272 And actually when this patient  
NOTE Confidence: 0.833701692

00:08:13.272 --> 00:08:15.079 progress we're able then amend,  
NOTE Confidence: 0.833701692

00:08:15.080 --> 00:08:16.280 amend another protocol to  
NOTE Confidence: 0.833701692

00:08:16.280 --> 00:08:18.080 put them on a PARP ATR,  
NOTE Confidence: 0.833701692

00:08:18.080 --> 00:08:19.100 inhibit accommodation based on some  
NOTE Confidence: 0.833701692

00:08:19.100 --> 00:08:20.560 of the work from our laboratory.  
NOTE Confidence: 0.833701692

00:08:20.560 --> 00:08:22.401 And that patient actually had a pretty  
NOTE Confidence: 0.833701692

00:08:22.401 --> 00:08:23.958 durable response for quite some time.  
NOTE Confidence: 0.833701692

00:08:23.960 --> 00:08:25.880 We published that in 2021.  
NOTE Confidence: 0.833701692

00:08:25.880 --> 00:08:28.505 We then continued to try to find  
NOTE Confidence: 0.833701692

00:08:28.505 --> 00:08:30.239 off label opportunities to chest  
NOTE Confidence: 0.833701692

00:08:30.240 --> 00:08:32.105 PARP inhibitors in these onco  
NOTE Confidence: 0.833701692

00:08:32.105 --> 00:08:33.102 metabolite producing tumors.  
NOTE Confidence: 0.833701692

00:08:33.102 --> 00:08:35.590 This is an example of an SDH deficient  
NOTE Confidence: 0.833701692

00:08:35.648 --> 00:08:37.760 gist that we saw in Pete's tumor board  
NOTE Confidence: 0.833701692

00:08:37.760 --> 00:08:39.488 and Charles Singh and Juan Vasquez

NOTE Confidence: 0.833701692

00:08:39.488 --> 00:08:40.966 and actually Forzano Prezankar should

NOTE Confidence: 0.833701692

00:08:40.966 --> 00:08:42.634 also mentions the senior author here.

NOTE Confidence: 0.790096674166667

00:08:42.640 --> 00:08:45.517 We actually had a pretty remarkable response

NOTE Confidence: 0.790096674166667

00:08:45.517 --> 00:08:47.600 looking at temozolomide combined with

NOTE Confidence: 0.790096674166667

00:08:47.600 --> 00:08:51.596 olaparib in this particular case here.

NOTE Confidence: 0.790096674166667

00:08:51.600 --> 00:08:52.797 More recently though,

NOTE Confidence: 0.790096674166667

00:08:52.797 --> 00:08:54.792 we've now really embraced this

NOTE Confidence: 0.790096674166667

00:08:54.792 --> 00:08:56.445 combination approach looking at

NOTE Confidence: 0.790096674166667

00:08:56.445 --> 00:08:58.041 alkylator combinations like TMZ

NOTE Confidence: 0.790096674166667

00:08:58.041 --> 00:08:59.637 combined with PARP inhibitors.

NOTE Confidence: 0.790096674166667

00:08:59.640 --> 00:09:01.952 And this is a trial we started a

NOTE Confidence: 0.790096674166667

00:09:01.952 --> 00:09:03.903 few years back called ABC 18 O1.

NOTE Confidence: 0.790096674166667

00:09:03.903 --> 00:09:05.641 And I just want to give you a little

NOTE Confidence: 0.790096674166667

00:09:05.641 --> 00:09:07.321 update on where we are with this as

NOTE Confidence: 0.790096674166667

00:09:07.369 --> 00:09:08.743 well because it kind of gives you a

NOTE Confidence: 0.790096674166667

00:09:08.743 --> 00:09:10.229 sense of what it's like when you try  
NOTE Confidence: 0.790096674166667

00:09:10.229 --> 00:09:11.440 to translate work from the bench,  
NOTE Confidence: 0.790096674166667

00:09:11.440 --> 00:09:12.271 the bed size.  
NOTE Confidence: 0.790096674166667

00:09:12.271 --> 00:09:13.933 So many people are involved in  
NOTE Confidence: 0.790096674166667

00:09:13.933 --> 00:09:16.254 this type of work on this trial is  
NOTE Confidence: 0.790096674166667

00:09:16.254 --> 00:09:17.828 recurrent IDH mutant gliomas adult  
NOTE Confidence: 0.790096674166667

00:09:17.828 --> 00:09:19.704 and we also have a pediatric version  
NOTE Confidence: 0.790096674166667

00:09:19.704 --> 00:09:21.856 of this with Asher marks looking at  
NOTE Confidence: 0.790096674166667

00:09:21.856 --> 00:09:23.902 the PARP trapping PARP inhibitor BGB  
NOTE Confidence: 0.790096674166667

00:09:23.902 --> 00:09:26.599 290 and using a full dose of the BGB  
NOTE Confidence: 0.790096674166667

00:09:26.599 --> 00:09:28.831 290 with a very low dose of Tamizola  
NOTE Confidence: 0.790096674166667

00:09:28.831 --> 00:09:31.226 and almost as a sensitizer to BGB 290.  
NOTE Confidence: 0.790096674166667

00:09:31.226 --> 00:09:33.477 And this is a was a phase one two  
NOTE Confidence: 0.790096674166667

00:09:33.477 --> 00:09:35.391 trial that broke out into three  
NOTE Confidence: 0.790096674166667

00:09:35.391 --> 00:09:37.706 cohorts of which should find as  
NOTE Confidence: 0.790096674166667

00:09:37.706 --> 00:09:39.856 porous patients that are alkylated

NOTE Confidence: 0.790096674166667  
00:09:39.856 --> 00:09:41.690 refractory alkylator naive patients,  
NOTE Confidence: 0.790096674166667  
00:09:41.690 --> 00:09:44.115 R&B and the exploratory GBM.  
NOTE Confidence: 0.790096674166667  
00:09:44.120 --> 00:09:47.198 All these are IDH Newton gliomas.  
NOTE Confidence: 0.790096674166667  
00:09:47.200 --> 00:09:49.848 We built a lot of exciting sort of  
NOTE Confidence: 0.790096674166667  
00:09:49.848 --> 00:09:51.719 correlates correlatives and oratory studies.  
NOTE Confidence: 0.790096674166667  
00:09:51.720 --> 00:09:52.242 For instance,  
NOTE Confidence: 0.790096674166667  
00:09:52.242 --> 00:09:54.330 we built a phase zero trial here we're  
NOTE Confidence: 0.790096674166667  
00:09:54.383 --> 00:09:56.009 able to actually biopsy patients and  
NOTE Confidence: 0.790096674166667  
00:09:56.009 --> 00:09:58.049 and look for drug levels and enhancing  
NOTE Confidence: 0.790096674166667  
00:09:58.049 --> 00:09:59.855 and non enhancing disease and also  
NOTE Confidence: 0.790096674166667  
00:09:59.855 --> 00:10:01.721 show you some some cool stuff we did  
NOTE Confidence: 0.790096674166667  
00:10:01.721 --> 00:10:03.278 looking at MRI velocity studies to  
NOTE Confidence: 0.790096674166667  
00:10:03.278 --> 00:10:04.940 track tumor growth because as some  
NOTE Confidence: 0.790096674166667  
00:10:04.940 --> 00:10:06.788 of you know these IDH mean tumors  
NOTE Confidence: 0.790096674166667  
00:10:06.788 --> 00:10:08.826 grow rather slowly in in patients and  
NOTE Confidence: 0.790096674166667

00:10:08.826 --> 00:10:10.878 can be difficult to track responses.  
NOTE Confidence: 0.790096674166667

00:10:10.880 --> 00:10:12.563 So just share a little bit of an update  
NOTE Confidence: 0.790096674166667

00:10:12.563 --> 00:10:14.040 just because of time but I want to  
NOTE Confidence: 0.790096674166667

00:10:14.040 --> 00:10:15.428 kind of give you a flavor of where  
NOTE Confidence: 0.790096674166667

00:10:15.428 --> 00:10:17.800 we are on on for this stage of the project.  
NOTE Confidence: 0.790096674166667

00:10:17.800 --> 00:10:19.896 So this is the the phase zero trial  
NOTE Confidence: 0.790096674166667

00:10:19.896 --> 00:10:21.696 we we we wrote it was really exciting  
NOTE Confidence: 0.790096674166667

00:10:21.696 --> 00:10:23.199 to sort of get this off the ground.  
NOTE Confidence: 0.790096674166667

00:10:23.200 --> 00:10:24.873 It's one of our first phase zeros  
NOTE Confidence: 0.790096674166667

00:10:24.873 --> 00:10:26.422 we've done and as you can see  
NOTE Confidence: 0.790096674166667

00:10:26.422 --> 00:10:28.099 we were able to give the drug at  
NOTE Confidence: 0.790096674166667

00:10:28.099 --> 00:10:29.559 a full dose 60 milligram BBID,  
NOTE Confidence: 0.790096674166667

00:10:29.559 --> 00:10:31.154 the PARP inhibitor without the  
NOTE Confidence: 0.790096674166667

00:10:31.154 --> 00:10:33.079 tamizole mod for seven to 10 days.  
NOTE Confidence: 0.790096674166667

00:10:33.080 --> 00:10:34.711 And then we're able to take the  
NOTE Confidence: 0.790096674166667

00:10:34.711 --> 00:10:36.226 patients to the OR and essentially

NOTE Confidence: 0.790096674166667  
00:10:36.226 --> 00:10:37.891 biopsy not not only enhancing  
NOTE Confidence: 0.790096674166667  
00:10:37.891 --> 00:10:39.549 disease but non enhancing disease  
NOTE Confidence: 0.790096674166667  
00:10:39.549 --> 00:10:41.649 to look at whether we truly had  
NOTE Confidence: 0.790096674166667  
00:10:41.649 --> 00:10:43.363 blood brain barrier penetration of  
NOTE Confidence: 0.790096674166667  
00:10:43.363 --> 00:10:45.391 our drug and then obviously blood  
NOTE Confidence: 0.790096674166667  
00:10:45.400 --> 00:10:47.372 for normalization or comparison.  
NOTE Confidence: 0.790096674166667  
00:10:47.372 --> 00:10:49.837 We developed a protocol to  
NOTE Confidence: 0.790096674166667  
00:10:49.837 --> 00:10:51.944 develop BGB to detect BGB 290.  
NOTE Confidence: 0.790096674166667  
00:10:51.944 --> 00:10:54.280 This was Jing Lee's group at Wayne State,  
NOTE Confidence: 0.790096674166667  
00:10:54.280 --> 00:10:55.860 the Carmanos Cancer Institute  
NOTE Confidence: 0.790096674166667  
00:10:55.860 --> 00:10:57.874 to to detect the BGB 290.  
NOTE Confidence: 0.790096674166667  
00:10:57.874 --> 00:10:59.393 And I'll just show you some of  
NOTE Confidence: 0.790096674166667  
00:10:59.393 --> 00:11:01.072 the report results that we just  
NOTE Confidence: 0.790096674166667  
00:11:01.072 --> 00:11:03.376 reported at Snow an updated version  
NOTE Confidence: 0.790096674166667  
00:11:03.376 --> 00:11:04.678 and published recently.  
NOTE Confidence: 0.790096674166667

00:11:04.680 --> 00:11:06.040 We can see here it was quite nice.  
NOTE Confidence: 0.790096674166667

00:11:06.040 --> 00:11:08.056 We could see that we could detect high  
NOTE Confidence: 0.790096674166667

00:11:08.056 --> 00:11:10.374 levels of total pimiprid that's BGB 290.  
NOTE Confidence: 0.790096674166667

00:11:10.374 --> 00:11:12.009 The green circles are in  
NOTE Confidence: 0.790096674166667

00:11:12.009 --> 00:11:12.990 non enhancing disease  
NOTE Confidence: 0.81359031173913

00:11:13.052 --> 00:11:15.047 and then the red is the enhancing  
NOTE Confidence: 0.81359031173913

00:11:15.047 --> 00:11:16.798 tumor and then we can detect,  
NOTE Confidence: 0.81359031173913

00:11:16.800 --> 00:11:19.410 detect substantial levels  
NOTE Confidence: 0.81359031173913

00:11:19.410 --> 00:11:21.435 of unbound drug shown here.  
NOTE Confidence: 0.81359031173913

00:11:21.440 --> 00:11:23.138 And when we calculate KPUU we  
NOTE Confidence: 0.81359031173913

00:11:23.138 --> 00:11:24.600 get these numbers shown here.  
NOTE Confidence: 0.81359031173913

00:11:24.600 --> 00:11:26.200 It's a little skewed because  
NOTE Confidence: 0.81359031173913

00:11:26.200 --> 00:11:27.396 of the plasma numbers.  
NOTE Confidence: 0.81359031173913

00:11:27.396 --> 00:11:29.520 So we sort of normalize in the far right,  
NOTE Confidence: 0.81359031173913

00:11:29.520 --> 00:11:31.396 but this is actually the first study  
NOTE Confidence: 0.81359031173913

00:11:31.396 --> 00:11:33.460 to show that both enhancing and on

NOTE Confidence: 0.81359031173913

00:11:33.460 --> 00:11:35.266 enhancing tumor we can detect the

NOTE Confidence: 0.81359031173913

00:11:35.320 --> 00:11:37.158 part where neighbor BGB 290 which

NOTE Confidence: 0.81359031173913

00:11:37.158 --> 00:11:39.020 is thought to be seen as penetrant

NOTE Confidence: 0.81359031173913

00:11:39.085 --> 00:11:40.919 but was not known as only project

NOTE Confidence: 0.81359031173913

00:11:40.920 --> 00:11:42.852 modeled in the animals to to

NOTE Confidence: 0.81359031173913

00:11:42.852 --> 00:11:44.680 penetrate the blood brain barrier.

NOTE Confidence: 0.81359031173913

00:11:44.680 --> 00:11:45.836 Another flavor of this,

NOTE Confidence: 0.81359031173913

00:11:45.836 --> 00:11:46.992 because we're still continuing

NOTE Confidence: 0.81359031173913

00:11:46.992 --> 00:11:48.480 to now look at responses,

NOTE Confidence: 0.81359031173913

00:11:48.480 --> 00:11:50.208 I can tell you today is we don't

NOTE Confidence: 0.81359031173913

00:11:50.208 --> 00:11:51.985 have you know overwhelming responses

NOTE Confidence: 0.81359031173913

00:11:51.985 --> 00:11:53.632 with this combination therapy,

NOTE Confidence: 0.81359031173913

00:11:53.632 --> 00:11:56.096 but we do have outliers that are

NOTE Confidence: 0.81359031173913

00:11:56.096 --> 00:11:57.926 actually seeming to have some response.

NOTE Confidence: 0.81359031173913

00:11:57.926 --> 00:11:59.556 And as I mentioned earlier,

NOTE Confidence: 0.81359031173913

00:11:59.560 --> 00:12:01.380 IDH main tumors are fascinating  
NOTE Confidence: 0.81359031173913

00:12:01.380 --> 00:12:03.200 because they grow incredibly slow.  
NOTE Confidence: 0.81359031173913

00:12:03.200 --> 00:12:05.524 And as if anyone knows from the  
NOTE Confidence: 0.81359031173913

00:12:05.524 --> 00:12:07.742 audios trials that recently are now  
NOTE Confidence: 0.81359031173913

00:12:07.742 --> 00:12:09.919 an NDA filed for the IDH inhibitors,  
NOTE Confidence: 0.81359031173913

00:12:09.920 --> 00:12:11.240 these tumors actually have to be  
NOTE Confidence: 0.81359031173913

00:12:11.240 --> 00:12:12.394 tracked over time because they  
NOTE Confidence: 0.81359031173913

00:12:12.394 --> 00:12:13.078 often don't shrink.  
NOTE Confidence: 0.81359031173913

00:12:13.080 --> 00:12:14.280 It's more disease stability  
NOTE Confidence: 0.81359031173913

00:12:14.280 --> 00:12:15.480 that you're looking for.  
NOTE Confidence: 0.81359031173913

00:12:15.480 --> 00:12:16.998 So we worked with Ben Ellenson  
NOTE Confidence: 0.81359031173913

00:12:16.998 --> 00:12:18.383 who's developed an MRI velocity  
NOTE Confidence: 0.81359031173913

00:12:18.383 --> 00:12:19.963 protocol working in the company  
NOTE Confidence: 0.81359031173913

00:12:19.963 --> 00:12:21.594 called Neosoma where they can  
NOTE Confidence: 0.81359031173913

00:12:21.594 --> 00:12:22.858 automatically segment the enhancing  
NOTE Confidence: 0.81359031173913

00:12:22.858 --> 00:12:24.922 and non enhancing areas of disease.

NOTE Confidence: 0.81359031173913

00:12:24.922 --> 00:12:27.332 Then volumetrically average and you

NOTE Confidence: 0.81359031173913

00:12:27.332 --> 00:12:29.680 can essentially get three prior

NOTE Confidence: 0.81359031173913

00:12:29.680 --> 00:12:31.702 Mrs and then three Mrs after

NOTE Confidence: 0.81359031173913

00:12:31.702 --> 00:12:34.047 treatment and then get a a sense

NOTE Confidence: 0.81359031173913

00:12:34.047 --> 00:12:35.597 of disease of velocity again.

NOTE Confidence: 0.81359031173913

00:12:35.600 --> 00:12:37.511 We just reported these results at Snow

NOTE Confidence: 0.81359031173913

00:12:37.511 --> 00:12:39.998 at the Neuro Oncology Conference last year.

NOTE Confidence: 0.81359031173913

00:12:40.000 --> 00:12:40.960 And what you can see here,

NOTE Confidence: 0.81359031173913

00:12:40.960 --> 00:12:42.008 looking in arm A,

NOTE Confidence: 0.81359031173913

00:12:42.008 --> 00:12:43.706 this is the calculator refractory patients.

NOTE Confidence: 0.81359031173913

00:12:43.706 --> 00:12:46.120 I know it's a little bit small here,

NOTE Confidence: 0.81359031173913

00:12:46.120 --> 00:12:47.998 but you can see three patients,

NOTE Confidence: 0.81359031173913

00:12:48.000 --> 00:12:48.480 an example.

NOTE Confidence: 0.81359031173913

00:12:48.480 --> 00:12:50.720 It's pretty clear that you had progression

NOTE Confidence: 0.81359031173913

00:12:50.720 --> 00:12:52.700 and then either disease stabilization or

NOTE Confidence: 0.81359031173913

00:12:52.700 --> 00:12:55.280 arguably some amount of disease reduction.

NOTE Confidence: 0.81359031173913

00:12:55.280 --> 00:12:57.400 And we saw this in the Arm B,

NOTE Confidence: 0.81359031173913

00:12:57.400 --> 00:12:59.758 the the arm B as well.

NOTE Confidence: 0.81359031173913

00:12:59.760 --> 00:13:00.157 Again,

NOTE Confidence: 0.81359031173913

00:13:00.157 --> 00:13:02.936 6 cases here were other disease stability

NOTE Confidence: 0.81359031173913

00:13:02.936 --> 00:13:05.960 or disease regression and also in the

NOTE Confidence: 0.81359031173913

00:13:05.960 --> 00:13:08.115 exploratory cohort of recurrent GBMS.

NOTE Confidence: 0.81359031173913

00:13:08.120 --> 00:13:10.600 Again, so this is A work in progress,

NOTE Confidence: 0.81359031173913

00:13:10.600 --> 00:13:12.200 but was real, real fun to work with.

NOTE Confidence: 0.81359031173913

00:13:12.200 --> 00:13:14.513 Ben and his group at UCLA just sort of

NOTE Confidence: 0.81359031173913

00:13:14.513 --> 00:13:16.094 track some of these tumor responses.

NOTE Confidence: 0.81359031173913

00:13:16.094 --> 00:13:18.326 So just wanted to kind of give you sort

NOTE Confidence: 0.81359031173913

00:13:18.326 --> 00:13:20.153 of a sense of where we are with that,

NOTE Confidence: 0.81359031173913

00:13:20.160 --> 00:13:20.865 with that work,

NOTE Confidence: 0.81359031173913

00:13:20.865 --> 00:13:23.359 as it's been a labor of love for us in

NOTE Confidence: 0.81359031173913

00:13:23.359 --> 00:13:25.193 terms of trying to translate that work.

NOTE Confidence: 0.81359031173913

00:13:25.200 --> 00:13:27.198 But I really want to focus on more of

NOTE Confidence: 0.81359031173913

00:13:27.198 --> 00:13:29.480 our recent discoveries in the laboratory,

NOTE Confidence: 0.81359031173913

00:13:29.480 --> 00:13:30.520 which is we've been really,

NOTE Confidence: 0.81359031173913

00:13:30.520 --> 00:13:32.716 really excited about South for this.

NOTE Confidence: 0.81359031173913

00:13:32.720 --> 00:13:34.274 We need a little bit of background.

NOTE Confidence: 0.81359031173913

00:13:34.280 --> 00:13:36.639 So I'm a GB M radiation oncologist

NOTE Confidence: 0.81359031173913

00:13:36.639 --> 00:13:37.313 by training.

NOTE Confidence: 0.81359031173913

00:13:37.320 --> 00:13:39.520 I went into CNS because there's only CNS,

NOTE Confidence: 0.81359031173913

00:13:39.520 --> 00:13:39.777 right.

NOTE Confidence: 0.81359031173913

00:13:39.777 --> 00:13:41.319 So only three trials to know

NOTE Confidence: 0.81359031173913

00:13:41.319 --> 00:13:42.759 for gliomyemics in clinic today.

NOTE Confidence: 0.81359031173913

00:13:42.760 --> 00:13:43.738 And it's very,

NOTE Confidence: 0.81359031173913

00:13:43.738 --> 00:13:44.716 it's always nice,

NOTE Confidence: 0.81359031173913

00:13:44.720 --> 00:13:46.000 not like pathology where you

NOTE Confidence: 0.81359031173913

00:13:46.000 --> 00:13:47.280 have like hundreds of papers

NOTE Confidence: 0.700767125714286

00:13:47.334 --> 00:13:48.278 you have to memorize.  
NOTE Confidence: 0.700767125714286

00:13:48.280 --> 00:13:51.019 But you can see here there's 333 key trials.  
NOTE Confidence: 0.700767125714286

00:13:51.019 --> 00:13:54.743 The main one here is the Walker trial 1978.  
NOTE Confidence: 0.700767125714286

00:13:54.743 --> 00:13:57.521 The Walker, Walker and colleagues actually  
NOTE Confidence: 0.700767125714286

00:13:57.521 --> 00:13:59.973 randomized patients to surgical resection  
NOTE Confidence: 0.700767125714286

00:13:59.973 --> 00:14:02.955 for GBM followed by adjuvant chemotherapy,  
NOTE Confidence: 0.700767125714286

00:14:02.960 --> 00:14:05.744 sorry followed by adjuvant radiation or  
NOTE Confidence: 0.700767125714286

00:14:05.744 --> 00:14:07.600 adjuvant alkylator chemotherapy BCNU,  
NOTE Confidence: 0.700767125714286

00:14:07.600 --> 00:14:09.511 the structure shown there which will be  
NOTE Confidence: 0.700767125714286

00:14:09.511 --> 00:14:11.358 important or the combination of both.  
NOTE Confidence: 0.700767125714286

00:14:11.360 --> 00:14:12.540 This trial put radiation oncology  
NOTE Confidence: 0.700767125714286

00:14:12.540 --> 00:14:14.239 in the map in the CNS space.  
NOTE Confidence: 0.700767125714286

00:14:14.240 --> 00:14:16.970 Essentially all patients now from then  
NOTE Confidence: 0.700767125714286

00:14:16.970 --> 00:14:19.858 on received post OP radiation therapy  
NOTE Confidence: 0.700767125714286

00:14:19.858 --> 00:14:22.569 for GBM and then we had about a million  
NOTE Confidence: 0.700767125714286

00:14:22.569 --> 00:14:23.855 negative trials until about 2005.

