WEBVTT

00:00:00.000 --> 00:00:02.490 Support for Yale Cancer Answers

NOTE Confidence: 0.85496736

00:00:02.490 --> 00:00:04.980 comes from AstraZeneca, dedicated

NOTE Confidence: 0.85496736

00:00:05.057 --> 00:00:07.432 to advancing options and providing

NOTE Confidence: 0.85496736

00:00:07.432 --> 00:00:10.420 hope for people living with cancer.

NOTE Confidence: 0.85496736

00:00:10.420 --> 00:00:14.380 More information at astrazeneca-us.com.

NOTE Confidence: 0.85496736

00:00:14.380 --> 00:00:16.522 Welcome to Yale Cancer Answers with

NOTE Confidence: 0.85496736

00:00:16.522 --> 00:00:18.929 your host doctor Anees Chagpar.

NOTE Confidence: 0.85496736

00:00:18.930 --> 00:00:20.810 Yale Cancer Answers features the

NOTE Confidence: 0.85496736

00:00:20.810 --> 00:00:23.111 latest information on cancer care by

NOTE Confidence: 0.85496736

00:00:23.111 --> 00:00:24.567 welcoming oncologists and specialists

NOTE Confidence: 0.85496736

00:00:24.567 --> 00:00:27.019 who are on the forefront of the

NOTE Confidence: 0.85496736

00:00:27.019 --> 00:00:28.723 battle to fight cancer. This week,

NOTE Confidence: 0.85496736

00:00:28.730 --> 00:00:30.455 it's a conversation about genetic

NOTE Confidence: 0.85496736

00:00:30.455 --> 00:00:32.180 and environmental influences in colon

NOTE Confidence: 0.85496736

00:00:32.230 --> 00:00:33.980 cancer with Doctor Caroline Johnson.

NOTE Confidence: 0.85496736

00:00:33.980 --> 00:00:35.960 Doctor Johnson is assistant professor

NOTE Confidence: 0.85496736

00:00:35.960 --> 00:00:38.341 of Epidemiology in the Department of

NOTE Confidence: 0.85496736

00:00:38.341 --> 00:00:40.041 Environmental Health Sciences at the

NOTE Confidence: 0.85496736

00:00:40.041 --> 00:00:42.367 Yale School of Public Health and Doctor

NOTE Confidence: 0.85496736

00:00:42.367 --> 00:00:44.474 Chagpar is a professor of surgical

NOTE Confidence: 0.85496736

00:00:44.480 --> 00:00:46.930 oncology at the Yale School of Medicine.

NOTE Confidence: 0.87317926

00:00:48.260 --> 00:00:50.204 Caroline you can

NOTE Confidence: 0.87317926

00:00:50.204 --> 00:00:52.634 start off by telling us

NOTE Confidence: 0.87317926

00:00:52.640 --> 00:00:55.568 a little bit about your research?

NOTE Confidence: 0.87317926

00:00:55.570 --> 00:00:58.486 I use a technology called metabolomics

NOTE Confidence: 0.87317926

00:00:58.486 --> 00:01:00.922 to investigate specific differences

NOTE Confidence: 0.87317926

00:01:00.922 --> 00:01:03.838 in metabolism that affect colon cancer,

NOTE Confidence: 0.87317926

00:01:03.840 --> 00:01:05.301 development progression and

NOTE Confidence: 0.87317926

00:01:05.301 --> 00:01:07.249 even response to therapeutics.