NOTE Confidence: 0.700767125714286  
00:14:23.855 --> 00:14:25.640 And then we had the pivotal trial.  
NOTE Confidence: 0.700767125714286  
00:14:25.640 --> 00:14:28.125 This was the STOOOP trial which essentially  
NOTE Confidence: 0.700767125714286  
00:14:28.125 --> 00:14:30.252 tested a different alkylator, A,  
NOTE Confidence: 0.700767125714286  
00:14:30.252 --> 00:14:32.724 a, a more selective mono functional  
NOTE Confidence: 0.700767125714286  
00:14:32.724 --> 00:14:34.437 alkylator called temazolamide and  
NOTE Confidence: 0.700767125714286  
00:14:34.437 --> 00:14:37.299 looked at whether adding it concurrent  
NOTE Confidence: 0.700767125714286  
00:14:37.299 --> 00:14:39.373 with temazolamide with radiation  
NOTE Confidence: 0.700767125714286  
00:14:39.373 --> 00:14:41.866 rather and adjuvantly Temazoma would  
NOTE Confidence: 0.700767125714286  
00:14:41.866 --> 00:14:43.438 have a survival benefit.  
NOTE Confidence: 0.700767125714286  
00:14:43.440 --> 00:14:44.995 And they're even though this  
NOTE Confidence: 0.700767125714286  
00:14:44.995 --> 00:14:46.239 doesn't look very impressive,  
NOTE Confidence: 0.700767125714286  
00:14:46.240 --> 00:14:48.440 this is actually a was a pretty pretty  
NOTE Confidence: 0.700767125714286  
00:14:48.440 --> 00:14:50.599 big result for the glioma field because  
NOTE Confidence: 0.700767125714286  
00:14:50.599 --> 00:14:52.880 we've had so many failures in the past.  
NOTE Confidence: 0.700767125714286  
00:14:52.880 --> 00:14:54.896 A follow up study based on this  
NOTE Confidence: 0.700767125714286

00:14:54.896 --> 00:14:56.880 trial though made a key distinction.  
NOTE Confidence: 0.700767125714286

00:14:56.880 --> 00:14:58.987 It was the patients that had tumors  
NOTE Confidence: 0.700767125714286

00:14:58.987 --> 00:15:00.531 with silenced methylone E methyl  
NOTE Confidence: 0.700767125714286

00:15:00.531 --> 00:15:02.277 transferase and this is ADNA repair  
NOTE Confidence: 0.700767125714286

00:15:02.277 --> 00:15:04.398 protein that we'll talk about in a moment.  
NOTE Confidence: 0.700767125714286

00:15:04.400 --> 00:15:06.880 When you're stratified by that you get  
NOTE Confidence: 0.700767125714286

00:15:06.880 --> 00:15:09.040 a huge difference in overall survival.  
NOTE Confidence: 0.700767125714286

00:15:09.040 --> 00:15:09.570 So this,  
NOTE Confidence: 0.700767125714286

00:15:09.570 --> 00:15:10.100 this real,  
NOTE Confidence: 0.700767125714286

00:15:10.100 --> 00:15:12.676 this paper from Hagee ET all that that did  
NOTE Confidence: 0.700767125714286

00:15:12.676 --> 00:15:14.839 the analysis from Roger Stoops data really  
NOTE Confidence: 0.700767125714286

00:15:14.899 --> 00:15:16.999 established that MGMT was a biomarker.  
NOTE Confidence: 0.700767125714286

00:15:17.000 --> 00:15:18.272 I would actually argue if you  
NOTE Confidence: 0.700767125714286

00:15:18.272 --> 00:15:19.120 talk about synthetically valid,  
NOTE Confidence: 0.700767125714286

00:15:19.120 --> 00:15:21.458 this is one of the first synthetic  
NOTE Confidence: 0.700767125714286

00:15:21.458 --> 00:15:23.200 lethal interactions that had clinical

NOTE Confidence: 0.700767125714286  
00:15:23.200 --> 00:15:24.310 significance where tamazolmid  
NOTE Confidence: 0.700767125714286  
00:15:24.310 --> 00:15:26.160 works in MGMT silence tumors.  
NOTE Confidence: 0.700767125714286  
00:15:26.160 --> 00:15:28.960 But we could argue that for for hours.  
NOTE Confidence: 0.700767125714286  
00:15:28.960 --> 00:15:30.490 So now delving a little bit  
NOTE Confidence: 0.700767125714286  
00:15:30.490 --> 00:15:31.800 deeper into the laboratory side.  
NOTE Confidence: 0.700767125714286  
00:15:31.800 --> 00:15:34.600 So why? Why is this the case?  
NOTE Confidence: 0.700767125714286  
00:15:34.600 --> 00:15:36.652 So I've been fascinated ever since I was a  
NOTE Confidence: 0.700767125714286  
00:15:36.652 --> 00:15:38.356 graduate student here in the early 2000s.  
NOTE Confidence: 0.700767125714286  
00:15:38.360 --> 00:15:38.809 Molecularly,  
NOTE Confidence: 0.700767125714286  
00:15:38.809 --> 00:15:41.952 what we understand is that temozolomide opens  
NOTE Confidence: 0.700767125714286  
00:15:41.952 --> 00:15:45.435 up into this methyl diazonium ion shown here,  
NOTE Confidence: 0.700767125714286  
00:15:45.440 --> 00:15:47.198 and it methylates the O six  
NOTE Confidence: 0.700767125714286  
00:15:47.198 --> 00:15:48.077 position of guanine.  
NOTE Confidence: 0.700767125714286  
00:15:48.080 --> 00:15:49.977 Now only about 5% of the damage  
NOTE Confidence: 0.700767125714286  
00:15:49.977 --> 00:15:52.238 from TMZ is actually at the O six.  
NOTE Confidence: 0.700767125714286

00:15:52.240 --> 00:15:53.440 It's actually all over the bases,  
NOTE Confidence: 0.700767125714286

00:15:53.440 --> 00:15:55.477 but this is the important one for  
NOTE Confidence: 0.700767125714286

00:15:55.477 --> 00:15:56.992 the cytotoxicity that you see  
NOTE Confidence: 0.700767125714286

00:15:56.992 --> 00:15:58.156 with MGMT SCIENCE TUMORS.  
NOTE Confidence: 0.700767125714286

00:15:58.160 --> 00:15:58.684 So first,  
NOTE Confidence: 0.700767125714286

00:15:58.684 --> 00:15:59.994 normal cells express high levels  
NOTE Confidence: 0.700767125714286

00:15:59.994 --> 00:16:01.586 of this enzyme called methyl  
NOTE Confidence: 0.700767125714286

00:16:01.586 --> 00:16:02.717 guanine methyl transferase.  
NOTE Confidence: 0.700767125714286

00:16:02.720 --> 00:16:03.952 It's a suicide enzyme.  
NOTE Confidence: 0.700767125714286

00:16:03.952 --> 00:16:07.010 It plucks that O 6 methyl off and  
NOTE Confidence: 0.700767125714286

00:16:07.010 --> 00:16:08.664 other potential lesions as well.  
NOTE Confidence: 0.700767125714286

00:16:08.664 --> 00:16:10.880 But if you don't have MGMT what  
NOTE Confidence: 0.700767125714286

00:16:10.880 --> 00:16:12.455 you get is during replication  
NOTE Confidence: 0.700767125714286

00:16:12.455 --> 00:16:14.056 with about 90% bypass efficiency,  
NOTE Confidence: 0.700767125714286

00:16:14.056 --> 00:16:15.696 the polymerase will drive across  
NOTE Confidence: 0.700767125714286

00:16:15.696 --> 00:16:17.899 that O 6 methyl guanine and it

NOTE Confidence: 0.700767125714286  
00:16:17.899 --> 00:16:19.354 will miss pair with thyme.  
NOTE Confidence: 0.700767125714286  
00:16:19.360 --> 00:16:20.308 This activates mismatch repair  
NOTE Confidence: 0.700767125714286  
00:16:20.308 --> 00:16:21.493 which basically says you've made  
NOTE Confidence: 0.700767125714286  
00:16:21.493 --> 00:16:22.639 an error to the polymerase.  
NOTE Confidence: 0.700767125714286  
00:16:22.640 --> 00:16:24.248 Polymerase does the same thing over  
NOTE Confidence: 0.700767125714286  
00:16:24.248 --> 00:16:26.222 and over again and you get this  
NOTE Confidence: 0.700767125714286  
00:16:26.222 --> 00:16:27.944 thing called futile cycling which is  
NOTE Confidence: 0.700767125714286  
00:16:27.944 --> 00:16:29.112 very fascinating because essentially  
NOTE Confidence: 0.700767125714286  
00:16:29.112 --> 00:16:31.458 the the at at one point mismatch  
NOTE Confidence: 0.700767125714286  
00:16:31.458 --> 00:16:32.958 repair essentially realizes cannot  
NOTE Confidence: 0.551995579166667  
00:16:32.960 --> 00:16:35.064 actually, you know change  
NOTE Confidence: 0.551995579166667  
00:16:35.064 --> 00:16:36.116 polymerase's errors.  
NOTE Confidence: 0.551995579166667  
00:16:36.120 --> 00:16:37.961 I'm sure it doesn't actually do it  
NOTE Confidence: 0.551995579166667  
00:16:37.961 --> 00:16:39.519 that dramatically but it stimulates  
NOTE Confidence: 0.551995579166667  
00:16:39.519 --> 00:16:41.100 apoptosis and this actually accounts  
NOTE Confidence: 0.551995579166667

00:16:41.100 --> 00:16:42.930 for the cytotoxicity even though it's

NOTE Confidence: 0.551995579166667

00:16:42.979 --> 00:16:44.596 a very small amount of the damage.

NOTE Confidence: 0.551995579166667

00:16:44.600 --> 00:16:47.197 And what we now understand is that

NOTE Confidence: 0.551995579166667

00:16:47.200 --> 00:16:49.321 over the last three or four years

NOTE Confidence: 0.551995579166667

00:16:49.321 --> 00:16:50.875 quantitatively we can say that

NOTE Confidence: 0.551995579166667

00:16:50.875 --> 00:16:52.627 large fractions of of tumors that

NOTE Confidence: 0.551995579166667

00:16:52.627 --> 00:16:54.319 respond to TMZ that have MGMT.

NOTE Confidence: 0.551995579166667

00:16:54.320 --> 00:16:55.610 Silence promoters.

NOTE Confidence: 0.551995579166667

00:16:55.610 --> 00:16:58.190 They simply just knockout

NOTE Confidence: 0.551995579166667

00:16:58.190 --> 00:16:59.712 mismatch repair again.

NOTE Confidence: 0.551995579166667

00:16:59.712 --> 00:17:01.104 We knew about this in the

NOTE Confidence: 0.551995579166667

00:17:01.104 --> 00:17:02.256 90s and the early 2000s,

NOTE Confidence: 0.551995579166667

00:17:02.256 --> 00:17:03.852 but it was really these two papers

NOTE Confidence: 0.551995579166667

00:17:03.852 --> 00:17:05.691 I'm presenting here in the last few

NOTE Confidence: 0.551995579166667

00:17:05.691 --> 00:17:07.000 years that have quantified this.

NOTE Confidence: 0.551995579166667

00:17:07.000 --> 00:17:08.548 And so just to show exactly

NOTE Confidence: 0.551995579166667  
00:17:08.548 --> 00:17:09.580 what's happening is you're  
NOTE Confidence: 0.551995579166667  
00:17:09.630 --> 00:17:11.160 simply turning off the firewall.  
NOTE Confidence: 0.551995579166667  
00:17:11.160 --> 00:17:12.714 So now you're knocking out mismatch repair.  
NOTE Confidence: 0.551995579166667  
00:17:12.720 --> 00:17:14.176 You're actually creating mismatches,  
NOTE Confidence: 0.551995579166667  
00:17:14.176 --> 00:17:16.360 all of the genome genetic instability,  
NOTE Confidence: 0.551995579166667  
00:17:16.360 --> 00:17:18.607 but there's no fire alarm to to  
NOTE Confidence: 0.551995579166667  
00:17:18.607 --> 00:17:20.560 trigger apoptosis or futile cycling.  
NOTE Confidence: 0.551995579166667  
00:17:20.560 --> 00:17:21.598 Sort of like a tree following  
NOTE Confidence: 0.551995579166667  
00:17:21.598 --> 00:17:22.840 the woods if no one's around.  
NOTE Confidence: 0.551995579166667  
00:17:22.840 --> 00:17:25.156 Does it really make a sound?  
NOTE Confidence: 0.551995579166667  
00:17:25.160 --> 00:17:27.600 So if you're sort of just checking e-mail,  
NOTE Confidence: 0.551995579166667  
00:17:27.600 --> 00:17:29.357 just the the take home message here.  
NOTE Confidence: 0.551995579166667  
00:17:29.360 --> 00:17:31.040 TMZ works well on MGMC.  
NOTE Confidence: 0.551995579166667  
00:17:31.040 --> 00:17:32.216 Silence, tumors OK,  
NOTE Confidence: 0.551995579166667  
00:17:32.216 --> 00:17:34.960 but resistance emerges and I'd say in  
NOTE Confidence: 0.551995579166667

00:17:35.036 --> 00:17:37.976 in half of all gliomas it's actually  
NOTE Confidence: 0.551995579166667

00:17:37.976 --> 00:17:40.479 clonally driven mismatch repair mutations.  
NOTE Confidence: 0.551995579166667

00:17:40.480 --> 00:17:42.316 So for us this was a sort of multi  
NOTE Confidence: 0.551995579166667

00:17:42.316 --> 00:17:44.007 forks in the road where when we saw  
NOTE Confidence: 0.551995579166667

00:17:44.007 --> 00:17:46.237 this in in the clinic this is actually  
NOTE Confidence: 0.551995579166667

00:17:46.237 --> 00:17:47.797 an example we're seeing patients,  
NOTE Confidence: 0.551995579166667

00:17:47.800 --> 00:17:49.276 we said well this is fascinating,  
NOTE Confidence: 0.551995579166667

00:17:49.280 --> 00:17:52.080 these patients still have silence  
NOTE Confidence: 0.551995579166667

00:17:52.080 --> 00:17:54.020 MGMT and they've acquired A mismatch  
NOTE Confidence: 0.551995579166667

00:17:54.020 --> 00:17:55.400 permutation TMZ is not working.  
NOTE Confidence: 0.551995579166667

00:17:55.400 --> 00:17:56.918 So how could we fix this?  
NOTE Confidence: 0.551995579166667

00:17:56.920 --> 00:17:58.927 Can we come up with a new therapy that  
NOTE Confidence: 0.551995579166667

00:17:58.927 --> 00:18:00.498 still exploited the MGMT biomarker  
NOTE Confidence: 0.551995579166667

00:18:00.498 --> 00:18:02.766 and we first thought about creating  
NOTE Confidence: 0.551995579166667

00:18:02.766 --> 00:18:05.040 alkylators that could be MMR independent.  
NOTE Confidence: 0.551995579166667

00:18:05.040 --> 00:18:06.924 So just let's just make superpotent

NOTE Confidence: 0.551995579166667  
00:18:06.924 --> 00:18:08.900 alkylators that would just crush anything  
NOTE Confidence: 0.551995579166667  
00:18:08.900 --> 00:18:11.720 that walked and well we've done that before.  
NOTE Confidence: 0.551995579166667  
00:18:11.720 --> 00:18:12.628 So the Walker trial,  
NOTE Confidence: 0.551995579166667  
00:18:12.628 --> 00:18:14.440 I showed you BCNU back in the day,  
NOTE Confidence: 0.551995579166667  
00:18:14.440 --> 00:18:15.852 non selective alkylator, Kintara,  
NOTE Confidence: 0.551995579166667  
00:18:15.852 --> 00:18:18.325 this is a drug called VALO A3  
NOTE Confidence: 0.551995579166667  
00:18:18.325 --> 00:18:20.677 reformulation of an old drug from the 70s,  
NOTE Confidence: 0.551995579166667  
00:18:20.680 --> 00:18:21.784 non selective alkylator.  
NOTE Confidence: 0.551995579166667  
00:18:21.784 --> 00:18:24.360 Again this actually just failed in the  
NOTE Confidence: 0.551995579166667  
00:18:24.422 --> 00:18:26.684 GBM agile phase three trial and a drug.  
NOTE Confidence: 0.551995579166667  
00:18:26.684 --> 00:18:28.280 We'll talk about Azelastone in a moment.  
NOTE Confidence: 0.551995579166667  
00:18:28.280 --> 00:18:30.476 These are effectively steamrolling the DNA.  
NOTE Confidence: 0.551995579166667  
00:18:30.480 --> 00:18:33.378 This is my 4 year old's steamroller  
NOTE Confidence: 0.551995579166667  
00:18:33.378 --> 00:18:35.669 to be dramatic there we also thought,  
NOTE Confidence: 0.551995579166667  
00:18:35.669 --> 00:18:35.852 OK,  
NOTE Confidence: 0.551995579166667

00:18:35.852 --> 00:18:37.205 so we're not going to do that  
NOTE Confidence: 0.551995579166667

00:18:37.205 --> 00:18:38.453 because that's going to not going  
NOTE Confidence: 0.551995579166667

00:18:38.453 --> 00:18:39.713 to have that therapeutic index  
NOTE Confidence: 0.551995579166667

00:18:39.713 --> 00:18:41.198 constraint that we really wanted.  
NOTE Confidence: 0.551995579166667

00:18:41.200 --> 00:18:42.840 So what about reactivating MMR?  
NOTE Confidence: 0.551995579166667

00:18:42.840 --> 00:18:43.840 That could be cool.  
NOTE Confidence: 0.551995579166667

00:18:43.840 --> 00:18:45.995 We actually had a a pitch competition  
NOTE Confidence: 0.551995579166667

00:18:45.995 --> 00:18:47.920 maybe Demetrius remembers the pitch  
NOTE Confidence: 0.551995579166667

00:18:47.920 --> 00:18:49.534 competitions back in several years  
NOTE Confidence: 0.551995579166667

00:18:49.534 --> 00:18:51.256 ago to to start a company around this  
NOTE Confidence: 0.551995579166667

00:18:51.256 --> 00:18:52.961 and and this got shut down because  
NOTE Confidence: 0.551995579166667

00:18:52.961 --> 00:18:54.509 there's too many mutations that you  
NOTE Confidence: 0.551995579166667

00:18:54.555 --> 00:18:56.115 can't you know custom reactivate  
NOTE Confidence: 0.551995579166667

00:18:56.115 --> 00:18:57.675 mismatch repair if there's mutations  
NOTE Confidence: 0.551995579166667

00:18:57.680 --> 00:19:00.278 all across the open reading frame.  
NOTE Confidence: 0.551995579166667

00:19:00.280 --> 00:19:02.576 But we landed on this idea of creating

NOTE Confidence: 0.551995579166667  
00:19:02.576 --> 00:19:04.200 alkylators which are MMR independent  
NOTE Confidence: 0.551995579166667  
00:19:04.200 --> 00:19:06.756 but would retain the MGMT dependence.  
NOTE Confidence: 0.551995579166667  
00:19:06.760 --> 00:19:07.925 So harkening back to this  
NOTE Confidence: 0.551995579166667  
00:19:07.925 --> 00:19:09.090 therapeutic index curves that I  
NOTE Confidence: 0.705756121538461  
00:19:09.139 --> 00:19:10.000 talked about earlier.  
NOTE Confidence: 0.705756121538461  
00:19:10.000 --> 00:19:11.764 So the red and the green curves  
NOTE Confidence: 0.705756121538461  
00:19:11.764 --> 00:19:13.456 because we know these tumors still  
NOTE Confidence: 0.705756121538461  
00:19:13.456 --> 00:19:15.514 have silenced MGMT in the cases that  
NOTE Confidence: 0.705756121538461  
00:19:15.576 --> 00:19:17.556 acquire the mismatch repair mutation.  
NOTE Confidence: 0.705756121538461  
00:19:17.560 --> 00:19:19.240 So with that we turn to Seth Herzan.  
NOTE Confidence: 0.705756121538461  
00:19:19.240 --> 00:19:21.480 We had been working together in the  
NOTE Confidence: 0.705756121538461  
00:19:21.480 --> 00:19:24.357 past and we got our band back together.  
NOTE Confidence: 0.705756121538461  
00:19:24.360 --> 00:19:25.760 Seth is actually a really good guitarist  
NOTE Confidence: 0.705756121538461  
00:19:25.760 --> 00:19:27.238 and we haven't played a show together,  
NOTE Confidence: 0.705756121538461  
00:19:27.240 --> 00:19:28.952 but I'm still playing drums trying to quit  
NOTE Confidence: 0.705756121538461

00:19:28.952 --> 00:19:30.998 my day job, which I because I'm here today.

NOTE Confidence: 0.705756121538461

00:19:31.000 --> 00:19:33.040 I haven't been able to do it yet.

NOTE Confidence: 0.705756121538461

00:19:33.040 --> 00:19:35.960 But so in 2018 came to Seth and I said,

NOTE Confidence: 0.705756121538461

00:19:35.960 --> 00:19:37.423 listen, you know, we've been working on

NOTE Confidence: 0.705756121538461

00:19:37.423 --> 00:19:39.000 some DNA repair inhibitors a while back.

NOTE Confidence: 0.705756121538461

00:19:39.000 --> 00:19:40.304 So let's let's figure out a way to

NOTE Confidence: 0.705756121538461

00:19:40.304 --> 00:19:41.637 come up with these new molecules.

NOTE Confidence: 0.705756121538461

00:19:41.640 --> 00:19:43.320 We called it Secret name with

NOTE Confidence: 0.705756121538461

00:19:43.320 --> 00:19:45.612 Crowbar into O 6, the CEO 6 project.

NOTE Confidence: 0.705756121538461

00:19:45.612 --> 00:19:46.198 You know,

NOTE Confidence: 0.705756121538461

00:19:46.200 --> 00:19:48.080 at the time I was doing the IDH parp story,

NOTE Confidence: 0.705756121538461

00:19:48.080 --> 00:19:50.248 he was working on all his crazy antibiotics

NOTE Confidence: 0.705756121538461

00:19:50.248 --> 00:19:52.759 that he makes and publishes in big journals.

NOTE Confidence: 0.705756121538461

00:19:52.760 --> 00:19:55.160 And it all centered around a simple question,

NOTE Confidence: 0.705756121538461

00:19:55.160 --> 00:19:58.877 which is, can we change the R group here?

NOTE Confidence: 0.705756121538461

00:19:58.880 --> 00:19:59.840 And again, I'm not a chemist,

NOTE Confidence: 0.705756121538461  
00:19:59.840 --> 00:20:01.028 my dad's a chemist.  
NOTE Confidence: 0.705756121538461  
00:20:01.028 --> 00:20:03.160 I did not inherit his chemistry gene.  
NOTE Confidence: 0.705756121538461  
00:20:03.160 --> 00:20:04.280 But it certainly was very  
NOTE Confidence: 0.705756121538461  
00:20:04.280 --> 00:20:05.715 interesting in the idea of, like,  
NOTE Confidence: 0.705756121538461  
00:20:05.715 --> 00:20:08.235 there's got to be something that we could  
NOTE Confidence: 0.705756121538461  
00:20:08.235 --> 00:20:10.956 put on here that could be removed by MGMT,  
NOTE Confidence: 0.705756121538461  
00:20:10.960 --> 00:20:11.351 right?  
NOTE Confidence: 0.705756121538461  
00:20:11.351 --> 00:20:11.742 But.  
NOTE Confidence: 0.705756121538461  
00:20:11.742 --> 00:20:13.306 But independent of mismatch  
NOTE Confidence: 0.705756121538461  
00:20:13.306 --> 00:20:15.440 repair status for cell killing.  
NOTE Confidence: 0.705756121538461  
00:20:15.440 --> 00:20:15.816 OK.  
NOTE Confidence: 0.705756121538461  
00:20:15.816 --> 00:20:17.920 So at that point, I'm very,  
NOTE Confidence: 0.705756121538461  
00:20:17.920 --> 00:20:19.420 very grateful to have talented  
NOTE Confidence: 0.705756121538461  
00:20:19.420 --> 00:20:20.800 trainees come in the lab.  
NOTE Confidence: 0.705756121538461  
00:20:20.800 --> 00:20:21.960 Kingston Lynn who's here today.  
NOTE Confidence: 0.705756121538461

00:20:21.960 --> 00:20:24.440 Susan Gable at Thinkston Clinic  
NOTE Confidence: 0.705756121538461

00:20:24.440 --> 00:20:25.882 in a cycle of life because Susan  
NOTE Confidence: 0.705756121538461

00:20:25.882 --> 00:20:27.358 Gable did her PhD in Peter Glazer's  
NOTE Confidence: 0.705756121538461

00:20:27.358 --> 00:20:28.840 lab and then came to my labs.  
NOTE Confidence: 0.705756121538461

00:20:28.840 --> 00:20:31.128 And so these two folks came in and  
NOTE Confidence: 0.705756121538461

00:20:31.128 --> 00:20:33.797 we had a a mission for both of them,  
NOTE Confidence: 0.705756121538461

00:20:33.800 --> 00:20:35.280 which is essentially, you know,  
NOTE Confidence: 0.705756121538461

00:20:35.280 --> 00:20:36.200 put in our group.  
NOTE Confidence: 0.705756121538461

00:20:36.200 --> 00:20:37.120 That's not a methyl,  
NOTE Confidence: 0.705756121538461

00:20:37.120 --> 00:20:38.895 that's more complex that can  
NOTE Confidence: 0.705756121538461

00:20:38.895 --> 00:20:40.315 be removed by MGMT.  
NOTE Confidence: 0.705756121538461

00:20:40.320 --> 00:20:43.158 But kill cells independent our status  
NOTE Confidence: 0.705756121538461

00:20:43.160 --> 00:20:46.037 and semi jokingly told them you know  
NOTE Confidence: 0.705756121538461

00:20:46.040 --> 00:20:47.433 let's look at this plot and sort  
NOTE Confidence: 0.705756121538461

00:20:47.433 --> 00:20:49.091 of walk them through it and said OK  
NOTE Confidence: 0.705756121538461

00:20:49.091 --> 00:20:51.065 look at the green curve you get MGMT

NOTE Confidence: 0.705756121538461  
00:20:51.065 --> 00:20:52.277 silence mismatch repair proficient.  
NOTE Confidence: 0.705756121538461  
00:20:52.280 --> 00:20:54.436 Very nice to sell killing with TMZ.  
NOTE Confidence: 0.705756121538461  
00:20:54.440 --> 00:20:55.987 OK yellow line is when you knock  
NOTE Confidence: 0.705756121538461  
00:20:55.987 --> 00:20:57.305 out mismatch repair you see the  
NOTE Confidence: 0.705756121538461  
00:20:57.305 --> 00:20:58.529 drug now looks invisible and then  
NOTE Confidence: 0.705756121538461  
00:20:58.529 --> 00:21:00.005 if you have MGMT doesn't matter  
NOTE Confidence: 0.705756121538461  
00:21:00.005 --> 00:21:01.468 because the methyl group gets \*\*\*\*\*  
NOTE Confidence: 0.705756121538461  
00:21:01.468 --> 00:21:03.292 \*\* and we sort of semi joking and  
NOTE Confidence: 0.705756121538461  
00:21:03.292 --> 00:21:04.814 said make some molecules and do  
NOTE Confidence: 0.705756121538461  
00:21:04.814 --> 00:21:06.662 not call us back until the yellow  
NOTE Confidence: 0.705756121538461  
00:21:06.662 --> 00:21:08.037 line drops below the green.  
NOTE Confidence: 0.705756121538461  
00:21:08.040 --> 00:21:10.800 Do not bring the black or the blue line down.  
NOTE Confidence: 0.705756121538461  
00:21:10.800 --> 00:21:12.820 Obviously we Kingston knows we're  
NOTE Confidence: 0.705756121538461  
00:21:12.820 --> 00:21:15.016 always available as mentors but they  
NOTE Confidence: 0.705756121538461  
00:21:15.016 --> 00:21:17.032 made about 100 molecules and one of  
NOTE Confidence: 0.705756121538461

00:21:17.032 --> 00:21:19.360 the molecules fulfilled the criteria.  
NOTE Confidence: 0.705756121538461

00:21:19.360 --> 00:21:21.222 I still remember and I'm sure Kingston  
NOTE Confidence: 0.705756121538461

00:21:21.222 --> 00:21:22.832 and Cesar remember the day that  
NOTE Confidence: 0.705756121538461

00:21:22.832 --> 00:21:24.356 they emailed us about this molecule.  
NOTE Confidence: 0.705756121538461

00:21:24.360 --> 00:21:26.508 Literally isogenic cell lines  
NOTE Confidence: 0.705756121538461

00:21:26.508 --> 00:21:28.656 selectively killing cells based  
NOTE Confidence: 0.705756121538461

00:21:28.656 --> 00:21:31.092 on MGMT status but independent  
NOTE Confidence: 0.705756121538461

00:21:31.092 --> 00:21:32.716 of mismatch repair status.  
NOTE Confidence: 0.93402193

00:21:32.720 --> 00:21:35.030 Really, really nice sort of  
NOTE Confidence: 0.93402193

00:21:35.030 --> 00:21:36.878 potential therapeutic index here.  
NOTE Confidence: 0.93402193

00:21:36.880 --> 00:21:38.400 And so just to dive into some of the data,  
NOTE Confidence: 0.93402193

00:21:38.400 --> 00:21:40.182 we spent a lot of time where we had  
NOTE Confidence: 0.93402193

00:21:40.182 --> 00:21:42.116 that phenotype and we didn't really  
NOTE Confidence: 0.93402193

00:21:42.116 --> 00:21:43.801 understand exactly what the mechanism  
NOTE Confidence: 0.93402193

00:21:43.850 --> 00:21:45.634 was and we're going to get to the  
NOTE Confidence: 0.93402193

00:21:45.634 --> 00:21:48.320 chemistry a little bit towards the end.

NOTE Confidence: 0.93402193

00:21:48.320 --> 00:21:50.416 And so Susan came in and started doing

NOTE Confidence: 0.93402193

00:21:50.416 --> 00:21:52.918 a lot of DNA repair functional assays.

NOTE Confidence: 0.93402193

00:21:52.920 --> 00:21:54.776 And what you can see here she did

NOTE Confidence: 0.93402193

00:21:54.776 --> 00:21:56.438 the neutral comment simply asking,

NOTE Confidence: 0.93402193

00:21:56.440 --> 00:21:58.090 you know, are there an increase

NOTE Confidence: 0.93402193

00:21:58.090 --> 00:22:00.200 in DNA double strand breaks in the

NOTE Confidence: 0.93402193

00:22:00.200 --> 00:22:02.120 background of the double negative cells.

NOTE Confidence: 0.93402193

00:22:02.120 --> 00:22:03.992 And so first I'll just walk you through

NOTE Confidence: 0.93402193

00:22:03.992 --> 00:22:05.637 here's TMZ and then you know it's a

NOTE Confidence: 0.93402193

00:22:05.637 --> 00:22:07.520 little bit of a good figure minus plus,

NOTE Confidence: 0.93402193

00:22:07.520 --> 00:22:09.828 that's MGMT minus miss,

NOTE Confidence: 0.93402193

00:22:09.828 --> 00:22:11.559 mismatch appear proficient,

NOTE Confidence: 0.93402193

00:22:11.560 --> 00:22:12.276 you can see that.

NOTE Confidence: 0.93402193

00:22:12.276 --> 00:22:13.589 So you get you get double strim

NOTE Confidence: 0.93402193

00:22:13.589 --> 00:22:14.954 breaks and we had published on this

NOTE Confidence: 0.93402193

00:22:14.954 --> 00:22:16.520 a few years back that made sense.  
NOTE Confidence: 0.93402193

00:22:16.520 --> 00:22:18.200 But with the KO50 molecule,  
NOTE Confidence: 0.93402193

00:22:18.200 --> 00:22:19.782 the minus plus and the minus minus  
NOTE Confidence: 0.93402193

00:22:19.782 --> 00:22:21.439 you don't really get a a huge  
NOTE Confidence: 0.93402193

00:22:21.439 --> 00:22:22.599 difference in double strim breaks.  
NOTE Confidence: 0.93402193

00:22:22.600 --> 00:22:25.054 And note that when you knockout MGMT  
NOTE Confidence: 0.93402193

00:22:25.054 --> 00:22:27.298 and mismatch repair here with TMZ  
NOTE Confidence: 0.93402193

00:22:27.298 --> 00:22:29.773 the drugs invisible in terms of the  
NOTE Confidence: 0.93402193

00:22:29.773 --> 00:22:31.705 damage and that's a futile cycling  
NOTE Confidence: 0.93402193

00:22:31.774 --> 00:22:34.159 inducing strand breaks and apoptosis.  
NOTE Confidence: 0.93402193

00:22:34.160 --> 00:22:36.015 But here clearly not double  
NOTE Confidence: 0.93402193

00:22:36.015 --> 00:22:37.514 strand break clear mechanism.  
NOTE Confidence: 0.93402193

00:22:37.514 --> 00:22:39.776 She then actually pulled the paper  
NOTE Confidence: 0.93402193

00:22:39.776 --> 00:22:41.836 from the mid 90s and this is what  
NOTE Confidence: 0.93402193

00:22:41.836 --> 00:22:43.030 I love about trainees working with  
NOTE Confidence: 0.93402193

00:22:43.074 --> 00:22:44.382 trainees has pulled this out herself

NOTE Confidence: 0.93402193

00:22:44.382 --> 00:22:48.200 in an old cross linking comet assay

NOTE Confidence: 0.93402193

00:22:48.200 --> 00:22:50.160 and this is how this assay works.

NOTE Confidence: 0.93402193

00:22:50.160 --> 00:22:52.197 So here's some of you don't know.

NOTE Confidence: 0.93402193

00:22:52.200 --> 00:22:52.878 You take nuclei,

NOTE Confidence: 0.93402193

00:22:52.878 --> 00:22:54.788 you put it in agros gel and you

NOTE Confidence: 0.93402193

00:22:54.788 --> 00:22:56.158 run it across electric field

NOTE Confidence: 0.93402193

00:22:56.160 --> 00:22:57.240 and if there's DNA breaks,

NOTE Confidence: 0.93402193

00:22:57.240 --> 00:22:59.832 they'll sort of fade behind it like a comet.

NOTE Confidence: 0.93402193

00:22:59.840 --> 00:23:01.082 And so in this assay drug

NOTE Confidence: 0.93402193

00:23:01.082 --> 00:23:02.240 induced DNA double strand breaks,

NOTE Confidence: 0.93402193

00:23:02.240 --> 00:23:04.200 single strand breaks will induce a comet.

NOTE Confidence: 0.93402193

00:23:04.200 --> 00:23:06.110 IR induced breaks will induce

NOTE Confidence: 0.93402193

00:23:06.110 --> 00:23:07.638 an even bigger comment.

NOTE Confidence: 0.93402193

00:23:07.640 --> 00:23:09.496 But if you have a drug that has

NOTE Confidence: 0.93402193

00:23:09.496 --> 00:23:11.185 a cross linking effect, OK,

NOTE Confidence: 0.93402193

00:23:11.185 --> 00:23:13.546 it and you, the way we add, you know,  
NOTE Confidence: 0.93402193

00:23:13.546 --> 00:23:15.317 we add these drugs and then treat,  
NOTE Confidence: 0.93402193

00:23:15.320 --> 00:23:16.718 it'll actually stitch the DNA up,  
NOTE Confidence: 0.93402193

00:23:16.720 --> 00:23:18.640 it'll prevent that comment from forming.  
NOTE Confidence: 0.93402193

00:23:18.640 --> 00:23:18.996 OK.  
NOTE Confidence: 0.93402193

00:23:18.996 --> 00:23:21.488 And this was used in the Fanconi  
NOTE Confidence: 0.93402193

00:23:21.488 --> 00:23:22.200 anaemia days.  
NOTE Confidence: 0.93402193

00:23:22.200 --> 00:23:22.668 So very,  
NOTE Confidence: 0.93402193

00:23:22.668 --> 00:23:23.838 very nice assay to consider.  
NOTE Confidence: 0.93402193

00:23:23.840 --> 00:23:25.464 So I'm going to walk you through  
NOTE Confidence: 0.93402193

00:23:25.464 --> 00:23:27.024 what she found because this basically  
NOTE Confidence: 0.93402193

00:23:27.024 --> 00:23:29.040 gave us our first clue on exactly  
NOTE Confidence: 0.93402193

00:23:29.100 --> 00:23:30.078 what was happening.  
NOTE Confidence: 0.93402193

00:23:30.080 --> 00:23:31.304 So let's just walk through the  
NOTE Confidence: 0.93402193

00:23:31.304 --> 00:23:32.120 0 Gray shown here.  
NOTE Confidence: 0.93402193

00:23:32.120 --> 00:23:34.920 So DMSO no, no Comet Tail Mitomycin.

NOTE Confidence: 0.93402193

00:23:34.920 --> 00:23:37.250 See, that's a cross linking agents, you know.

NOTE Confidence: 0.93402193

00:23:37.250 --> 00:23:39.075 So no, no effect there.

NOTE Confidence: 0.93402193

00:23:39.080 --> 00:23:40.620 TMZ induces single tram breaks

NOTE Confidence: 0.93402193

00:23:40.620 --> 00:23:42.160 and some double tram breaks.

NOTE Confidence: 0.93402193

00:23:42.160 --> 00:23:44.834 You can see a significant effect there.

NOTE Confidence: 0.93402193

00:23:44.840 --> 00:23:47.000 And then KL50 some damage but

NOTE Confidence: 0.93402193

00:23:47.000 --> 00:23:48.440 but not as significant.

NOTE Confidence: 0.93402193

00:23:48.440 --> 00:23:51.896 Now when you add the the radiation sort of

NOTE Confidence: 0.93402193

00:23:51.896 --> 00:23:54.236 probe for the potential crossing in activity,

NOTE Confidence: 0.93402193

00:23:54.240 --> 00:23:55.848 you can see here that when

NOTE Confidence: 0.93402193

00:23:55.848 --> 00:23:56.920 you add mitomycin C,

NOTE Confidence: 0.93402193

00:23:56.920 --> 00:23:58.294 when you go to high doses

NOTE Confidence: 0.93402193

00:23:58.294 --> 00:23:59.440 you're stitching the DNA out,

NOTE Confidence: 0.888377290909091

00:23:59.440 --> 00:24:02.080 OK. And so now you're unable to create

NOTE Confidence: 0.888377290909091

00:24:02.080 --> 00:24:04.600 that common tail and then TMZ as expected,

NOTE Confidence: 0.888377290909091

00:24:04.600 --> 00:24:07.358 no cross linking activity. But then KL50,  
NOTE Confidence: 0.888377290909091

00:24:07.360 --> 00:24:09.370 we started to notice an appreciable  
NOTE Confidence: 0.888377290909091

00:24:09.370 --> 00:24:11.519 sort of restriction of that comment.  
NOTE Confidence: 0.888377290909091

00:24:11.520 --> 00:24:12.720 The pictures are there, shown on the right.  
NOTE Confidence: 0.888377290909091

00:24:12.720 --> 00:24:15.826 So this is the first realization that this  
NOTE Confidence: 0.888377290909091

00:24:15.826 --> 00:24:18.358 is probably a cross linking mechanism,  
NOTE Confidence: 0.888377290909091

00:24:18.360 --> 00:24:21.978 but selected to the MGMT minus background.  
NOTE Confidence: 0.888377290909091

00:24:21.978 --> 00:24:25.920 She then went on and did some DDR foci assays  
NOTE Confidence: 0.888377290909091

00:24:25.920 --> 00:24:28.452 and I'll just sort of gloss over because the  
NOTE Confidence: 0.888377290909091

00:24:28.452 --> 00:24:30.358 time won't be able to go through all this.  
NOTE Confidence: 0.888377290909091

00:24:30.360 --> 00:24:32.748 But look at the red shaded box here again.  
NOTE Confidence: 0.888377290909091

00:24:32.748 --> 00:24:34.836 What was great about doing this  
NOTE Confidence: 0.888377290909091

00:24:34.836 --> 00:24:36.376 isogenically modeling each MGMT  
NOTE Confidence: 0.888377290909091

00:24:36.376 --> 00:24:38.360 versus mismatch repair status.  
NOTE Confidence: 0.888377290909091

00:24:38.360 --> 00:24:40.440 You know the red shaded box here you  
NOTE Confidence: 0.888377290909091

00:24:40.440 --> 00:24:43.040 can see basically DMSO versus TMZ.

NOTE Confidence: 0.888377290909091  
00:24:43.040 --> 00:24:44.600 Again, the drug is invisible,  
NOTE Confidence: 0.888377290909091  
00:24:44.600 --> 00:24:45.640 damage is being induced,  
NOTE Confidence: 0.888377290909091  
00:24:45.640 --> 00:24:47.360 but it's not being detected.  
NOTE Confidence: 0.888377290909091  
00:24:47.360 --> 00:24:48.480 We can see KL50,  
NOTE Confidence: 0.888377290909091  
00:24:48.480 --> 00:24:50.160 now we're getting induction DNA damage.  
NOTE Confidence: 0.888377290909091  
00:24:50.160 --> 00:24:52.274 You can follow that kinetically over time.  
NOTE Confidence: 0.888377290909091  
00:24:52.280 --> 00:24:55.640 You can see or by 96 hours TMZ versus KL50.  
NOTE Confidence: 0.888377290909091  
00:24:55.640 --> 00:24:56.840 The yellow line,  
NOTE Confidence: 0.888377290909091  
00:24:56.840 --> 00:24:58.280 that's the MGMT deficient,  
NOTE Confidence: 0.888377290909091  
00:24:58.280 --> 00:25:00.080 double negative mismatch for deficient.  
NOTE Confidence: 0.888377290909091  
00:25:00.080 --> 00:25:01.634 You can see that that in the  
NOTE Confidence: 0.888377290909091  
00:25:01.634 --> 00:25:02.680 KL50 get induction damage.  
NOTE Confidence: 0.888377290909091  
00:25:02.680 --> 00:25:05.340 And then what I think is really cool is we  
NOTE Confidence: 0.888377290909091  
00:25:05.403 --> 00:25:08.000 then segmented the nuclei by DNA content,  
NOTE Confidence: 0.888377290909091  
00:25:08.000 --> 00:25:11.160 just geometric averaging and segmentation.  
NOTE Confidence: 0.888377290909091

00:25:11.160 --> 00:25:13.208 You can see here this is done actually  
NOTE Confidence: 0.888377290909091

00:25:13.208 --> 00:25:15.520 with the CMD when you look at G1S and G2.  
NOTE Confidence: 0.888377290909091

00:25:15.520 --> 00:25:17.552 What was really cool here is you actually  
NOTE Confidence: 0.888377290909091

00:25:17.552 --> 00:25:19.718 get damage in every phase in the cell cycle.  
NOTE Confidence: 0.888377290909091

00:25:19.720 --> 00:25:21.911 So this actually suggests that the the  
NOTE Confidence: 0.888377290909091

00:25:21.911 --> 00:25:23.766 cross linking activity that we think is  
NOTE Confidence: 0.888377290909091

00:25:23.766 --> 00:25:25.679 there based on the on the comet assay  
NOTE Confidence: 0.888377290909091

00:25:25.680 --> 00:25:27.360 and then the cell cycle profile suggests  
NOTE Confidence: 0.888377290909091

00:25:27.360 --> 00:25:28.600 that doesn't require replication.  
NOTE Confidence: 0.888377290909091

00:25:28.600 --> 00:25:30.672 Even so this is not a futile cycling  
NOTE Confidence: 0.888377290909091

00:25:30.672 --> 00:25:32.438 mechanism unlike TMZ for the real DNA  
NOTE Confidence: 0.888377290909091

00:25:32.438 --> 00:25:34.013 repair efficient out this is actually  
NOTE Confidence: 0.888377290909091

00:25:34.013 --> 00:25:35.628 phosphor RPA which is interesting  
NOTE Confidence: 0.888377290909091

00:25:35.628 --> 00:25:37.799 because our patient not be loading in  
NOTE Confidence: 0.888377290909091

00:25:37.799 --> 00:25:40.321 G1 or G0 just at a conference over  
NOTE Confidence: 0.888377290909091

00:25:40.321 --> 00:25:42.685 the weekend in Cancun DNA repair

NOTE Confidence: 0.888377290909091  
00:25:42.685 --> 00:25:44.720 conference and someone had to do it  
NOTE Confidence: 0.888377290909091  
00:25:44.720 --> 00:25:46.766 and went there and actually spoke  
NOTE Confidence: 0.888377290909091  
00:25:46.766 --> 00:25:49.337 to some people about RPA can form at  
NOTE Confidence: 0.888377290909091  
00:25:49.337 --> 00:25:51.725 single strand DNA in G0G1 cells and  
NOTE Confidence: 0.888377290909091  
00:25:51.725 --> 00:25:53.800 so mechanistically really cool stuff.  
NOTE Confidence: 0.888377290909091  
00:25:53.800 --> 00:25:55.120 So now what about the chemistry.  
NOTE Confidence: 0.888377290909091  
00:25:55.120 --> 00:25:57.528 So going to gloss over a fair amount  
NOTE Confidence: 0.888377290909091  
00:25:57.528 --> 00:25:59.316 of Kingston's thesis just because of  
NOTE Confidence: 0.888377290909091  
00:25:59.316 --> 00:26:01.080 time today and I know it presented  
NOTE Confidence: 0.888377290909091  
00:26:01.136 --> 00:26:02.596 elements of the story before,  
NOTE Confidence: 0.888377290909091  
00:26:02.600 --> 00:26:05.504 but Kingston and Seth Herzan really  
NOTE Confidence: 0.888377290909091  
00:26:05.504 --> 00:26:08.596 dove in the chemistry up on sign sale  
NOTE Confidence: 0.888377290909091  
00:26:08.596 --> 00:26:10.772 with Susan sort of back stopping on  
NOTE Confidence: 0.888377290909091  
00:26:10.772 --> 00:26:12.677 the DNA repair mechanistic studies.  
NOTE Confidence: 0.888377290909091  
00:26:12.680 --> 00:26:14.510 And this is basically what they  
NOTE Confidence: 0.888377290909091

00:26:14.510 --> 00:26:16.000 figured out and they taught me to  
NOTE Confidence: 0.888377290909091

00:26:16.000 --> 00:26:17.320 say when you talk about chemistry,  
NOTE Confidence: 0.888377290909091

00:26:17.320 --> 00:26:19.798 say things like 4A4B and 4C,  
NOTE Confidence: 0.888377290909091

00:26:19.800 --> 00:26:21.495 very chemistry savvy.  
NOTE Confidence: 0.888377290909091

00:26:21.495 --> 00:26:23.755 SO<sub>4</sub>A is the molecule.  
NOTE Confidence: 0.888377290909091

00:26:23.760 --> 00:26:25.839 So Kale 50 is a fluoro ethyl  
NOTE Confidence: 0.888377290909091

00:26:25.839 --> 00:26:27.864 instead of a methyl and so Team  
NOTE Confidence: 0.888377290909091

00:26:27.864 --> 00:26:29.112 Z would have the methyl here.  
NOTE Confidence: 0.888377290909091

00:26:29.120 --> 00:26:31.535 Very simple but elegant change  
NOTE Confidence: 0.888377290909091

00:26:31.535 --> 00:26:32.984 that fundamentally changes  
NOTE Confidence: 0.888377290909091

00:26:32.984 --> 00:26:35.440 the way this molecule acts.  
NOTE Confidence: 0.888377290909091

00:26:35.440 --> 00:26:37.491 You get a ring opening which then  
NOTE Confidence: 0.888377290909091

00:26:37.491 --> 00:26:38.817 creates this fluoroethyl diazonium  
NOTE Confidence: 0.888377290909091

00:26:38.817 --> 00:26:40.757 which is this reactive intermediate.  
NOTE Confidence: 0.846847728214286

00:26:40.760 --> 00:26:42.385 This fluoroethyl diazonium then attaches  
NOTE Confidence: 0.846847728214286