NOTE Confidence: 0.87317926

00:01:07.250 --> 00:01:10.165 So particularly in my research

NOTE Confidence: 0.87317926

00:01:10.165 --> 00:01:12.497 I'm interested in examining

NOTE Confidence: 0.87317926

00:01:12.500 --> 00:01:15.002 metabolism in patients that develop tumors

NOTE Confidence: 0.87317926

00:01:15.002 --> 00:01:18.406 that occur on the right side of the colon,

NOTE Confidence: 0.87317926

00:01:18.410 --> 00:01:21.443 so that is the area of the colon between

NOTE Confidence: 0.87317926

00:01:21.443 --> 00:01:24.259 the appendix and slightly up from

NOTE Confidence: 0.87317926

00:01:24.259 --> 00:01:27.470 there in the rectum and ascending colon,

NOTE Confidence: 0.87317926

00:01:27.470 --> 00:01:29.948 because those patients have the poorest

NOTE Confidence: 0.87317926

00:01:29.948 --> 00:01:32.855 survival and what we've seen in the

NOTE Confidence: 0.87317926

00:01:32.855 --> 00:01:34.825 literature is actually female patients

NOTE Confidence: 0.87317926

00:01:34.825 --> 00:01:37.122 have much higher incidence of tumors

NOTE Confidence: 0.87317926

00:01:37.122 --> 00:01:40.230 that occur in this region of the colon,

NOTE Confidence: 0.87317926

00:01:40.230 --> 00:01:43.050 so we've been using

NOTE Confidence: 0.87317926

00:01:43.050 --> 00:01:44.975 metabolomics to get a

NOTE Confidence: 0.87317926

00:01:44.975 --> 00:01:46.515 better understanding of the

NOTE Confidence: 0.87317926

00:01:46.515 --> 00:01:47.929 metabolism of these tumors.

NOTE Confidence: 0.87317926

00:01:47.930 --> 00:01:50.180 So maybe we can stop there

NOTE Confidence: 0.8275753

00:01:50.180 --> 00:01:52.952 for a second and just kind of dig a

NOTE Confidence: 0.8275753

00:01:52.952 --> 00:01:55.438 little bit deeper into what exactly

NOTE Confidence: 0.8275753

00:01:55.438 --> 00:01:58.050 metabolomics is and how that works.

00:01:59.930 --> 00:02:02.810 It's the study of all the small

NOTE Confidence: 0.8275753

00:02:02.810 --> 00:02:04.925 molecules that are present within a

NOTE Confidence: 0.8275753

00:02:04.925 --> 00:02:07.820 sample so we can take a biological sample

NOTE Confidence: 0.8275753

00:02:07.820 --> 00:02:11.180 from a patient such as a blood sample,

NOTE Confidence: 0.8275753

00:02:11.180 --> 00:02:14.260 or even a tumor tissue,

NOTE Confidence: 0.8275753

00:02:14.260 --> 00:02:17.356 and we can analyze it in an agnostic manner.

NOTE Confidence: 0.8275753

00:02:17.360 --> 00:02:19.663 So we examine basically all the different

NOTE Confidence: 0.8275753

00:02:19.663 --> 00:02:21.771 levels of all the small molecules

NOTE Confidence: 0.8275753

00:02:21.771 --> 00:02:23.883 that might be within that sample

00:02:27.680 --> 00:02:29.738 and this is similar to genomics

NOTE Confidence: 0.8275753

00:02:29.738 --> 00:02:30.424 or transcriptomics.

NOTE Confidence: 0.8275753

00:02:30.430 --> 00:02:32.150 So small molecules are basically

NOTE Confidence: 0.8275753

00:02:32.150 --> 00:02:33.870 metabolites that are within our

NOTE Confidence: 0.8275753

00:02:33.932 --> 00:02:35.834 bodies that come from the processing

NOTE Confidence: 0.8275753

00:02:35.834 --> 00:02:37.650 of things like dietary products,

NOTE Confidence: 0.8275753

00:02:37.650 --> 00:02:39.660 and they produce vital components

NOTE Confidence: 0.8275753

00:02:39.660 --> 00:02:41.670 that are needed for our bodies

NOTE Confidence: 0.8275753

00:02:41.670 --> 00:02:43.554 for different biological processes,

NOTE Confidence: 0.8275753

00:02:43.554 --> 00:02:45.909 such as growth and healing,

NOTE Confidence: 0.8275753

00:02:45.910 --> 00:02:47.323 immune responses, energy,

NOTE Confidence: 0.8275753

00:02:47.323 --> 00:02:48.736 and even sleep,

NOTE Confidence: 0.8275753

00:02:48.740 --> 00:02:51.800 so metabolomic analysis can also

NOTE Confidence: 0.8275753

00:02:51.800 --> 00:02:53.924 really show us about the metabolism

NOTE Confidence: 0.8275753

00:02:53.924 --> 00:02:56.300 of an individual and it can

NOTE Confidence: 0.8275753

00:02:56.300 --> 00:02:58.379 also show us metabolism of things

NOTE Confidence: 0.8275753

00:02:58.448 --> 00:03:00.144 like environmental chemicals and

NOTE Confidence: 0.8275753

00:03:00.144 --> 00:03:02.688 drugs as well within an individual

NOTE Confidence: 0.8275753

00:03:02.690 --> 00:03:04.628 and that could

NOTE Confidence: 0.8275753

00:03:04.628 --> 00:03:07.198 be produced by the bacteria or even

NOTE Confidence: 0.8275753

00:03:07.198 --> 00:03:09.218 the microbiome within an individual.