00:26:42.385 --> 00:26:44.881 to the O six position of guanine and

NOTE Confidence: 0.846847728214286  
00:26:44.881 --> 00:26:46.785 what Kingston and and Seth and others  
NOTE Confidence: 0.846847728214286  
00:26:46.846 --> 00:26:48.838 have shown is that MGMT can remove it.  
NOTE Confidence: 0.846847728214286  
00:26:48.840 --> 00:26:51.129 So the old name for MGMT is  
NOTE Confidence: 0.846847728214286  
00:26:51.129 --> 00:26:52.440 alkyl guanine transfer AGT.  
NOTE Confidence: 0.846847728214286  
00:26:52.440 --> 00:26:54.360 So it's not just a methyl  
NOTE Confidence: 0.846847728214286  
00:26:54.360 --> 00:26:55.320 guanine methyl transferase,  
NOTE Confidence: 0.846847728214286  
00:26:55.320 --> 00:26:57.880 even though we think of it just as  
NOTE Confidence: 0.846847728214286  
00:26:57.880 --> 00:27:00.280 MGMTMGMT can remove this pretty readily.  
NOTE Confidence: 0.846847728214286  
00:27:00.280 --> 00:27:01.780 But what what's fascinating is  
NOTE Confidence: 0.846847728214286  
00:27:01.780 --> 00:27:03.280 Kingston pulled out some belief  
NOTE Confidence: 0.846847728214286  
00:27:03.332 --> 00:27:04.640 papers from the 80s or 90s.  
NOTE Confidence: 0.846847728214286  
00:27:04.640 --> 00:27:06.495 If I remember where he found some  
NOTE Confidence: 0.846847728214286  
00:27:06.495 --> 00:27:08.078 oligo studies where they looked at  
NOTE Confidence: 0.846847728214286  
00:27:08.078 --> 00:27:09.793 fluoro ethyl addicts of the O 6:00  
NOTE Confidence: 0.846847728214286  
00:27:09.846 --> 00:27:11.421 and had some literature precedents  
NOTE Confidence: 0.846847728214286

00:27:11.421 --> 00:27:12.996 that it was actually forming  
NOTE Confidence: 0.846847728214286

00:27:13.000 --> 00:27:14.384 an ethanol guanine intermediate  
NOTE Confidence: 0.846847728214286

00:27:14.384 --> 00:27:16.114 which would be highly unstable,  
NOTE Confidence: 0.846847728214286

00:27:16.120 --> 00:27:17.628 could possibly cross link.  
NOTE Confidence: 0.846847728214286

00:27:17.628 --> 00:27:18.759 And that's exactly,  
NOTE Confidence: 0.846847728214286

00:27:18.760 --> 00:27:20.223 you know you know blowing past a  
NOTE Confidence: 0.846847728214286

00:27:20.223 --> 00:27:22.380 lot of the work that that he and the  
NOTE Confidence: 0.846847728214286

00:27:22.380 --> 00:27:23.959 Horizon Laboratory did to prove this,  
NOTE Confidence: 0.846847728214286

00:27:23.960 --> 00:27:25.796 but essentially show with a very  
NOTE Confidence: 0.846847728214286

00:27:25.796 --> 00:27:27.989 slow T 1/2 this actually forms  
NOTE Confidence: 0.846847728214286

00:27:27.989 --> 00:27:29.258 ethanoguanine intermediate molecule  
NOTE Confidence: 0.846847728214286

00:27:29.258 --> 00:27:32.181 6 and then cross links with this  
NOTE Confidence: 0.846847728214286

00:27:32.181 --> 00:27:34.168 adjacent cytosine as you can imagine.  
NOTE Confidence: 0.846847728214286

00:27:34.168 --> 00:27:35.678 Now this is MGMT dependence.  
NOTE Confidence: 0.846847728214286

00:27:35.680 --> 00:27:37.367 So if you don't have MGMT you  
NOTE Confidence: 0.846847728214286

00:27:37.367 --> 00:27:38.440 you have the slow,

NOTE Confidence: 0.846847728214286  
00:27:38.440 --> 00:27:42.745 slow reactive process but not  
NOTE Confidence: 0.846847728214286  
00:27:42.745 --> 00:27:45.120 dependent on mismatch repair activity.  
NOTE Confidence: 0.846847728214286  
00:27:45.120 --> 00:27:48.277 So very, very nice mechanistic studies there.  
NOTE Confidence: 0.846847728214286  
00:27:48.280 --> 00:27:49.435 But now I sort of want to,  
NOTE Confidence: 0.846847728214286  
00:27:49.440 --> 00:27:50.042 you know,  
NOTE Confidence: 0.846847728214286  
00:27:50.042 --> 00:27:52.149 step back to the clinical data because  
NOTE Confidence: 0.846847728214286  
00:27:52.149 --> 00:27:54.184 this is something that had always  
NOTE Confidence: 0.846847728214286  
00:27:54.184 --> 00:27:56.460 vexed me even during residency and as  
NOTE Confidence: 0.846847728214286  
00:27:56.460 --> 00:27:58.518 an attending is as I showed you earlier,  
NOTE Confidence: 0.846847728214286  
00:27:58.520 --> 00:28:00.424 if you look at the Walker trial in 1978,  
NOTE Confidence: 0.846847728214286  
00:28:00.424 --> 00:28:01.320 well they, you know,  
NOTE Confidence: 0.846847728214286  
00:28:01.320 --> 00:28:04.274 they did an alculator, they used BCNU.  
NOTE Confidence: 0.846847728214286  
00:28:04.280 --> 00:28:05.918 And so why didn't a cross  
NOTE Confidence: 0.846847728214286  
00:28:05.918 --> 00:28:07.320 linking Alculator work back then?  
NOTE Confidence: 0.846847728214286  
00:28:07.320 --> 00:28:08.400 You know, could it be,  
NOTE Confidence: 0.846847728214286

00:28:08.400 --> 00:28:09.516 you know, you know what what,  
NOTE Confidence: 0.846847728214286

00:28:09.520 --> 00:28:11.400 what are the factors that the trial was  
NOTE Confidence: 0.846847728214286

00:28:11.400 --> 00:28:12.756 negative because the Stoop trial in  
NOTE Confidence: 0.846847728214286

00:28:12.756 --> 00:28:14.480 the far right was positive with Alculator.  
NOTE Confidence: 0.846847728214286

00:28:14.480 --> 00:28:16.720 But I told you it's a mono functional  
NOTE Confidence: 0.846847728214286

00:28:16.720 --> 00:28:19.000 alculator that doesn't cross link.  
NOTE Confidence: 0.846847728214286

00:28:19.000 --> 00:28:20.620 And we actually spent a lot of time I  
NOTE Confidence: 0.846847728214286

00:28:20.620 --> 00:28:22.237 think my first five years in attending,  
NOTE Confidence: 0.846847728214286

00:28:22.240 --> 00:28:24.200 I was delving the literature.  
NOTE Confidence: 0.846847728214286

00:28:24.200 --> 00:28:25.845 I was obsessed with the idea that  
NOTE Confidence: 0.846847728214286

00:28:25.845 --> 00:28:27.601 Oh well it's because BCNU is given  
NOTE Confidence: 0.846847728214286

00:28:27.601 --> 00:28:29.564 every six weeks and so it's not  
NOTE Confidence: 0.846847728214286

00:28:29.564 --> 00:28:31.196 given during fractionated radiation.  
NOTE Confidence: 0.846847728214286

00:28:31.200 --> 00:28:33.375 So they missed the opportunity  
NOTE Confidence: 0.846847728214286

00:28:33.375 --> 00:28:34.680 for radio sensitization.  
NOTE Confidence: 0.846847728214286

00:28:34.680 --> 00:28:36.075 We spend a lot of grant money on that,

NOTE Confidence: 0.846847728214286  
00:28:36.080 --> 00:28:37.184 not true,  
NOTE Confidence: 0.846847728214286  
00:28:37.184 --> 00:28:39.097 doesn't really matter and  
NOTE Confidence: 0.846847728214286  
00:28:39.097 --> 00:28:40.639 so we'll we'll go into that.  
NOTE Confidence: 0.846847728214286  
00:28:40.640 --> 00:28:42.103 But if you actually look at the  
NOTE Confidence: 0.846847728214286  
00:28:42.103 --> 00:28:43.549 chemistry and I really you know  
NOTE Confidence: 0.846847728214286  
00:28:43.549 --> 00:28:45.097 thank the trainees for teaching Seth  
NOTE Confidence: 0.846847728214286  
00:28:45.097 --> 00:28:46.599 Roson for teaching me this stuff.  
NOTE Confidence: 0.846847728214286  
00:28:46.600 --> 00:28:48.462 But if you look at the these  
NOTE Confidence: 0.846847728214286  
00:28:48.462 --> 00:28:50.584 reactive chlorine, these are very,  
NOTE Confidence: 0.846847728214286  
00:28:50.584 --> 00:28:53.224 very efficient non selective cross  
NOTE Confidence: 0.846847728214286  
00:28:53.224 --> 00:28:55.517 linking sort of payloads as we'll call them.  
NOTE Confidence: 0.846847728214286  
00:28:55.520 --> 00:28:57.200 Compare that with this methyl here,  
NOTE Confidence: 0.846847728214286  
00:28:57.200 --> 00:28:59.500 which is essentially non cross  
NOTE Confidence: 0.846847728214286  
00:28:59.500 --> 00:29:00.954 linking MGMT dependent.  
NOTE Confidence: 0.846847728214286  
00:29:00.954 --> 00:29:03.439 Futile cycling is the mechanism.  
NOTE Confidence: 0.846847728214286

00:29:03.440 --> 00:29:05.240 And actually as I we started to dive  
NOTE Confidence: 0.846847728214286

00:29:05.240 --> 00:29:06.641 into this literature around the  
NOTE Confidence: 0.846847728214286

00:29:06.641 --> 00:29:08.435 time that we started this project  
NOTE Confidence: 0.846847728214286

00:29:08.440 --> 00:29:09.640 started going deeper  
NOTE Confidence: 0.86257736

00:29:10.400 --> 00:29:11.720 and it turns out between  
NOTE Confidence: 0.69353630375

00:29:11.720 --> 00:29:13.911 and actually became friends with Rose Stoop  
NOTE Confidence: 0.69353630375

00:29:13.911 --> 00:29:16.398 who's now a mentor and A and a friend.  
NOTE Confidence: 0.69353630375

00:29:16.400 --> 00:29:17.945 And actually he talked to  
NOTE Confidence: 0.69353630375

00:29:17.945 --> 00:29:19.880 to Roger about this as well.  
NOTE Confidence: 0.69353630375

00:29:19.880 --> 00:29:21.784 There was a in between around the time  
NOTE Confidence: 0.69353630375

00:29:21.784 --> 00:29:24.294 of BC and U and before the Stoop trial  
NOTE Confidence: 0.69353630375

00:29:24.294 --> 00:29:25.899 there were actually other tamizolamide  
NOTE Confidence: 0.69353630375

00:29:25.899 --> 00:29:28.011 precursors that were tested in the  
NOTE Confidence: 0.69353630375

00:29:28.011 --> 00:29:30.202 clinic that kind of give a little bit  
NOTE Confidence: 0.69353630375

00:29:30.202 --> 00:29:32.200 of sense of what likely happened.  
NOTE Confidence: 0.69353630375

00:29:32.200 --> 00:29:34.513 So DTICI think many of you may know is

NOTE Confidence: 0.69353630375

00:29:34.513 --> 00:29:36.918 the carbazine we use this in Melanoma,

NOTE Confidence: 0.69353630375

00:29:36.920 --> 00:29:39.244 but there's actually a drug called azolastone

NOTE Confidence: 0.69353630375

00:29:39.244 --> 00:29:40.984 that was developed before tamizolamide.

NOTE Confidence: 0.69353630375

00:29:40.984 --> 00:29:43.960 And I'll just have you note there the,

NOTE Confidence: 0.69353630375

00:29:43.960 --> 00:29:44.700 the chlorine,

NOTE Confidence: 0.69353630375

00:29:44.700 --> 00:29:46.550 the similarity here very reactive

NOTE Confidence: 0.69353630375

00:29:46.550 --> 00:29:48.666 drug and this was actually brought

NOTE Confidence: 0.69353630375

00:29:48.666 --> 00:29:50.871 into the into phase one and two

NOTE Confidence: 0.69353630375

00:29:50.937 --> 00:29:52.513 clinical trials before temozoline

NOTE Confidence: 0.69353630375

00:29:52.513 --> 00:29:54.877 made its debut into the clinic.

NOTE Confidence: 0.69353630375

00:29:54.880 --> 00:29:56.077 And actually just to sort of get,

NOTE Confidence: 0.69353630375

00:29:56.080 --> 00:29:57.158 you know, going to the rabbit hole,

NOTE Confidence: 0.69353630375

00:29:57.160 --> 00:30:00.600 please not TMI or too much information here,

NOTE Confidence: 0.69353630375

00:30:00.600 --> 00:30:02.769 but this drug was made by actually a post

NOTE Confidence: 0.69353630375

00:30:02.769 --> 00:30:05.157 grad named Robert Stone and Aston University,

NOTE Confidence: 0.69353630375

00:30:05.160 --> 00:30:07.836 Aston University and in the UK,  
NOTE Confidence: 0.69353630375

00:30:07.840 --> 00:30:08.928 hence the name Azelastone.  
NOTE Confidence: 0.69353630375

00:30:08.928 --> 00:30:11.033 And it has this sort of chlorine  
NOTE Confidence: 0.69353630375

00:30:11.033 --> 00:30:13.078 reactivity that I mentioned earlier.  
NOTE Confidence: 0.69353630375

00:30:13.080 --> 00:30:14.340 And again, very interesting  
NOTE Confidence: 0.69353630375

00:30:14.340 --> 00:30:15.915 because the molecule at Kingston,  
NOTE Confidence: 0.69353630375

00:30:15.920 --> 00:30:17.915 it actually looks quite similar to this,  
NOTE Confidence: 0.69353630375

00:30:17.920 --> 00:30:18.150 right,  
NOTE Confidence: 0.69353630375

00:30:18.150 --> 00:30:19.760 But it only only differs by flooring.  
NOTE Confidence: 0.69353630375

00:30:19.760 --> 00:30:20.976 The chemist will say,  
NOTE Confidence: 0.69353630375

00:30:20.976 --> 00:30:22.800 well this is important because flooring  
NOTE Confidence: 0.69353630375

00:30:22.852 --> 00:30:25.120 is actually a very poor leaving group  
NOTE Confidence: 0.69353630375

00:30:25.120 --> 00:30:27.846 and some of us remember that from  
NOTE Confidence: 0.69353630375

00:30:27.846 --> 00:30:29.802 college level chemistry and when  
NOTE Confidence: 0.69353630375

00:30:29.802 --> 00:30:31.488 Robert Stone made this molecule they  
NOTE Confidence: 0.69353630375

00:30:31.488 --> 00:30:32.840 actually tested this in animals.

NOTE Confidence: 0.69353630375

00:30:32.840 --> 00:30:35.180 They actually flatlined a number

NOTE Confidence: 0.69353630375

00:30:35.180 --> 00:30:36.716 of different tumor models.

NOTE Confidence: 0.69353630375

00:30:36.716 --> 00:30:38.504 And actually this book that that

NOTE Confidence: 0.69353630375

00:30:38.504 --> 00:30:40.120 Kings and I read about this,

NOTE Confidence: 0.69353630375

00:30:40.120 --> 00:30:41.974 they actually made a poster called

NOTE Confidence: 0.69353630375

00:30:41.974 --> 00:30:43.808 Azolastone the movie because they were

NOTE Confidence: 0.69353630375

00:30:43.808 --> 00:30:45.712 going to cure cancer with this molecule.

NOTE Confidence: 0.69353630375

00:30:45.720 --> 00:30:48.100 This was going to be the alkylator

NOTE Confidence: 0.69353630375

00:30:48.100 --> 00:30:49.120 of all alkylators.

NOTE Confidence: 0.69353630375

00:30:49.120 --> 00:30:50.608 But alas it went into multiple

NOTE Confidence: 0.69353630375

00:30:50.608 --> 00:30:51.352 phase one trials.

NOTE Confidence: 0.69353630375

00:30:51.360 --> 00:30:52.932 The drug was also called Monozola

NOTE Confidence: 0.69353630375

00:30:52.932 --> 00:30:54.740 line and actually failed in the mid

NOTE Confidence: 0.69353630375

00:30:54.740 --> 00:30:56.156 80s because of dose living toxicity.

NOTE Confidence: 0.69353630375

00:30:56.160 --> 00:30:57.952 They tried multiple scheduling

NOTE Confidence: 0.69353630375

00:30:57.952 --> 00:30:59.635 regimens and and and then soon  
NOTE Confidence: 0.69353630375

00:30:59.635 --> 00:31:01.240 after Roger Stoop came on board,  
NOTE Confidence: 0.69353630375

00:31:01.240 --> 00:31:02.842 picked up TMZ and then ran  
NOTE Confidence: 0.69353630375

00:31:02.842 --> 00:31:04.320 that into the stoop trial.  
NOTE Confidence: 0.69353630375

00:31:04.320 --> 00:31:06.016 And so it's fascinating for me when we  
NOTE Confidence: 0.69353630375

00:31:06.016 --> 00:31:07.501 think about this and this competitors  
NOTE Confidence: 0.69353630375

00:31:07.501 --> 00:31:09.235 made this this really funny poster to  
NOTE Confidence: 0.69353630375

00:31:09.235 --> 00:31:10.976 make fun of them for failing I guess  
NOTE Confidence: 0.69353630375

00:31:10.976 --> 00:31:13.598 back in the day it was a lot more fun  
NOTE Confidence: 0.69353630375

00:31:13.600 --> 00:31:15.119 And if you think about it clinically,  
NOTE Confidence: 0.69353630375

00:31:15.120 --> 00:31:17.213 so in the clinic we use lomastine  
NOTE Confidence: 0.69353630375

00:31:17.213 --> 00:31:19.219 to salvage patients when they failed  
NOTE Confidence: 0.69353630375

00:31:19.219 --> 00:31:21.405 team azolamide or if they just you  
NOTE Confidence: 0.69353630375

00:31:21.405 --> 00:31:22.811 know recurrent glioma patients and  
NOTE Confidence: 0.69353630375

00:31:22.811 --> 00:31:24.499 again not a chemist but the red shaded  
NOTE Confidence: 0.69353630375

00:31:24.499 --> 00:31:25.999 box will show you the chlorine.

NOTE Confidence: 0.69353630375  
00:31:26.000 --> 00:31:28.640 Again similar warhead here,  
NOTE Confidence: 0.69353630375  
00:31:28.640 --> 00:31:30.878 highly reactive and interestingly even  
NOTE Confidence: 0.69353630375  
00:31:30.878 --> 00:31:32.714 though we salvage patients with Lumosity,  
NOTE Confidence: 0.69353630375  
00:31:32.720 --> 00:31:34.120 it really has no survival  
NOTE Confidence: 0.69353630375  
00:31:34.120 --> 00:31:35.240 benefit in recurrent glioma.  
NOTE Confidence: 0.69353630375  
00:31:35.240 --> 00:31:36.580 This is something that we  
NOTE Confidence: 0.69353630375  
00:31:36.580 --> 00:31:37.920 struggled with for a while.  
NOTE Confidence: 0.69353630375  
00:31:37.920 --> 00:31:39.816 And so I would argue that or we  
NOTE Confidence: 0.69353630375  
00:31:39.816 --> 00:31:41.595 would argue rather that this is  
NOTE Confidence: 0.69353630375  
00:31:41.595 --> 00:31:43.155 again a therapeutic index play.  
NOTE Confidence: 0.763178658  
00:31:43.160 --> 00:31:46.280 The slow cross linking activity of  
NOTE Confidence: 0.763178658  
00:31:46.280 --> 00:31:48.926 KL50 with the MGMT dependency sort  
NOTE Confidence: 0.763178658  
00:31:48.926 --> 00:31:50.894 of possibly makes it the the best of  
NOTE Confidence: 0.763178658  
00:31:50.894 --> 00:31:53.016 both worlds in terms of having more  
NOTE Confidence: 0.763178658  
00:31:53.016 --> 00:31:55.156 DNA damage that's MMR independence.  
NOTE Confidence: 0.763178658

00:31:55.160 --> 00:31:58.030 It doesn't fall prey to a mismatch  
NOTE Confidence: 0.763178658

00:31:58.030 --> 00:32:00.276 permutation which I think is the key.  
NOTE Confidence: 0.763178658

00:32:00.280 --> 00:32:01.837 So to get at this we looked at this,  
NOTE Confidence: 0.763178658

00:32:01.840 --> 00:32:03.424 we went back from serve clinical  
NOTE Confidence: 0.763178658

00:32:03.424 --> 00:32:05.277 observations and went back to the Herzon  
NOTE Confidence: 0.763178658

00:32:05.277 --> 00:32:06.527 laboratory and also our laboratory  
NOTE Confidence: 0.763178658

00:32:06.527 --> 00:32:08.200 to look at this little more deep  
NOTE Confidence: 0.763178658

00:32:08.200 --> 00:32:10.778 because again this is all just sort of  
NOTE Confidence: 0.763178658

00:32:10.778 --> 00:32:12.906 hearsay without some preclinical data.  
NOTE Confidence: 0.763178658

00:32:12.906 --> 00:32:15.237 And so Eric Kuzman and and Kingston  
NOTE Confidence: 0.763178658

00:32:15.237 --> 00:32:17.206 and folks in Herzon lab actually  
NOTE Confidence: 0.763178658

00:32:17.206 --> 00:32:19.080 then measured the rate of ICO.  
NOTE Confidence: 0.763178658

00:32:19.080 --> 00:32:21.800 Interesting cross link formation  
NOTE Confidence: 0.763178658

00:32:21.800 --> 00:32:23.348 using a very nice elegant technique  
NOTE Confidence: 0.763178658

00:32:23.348 --> 00:32:25.405 which I I won't go into because I  
NOTE Confidence: 0.763178658

00:32:25.405 --> 00:32:27.117 couldn't do justice to us this was

NOTE Confidence: 0.763178658

00:32:27.117 --> 00:32:28.838 just is it hopefully about to be

NOTE Confidence: 0.763178658

00:32:28.838 --> 00:32:30.320 published and deposited in chem RVX.

NOTE Confidence: 0.763178658

00:32:30.320 --> 00:32:31.928 We can see here looking at the floor

NOTE Confidence: 0.763178658

00:32:31.928 --> 00:32:33.437 out the with this cross linking

NOTE Confidence: 0.763178658

00:32:33.440 --> 00:32:35.484 assay in vitro you can see indeed

NOTE Confidence: 0.763178658

00:32:35.484 --> 00:32:37.439 very slow cross linking activity.

NOTE Confidence: 0.763178658

00:32:37.440 --> 00:32:40.080 OK, so if you have MGMT,

NOTE Confidence: 0.763178658

00:32:40.080 --> 00:32:42.600 arguably if a normal solo has MGMT,

NOTE Confidence: 0.763178658

00:32:42.600 --> 00:32:45.040 there will be time for it to pluck that off.

NOTE Confidence: 0.763178658

00:32:45.040 --> 00:32:47.720 By contrast, if you look at the chloroethyl,

NOTE Confidence: 0.763178658

00:32:47.720 --> 00:32:50.424 that's the mitozole, my version, or the CCNU.

NOTE Confidence: 0.763178658

00:32:50.424 --> 00:32:53.346 Arguably you can see very rapid cross

NOTE Confidence: 0.763178658

00:32:53.346 --> 00:32:56.192 linking activities T 1/2 of 6.3 hours.

NOTE Confidence: 0.763178658

00:32:56.192 --> 00:32:58.240 So this likely is consistent with the idea

NOTE Confidence: 0.763178658

00:32:58.295 --> 00:33:00.276 that if you're cross linking too quickly,

NOTE Confidence: 0.763178658

00:33:00.280 --> 00:33:01.440 you're not going to have.  
NOTE Confidence: 0.763178658

00:33:01.440 --> 00:33:02.958 Even if MGMT can get to  
NOTE Confidence: 0.763178658

00:33:02.958 --> 00:33:04.200 that lesion and remove it,  
NOTE Confidence: 0.763178658

00:33:04.200 --> 00:33:05.929 it's unlikely to have as much of  
NOTE Confidence: 0.763178658

00:33:05.929 --> 00:33:07.225 A therapeutic index as something  
NOTE Confidence: 0.763178658

00:33:07.225 --> 00:33:08.996 like a fluoroethyl that has a very,  
NOTE Confidence: 0.763178658

00:33:09.000 --> 00:33:10.600 very slow T 1/2.  
NOTE Confidence: 0.763178658

00:33:10.600 --> 00:33:11.400 And again,  
NOTE Confidence: 0.763178658

00:33:11.400 --> 00:33:13.185 I'll I'll note that this is really  
NOTE Confidence: 0.763178658

00:33:13.185 --> 00:33:14.560 the 1st for this KL50.  
NOTE Confidence: 0.763178658

00:33:14.560 --> 00:33:16.832 It's the first time this molecule has really  
NOTE Confidence: 0.763178658

00:33:16.832 --> 00:33:20.160 ever been described by Kingston and Susan.  
NOTE Confidence: 0.763178658

00:33:20.160 --> 00:33:21.899 So then we brought that chemistry  
NOTE Confidence: 0.763178658

00:33:21.899 --> 00:33:23.693 observation back to our laboratory and  
NOTE Confidence: 0.763178658

00:33:23.693 --> 00:33:25.715 we just like to do the thing we do,  
NOTE Confidence: 0.763178658

00:33:25.720 --> 00:33:27.142 which is cloning survival assays over

NOTE Confidence: 0.763178658

00:33:27.142 --> 00:33:28.998 and over again in Isagenix cell lines.

NOTE Confidence: 0.763178658

00:33:29.000 --> 00:33:30.280 Some people hate us when we do this,

NOTE Confidence: 0.763178658

00:33:30.280 --> 00:33:32.480 but we think it's important.

NOTE Confidence: 0.763178658

00:33:32.480 --> 00:33:33.180 So look at TMZ.

NOTE Confidence: 0.763178658

00:33:33.180 --> 00:33:34.480 I've walked you through that date again.

NOTE Confidence: 0.763178658

00:33:34.480 --> 00:33:36.328 The methyl group futile cycling, right?

NOTE Confidence: 0.763178658

00:33:36.328 --> 00:33:38.168 The green line becomes invisible

NOTE Confidence: 0.763178658

00:33:38.168 --> 00:33:39.640 with the yellow line.

NOTE Confidence: 0.763178658

00:33:39.640 --> 00:33:40.918 Then look at kale 50 again,

NOTE Confidence: 0.763178658

00:33:40.920 --> 00:33:42.360 very nice therapeutic index here.

NOTE Confidence: 0.763178658

00:33:42.360 --> 00:33:43.920 You're going to very high doses,

NOTE Confidence: 0.763178658

00:33:43.920 --> 00:33:46.678 200 micromolar kale 50 and you're not

NOTE Confidence: 0.763178658

00:33:46.678 --> 00:33:48.999 killing anything that has MGMT intact.

NOTE Confidence: 0.763178658

00:33:49.000 --> 00:33:51.450 Now let's compare CC and U and

NOTE Confidence: 0.763178658

00:33:51.450 --> 00:33:53.184 mitozolamide and indeed you can

NOTE Confidence: 0.763178658

00:33:53.184 --> 00:33:55.548 look at azolastone and you you do  
NOTE Confidence: 0.763178658

00:33:55.548 --> 00:33:57.624 get MMR independent cell killing.  
NOTE Confidence: 0.763178658

00:33:57.624 --> 00:33:59.954 But it's that therapeutic index.  
NOTE Confidence: 0.763178658

00:33:59.960 --> 00:34:01.983 We would argue it's it's with both  
NOTE Confidence: 0.763178658

00:34:01.983 --> 00:34:04.357 myzalamide and CC and U very potent alkalis.  
NOTE Confidence: 0.763178658

00:34:04.360 --> 00:34:05.608 But that window is narrow and  
NOTE Confidence: 0.763178658

00:34:05.608 --> 00:34:06.232 some people say,  
NOTE Confidence: 0.763178658

00:34:06.240 --> 00:34:08.165 well then why don't you just dose  
NOTE Confidence: 0.763178658

00:34:08.165 --> 00:34:10.019 the patients 150 micromolar 100.  
NOTE Confidence: 0.763178658

00:34:10.019 --> 00:34:11.318 It's not easy.  
NOTE Confidence: 0.763178658

00:34:11.320 --> 00:34:13.399 As many of you know in a clinical trial  
NOTE Confidence: 0.763178658

00:34:13.399 --> 00:34:15.261 getting those doses right across a  
NOTE Confidence: 0.763178658

00:34:15.261 --> 00:34:16.836 very heterogeneous group of patients,  
NOTE Confidence: 0.90533006125

00:34:16.840 --> 00:34:18.165 you're going to need this  
NOTE Confidence: 0.90533006125

00:34:18.165 --> 00:34:18.960 wider therapeutic index.  
NOTE Confidence: 0.90533006125

00:34:18.960 --> 00:34:19.716 So it's red in the green.

NOTE Confidence: 0.90533006125

00:34:19.720 --> 00:34:22.600 Curves need to be far apart.

NOTE Confidence: 0.90533006125

00:34:22.600 --> 00:34:24.220 So just to summarize for

NOTE Confidence: 0.90533006125

00:34:24.220 --> 00:34:25.840 this part of the talk,

NOTE Confidence: 0.90533006125

00:34:25.840 --> 00:34:27.317 you know what we believe is happening.

NOTE Confidence: 0.90533006125

00:34:27.320 --> 00:34:29.385 This is actually a slide summary from

NOTE Confidence: 0.90533006125

00:34:29.385 --> 00:34:31.449 Susan Gable who now has her own lab

NOTE Confidence: 0.90533006125

00:34:31.449 --> 00:34:33.479 here at Yale looking at tamozolamide.

NOTE Confidence: 0.90533006125

00:34:33.479 --> 00:34:34.838 Again, futile cycling,

NOTE Confidence: 0.90533006125

00:34:34.840 --> 00:34:36.770 removed by A rapidly removed

NOTE Confidence: 0.90533006125

00:34:36.770 --> 00:34:38.314 by MGMT expressing cells.

NOTE Confidence: 0.90533006125

00:34:38.320 --> 00:34:42.340 Futile cycling then induces tumor

NOTE Confidence: 0.90533006125

00:34:42.340 --> 00:34:44.720 cell death in the absence of MGMT,

NOTE Confidence: 0.90533006125

00:34:44.720 --> 00:34:46.500 but requires MMR proficiency

NOTE Confidence: 0.90533006125

00:34:46.500 --> 00:34:48.280 when you knockout MMR.

NOTE Confidence: 0.90533006125

00:34:48.280 --> 00:34:49.576 The lesion,

NOTE Confidence: 0.90533006125

00:34:49.576 --> 00:34:51.520 essentially invisible mitazolamide,  
NOTE Confidence: 0.90533006125

00:34:51.520 --> 00:34:52.312 the chloroethyl,  
NOTE Confidence: 0.90533006125

00:34:52.312 --> 00:34:55.480 So very fast acting forms at Athena Guanine.  
NOTE Confidence: 0.90533006125

00:34:55.480 --> 00:34:59.020 OK and is MMR independent but  
NOTE Confidence: 0.90533006125

00:34:59.020 --> 00:35:02.937 has an MGM is is less dependent  
NOTE Confidence: 0.90533006125

00:35:02.937 --> 00:35:05.679 on MGMT status and then KL50,  
NOTE Confidence: 0.90533006125

00:35:05.680 --> 00:35:07.824 which we would say is sort of the  
NOTE Confidence: 0.90533006125

00:35:07.824 --> 00:35:09.394 possibly the Goldilocks phenomenon  
NOTE Confidence: 0.90533006125

00:35:09.394 --> 00:35:11.637 but has has the best of both worlds.  
NOTE Confidence: 0.90533006125

00:35:11.640 --> 00:35:14.556 OK and I'll just show you one example.  
NOTE Confidence: 0.90533006125

00:35:14.560 --> 00:35:15.718 Because this date has been published,  
NOTE Confidence: 0.90533006125

00:35:15.720 --> 00:35:17.484 I'd like to move on to sort of some  
NOTE Confidence: 0.90533006125

00:35:17.484 --> 00:35:19.440 of our more recent unpublished work.  
NOTE Confidence: 0.90533006125

00:35:19.440 --> 00:35:20.608 This works incredibly well.  
NOTE Confidence: 0.90533006125

00:35:20.608 --> 00:35:22.758 We sent this date we sent these  
NOTE Confidence: 0.90533006125

00:35:22.758 --> 00:35:25.145 molecules to Jan Sarcoria the at the

NOTE Confidence: 0.90533006125  
00:35:25.145 --> 00:35:27.027 translational brain tumor Center at the  
NOTE Confidence: 0.90533006125  
00:35:27.027 --> 00:35:28.880 Mayo Clinic and asked them to compare.  
NOTE Confidence: 0.90533006125  
00:35:28.880 --> 00:35:30.836 Let's look at TMZ lomastine and  
NOTE Confidence: 0.90533006125  
00:35:30.836 --> 00:35:33.109 KL50 and let's look at intracranial  
NOTE Confidence: 0.90533006125  
00:35:33.109 --> 00:35:35.349 GBM xenographs that have acquired  
NOTE Confidence: 0.90533006125  
00:35:35.349 --> 00:35:37.788 this this aggressive phenotype MGMT  
NOTE Confidence: 0.90533006125  
00:35:37.788 --> 00:35:39.836 science mismatch period efficient  
NOTE Confidence: 0.90533006125  
00:35:39.840 --> 00:35:41.885 and you can see here on the left as  
NOTE Confidence: 0.90533006125  
00:35:41.885 --> 00:35:43.355 expected and this is aggressive model.  
NOTE Confidence: 0.90533006125  
00:35:43.360 --> 00:35:45.440 All the animals 30 days the vehicle  
NOTE Confidence: 0.90533006125  
00:35:45.440 --> 00:35:47.240 are are dead Temazolamide is invisible  
NOTE Confidence: 0.90533006125  
00:35:47.240 --> 00:35:48.738 under these conditions lomusting we  
NOTE Confidence: 0.90533006125  
00:35:48.738 --> 00:35:50.705 wouldn't expect it to work as that  
NOTE Confidence: 0.90533006125  
00:35:50.755 --> 00:35:52.837 therapeutic index issue in this experiment,  
NOTE Confidence: 0.90533006125  
00:35:52.840 --> 00:35:54.800 no efficacy here on the right though.  
NOTE Confidence: 0.90533006125

00:35:54.800 --> 00:35:56.408 You know we've been doing these  
NOTE Confidence: 0.90533006125

00:35:56.408 --> 00:35:57.927 types of experiments for about 12  
NOTE Confidence: 0.90533006125

00:35:57.927 --> 00:35:59.864 years in our own lab and pretty  
NOTE Confidence: 0.90533006125

00:35:59.864 --> 00:36:01.280 remarkable efficacy here.  
NOTE Confidence: 0.90533006125

00:36:01.280 --> 00:36:03.555 This is an 8 fold improvement in  
NOTE Confidence: 0.90533006125

00:36:03.555 --> 00:36:05.235 overall survival as a monotherapy  
NOTE Confidence: 0.90533006125

00:36:05.235 --> 00:36:07.155 or again TMZ has no effect.  
NOTE Confidence: 0.90533006125

00:36:07.160 --> 00:36:07.710 So really,  
NOTE Confidence: 0.90533006125

00:36:07.710 --> 00:36:09.910 really excited about the in vivo data that  
NOTE Confidence: 0.90533006125

00:36:09.963 --> 00:36:12.035 really is building the story of of this,  
NOTE Confidence: 0.90533006125

00:36:12.040 --> 00:36:14.752 this MGMT dependency and the mismatch  
NOTE Confidence: 0.90533006125

00:36:14.752 --> 00:36:16.560 repair independence could have  
NOTE Confidence: 0.90533006125

00:36:16.632 --> 00:36:18.972 some some potential therapeutic  
NOTE Confidence: 0.90533006125

00:36:18.972 --> 00:36:20.424 implications because that's sort of  
NOTE Confidence: 0.90533006125

00:36:20.424 --> 00:36:21.720 a summary of the initial discovery.  
NOTE Confidence: 0.90533006125

00:36:21.720 --> 00:36:24.079 So where are we going from here.

NOTE Confidence: 0.90533006125

00:36:24.080 --> 00:36:25.578 So one of the things that we're

NOTE Confidence: 0.90533006125

00:36:25.578 --> 00:36:27.115 interested in is it turns out

NOTE Confidence: 0.90533006125

00:36:27.115 --> 00:36:28.239 that MGMT promoter methylation,

NOTE Confidence: 0.90533006125

00:36:28.240 --> 00:36:29.680 we only talk about that in

NOTE Confidence: 0.90533006125

00:36:29.680 --> 00:36:30.640 like CNS tumor board.

NOTE Confidence: 0.90533006125

00:36:30.640 --> 00:36:32.400 We never like to think about this that

NOTE Confidence: 0.90533006125

00:36:32.400 --> 00:36:34.198 MGMT could be silenced in other cancers.

NOTE Confidence: 0.90533006125

00:36:34.200 --> 00:36:37.755 It turns out that subsets of all cancers AML,

NOTE Confidence: 0.90533006125

00:36:37.760 --> 00:36:38.107 colon,

NOTE Confidence: 0.90533006125

00:36:38.107 --> 00:36:39.148 sarcoma and lung,

NOTE Confidence: 0.90533006125

00:36:39.148 --> 00:36:41.230 they all actually have silence for

NOTE Confidence: 0.90533006125

00:36:41.292 --> 00:36:43.142 whatever reason have have subsets

NOTE Confidence: 0.90533006125

00:36:43.142 --> 00:36:44.992 of cancers have silence MGMT.

NOTE Confidence: 0.90533006125

00:36:45.000 --> 00:36:45.840 And so get at this.

NOTE Confidence: 0.90533006125

00:36:45.840 --> 00:36:48.157 The team did a use the Prism

NOTE Confidence: 0.90533006125

00:36:48.157 --> 00:36:50.080 screening platform up at the broad.  
NOTE Confidence: 0.90533006125

00:36:50.080 --> 00:36:51.056 I'd encourage anyone who's  
NOTE Confidence: 0.90533006125

00:36:51.056 --> 00:36:52.276 interested in using this platform.  
NOTE Confidence: 0.90533006125

00:36:52.280 --> 00:36:55.717 It's a really cool pooled bar coded  
NOTE Confidence: 0.90533006125

00:36:55.720 --> 00:36:58.692 drug screen \$10,000 a molecule and  
NOTE Confidence: 0.90533006125

00:36:58.692 --> 00:37:00.741 you actually compared to some of their  
NOTE Confidence: 0.90533006125

00:37:00.741 --> 00:37:02.785 existing data and what not and it's  
NOTE Confidence: 0.90533006125

00:37:02.785 --> 00:37:05.360 basically 930 cell lines across 45  
NOTE Confidence: 0.755507468571428

00:37:05.360 --> 00:37:07.562 lineages. You essentially send your drug  
NOTE Confidence: 0.755507468571428

00:37:07.562 --> 00:37:10.239 up there and what they'd said is OK,  
NOTE Confidence: 0.755507468571428

00:37:10.240 --> 00:37:11.878 let's ask, let's look at KL50 and  
NOTE Confidence: 0.755507468571428

00:37:11.878 --> 00:37:13.454 look and they've got all the genomic  
NOTE Confidence: 0.755507468571428

00:37:13.454 --> 00:37:15.196 data or a seat data that you can  
NOTE Confidence: 0.755507468571428

00:37:15.196 --> 00:37:16.799 correlate with it and say are there.  
NOTE Confidence: 0.755507468571428

00:37:16.800 --> 00:37:17.880 When we treat with KL50,  
NOTE Confidence: 0.755507468571428

00:37:17.880 --> 00:37:20.530 are there any specific genomic

NOTE Confidence: 0.755507468571428  
00:37:20.530 --> 00:37:22.496 biomarkers that correlate with  
NOTE Confidence: 0.755507468571428  
00:37:22.496 --> 00:37:24.376 sensitivity or resistance and MGMT  
NOTE Confidence: 0.755507468571428  
00:37:24.376 --> 00:37:26.795 was the true correlate was the  
NOTE Confidence: 0.755507468571428  
00:37:26.795 --> 00:37:28.920 reproducible correlate for KL50 activity.  
NOTE Confidence: 0.755507468571428  
00:37:28.920 --> 00:37:30.832 And when you break it out by different  
NOTE Confidence: 0.755507468571428  
00:37:30.832 --> 00:37:33.039 cell of origin types for the cell lines,  
NOTE Confidence: 0.755507468571428  
00:37:33.040 --> 00:37:35.760 you can see MGMT low is in the  
NOTE Confidence: 0.755507468571428  
00:37:35.760 --> 00:37:38.000 orange and MGMT high is in the green.  
NOTE Confidence: 0.755507468571428  
00:37:38.000 --> 00:37:40.373 You could see across the board all  
NOTE Confidence: 0.755507468571428  
00:37:40.373 --> 00:37:42.479 different tumor types when you have low  
NOTE Confidence: 0.755507468571428  
00:37:42.480 --> 00:37:45.636 MGMTKL 50 is significantly more active.  
NOTE Confidence: 0.755507468571428  
00:37:45.640 --> 00:37:47.503 So this prompted us to move on and this  
NOTE Confidence: 0.755507468571428  
00:37:47.503 --> 00:37:49.635 is work that as Susan finished up her MD,  
NOTE Confidence: 0.755507468571428  
00:37:49.640 --> 00:37:51.509 PhD in our laboratory or sorry her  
NOTE Confidence: 0.755507468571428  
00:37:51.509 --> 00:37:53.108 sorry her residency in our laboratory  
NOTE Confidence: 0.755507468571428

00:37:53.108 --> 00:37:55.198 and then went on and started her own  
NOTE Confidence: 0.755507468571428

00:37:55.198 --> 00:37:57.312 lab and we're now our two laboratories  
NOTE Confidence: 0.755507468571428

00:37:57.312 --> 00:37:57.916 are collaborating.  
NOTE Confidence: 0.755507468571428

00:37:57.920 --> 00:38:01.640 She went and started sampling PDX  
NOTE Confidence: 0.755507468571428

00:38:01.640 --> 00:38:04.640 libraries across a number of CROs  
NOTE Confidence: 0.755507468571428

00:38:04.640 --> 00:38:05.154 and academically.  
NOTE Confidence: 0.755507468571428

00:38:05.154 --> 00:38:06.953 We were able to find a number  
NOTE Confidence: 0.755507468571428

00:38:06.953 --> 00:38:08.038 of of models here.  
NOTE Confidence: 0.755507468571428

00:38:08.040 --> 00:38:09.876 These are all different tumor types,  
NOTE Confidence: 0.755507468571428

00:38:09.880 --> 00:38:11.800 some that have lost mismatch repair,  
NOTE Confidence: 0.755507468571428

00:38:11.800 --> 00:38:14.194 some that have lost MGMT or both.  
NOTE Confidence: 0.755507468571428

00:38:14.200 --> 00:38:17.070 Focusing in on 2 examples here shown  
NOTE Confidence: 0.755507468571428

00:38:17.070 --> 00:38:20.291 here and you can see in this case  
NOTE Confidence: 0.755507468571428

00:38:20.291 --> 00:38:22.072 this these two models both silence  
NOTE Confidence: 0.755507468571428

00:38:22.072 --> 00:38:25.080 MGMT one loss MLH one and one loss  
NOTE Confidence: 0.755507468571428

00:38:25.160 --> 00:38:27.420 MSH 2 and again pretty remarkable

NOTE Confidence: 0.755507468571428  
00:38:27.420 --> 00:38:29.280 data for monotherapy efficacy.  
NOTE Confidence: 0.755507468571428  
00:38:29.280 --> 00:38:30.568 Getting back to the the idea of  
NOTE Confidence: 0.755507468571428  
00:38:30.568 --> 00:38:31.920 like if you've got data like this,  
NOTE Confidence: 0.755507468571428  
00:38:31.920 --> 00:38:33.590 this is the type of stuff you want to try  
NOTE Confidence: 0.755507468571428  
00:38:33.634 --> 00:38:35.034 to move in the clinic because there's  
NOTE Confidence: 0.755507468571428  
00:38:35.034 --> 00:38:37.019 a chance we could see an efficacy in a  
NOTE Confidence: 0.755507468571428  
00:38:37.019 --> 00:38:38.291 heavily pretreated phase one population.  
NOTE Confidence: 0.755507468571428  
00:38:38.291 --> 00:38:41.320 You can see here this is looking at  
NOTE Confidence: 0.755507468571428  
00:38:41.320 --> 00:38:43.720 Melanoma model and a lung model.  
NOTE Confidence: 0.755507468571428  
00:38:43.720 --> 00:38:45.688 Again TMZ versus KL50.  
NOTE Confidence: 0.755507468571428  
00:38:45.688 --> 00:38:48.148 TMZ as expected invisible under  
NOTE Confidence: 0.755507468571428  
00:38:48.148 --> 00:38:49.812 these in this tumor genotype,  
NOTE Confidence: 0.755507468571428  
00:38:49.812 --> 00:38:51.570 very nice tumor growth delay with  
NOTE Confidence: 0.755507468571428  
00:38:51.630 --> 00:38:53.398 KL50 and and I'll just know this is  
NOTE Confidence: 0.755507468571428  
00:38:53.398 --> 00:38:55.349 3 doses times 3 cycles and then we  
NOTE Confidence: 0.755507468571428

00:38:55.349 --> 00:38:57.192 stop dosing and then you go out to  
NOTE Confidence: 0.755507468571428

00:38:57.192 --> 00:38:58.500 day 80 and we've got essentially  
NOTE Confidence: 0.755507468571428

00:38:58.556 --> 00:39:00.635 sustained tumor regressions and we see  
NOTE Confidence: 0.755507468571428

00:39:00.635 --> 00:39:02.574 this also for lung cancer as well.  
NOTE Confidence: 0.755507468571428

00:39:02.574 --> 00:39:04.416 We've since been now moving on  
NOTE Confidence: 0.755507468571428

00:39:04.416 --> 00:39:05.799 to different tumor types.  
NOTE Confidence: 0.755507468571428

00:39:05.800 --> 00:39:07.662 I talked to you about our interest  
NOTE Confidence: 0.755507468571428

00:39:07.662 --> 00:39:09.671 in AML and started a collaboration  
NOTE Confidence: 0.755507468571428

00:39:09.671 --> 00:39:11.975 with Stephanie Helene and what you'll  
NOTE Confidence: 0.755507468571428

00:39:11.975 --> 00:39:14.472 see here is in is a petite in our  
NOTE Confidence: 0.755507468571428

00:39:14.472 --> 00:39:16.102 laboratory post doc started modeling  
NOTE Confidence: 0.755507468571428

00:39:16.102 --> 00:39:18.440 this in a number of different AML cell lines.  
NOTE Confidence: 0.755507468571428

00:39:18.440 --> 00:39:20.302 Pulled some of that data from the  
NOTE Confidence: 0.755507468571428

00:39:20.302 --> 00:39:22.560 PRISM screen, the 930 cell line data.  
NOTE Confidence: 0.755507468571428

00:39:22.560 --> 00:39:25.520 And you can see that when you look at  
NOTE Confidence: 0.755507468571428

00:39:25.520 --> 00:39:28.348 TMZ and KL FIT MGMT low versus high

NOTE Confidence: 0.755507468571428  
00:39:28.348 --> 00:39:31.680 you can see largely very nice correlation.  
NOTE Confidence: 0.755507468571428  
00:39:31.680 --> 00:39:33.283 And he's now what he's been doing  
NOTE Confidence: 0.755507468571428  
00:39:33.283 --> 00:39:35.023 is doing the same thing we did  
NOTE Confidence: 0.755507468571428  
00:39:35.023 --> 00:39:36.517 earlier with the other models is  
NOTE Confidence: 0.755507468571428  
00:39:36.573 --> 00:39:38.163 doing isogenic knockouts now asking  
NOTE Confidence: 0.755507468571428  
00:39:38.163 --> 00:39:40.620 the question of you know MGMT status  
NOTE Confidence: 0.755507468571428  
00:39:40.620 --> 00:39:42.120 versus mismatch repair status.  
NOTE Confidence: 0.942712165  
00:39:42.120 --> 00:39:44.430 And you can see here in these  
NOTE Confidence: 0.942712165  
00:39:44.430 --> 00:39:45.960 models now you get a very nice,  
NOTE Confidence: 0.942712165  
00:39:45.960 --> 00:39:48.220 this is KL50 in a in a molem 13 AML  
NOTE Confidence: 0.942712165  
00:39:48.294 --> 00:39:50.109 model where we knockout mismatch  
NOTE Confidence: 0.942712165  
00:39:50.109 --> 00:39:52.326 repair and then in MGMT deficient  
NOTE Confidence: 0.942712165  
00:39:52.326 --> 00:39:55.022 that's the red and the blue shown here  
NOTE Confidence: 0.942712165  
00:39:55.022 --> 00:39:57.358 and you see very nice activity here.  
NOTE Confidence: 0.942712165  
00:39:57.360 --> 00:39:58.440 We're now working with Stephanie,  
NOTE Confidence: 0.942712165

00:39:58.440 --> 00:40:00.638 don't have the data to show today  
NOTE Confidence: 0.942712165

00:40:00.640 --> 00:40:02.188 looking at her PDX models because  
NOTE Confidence: 0.942712165

00:40:02.188 --> 00:40:03.726 we actually think there could be  
NOTE Confidence: 0.942712165

00:40:03.726 --> 00:40:05.336 a potential to use some of these  
NOTE Confidence: 0.942712165

00:40:05.336 --> 00:40:06.480 molecules in the AML setting,  
NOTE Confidence: 0.942712165

00:40:06.480 --> 00:40:08.760 the subsets that have silenced MGMT.  
NOTE Confidence: 0.868727302307692

00:40:11.120 --> 00:40:13.976 So really in the last you know five  
NOTE Confidence: 0.868727302307692

00:40:13.976 --> 00:40:16.864 about 10-10 minutes or so sort of talk  
NOTE Confidence: 0.868727302307692

00:40:16.864 --> 00:40:19.072 about where we're going from here.  
NOTE Confidence: 0.868727302307692

00:40:19.080 --> 00:40:21.075 So the first thing which is really  
NOTE Confidence: 0.868727302307692

00:40:21.075 --> 00:40:23.199 interesting is we had this molecule KL50  
NOTE Confidence: 0.868727302307692

00:40:23.200 --> 00:40:25.560 never really been described before.  
NOTE Confidence: 0.868727302307692

00:40:25.560 --> 00:40:26.944 We want to translate this in the clinic  
NOTE Confidence: 0.868727302307692

00:40:26.944 --> 00:40:28.460 and we had you know gotten really lucky  
NOTE Confidence: 0.868727302307692

00:40:28.460 --> 00:40:29.921 with the IDH PARP story because there  
NOTE Confidence: 0.868727302307692

00:40:29.921 --> 00:40:31.475 was FDA approved PARP and intervals and

NOTE Confidence: 0.868727302307692  
00:40:31.480 --> 00:40:33.076 we just needed to call those companies,  
NOTE Confidence: 0.868727302307692  
00:40:33.080 --> 00:40:35.048 write the trials and then and  
NOTE Confidence: 0.868727302307692  
00:40:35.048 --> 00:40:36.360 then run them here.  
NOTE Confidence: 0.868727302307692  
00:40:36.360 --> 00:40:39.185 There's really no source of KL50 and  
NOTE Confidence: 0.868727302307692  
00:40:39.185 --> 00:40:40.775 we've started a few companies before  
NOTE Confidence: 0.868727302307692  
00:40:40.775 --> 00:40:43.080 this so we sort of knew how to do this.  
NOTE Confidence: 0.868727302307692  
00:40:43.080 --> 00:40:44.998 But ultimately to to cut to the  
NOTE Confidence: 0.868727302307692  
00:40:44.998 --> 00:40:47.158 chase here we ended up just spinning  
NOTE Confidence: 0.868727302307692  
00:40:47.158 --> 00:40:49.253 out our own company and this was  
NOTE Confidence: 0.868727302307692  
00:40:49.253 --> 00:40:51.150 great to work with Kingston who as  
NOTE Confidence: 0.868727302307692  
00:40:51.213 --> 00:40:53.320 a as a MDPHD student and then Seth  
NOTE Confidence: 0.868727302307692  
00:40:53.320 --> 00:40:55.600 Herzan's Co Pi and then my long time  
NOTE Confidence: 0.868727302307692  
00:40:55.600 --> 00:40:56.879 business partner Kevin Ragan.  
NOTE Confidence: 0.868727302307692  
00:40:56.880 --> 00:40:59.148 We had a nice write up and end points  
NOTE Confidence: 0.868727302307692  
00:40:59.148 --> 00:41:01.200 about two years back and this is just a  
NOTE Confidence: 0.868727302307692

00:41:01.200 --> 00:41:02.620 glimpse of the founding team and right

NOTE Confidence: 0.868727302307692

00:41:02.620 --> 00:41:04.000 around that time Kingston very proud.

NOTE Confidence: 0.868727302307692

00:41:04.000 --> 00:41:06.840 It's Forbes 30 under 30.

NOTE Confidence: 0.868727302307692

00:41:06.840 --> 00:41:08.156 I'm still waiting for 50 under 50,

NOTE Confidence: 0.868727302307692

00:41:08.160 --> 00:41:09.564 but I don't think they're going

NOTE Confidence: 0.868727302307692

00:41:09.564 --> 00:41:12.896 to have one it's too but so,

NOTE Confidence: 0.868727302307692

00:41:12.896 --> 00:41:14.036 so what's the company doing.

NOTE Confidence: 0.868727302307692

00:41:14.040 --> 00:41:15.520 So it's been really great.

NOTE Confidence: 0.868727302307692

00:41:15.520 --> 00:41:15.814 So,

NOTE Confidence: 0.868727302307692

00:41:15.814 --> 00:41:17.578 so really the company is now

NOTE Confidence: 0.868727302307692

00:41:17.578 --> 00:41:19.670 taking that tool compound KO 50

NOTE Confidence: 0.868727302307692

00:41:19.670 --> 00:41:21.680 and really now engineering it for

NOTE Confidence: 0.868727302307692

00:41:21.680 --> 00:41:24.000 ready for prime time so to speak.

NOTE Confidence: 0.868727302307692

00:41:24.000 --> 00:41:25.150 Turning that into what we

NOTE Confidence: 0.868727302307692

00:41:25.150 --> 00:41:25.840 call development candidate,

NOTE Confidence: 0.868727302307692

00:41:25.840 --> 00:41:27.597 some of you know what that means,

NOTE Confidence: 0.868727302307692  
00:41:27.600 --> 00:41:29.108 but essentially suitable for  
NOTE Confidence: 0.868727302307692  
00:41:29.108 --> 00:41:30.239 Ind enabling studies.  
NOTE Confidence: 0.868727302307692  
00:41:30.240 --> 00:41:31.584 Didn't want to focus too much on  
NOTE Confidence: 0.868727302307692  
00:41:31.584 --> 00:41:32.902 this because of you know it's  
NOTE Confidence: 0.868727302307692  
00:41:32.902 --> 00:41:33.838 more company related stuff,  
NOTE Confidence: 0.868727302307692  
00:41:33.840 --> 00:41:35.958 but it has the original molecules,  
NOTE Confidence: 0.868727302307692  
00:41:35.960 --> 00:41:37.208 metabolic liabilities that preclude  
NOTE Confidence: 0.868727302307692  
00:41:37.208 --> 00:41:39.080 it from going to the clinic.  
NOTE Confidence: 0.868727302307692  
00:41:39.080 --> 00:41:39.985 We welcome anyone who reads  
NOTE Confidence: 0.868727302307692  
00:41:39.985 --> 00:41:41.239 the paper to try to do that.  
NOTE Confidence: 0.868727302307692  
00:41:41.240 --> 00:41:41.903 It's not possible.  
NOTE Confidence: 0.868727302307692  
00:41:41.903 --> 00:41:43.229 So we've been able to engineer  
NOTE Confidence: 0.868727302307692  
00:41:43.229 --> 00:41:44.559 that molecule and we have that.  
NOTE Confidence: 0.868727302307692  
00:41:44.560 --> 00:41:46.696 We have a new version of KL50 that  
NOTE Confidence: 0.868727302307692  
00:41:46.696 --> 00:41:48.668 has very good PKPD properties  
NOTE Confidence: 0.868727302307692

00:41:48.668 --> 00:41:50.958 enhancing its penetration and whatnot.

NOTE Confidence: 0.868727302307692

00:41:50.960 --> 00:41:52.836 And the company hopes to over the

NOTE Confidence: 0.868727302307692

00:41:52.836 --> 00:41:54.395 next year perform the necessary

NOTE Confidence: 0.868727302307692

00:41:54.395 --> 00:41:56.079 ID enabling studies to drive this

NOTE Confidence: 0.868727302307692

00:41:56.079 --> 00:41:56.718 into the clinic.

NOTE Confidence: 0.868727302307692

00:41:56.720 --> 00:41:58.400 And we hope if all goes according to

NOTE Confidence: 0.868727302307692

00:41:58.400 --> 00:42:00.079 plan that we can actually bring this

NOTE Confidence: 0.868727302307692

00:42:00.079 --> 00:42:01.839 into patients about a year from April,

NOTE Confidence: 0.868727302307692

00:42:01.840 --> 00:42:03.718 which would be really, really exciting.

NOTE Confidence: 0.868727302307692

00:42:03.720 --> 00:42:05.277 But we have to close our Series A first,

NOTE Confidence: 0.868727302307692

00:42:05.280 --> 00:42:09.120 which is going to be still a bit of a path.

NOTE Confidence: 0.868727302307692

00:42:09.120 --> 00:42:10.445 And what's really exciting is

NOTE Confidence: 0.868727302307692

00:42:10.445 --> 00:42:12.359 we think that we can use these,

NOTE Confidence: 0.868727302307692

00:42:12.360 --> 00:42:14.825 this molecule KL50 for tumors

NOTE Confidence: 0.868727302307692

00:42:14.825 --> 00:42:16.797 outside of the brain.

NOTE Confidence: 0.868727302307692

00:42:16.800 --> 00:42:18.480 We really think there's a potential

NOTE Confidence: 0.868727302307692  
00:42:18.480 --> 00:42:20.450 here to move this into things like  
NOTE Confidence: 0.868727302307692  
00:42:20.450 --> 00:42:22.840 colon cancer where 30 to 40% of tumors  
NOTE Confidence: 0.868727302307692  
00:42:22.840 --> 00:42:25.300 are MGMT silence and we've modeled this,  
NOTE Confidence: 0.868727302307692  
00:42:25.300 --> 00:42:27.440 this is just an example mod 16,  
NOTE Confidence: 0.868727302307692  
00:42:27.440 --> 00:42:29.512 this is sort of a a next generation  
NOTE Confidence: 0.868727302307692  
00:42:29.512 --> 00:42:31.666 kill 50 before our our development  
NOTE Confidence: 0.868727302307692  
00:42:31.666 --> 00:42:33.234 candidate called mod 246.  
NOTE Confidence: 0.868727302307692  
00:42:33.240 --> 00:42:35.190 But you can see here mod 16 in a colon  
NOTE Confidence: 0.8227583925  
00:42:35.250 --> 00:42:38.236 cancer model, a flank model MGMT science Mr.  
NOTE Confidence: 0.8227583925  
00:42:38.240 --> 00:42:40.838 prepared efficient very nice dose dependent  
NOTE Confidence: 0.8227583925  
00:42:40.840 --> 00:42:44.560 activity 10 Meg per keg treatment regimen  
NOTE Confidence: 0.8227583925  
00:42:44.560 --> 00:42:47.160 here inducing A tumor regressions.  
NOTE Confidence: 0.8227583925  
00:42:47.160 --> 00:42:48.864 And we're excited about this because  
NOTE Confidence: 0.8227583925  
00:42:48.864 --> 00:42:50.585 we've been working with folks that  
NOTE Confidence: 0.8227583925  
00:42:50.585 --> 00:42:52.199 you know well like Kirk Schopper  
NOTE Confidence: 0.8227583925

00:42:52.199 --> 00:42:53.680 pathology and Mike Tuccini already  
NOTE Confidence: 0.8227583925

00:42:53.680 --> 00:42:55.920 looking at whether we can do alkylator  
NOTE Confidence: 0.8227583925

00:42:55.920 --> 00:42:57.919 DNA repair inhibitor combinations.  
NOTE Confidence: 0.8227583925

00:42:57.920 --> 00:43:01.154 For example in MGMT silence colon cancer.  
NOTE Confidence: 0.8227583925

00:43:01.160 --> 00:43:02.882 And this is this is Mike Tuccini  
NOTE Confidence: 0.8227583925

00:43:02.882 --> 00:43:05.046 study that he ran recently with Kirk  
NOTE Confidence: 0.8227583925

00:43:05.046 --> 00:43:06.756 Chopper developed some really cool  
NOTE Confidence: 0.8227583925

00:43:06.756 --> 00:43:08.740 assays detect MGMT expression on this  
NOTE Confidence: 0.8227583925

00:43:08.740 --> 00:43:10.714 case using temazolomide in a Labra.  
NOTE Confidence: 0.8227583925

00:43:10.714 --> 00:43:13.431 This is before we discovered KL50 and  
NOTE Confidence: 0.8227583925

00:43:13.431 --> 00:43:15.888 now Mike's actually moved on to looking  
NOTE Confidence: 0.8227583925

00:43:15.888 --> 00:43:17.838 at Temazolomide in an ATR inhibitor.  
NOTE Confidence: 0.8227583925

00:43:17.840 --> 00:43:19.674 And so we're really excited for this  
NOTE Confidence: 0.8227583925

00:43:19.674 --> 00:43:21.762 because what we believe is not only can we  
NOTE Confidence: 0.8227583925

00:43:21.762 --> 00:43:24.028 test KL50 as a monotherapy in these cancers,  
NOTE Confidence: 0.8227583925

00:43:24.028 --> 00:43:25.960 we could actually probably combine this with

NOTE Confidence: 0.8227583925

00:43:26.014 --> 00:43:27.796 other agents like DNA repair inhibitors,

NOTE Confidence: 0.8227583925

00:43:27.800 --> 00:43:30.724 PARP inhibitors and ATR

NOTE Confidence: 0.8227583925

00:43:30.724 --> 00:43:32.917 inhibitors for example.

NOTE Confidence: 0.8227583925

00:43:32.920 --> 00:43:34.864 And then in the last sort of few slides

NOTE Confidence: 0.8227583925

00:43:34.864 --> 00:43:36.678 just kind of talk about sort of some

NOTE Confidence: 0.8227583925

00:43:36.678 --> 00:43:38.518 of the Wilder stuff that we're doing.

NOTE Confidence: 0.8227583925

00:43:38.520 --> 00:43:40.120 And so I showed you that mechanism earlier,

NOTE Confidence: 0.8227583925

00:43:40.120 --> 00:43:42.264 right, with all the, you know, 4A4B4C.

NOTE Confidence: 0.8227583925

00:43:42.264 --> 00:43:45.720 So when you focus on the blue box area,

NOTE Confidence: 0.8227583925

00:43:45.720 --> 00:43:47.120 we've got this kind of crazy idea.

NOTE Confidence: 0.8227583925

00:43:47.120 --> 00:43:49.000 I know our lab can sometimes be a

NOTE Confidence: 0.8227583925

00:43:49.000 --> 00:43:51.000 little going off the beaten path,

NOTE Confidence: 0.8227583925

00:43:51.000 --> 00:43:53.072 but we call this project breaking DDR

NOTE Confidence: 0.8227583925

00:43:53.072 --> 00:43:55.477 if you guys ever see a Breaking Bad.

NOTE Confidence: 0.8227583925

00:43:55.480 --> 00:43:57.160 So it's just sort of a little wild,

NOTE Confidence: 0.8227583925

00:43:57.160 --> 00:43:59.372 but but I promise you there there's  
NOTE Confidence: 0.8227583925

00:43:59.372 --> 00:44:00.320 some sanity here.  
NOTE Confidence: 0.8227583925

00:44:00.320 --> 00:44:01.838 So if you think about it,  
NOTE Confidence: 0.8227583925

00:44:01.840 --> 00:44:04.024 we're creating cross links that are  
NOTE Confidence: 0.8227583925

00:44:04.024 --> 00:44:06.000 specifically active in MGMT silence,  
NOTE Confidence: 0.8227583925

00:44:06.000 --> 00:44:08.598 misreactor deficient cells and arguably MGMT.  
NOTE Confidence: 0.8227583925

00:44:08.600 --> 00:44:11.300 Science misreproficient we are now  
NOTE Confidence: 0.8227583925

00:44:11.300 --> 00:44:14.000 by making this simple fluoroethyl  
NOTE Confidence: 0.8227583925

00:44:14.086 --> 00:44:16.780 substitution for the for the methyl  
NOTE Confidence: 0.8227583925

00:44:16.780 --> 00:44:19.079 group here we're actually now making  
NOTE Confidence: 0.8227583925

00:44:19.079 --> 00:44:21.524 the futile cycling pathway that  
NOTE Confidence: 0.8227583925

00:44:21.524 --> 00:44:23.480 Tamizoli works totally irrelevant.  
NOTE Confidence: 0.8227583925

00:44:23.480 --> 00:44:25.692 So now the cell is actually being  
NOTE Confidence: 0.8227583925

00:44:25.692 --> 00:44:27.455 forced because of its genomic  
NOTE Confidence: 0.8227583925

00:44:27.455 --> 00:44:29.315 biomorg because it lacks MGMT.  
NOTE Confidence: 0.8227583925

00:44:29.320 --> 00:44:31.693 It's now being driven into a cross

NOTE Confidence: 0.8227583925

00:44:31.693 --> 00:44:33.719 link repair pathway probably right.

NOTE Confidence: 0.8227583925

00:44:33.720 --> 00:44:35.624 So the question is are we now able

NOTE Confidence: 0.8227583925

00:44:35.624 --> 00:44:38.119 to at a bigger picture create DNA

NOTE Confidence: 0.8227583925

00:44:38.119 --> 00:44:40.079 modifiers right create novel analogues

NOTE Confidence: 0.8227583925

00:44:40.146 --> 00:44:42.309 that for instance here create a cross

NOTE Confidence: 0.8227583925

00:44:42.309 --> 00:44:44.248 link or create a double strand break.

NOTE Confidence: 0.8227583925

00:44:44.248 --> 00:44:45.760 So we're making new analog sets

NOTE Confidence: 0.8227583925

00:44:45.807 --> 00:44:47.157 sets lab and we've got James,

NOTE Confidence: 0.8227583925

00:44:47.160 --> 00:44:49.312 Iia here and others that are grad student

NOTE Confidence: 0.8227583925

00:44:49.312 --> 00:44:50.968 that are working on other analogues

NOTE Confidence: 0.8227583925

00:44:50.968 --> 00:44:52.998 and and different DNA repair defects.

NOTE Confidence: 0.8227583925

00:44:53.000 --> 00:44:55.232 But we could actually force a cell to

NOTE Confidence: 0.8227583925

00:44:55.232 --> 00:44:57.560 switch from one repair pathway to another.

NOTE Confidence: 0.8227583925

00:44:57.560 --> 00:44:57.857 OK.

NOTE Confidence: 0.8227583925

00:44:57.857 --> 00:44:59.936 And so this could be an enormous

NOTE Confidence: 0.8227583925

00:44:59.936 --> 00:45:01.327 opportunity for novel combinations  
NOTE Confidence: 0.8227583925

00:45:01.327 --> 00:45:03.523 of KL50 with DNA repair enhibbers  
NOTE Confidence: 0.8227583925

00:45:03.523 --> 00:45:05.806 that either you wouldn't think were  
NOTE Confidence: 0.8227583925

00:45:05.806 --> 00:45:07.666 possible or targeting DNA repair  
NOTE Confidence: 0.8227583925

00:45:07.666 --> 00:45:09.800 proteins that are not, you know,  
NOTE Confidence: 0.8227583925

00:45:09.800 --> 00:45:10.960 really thought to be relevant,  
NOTE Confidence: 0.8227583925

00:45:10.960 --> 00:45:12.100 but they become relevant.  
NOTE Confidence: 0.8227583925

00:45:12.100 --> 00:45:12.955 So for this,  
NOTE Confidence: 0.8227583925

00:45:12.960 --> 00:45:14.717 I'll just show you a little bit  
NOTE Confidence: 0.8227583925

00:45:14.720 --> 00:45:15.758 of some of our prelim data.  
NOTE Confidence: 0.8227583925

00:45:15.760 --> 00:45:17.496 And this is Colin a post doc  
NOTE Confidence: 0.8227583925

00:45:17.496 --> 00:45:18.240 in our laboratory.  
NOTE Confidence: 0.8227583925

00:45:18.240 --> 00:45:20.880 So he's been addressing this  
NOTE Confidence: 0.9259897225

00:45:20.880 --> 00:45:22.920 and also James and others in our laboratory,  
NOTE Confidence: 0.9259897225

00:45:22.920 --> 00:45:24.782 but he's been leading the efforts of  
NOTE Confidence: 0.9259897225

00:45:24.782 --> 00:45:26.800 creating a focused DNA repair gene library.

NOTE Confidence: 0.9259897225

00:45:26.800 --> 00:45:28.534 And we're always excited about potential

NOTE Confidence: 0.9259897225

00:45:28.534 --> 00:45:29.939 collaborations in this space because

NOTE Confidence: 0.9259897225

00:45:29.939 --> 00:45:31.547 he's really spent a lot of time the

NOTE Confidence: 0.9259897225

00:45:31.547 --> 00:45:32.851 last year building this platform

NOTE Confidence: 0.9259897225

00:45:32.851 --> 00:45:35.100 working with Select and Agilent and the

NOTE Confidence: 0.9259897225

00:45:35.100 --> 00:45:37.740 Agilent sequencing profile platform

NOTE Confidence: 0.9259897225

00:45:37.740 --> 00:45:40.430 about 335 DNA repair and response

NOTE Confidence: 0.9259897225

00:45:40.430 --> 00:45:43.585 genes targeting 6 guide RNAs per gene

NOTE Confidence: 0.9259897225

00:45:43.585 --> 00:45:45.678 standard sort of protocol shown here.

NOTE Confidence: 0.9259897225

00:45:45.678 --> 00:45:47.408 And essentially looking at what

NOTE Confidence: 0.9259897225

00:45:47.408 --> 00:45:49.561 are the nodes of sensitivity and

NOTE Confidence: 0.9259897225

00:45:49.561 --> 00:45:51.667 resistance for your drug of interest

NOTE Confidence: 0.9259897225

00:45:51.732 --> 00:45:53.520 that are related to DNA repair.

NOTE Confidence: 0.9259897225

00:45:53.520 --> 00:45:54.864 Obviously you can do a whole

NOTE Confidence: 0.9259897225

00:45:54.864 --> 00:45:56.342 genome CRISPR screen and we have

NOTE Confidence: 0.9259897225

00:45:56.342 --> 00:45:57.677 aspirations of doing that eventually.  
NOTE Confidence: 0.9259897225

00:45:57.680 --> 00:45:59.450 But these are giant experiments by  
NOTE Confidence: 0.9259897225

00:45:59.450 --> 00:46:01.280 doing a focus screen you can do,  
NOTE Confidence: 0.9259897225

00:46:01.280 --> 00:46:03.128 you know, you know,  
NOTE Confidence: 0.9259897225

00:46:03.128 --> 00:46:05.975 2015 centimeter dishes and and you'll  
NOTE Confidence: 0.9259897225

00:46:05.975 --> 00:46:08.400 be and it's relatively tractable.  
NOTE Confidence: 0.9259897225

00:46:08.400 --> 00:46:10.808 And so I'll just give you just a  
NOTE Confidence: 0.9259897225

00:46:10.808 --> 00:46:12.754 little smattering of some of the  
NOTE Confidence: 0.9259897225

00:46:12.754 --> 00:46:14.359 data that he's produced recently.  
NOTE Confidence: 0.9259897225

00:46:14.360 --> 00:46:16.248 So the first thing he did is started  
NOTE Confidence: 0.9259897225

00:46:16.248 --> 00:46:18.429 looking at KL50 and TMZ and ran it  
NOTE Confidence: 0.9259897225

00:46:18.429 --> 00:46:20.040 through his Christmas screening platform.  
NOTE Confidence: 0.9259897225

00:46:20.040 --> 00:46:21.188 And I should have been remiss of  
NOTE Confidence: 0.9259897225

00:46:21.188 --> 00:46:22.159 it and mentioned Sam Friedman,  
NOTE Confidence: 0.9259897225

00:46:22.160 --> 00:46:23.600 the bioinformaticist in our lab  
NOTE Confidence: 0.9259897225

00:46:23.600 --> 00:46:25.344 that built the platform for the

NOTE Confidence: 0.9259897225

00:46:25.344 --> 00:46:26.360 analysis of this data.

NOTE Confidence: 0.9259897225

00:46:26.360 --> 00:46:27.840 And what you can see here just as a glimpse,

NOTE Confidence: 0.9259897225

00:46:27.840 --> 00:46:30.605 you can see very nice in terms of

NOTE Confidence: 0.9259897225

00:46:30.605 --> 00:46:32.948 everything here is sensitive knockout of

NOTE Confidence: 0.9259897225

00:46:32.948 --> 00:46:35.072 that gene induces sensitivity and then

NOTE Confidence: 0.9259897225

00:46:35.072 --> 00:46:37.440 everything on the right induces resistance.

NOTE Confidence: 0.9259897225

00:46:37.440 --> 00:46:38.400 TP 53 comes out,

NOTE Confidence: 0.9259897225

00:46:38.400 --> 00:46:40.294 but it's at a pretty low magnitude

NOTE Confidence: 0.9259897225

00:46:40.294 --> 00:46:41.479 of effects there.

NOTE Confidence: 0.9259897225

00:46:41.480 --> 00:46:43.456 But you can actually see if you notice

NOTE Confidence: 0.9259897225

00:46:43.456 --> 00:46:45.422 there's a lot of Fanconi genes and

NOTE Confidence: 0.9259897225

00:46:45.422 --> 00:46:47.360 interesting genes that are are involved.

NOTE Confidence: 0.9259897225

00:46:47.360 --> 00:46:49.118 When you overlay this with TMZ,

NOTE Confidence: 0.9259897225

00:46:49.120 --> 00:46:50.336 it gets really interesting.

NOTE Confidence: 0.9259897225

00:46:50.336 --> 00:46:52.799 And so I'll show you this data here.

NOTE Confidence: 0.9259897225

00:46:52.800 --> 00:46:54.456 He's doing a lot of work here but I'm  
NOTE Confidence: 0.9259897225

00:46:54.456 --> 00:46:55.918 just summarizing because of time.  
NOTE Confidence: 0.9259897225

00:46:55.920 --> 00:46:58.592 You can see here now in these different  
NOTE Confidence: 0.9259897225

00:46:58.592 --> 00:47:00.633 quadrants you've got when you compare  
NOTE Confidence: 0.9259897225

00:47:00.633 --> 00:47:02.601 KL50 versus control and TMZ versus  
NOTE Confidence: 0.9259897225

00:47:02.662 --> 00:47:04.280 control what you can see are the  
NOTE Confidence: 0.9259897225

00:47:04.280 --> 00:47:05.786 genes that are whose knockout not  
NOTE Confidence: 0.9259897225

00:47:05.786 --> 00:47:07.598 when knocked out and do sensitivity.  
NOTE Confidence: 0.9259897225

00:47:07.600 --> 00:47:10.390 TMZ only versus resistance to TMZ  
NOTE Confidence: 0.9259897225

00:47:10.390 --> 00:47:13.320 only and then sensitive to KL50 only  
NOTE Confidence: 0.9259897225

00:47:13.320 --> 00:47:14.832 And you can see some interesting like  
NOTE Confidence: 0.9259897225

00:47:14.832 --> 00:47:16.871 one sort of knew that but you know  
NOTE Confidence: 0.9259897225

00:47:16.871 --> 00:47:17.947 arguably still pretty interesting  
NOTE Confidence: 0.9259897225

00:47:17.947 --> 00:47:19.893 then one on the right here this was  
NOTE Confidence: 0.9259897225

00:47:19.893 --> 00:47:21.144 actually great because you could  
NOTE Confidence: 0.9259897225

00:47:21.144 --> 00:47:22.776 see the mismatch repaired genes all

NOTE Confidence: 0.9259897225

00:47:22.776 --> 00:47:24.686 come out when you knock them out

NOTE Confidence: 0.9259897225

00:47:24.686 --> 00:47:25.996 and become resistant to TMZ.

NOTE Confidence: 0.9259897225

00:47:26.000 --> 00:47:27.476 And you'll notice actually for the

NOTE Confidence: 0.9259897225

00:47:27.476 --> 00:47:28.940 again the DNA repair official is

NOTE Confidence: 0.9259897225

00:47:28.940 --> 00:47:30.438 the missing gene here is MSH 3.

NOTE Confidence: 0.9259897225

00:47:30.440 --> 00:47:32.764 So the two three complex which repairs

NOTE Confidence: 0.9259897225

00:47:32.764 --> 00:47:35.240 loops and not insert mismatches was

NOTE Confidence: 0.9259897225

00:47:35.240 --> 00:47:37.160 not a determinant of of resistance.

NOTE Confidence: 0.9259897225

00:47:37.160 --> 00:47:38.670 So then functionally validating the

NOTE Confidence: 0.9259897225

00:47:38.670 --> 00:47:41.458 screen as a as a really great way

NOTE Confidence: 0.9259897225

00:47:41.458 --> 00:47:42.676 to fingerprint molecules.

NOTE Confidence: 0.9259897225

00:47:42.680 --> 00:47:44.766 But we can see one gene actually

NOTE Confidence: 0.9259897225

00:47:44.766 --> 00:47:46.672 popped out that was really interesting

NOTE Confidence: 0.9259897225

00:47:46.672 --> 00:47:49.229 and this is called B Rip One which

NOTE Confidence: 0.9259897225

00:47:49.229 --> 00:47:50.879 is also known as Frank J.

NOTE Confidence: 0.9259897225

00:47:50.880 --> 00:47:53.244 And so we've been interested in  
NOTE Confidence: 0.9259897225

00:47:53.244 --> 00:47:54.820 understanding this further and  
NOTE Confidence: 0.76271804125

00:47:54.888 --> 00:47:56.841 to to get at this we reached out to  
NOTE Confidence: 0.76271804125

00:47:56.841 --> 00:47:58.691 Sharon Kanter who's done a lot of work  
NOTE Confidence: 0.76271804125

00:47:58.691 --> 00:48:00.278 in the Fang Jay space and Colin reached  
NOTE Confidence: 0.76271804125

00:48:00.278 --> 00:48:02.159 out to her to see if we could validate  
NOTE Confidence: 0.76271804125

00:48:02.159 --> 00:48:03.755 this in some Fang Jay knockouts.  
NOTE Confidence: 0.76271804125

00:48:03.760 --> 00:48:05.468 All lines and here's 3 knockouts all  
NOTE Confidence: 0.76271804125

00:48:05.468 --> 00:48:07.480 lines that we got you can see her MGMT.  
NOTE Confidence: 0.76271804125

00:48:07.480 --> 00:48:10.150 Science. Mr. repair proficient it's a  
NOTE Confidence: 0.76271804125

00:48:10.150 --> 00:48:14.080 double negative and then MGMT proficient  
NOTE Confidence: 0.76271804125

00:48:14.080 --> 00:48:16.845 but knockout sorry knockout MGMT.  
NOTE Confidence: 0.76271804125

00:48:16.845 --> 00:48:18.505 Chemically those expensive guanine  
NOTE Confidence: 0.76271804125

00:48:18.505 --> 00:48:20.997 and you can see there's no real  
NOTE Confidence: 0.76271804125

00:48:21.000 --> 00:48:24.438 effects of knocking out, thank Jay  
NOTE Confidence: 0.76271804125

00:48:24.440 --> 00:48:26.120 in terms of tamzolamide sensitivity.

NOTE Confidence: 0.76271804125

00:48:26.120 --> 00:48:27.488 And again we would not expect

NOTE Confidence: 0.76271804125

00:48:27.488 --> 00:48:28.760 that from the crisper screen,

NOTE Confidence: 0.76271804125

00:48:28.760 --> 00:48:29.924 but you can see some this

NOTE Confidence: 0.76271804125

00:48:29.924 --> 00:48:31.000 is short term growth delay.

NOTE Confidence: 0.76271804125

00:48:31.000 --> 00:48:32.872 So we still have some clonogenics to do here.

NOTE Confidence: 0.76271804125

00:48:32.880 --> 00:48:34.308 But just you can see in the

NOTE Confidence: 0.76271804125

00:48:34.308 --> 00:48:35.979 middle here that in this HEK,

NOTE Confidence: 0.76271804125

00:48:35.979 --> 00:48:37.038 this hex align,

NOTE Confidence: 0.76271804125

00:48:37.040 --> 00:48:39.320 MGC science mismatch very deficient,

NOTE Confidence: 0.76271804125

00:48:39.320 --> 00:48:40.200 you can see a very,

NOTE Confidence: 0.76271804125

00:48:40.200 --> 00:48:42.972 very nice effect of a Fank

NOTE Confidence: 0.76271804125

00:48:42.972 --> 00:48:44.358 Jay inducing sensitivity.

NOTE Confidence: 0.76271804125

00:48:44.360 --> 00:48:46.292 So this platform is exciting because

NOTE Confidence: 0.76271804125

00:48:46.292 --> 00:48:48.758 just sort of going the previous slide,

NOTE Confidence: 0.76271804125

00:48:48.760 --> 00:48:50.360 what we're trying to do,

NOTE Confidence: 0.76271804125

00:48:50.360 --> 00:48:51.984 what we're now going to be looking  
NOTE Confidence: 0.76271804125

00:48:51.984 --> 00:48:54.170 at is actually using this platform to  
NOTE Confidence: 0.76271804125

00:48:54.170 --> 00:48:55.610 actually start fingerprinting different  
NOTE Confidence: 0.76271804125

00:48:55.610 --> 00:48:57.189 alkylators as we make different  
NOTE Confidence: 0.76271804125

00:48:57.189 --> 00:48:58.809 model modifiers and warheads to sort  
NOTE Confidence: 0.76271804125

00:48:58.809 --> 00:49:00.640 of see how the landscape shifts.  
NOTE Confidence: 0.76271804125

00:49:00.640 --> 00:49:02.380 And actually we're always open  
NOTE Confidence: 0.76271804125

00:49:02.380 --> 00:49:03.076 to collaborations,  
NOTE Confidence: 0.76271804125

00:49:03.080 --> 00:49:04.620 you know shoot calling or or mean  
NOTE Confidence: 0.76271804125

00:49:04.620 --> 00:49:05.802 e-mail if you're interested in  
NOTE Confidence: 0.76271804125

00:49:05.802 --> 00:49:07.475 testing a drug out in our platform.  
NOTE Confidence: 0.76271804125

00:49:07.480 --> 00:49:09.520 And depending on the interest in the fit,  
NOTE Confidence: 0.76271804125

00:49:09.520 --> 00:49:11.476 we could, we could certainly collaborate,  
NOTE Confidence: 0.76271804125

00:49:11.480 --> 00:49:14.040 we have this kind of running pretty well.  
NOTE Confidence: 0.76271804125

00:49:14.040 --> 00:49:16.105 So with that sort of just conclusions  
NOTE Confidence: 0.76271804125

00:49:16.105 --> 00:49:17.643 and future directions hopefully I've

NOTE Confidence: 0.76271804125

00:49:17.643 --> 00:49:19.443 shown you that we've identified the

NOTE Confidence: 0.76271804125

00:49:19.443 --> 00:49:21.206 first MGT dependent mismatch repair

NOTE Confidence: 0.76271804125

00:49:21.206 --> 00:49:23.056 independent alculator which has a

NOTE Confidence: 0.76271804125

00:49:23.056 --> 00:49:24.976 very favorable TI which I believe

NOTE Confidence: 0.76271804125

00:49:24.976 --> 00:49:26.152 potentially meets the constraints

NOTE Confidence: 0.76271804125

00:49:26.152 --> 00:49:28.775 of of what could be successful as a

NOTE Confidence: 0.76271804125

00:49:28.775 --> 00:49:30.095 synthetic lethal targeting strategy

NOTE Confidence: 0.76271804125

00:49:30.146 --> 00:49:31.714 that can make it in the clinic.

NOTE Confidence: 0.76271804125

00:49:31.720 --> 00:49:33.771 We've spent a lot of time loosening

NOTE Confidence: 0.76271804125

00:49:33.771 --> 00:49:35.704 the mechanism of activity then a

NOTE Confidence: 0.76271804125

00:49:35.704 --> 00:49:37.064 lot of validation experiments that

NOTE Confidence: 0.76271804125

00:49:37.064 --> 00:49:38.200 are presented here today.

NOTE Confidence: 0.76271804125

00:49:38.200 --> 00:49:40.146 We'd argue this is a whole new

NOTE Confidence: 0.76271804125

00:49:40.146 --> 00:49:42.159 way to exploit DNA repair defects

NOTE Confidence: 0.76271804125

00:49:42.160 --> 00:49:44.160 and hopefully you'll see James

NOTE Confidence: 0.76271804125

00:49:44.160 --> 00:49:45.199 Elias upcoming RIP talk.  
NOTE Confidence: 0.76271804125

00:49:45.199 --> 00:49:46.960 I don't know if it's coming up soon,  
NOTE Confidence: 0.76271804125

00:49:46.960 --> 00:49:48.820 but sometimes doing this for  
NOTE Confidence: 0.76271804125

00:49:48.820 --> 00:49:50.680 HRD or brach immune cancers,  
NOTE Confidence: 0.76271804125

00:49:50.680 --> 00:49:52.728 we can do this for IDH immune cancers  
NOTE Confidence: 0.76271804125

00:49:52.728 --> 00:49:54.239 with actually inhibit out BH.  
NOTE Confidence: 0.76271804125

00:49:54.239 --> 00:49:56.237 There's a lot of different pathways  
NOTE Confidence: 0.76271804125

00:49:56.237 --> 00:49:58.452 we can go here and I think we  
NOTE Confidence: 0.76271804125

00:49:58.452 --> 00:49:59.867 can actually do really novel  
NOTE Confidence: 0.76271804125

00:49:59.867 --> 00:50:01.618 combinations here looking at DNA  
NOTE Confidence: 0.76271804125

00:50:01.618 --> 00:50:02.680 preparing hip accommodations.  
NOTE Confidence: 0.76271804125

00:50:02.680 --> 00:50:04.759 What I haven't shown you Juan Vasquez,  
NOTE Confidence: 0.76271804125

00:50:04.760 --> 00:50:06.866 postdoc in our lab and now has his own  
NOTE Confidence: 0.76271804125

00:50:06.866 --> 00:50:09.259 lab here is looking at immunotherapy  
NOTE Confidence: 0.76271804125

00:50:09.259 --> 00:50:11.048 combinations again because of immunogenic  
NOTE Confidence: 0.76271804125

00:50:11.048 --> 00:50:12.758 cell death from cross linking.

NOTE Confidence: 0.76271804125

00:50:12.760 --> 00:50:14.074 And of course very exciting to

NOTE Confidence: 0.76271804125

00:50:14.074 --> 00:50:15.360 launch this into a company.

NOTE Confidence: 0.76271804125

00:50:15.360 --> 00:50:16.236 We just shared a little bit.

NOTE Confidence: 0.76271804125

00:50:16.240 --> 00:50:17.759 There's a lot going on with modify

NOTE Confidence: 0.76271804125

00:50:17.759 --> 00:50:19.226 but didn't want to focus on on

NOTE Confidence: 0.76271804125

00:50:19.226 --> 00:50:20.771 that today which we hope will be in

NOTE Confidence: 0.76271804125

00:50:20.771 --> 00:50:23.436 the clinic in about a year or so.

NOTE Confidence: 0.790767504545455

00:50:23.440 --> 00:50:24.472 So of course as always I

NOTE Confidence: 0.790767504545455

00:50:24.472 --> 00:50:25.400 just make the slides here.

NOTE Confidence: 0.790767504545455

00:50:25.400 --> 00:50:27.024 So I got to thank the people

NOTE Confidence: 0.790767504545455

00:50:27.024 --> 00:50:28.437 actually do the the work and

NOTE Confidence: 0.790767504545455

00:50:28.437 --> 00:50:29.859 folks that I'll mention here run

NOTE Confidence: 0.790767504545455

00:50:29.859 --> 00:50:31.779 to me or long time lab manager

NOTE Confidence: 0.790767504545455

00:50:31.779 --> 00:50:33.513 Colin who did the crisper screen.

NOTE Confidence: 0.790767504545455

00:50:33.520 --> 00:50:35.570 Kingston Lynn and the PhD

NOTE Confidence: 0.790767504545455

00:50:35.570 --> 00:50:36.800 student graduating soon.  
NOTE Confidence: 0.790767504545455

00:50:36.800 --> 00:50:38.576 Pratik who did the post doc  
NOTE Confidence: 0.790767504545455

00:50:38.576 --> 00:50:39.760 doing the AML work.  
NOTE Confidence: 0.790767504545455

00:50:39.760 --> 00:50:41.699 And I've eluded some of the other  
NOTE Confidence: 0.790767504545455

00:50:41.699 --> 00:50:43.384 folks like James and and others  
NOTE Confidence: 0.790767504545455

00:50:43.384 --> 00:50:45.246 and then Susan Gable who now just  
NOTE Confidence: 0.790767504545455

00:50:45.301 --> 00:50:47.166 started her laboratory and Juan  
NOTE Confidence: 0.790767504545455

00:50:47.166 --> 00:50:49.104 Vasquez and of course the Herzog  
NOTE Confidence: 0.790767504545455

00:50:49.104 --> 00:50:51.017 Laboratory who's been really a joint  
NOTE Confidence: 0.790767504545455

00:50:51.017 --> 00:50:52.695 project through and through and then  
NOTE Confidence: 0.790767504545455

00:50:52.695 --> 00:50:54.335 finally thank all the folks that  
NOTE Confidence: 0.790767504545455

00:50:54.335 --> 00:50:56.160 fund our work and got ended on time.  
NOTE Confidence: 0.790767504545455

00:50:56.160 --> 00:50:56.880 This is great.  
NOTE Confidence: 0.790767504545455

00:50:56.880 --> 00:50:57.120 All right.  
NOTE Confidence: 0.76173267625

00:51:04.440 --> 00:51:08.160 So we have time for questions or yeah, sorry  
NOTE Confidence: 0.521108948666667

00:51:08.840 --> 00:51:11.153 the one you like your second or less of

NOTE Confidence: 0.521108948666667  
00:51:11.153 --> 00:51:13.797 a second talk about immune interactions  
NOTE Confidence: 0.521108948666667  
00:51:13.800 --> 00:51:15.224 they've done about lung cancer,  
NOTE Confidence: 0.521108948666667  
00:51:15.224 --> 00:51:18.336 colon cancer and the DNA response problems.  
NOTE Confidence: 0.521108948666667  
00:51:18.336 --> 00:51:21.200 We know those are very sensitive in  
NOTE Confidence: 0.521108948666667  
00:51:21.200 --> 00:51:23.339 the but I wonder if the but how much  
NOTE Confidence: 0.521108948666667  
00:51:23.339 --> 00:51:25.290 are you pushing on the idea that you're  
NOTE Confidence: 0.521108948666667  
00:51:25.290 --> 00:51:27.458 going to be enhancing the effectiveness  
NOTE Confidence: 0.521108948666667  
00:51:27.458 --> 00:51:29.410 by also enhancing that pathway.  
NOTE Confidence: 0.521108948666667  
00:51:29.410 --> 00:51:30.635 We already know it was  
NOTE Confidence: 0.366382148  
00:51:33.440 --> 00:51:35.607 important that the so of of mismatch repair  
NOTE Confidence: 0.366382148  
00:51:35.607 --> 00:51:37.490 loss or yeah so it's interesting because  
NOTE Confidence: 0.366382148  
00:51:37.536 --> 00:51:39.360 you know there's been a lot of interest.  
NOTE Confidence: 0.366382148  
00:51:39.360 --> 00:51:41.346 I think this may diagonally answer  
NOTE Confidence: 0.366382148  
00:51:41.346 --> 00:51:43.619 your question and tell me if it doesn't  
NOTE Confidence: 0.366382148  
00:51:43.619 --> 00:51:46.352 is a lot of people are now trying to  
NOTE Confidence: 0.366382148

00:51:46.352 --> 00:51:48.136 give tamazolamide to induce Microsoft  
NOTE Confidence: 0.366382148

00:51:48.136 --> 00:51:50.280 instability and mismatch repair.  
NOTE Confidence: 0.366382148

00:51:50.280 --> 00:51:52.009 And there's AGI trial of the air  
NOTE Confidence: 0.366382148

00:51:52.009 --> 00:51:53.745 through the trial where they actually  
NOTE Confidence: 0.366382148

00:51:53.745 --> 00:51:55.320 took MGMT silence colon cancer.  
NOTE Confidence: 0.366382148

00:51:55.320 --> 00:51:56.544 And they found that when you  
NOTE Confidence: 0.366382148

00:51:56.544 --> 00:51:58.080 give them TMZ the tumors respond,  
NOTE Confidence: 0.366382148

00:51:58.080 --> 00:51:59.064 they become resistant,  
NOTE Confidence: 0.366382148

00:51:59.064 --> 00:52:01.360 60% of them get mismatched pair mutations.  
NOTE Confidence: 0.366382148

00:52:01.360 --> 00:52:03.475 And then they went on to get immunotherapy  
NOTE Confidence: 0.366382148

00:52:03.475 --> 00:52:05.680 and they thought that they would respond  
NOTE Confidence: 0.366382148

00:52:05.680 --> 00:52:07.837 but the responses were quite limited.  
NOTE Confidence: 0.366382148

00:52:07.840 --> 00:52:10.560 And this is Keith Liggin up at up in  
NOTE Confidence: 0.366382148

00:52:10.560 --> 00:52:12.410 Boston pathologist who would has shown  
NOTE Confidence: 0.366382148

00:52:12.410 --> 00:52:14.405 that it's likely that there's just not  
NOTE Confidence: 0.366382148

00:52:14.405 --> 00:52:16.359 enough time for NEO antigen formation.

NOTE Confidence: 0.366382148

00:52:16.360 --> 00:52:19.615 So I think acquired mismatch of pair

NOTE Confidence: 0.366382148

00:52:19.615 --> 00:52:21.428 mutations after TMZ for instance

NOTE Confidence: 0.366382148

00:52:21.428 --> 00:52:23.113 will not respond to immunotherapy

NOTE Confidence: 0.366382148

00:52:23.113 --> 00:52:24.398 like we think we did.

NOTE Confidence: 0.366382148

00:52:24.400 --> 00:52:26.297 We do think though the KL50 induced

NOTE Confidence: 0.366382148

00:52:26.297 --> 00:52:27.744 cross linking could be immunogenic

NOTE Confidence: 0.366382148

00:52:27.744 --> 00:52:29.199 cell death could sensitize that

NOTE Confidence: 0.366382148

00:52:29.199 --> 00:52:30.959 sort of gets at your question.

NOTE Confidence: 0.366382148

00:52:30.960 --> 00:52:31.200 But

NOTE Confidence: 0.18066235

00:52:33.240 --> 00:52:36.595 yeah it's beautiful work and I think

NOTE Confidence: 0.18066235

00:52:36.595 --> 00:52:38.360 you know your work illustrates to

NOTE Confidence: 0.694995168

00:52:38.360 --> 00:52:41.600 training is the power of having you

NOTE Confidence: 0.694995168

00:52:41.600 --> 00:52:43.900 know a broad perspective historically

NOTE Confidence: 0.694995168

00:52:43.900 --> 00:52:47.055 what what what didn't mean why and

NOTE Confidence: 0.694995168

00:52:47.055 --> 00:52:49.599 then the focus on individual residues,

NOTE Confidence: 0.694995168

00:52:49.600 --> 00:52:52.960 the obsession that you've shown in your work,

NOTE Confidence: 0.694995168

00:52:52.960 --> 00:52:56.024 you know the details of all of this work.

NOTE Confidence: 0.694995168

00:52:56.024 --> 00:52:57.572 So Congrats. Thank you.

NOTE Confidence: 0.694995168

00:52:57.572 --> 00:53:01.648 I I have a basic question.

NOTE Confidence: 0.694995168

00:53:01.648 --> 00:53:06.400 The MGMT dependency, this is related

NOTE Confidence: 0.694995168

00:53:06.400 --> 00:53:08.985 to the the tumor lacking that enzyme,

NOTE Confidence: 0.694995168

00:53:08.985 --> 00:53:10.635 but the wild type cells have

NOTE Confidence: 0.694995168

00:53:10.635 --> 00:53:12.237 that enzyme as you understand.

NOTE Confidence: 0.694995168

00:53:12.240 --> 00:53:14.438 Yeah. So that's in part a great

NOTE Confidence: 0.486917185

00:53:16.840 --> 00:53:19.640 tolman of specificity there. Yes. And

NOTE Confidence: 0.516340701666667

00:53:21.920 --> 00:53:24.280 I was a question. The question is,

NOTE Confidence: 0.25214335

00:53:28.520 --> 00:53:33.079 yeah, it's a tough crowd, tough crowd.

NOTE Confidence: 0.25214335

00:53:33.080 --> 00:53:34.720 Demetrius always asking questions. The

NOTE Confidence: 0.778426584285714

00:53:35.480 --> 00:53:36.368 question is, you know,

NOTE Confidence: 0.778426584285714

00:53:36.368 --> 00:53:37.502 I was thinking, you know,

NOTE Confidence: 0.778426584285714

00:53:37.502 --> 00:53:38.888 would it be useful to wash

NOTE Confidence: 0.778426584285714  
00:53:38.888 --> 00:53:40.318 it out because you have,  
NOTE Confidence: 0.778426584285714  
00:53:40.320 --> 00:53:41.432 it's so sensitive. Right.  
NOTE Confidence: 0.778426584285714  
00:53:41.432 --> 00:53:42.822 So you could add back  
NOTE Confidence: 0.778426584285714  
00:53:42.822 --> 00:53:43.800 that enzyme essentially.  
NOTE Confidence: 0.5585509425  
00:53:44.560 --> 00:53:46.280 So. Oh, yeah. Yeah.  
NOTE Confidence: 0.674997036153846  
00:53:46.280 --> 00:53:47.864 Oh, interesting. And I don't know  
NOTE Confidence: 0.674997036153846  
00:53:47.864 --> 00:53:49.800 if that's if that would be useful,  
NOTE Confidence: 0.674997036153846  
00:53:49.800 --> 00:53:51.312 but it seems like your wild  
NOTE Confidence: 0.674997036153846  
00:53:51.312 --> 00:53:52.760 type does have that enzyme.  
NOTE Confidence: 0.674997036153846  
00:53:52.760 --> 00:53:54.195 So you're really not washing out there.  
NOTE Confidence: 0.674997036153846  
00:53:54.200 --> 00:53:56.475 I was thinking in terms of toxicity,  
NOTE Confidence: 0.674997036153846  
00:53:56.475 --> 00:53:59.520 but it will give you even greater.  
NOTE Confidence: 0.674997036153846  
00:53:59.520 --> 00:54:00.879 Yeah even wider  
NOTE Confidence: 0.77165078  
00:54:01.520 --> 00:54:02.192 dose. Yeah. Yeah.  
NOTE Confidence: 0.77165078  
00:54:02.192 --> 00:54:04.070 No, no, it's it's actually we're we  
NOTE Confidence: 0.77165078

00:54:04.070 --> 00:54:06.599 have a it's kind of a secret project.  
NOTE Confidence: 0.77165078

00:54:06.600 --> 00:54:09.040 Some grads didn't get mad if I talk about it.  
NOTE Confidence: 0.77165078

00:54:09.040 --> 00:54:11.040 But we're trying to go the other way  
NOTE Confidence: 0.77165078

00:54:11.040 --> 00:54:13.272 which is trying to like a radiation  
NOTE Confidence: 0.77165078

00:54:13.272 --> 00:54:15.312 activated version where where you knock  
NOTE Confidence: 0.77165078

00:54:15.312 --> 00:54:17.184 out MGMT like because MGT unmethylated  
NOTE Confidence: 0.77165078

00:54:17.184 --> 00:54:19.344 tumors is a huge unmet need there  
NOTE Confidence: 0.77165078

00:54:19.344 --> 00:54:20.874 because then the therapeutic index.  
NOTE Confidence: 0.77165078

00:54:20.880 --> 00:54:21.864 So again this is a diagonal  
NOTE Confidence: 0.77165078

00:54:21.864 --> 00:54:22.520 answer to your question,  
NOTE Confidence: 0.77165078

00:54:22.520 --> 00:54:24.805 but where we could actually  
NOTE Confidence: 0.77165078

00:54:24.805 --> 00:54:26.063 have MGMT inhibition,  
NOTE Confidence: 0.77165078

00:54:26.063 --> 00:54:28.121 so O 6 pencil guanine that's  
NOTE Confidence: 0.77165078

00:54:28.121 --> 00:54:30.400 activated only in the radiation field.  
NOTE Confidence: 0.77165078

00:54:30.400 --> 00:54:31.744 So that's kind of one way  
NOTE Confidence: 0.77165078

00:54:31.744 --> 00:54:32.640 we're getting at that.

NOTE Confidence: 0.77165078

00:54:32.640 --> 00:54:34.656 But to your point of some people have tried

NOTE Confidence: 0.77165078

00:54:34.656 --> 00:54:36.837 to do like rescue experiments and whatnot,

NOTE Confidence: 0.77165078

00:54:36.840 --> 00:54:38.240 I think it's it's hard,

NOTE Confidence: 0.77165078

00:54:38.240 --> 00:54:39.800 I think it would come down to to

NOTE Confidence: 0.77165078

00:54:39.800 --> 00:54:41.024 timing and sequencing just to

NOTE Confidence: 0.77165078

00:54:41.024 --> 00:54:42.596 try to magnify the therapy index.

NOTE Confidence: 0.77165078

00:54:42.600 --> 00:54:42.786 Yeah.

NOTE Confidence: 0.77165078

00:54:42.786 --> 00:54:43.158 In the

NOTE Confidence: 0.638274035

00:54:43.640 --> 00:54:46.356 animal studies that fail, do they fail

NOTE Confidence: 0.638274035

00:54:46.356 --> 00:54:49.960 because of progression? They fail, yeah,

NOTE Confidence: 0.7920387015

00:54:51.680 --> 00:54:52.796 yeah. Yeah. I think,

NOTE Confidence: 0.7920387015

00:54:52.796 --> 00:54:55.018 I think the therapeutic index is the issue

NOTE Confidence: 0.7920387015

00:54:55.018 --> 00:54:56.994 with the mouse studies we show is is,

NOTE Confidence: 0.7920387015

00:54:57.000 --> 00:54:59.344 is and we didn't show this because the

NOTE Confidence: 0.7920387015

00:54:59.344 --> 00:55:01.212 companies mainly working on this is the

NOTE Confidence: 0.7920387015

00:55:01.212 --> 00:55:03.239 Heen tox is is severely dose limiting.  
NOTE Confidence: 0.7920387015

00:55:03.240 --> 00:55:06.440 And and actually even with KL50 the the,  
NOTE Confidence: 0.7920387015

00:55:06.440 --> 00:55:08.197 the, the therapeutic index that we get  
NOTE Confidence: 0.7920387015

00:55:08.197 --> 00:55:10.110 if you do a rat tolerability study  
NOTE Confidence: 0.7920387015

00:55:10.110 --> 00:55:12.087 which is a better which I've been  
NOTE Confidence: 0.7920387015

00:55:12.087 --> 00:55:14.175 taught is the is a better surrogate for  
NOTE Confidence: 0.7920387015

00:55:14.175 --> 00:55:16.554 human Heen tox and like an actual rat.  
NOTE Confidence: 0.7920387015

00:55:16.560 --> 00:55:18.078 Straight up you know, 30 day,  
NOTE Confidence: 0.7920387015

00:55:18.080 --> 00:55:19.648 five day on observation.  
NOTE Confidence: 0.7920387015

00:55:19.648 --> 00:55:22.000 The Heen tox is dose limiting.  
NOTE Confidence: 0.7920387015

00:55:22.000 --> 00:55:23.480 And so that is probably the biggest issue.  
NOTE Confidence: 0.7920387015

00:55:23.480 --> 00:55:24.480 That's interesting.  
NOTE Confidence: 0.5216595525

00:55:26.520 --> 00:55:28.570 Think about dosing the blood  
NOTE Confidence: 0.5216595525

00:55:28.570 --> 00:55:30.120 based enzyme like that. That's  
NOTE Confidence: 0.793485329285714

00:55:30.120 --> 00:55:31.244 interesting. Oh yeah. Yeah.  
NOTE Confidence: 0.793485329285714

00:55:31.244 --> 00:55:33.301 And they could be taken up in

NOTE Confidence: 0.793485329285714  
00:55:33.301 --> 00:55:34.380 the Heen compartment. Yeah.  
NOTE Confidence: 0.793485329285714  
00:55:34.380 --> 00:55:35.264 We should talk actually.  
NOTE Confidence: 0.793485329285714  
00:55:35.264 --> 00:55:36.040 Yeah. Yeah. Yeah.  
NOTE Confidence: 0.754584102  
00:55:36.680 --> 00:55:37.704 It's something to consider.  
NOTE Confidence: 0.754584102  
00:55:37.704 --> 00:55:39.144 Yeah. Because if you're getting  
NOTE Confidence: 0.754584102  
00:55:39.144 --> 00:55:40.688 dose limiting tox. Yeah.  
NOTE Confidence: 0.754584102  
00:55:40.688 --> 00:55:42.648 You have this enzyme dependent,  
NOTE Confidence: 0.754584102  
00:55:42.648 --> 00:55:44.406 you know, to leave. Yeah. Yeah.  
NOTE Confidence: 0.754584102  
00:55:44.406 --> 00:55:45.200 There's a you might be able  
NOTE Confidence: 0.754584102  
00:55:45.200 --> 00:55:46.000 to take advantage of that,  
NOTE Confidence: 0.754584102  
00:55:46.000 --> 00:55:47.600 especially if it's Heen related.  
NOTE Confidence: 0.531490425  
00:55:48.080 --> 00:55:48.940 Yeah. We should talk later  
NOTE Confidence: 0.531490425  
00:55:48.940 --> 00:55:49.800 if there'd be an interesting  
NOTE Confidence: 0.531490425  
00:55:49.840 --> 00:55:50.720 way to selectively delivery.  
NOTE Confidence: 0.531490425  
00:55:50.720 --> 00:55:53.720 That's cool. Yeah. Yeah. Like,  
NOTE Confidence: 0.6358923

00:55:55.760 --> 00:55:56.759 yeah, we'll see.  
NOTE Confidence: 0.63761854  
00:56:06.520 --> 00:56:07.000 Yeah.  
NOTE Confidence: 0.5259187  
00:56:14.120 --> 00:56:14.560 Yeah,  
NOTE Confidence: 0.70450163  
00:56:17.560 --> 00:56:18.560 100%, Yeah.  
NOTE Confidence: 0.5181751  
00:56:21.040 --> 00:56:23.852 Yeah, it's very, no,  
NOTE Confidence: 0.5181751  
00:56:23.852 --> 00:56:25.076 it's very stressful actually.  
NOTE Confidence: 0.5181751  
00:56:25.080 --> 00:56:27.036 We're thinking about this a lot  
NOTE Confidence: 0.5181751  
00:56:27.040 --> 00:56:28.590 both academically and then obviously  
NOTE Confidence: 0.5181751  
00:56:28.590 --> 00:56:30.140 the company but academically and  
NOTE Confidence: 0.5181751  
00:56:30.187 --> 00:56:31.903 actually been relying a lot of  
NOTE Confidence: 0.5181751  
00:56:31.903 --> 00:56:33.006 pathology colleagues here for  
NOTE Confidence: 0.5181751  
00:56:33.006 --> 00:56:34.584 for input because one thing I've  
NOTE Confidence: 0.5181751  
00:56:34.584 --> 00:56:36.038 been digging in the literature,  
NOTE Confidence: 0.5181751  
00:56:36.040 --> 00:56:37.465 it's like so MGMT promoter  
NOTE Confidence: 0.5181751  
00:56:37.465 --> 00:56:39.235 methylation as many people in this  
NOTE Confidence: 0.5181751  
00:56:39.235 --> 00:56:40.680 audience know better than me.

NOTE Confidence: 0.5181751

00:56:40.680 --> 00:56:42.264 You know it's sort of a cut off

NOTE Confidence: 0.5181751

00:56:42.264 --> 00:56:43.827 and sort of arbitrary and so but

NOTE Confidence: 0.5181751

00:56:43.827 --> 00:56:45.420 then on the same side we've been

NOTE Confidence: 0.5181751

00:56:45.420 --> 00:56:46.756 trying to do an MGMTIHC essay,

NOTE Confidence: 0.5181751

00:56:46.756 --> 00:56:48.184 we've been doing some TM as

NOTE Confidence: 0.5181751

00:56:48.184 --> 00:56:49.679 right now we're working on this

NOTE Confidence: 0.5181751

00:56:49.680 --> 00:56:52.560 working with Kurt and then others.

NOTE Confidence: 0.5181751

00:56:52.560 --> 00:56:55.213 And the issue with the MGMTIHC is it

NOTE Confidence: 0.5181751

00:56:55.213 --> 00:56:57.880 it seems to not be as the threshold,

NOTE Confidence: 0.5181751

00:56:57.880 --> 00:56:59.386 the dynamic range where even if

NOTE Confidence: 0.5181751

00:56:59.386 --> 00:57:01.196 it's out on IHC there's still

NOTE Confidence: 0.5181751

00:57:01.196 --> 00:57:02.318 low level expression.

NOTE Confidence: 0.5181751

00:57:02.320 --> 00:57:02.924 Craig Orbinski,

NOTE Confidence: 0.5181751

00:57:02.924 --> 00:57:05.038 I don't know if he's a neuropathologist

NOTE Confidence: 0.5181751

00:57:05.040 --> 00:57:06.395 at Northwestern talks about this

NOTE Confidence: 0.5181751

00:57:06.395 --> 00:57:08.312 all the time and the other elephant

NOTE Confidence: 0.5181751

00:57:08.312 --> 00:57:10.352 in his room is the IHC is negative.

NOTE Confidence: 0.5181751

00:57:10.360 --> 00:57:12.383 When you treat the TMZ there is

NOTE Confidence: 0.5181751

00:57:12.383 --> 00:57:14.670 some data that MGMT can be re

NOTE Confidence: 0.5181751

00:57:14.670 --> 00:57:16.365 expressed and depending on the

NOTE Confidence: 0.5181751

00:57:16.365 --> 00:57:18.316 promoter methylation sites and so.

NOTE Confidence: 0.5181751

00:57:18.316 --> 00:57:20.220 So what I think is going to be

NOTE Confidence: 0.5181751

00:57:20.285 --> 00:57:22.040 the answer is a combination.

NOTE Confidence: 0.5181751

00:57:22.040 --> 00:57:24.302 So in the colon cancer literature

NOTE Confidence: 0.5181751

00:57:24.302 --> 00:57:26.000 recently what they're doing is

NOTE Confidence: 0.5181751

00:57:26.000 --> 00:57:28.880 both IHC for MGMT and promoter

NOTE Confidence: 0.5181751

00:57:28.880 --> 00:57:30.348 methylation and they're actually

NOTE Confidence: 0.5181751

00:57:30.348 --> 00:57:31.872 doing this thing called the methyl

NOTE Confidence: 0.5181751

00:57:31.872 --> 00:57:33.264 beam assay which you guys probably

NOTE Confidence: 0.5181751

00:57:33.264 --> 00:57:34.912 know more than meets like a digital

NOTE Confidence: 0.5181751

00:57:34.912 --> 00:57:35.959 MGMT promoter methylation.

NOTE Confidence: 0.5181751

00:57:35.960 --> 00:57:37.556 So Long story short is I think

NOTE Confidence: 0.5181751

00:57:37.560 --> 00:57:39.732 trying to have a double selection

NOTE Confidence: 0.5181751

00:57:39.732 --> 00:57:41.582 for homogeneously silenced by IHC

NOTE Confidence: 0.5181751

00:57:41.582 --> 00:57:43.616 and meets the criteria for promoter

NOTE Confidence: 0.5181751

00:57:43.616 --> 00:57:45.781 methylation will be key because there

NOTE Confidence: 0.5181751

00:57:45.781 --> 00:57:47.591 are partially methylated cases that

NOTE Confidence: 0.5181751

00:57:47.591 --> 00:57:49.160 are going to totally screw this up.

NOTE Confidence: 0.5181751

00:57:49.160 --> 00:57:49.960 It's related

NOTE Confidence: 0.65060273

00:57:51.360 --> 00:57:51.640 but I

NOTE Confidence: 0.6487414

00:57:54.400 --> 00:57:55.560 don't know, I don't want

NOTE Confidence: 0.446819254

00:57:58.440 --> 00:58:01.040 that. Oh yeah, because they are, yeah,

NOTE Confidence: 0.446819254

00:58:01.360 --> 00:58:03.079 100% yeah, so so TET is some of the,

NOTE Confidence: 0.446819254

00:58:03.080 --> 00:58:05.005 you know as question was

NOTE Confidence: 0.446819254

00:58:05.005 --> 00:58:06.160 about TET expression.

NOTE Confidence: 0.446819254

00:58:06.160 --> 00:58:10.176 So mutations in the 10/10/11 trans low case,

NOTE Confidence: 0.446819254

00:58:10.176 --> 00:58:12.396 which is hydroxy methyl cytosine  
NOTE Confidence: 0.446819254

00:58:12.396 --> 00:58:13.434 maintenance in AML.  
NOTE Confidence: 0.446819254

00:58:13.434 --> 00:58:15.216 We're doing this with Stephanie Helene's  
NOTE Confidence: 0.446819254

00:58:15.216 --> 00:58:17.440 lab where TET mutations are common.  
NOTE Confidence: 0.446819254

00:58:17.440 --> 00:58:19.552 We're trying to see if TET will be  
NOTE Confidence: 0.446819254

00:58:19.552 --> 00:58:21.476 a predictor for MGMT expression and  
NOTE Confidence: 0.446819254

00:58:21.476 --> 00:58:23.474 IDH mutations as many people know,  
NOTE Confidence: 0.446819254

00:58:23.480 --> 00:58:24.580 inhibit TET as well.  
NOTE Confidence: 0.446819254

00:58:24.580 --> 00:58:25.955 That's another project that we're  
NOTE Confidence: 0.446819254

00:58:25.955 --> 00:58:27.463 trying to get that which has been  
NOTE Confidence: 0.446819254

00:58:27.463 --> 00:58:28.800 harder to do than we thought.  
NOTE Confidence: 0.446819254

00:58:28.800 --> 00:58:29.958 But yeah, it's a great question.  
NOTE Confidence: 0.446819254

00:58:29.960 --> 00:58:31.200 Yeah, I have a question.  
NOTE Confidence: 0.603680027777778

00:58:31.320 --> 00:58:33.696 One of the sort of tumor you showed  
NOTE Confidence: 0.603680027777778

00:58:33.696 --> 00:58:36.520 with MGMT insulation is breast cancer,  
NOTE Confidence: 0.603680027777778

00:58:36.520 --> 00:58:38.171 breast cancer with the DRC one

NOTE Confidence: 0.603680027777778  
00:58:38.171 --> 00:58:39.359 deficiency in general line,  
NOTE Confidence: 0.603680027777778  
00:58:39.360 --> 00:58:41.120 the bottom is really nice.  
NOTE Confidence: 0.603680027777778  
00:58:41.120 --> 00:58:42.944 And the other showroom MIC mutation.  
NOTE Confidence: 0.603680027777778  
00:58:42.944 --> 00:58:45.248 But when they used it in  
NOTE Confidence: 0.603680027777778  
00:58:45.248 --> 00:58:46.400 the semantic mutation,  
NOTE Confidence: 0.603680027777778  
00:58:46.400 --> 00:58:48.815 the trial team made it and they  
NOTE Confidence: 0.603680027777778  
00:58:48.815 --> 00:58:51.920 did the HR score and they should  
NOTE Confidence: 0.603680027777778  
00:58:51.920 --> 00:58:53.760 benefit from Barbara negative.  
NOTE Confidence: 0.603680027777778  
00:58:53.760 --> 00:58:54.796 They only have semantic.  
NOTE Confidence: 0.603680027777778  
00:58:54.796 --> 00:58:56.840 So what's your thought the HR revealed?  
NOTE Confidence: 0.603680027777778  
00:58:56.840 --> 00:58:58.178 Mm hmm. Mm  
NOTE Confidence: 0.788802108  
00:58:58.180 --> 00:59:01.040 hmm. Yeah. I mean for you know,  
NOTE Confidence: 0.788802108  
00:59:01.040 --> 00:59:02.120 for that, that's a great question.  
NOTE Confidence: 0.788802108  
00:59:02.120 --> 00:59:03.255 I mean, there's even questions  
NOTE Confidence: 0.788802108  
00:59:03.255 --> 00:59:04.720 about loss of the second allele.  
NOTE Confidence: 0.788802108

00:59:04.720 --> 00:59:06.540 Susan, Don check at Pennis  
NOTE Confidence: 0.788802108

00:59:06.540 --> 00:59:08.360 asked that question as well.  
NOTE Confidence: 0.788802108

00:59:08.360 --> 00:59:09.860 It's confounded though because I think  
NOTE Confidence: 0.788802108

00:59:09.860 --> 00:59:11.637 the new PARP one selective PARP numbers  
NOTE Confidence: 0.788802108

00:59:11.637 --> 00:59:13.560 that you like like AZD 5 three O 5,  
NOTE Confidence: 0.788802108

00:59:13.560 --> 00:59:15.824 I think they may be able to get  
NOTE Confidence: 0.788802108

00:59:15.824 --> 00:59:18.110 enough PARP inhibition to hit even  
NOTE Confidence: 0.788802108

00:59:18.110 --> 00:59:19.760 if it's a happenence efficiency.  
NOTE Confidence: 0.788802108

00:59:19.760 --> 00:59:22.077 But you know, on a side note,  
NOTE Confidence: 0.788802108

00:59:22.080 --> 00:59:24.360 we're also looking at MGMT loss and HRD,  
NOTE Confidence: 0.788802108

00:59:24.360 --> 00:59:26.475 this is Susan Gables Labs doing that as well.  
NOTE Confidence: 0.788802108

00:59:26.480 --> 00:59:27.320 I don't know if I have a  
NOTE Confidence: 0.788802108

00:59:27.320 --> 00:59:28.040 full answer for you though.  
NOTE Confidence: 0.788802108

00:59:28.040 --> 00:59:28.760 Yeah, good, great.  
NOTE Confidence: 0.788802108

00:59:28.760 --> 00:59:29.720 So I just wanted  
NOTE Confidence: 0.7210149833333333

00:59:31.440 --> 00:59:36.280 to know how how much question.

NOTE Confidence: 0.61136632625

00:59:41.840 --> 00:59:43.440 Yeah, it's it's it's we're

NOTE Confidence: 0.61136632625

00:59:43.440 --> 00:59:44.400 alluding this earlier.

NOTE Confidence: 0.61136632625

00:59:44.400 --> 00:59:46.860 I think the correlation between

NOTE Confidence: 0.61136632625

00:59:46.860 --> 00:59:48.828 MGMT promoter silencing and

NOTE Confidence: 0.61136632625

00:59:48.828 --> 00:59:50.331 and MGMT protein expression,

NOTE Confidence: 0.61136632625

00:59:50.331 --> 00:59:52.353 it's quite variable and that's it's

NOTE Confidence: 0.61136632625

00:59:52.353 --> 00:59:55.180 a little bit in the glioma world if

NOTE Confidence: 0.61136632625

00:59:55.180 --> 00:59:57.172 you're promoter methylated MGMT TS out.

NOTE Confidence: 0.61136632625

00:59:57.172 --> 00:59:58.876 But in other cancers they're finding

NOTE Confidence: 0.61136632625

00:59:58.876 --> 01:00:01.047 that you can be promoter methylated but

NOTE Confidence: 0.61136632625

01:00:01.047 --> 01:00:03.079 still express MGMT the protein level.

NOTE Confidence: 0.61136632625

01:00:03.080 --> 01:00:04.440 So I think there's a lot of variability,

NOTE Confidence: 0.61136632625

01:00:04.440 --> 01:00:05.344 which is I think.

NOTE Confidence: 0.61136632625

01:00:05.344 --> 01:00:07.002 Going to be important especially for this

NOTE Confidence: 0.61136632625

01:00:07.002 --> 01:00:08.794 because the MGMT dependency is so exquisite.

NOTE Confidence: 0.61136632625

01:00:08.800 --> 01:00:12.512 So great. Cool.

NOTE Confidence: 0.61136632625

01:00:12.512 --> 01:00:13.880 I think we're at the top of the hour.

NOTE Confidence: 0.61136632625

01:00:13.880 --> 01:00:16.000 Thank you.