NOTE Confidence: 0.8275753

00:03:09.220 --> 00:03:11.675 And this technology is particularly

NOTE Confidence: 0.8275753

00:03:11.675 --> 00:03:12.657 important for cancer

NOTE Confidence: 0.8275753

00:03:12.660 --> 00:03:14.706 because we know that metabolites

NOTE Confidence: 0.8275753

00:03:14.706 --> 00:03:17.495 can affect how a tumor grows as tumor

NOTE Confidence: 0.8275753

00:03:17.495 --> 00:03:20.113 cells need nutrients and energy and the

NOTE Confidence: 0.8275753

00:03:20.113 --> 00:03:22.157 tumors themselves produce metabolites.

NOTE Confidence: 0.8275753

00:03:22.160 --> 00:03:23.890 So metabolomics can really provide

NOTE Confidence: 0.8275753

00:03:23.890 --> 00:03:26.093 us great insight into how an

NOTE Confidence: 0.8275753

00:03:26.093 --> 00:03:27.323 individual produces metabolites

NOTE Confidence: 0.8275753

00:03:27.323 --> 00:03:29.373 and how this might propagate

NOTE Confidence: 0.8275753

00:03:29.380 --> 00:03:30.900 tumor growth as well.

NOTE Confidence: 0.8275753

00:03:30.900 --> 00:03:32.040 So basically you're

NOTE Confidence: 0.83694094

00:03:32.040 --> 00:03:34.448 kind of looking at all of these

NOTE Confidence: 0.83694094

00:03:34.448 --> 00:03:36.407 metabolites to gain some insight

NOTE Confidence: 0.83694094

00:03:36.407 --> 00:03:38.115 into these colon cancers.

NOTE Confidence: 0.83694094

00:03:38.120 --> 00:03:40.318 Tell us what sample you used to

NOTE Confidence: 0.83694094

00:03:40.318 --> 00:03:42.680 to look at these metabolites.

NOTE Confidence: 0.83694094

00:03:42.680 --> 00:03:44.972 One can imagine that there may

NOTE Confidence: 0.83694094

00:03:44.972 --> 00:03:47.330 be many options that you would

NOTE Confidence: 0.83694094

00:03:47.330 --> 00:03:49.885 have whether it's looking at the stool

NOTE Confidence: 0.83694094

00:03:49.885 --> 00:03:52.679 or whether it's looking at tumor tissue,

NOTE Confidence: 0.83694094

00:03:52.680 --> 00:03:54.966 or whether it's looking at blood.

NOTE Confidence: 0.83694094

00:03:54.970 --> 00:03:58.026 So what exactly do you do to try

NOTE Confidence: 0.84392136

00:03:58.030 --> 00:03:59.554 to gain this insight?

NOTE Confidence: 0.84392136

00:03:59.554 --> 00:04:02.561 That's a really good question,

NOTE Confidence: 0.84392136

00:04:02.561 --> 00:04:05.130 basically we can take anything, we can

NOTE Confidence: 0.84392136

00:04:05.207 --> 00:04:07.958 take a blood sample or stool sample,

NOTE Confidence: 0.84392136

00:04:07.960 --> 00:04:09.344 or a tumor tissue,

NOTE Confidence: 0.84392136

00:04:09.344 --> 00:04:12.160 and we can obtain these from patients,

NOTE Confidence: 0.84392136

00:04:12.160 --> 00:04:14.736 and we can extract all the different

NOTE Confidence: 0.84392136

00:04:14.736 --> 00:04:17.578 metabolites out of these biological samples.

NOTE Confidence: 0.84392136

00:04:17.580 --> 00:04:21.010 And what we end up with is sort of a mixture

NOTE Confidence: 0.84392136

00:04:21.099 --> 00:04:24.267 of anywhere from maybe 3000 up to you

NOTE Confidence: 0.84392136

00:04:24.267 --> 00:04:27.363 know 10 to 20,000 different molecules

NOTE Confidence: 0.84392136

00:04:27.363 --> 00:04:30.687 that could be present within this

NOTE Confidence: 0.84392136

00:04:30.690 --> 00:04:33.306 sample within my research so far,

NOTE Confidence: 0.84392136

00:04:33.310 --> 00:04:35.058 we have primarily examined

NOTE Confidence: 0.84392136

00:04:35.058 --> 00:04:36.806 tumor tissues from patients,

NOTE Confidence: 0.84392136

00:04:36.810 --> 00:04:39.175 so with collaborations with

NOTE Confidence: 0.84392136

00:04:39.175 --> 00:04:41.540 both Sloan Kettering Cancer Center

NOTE Confidence: 0.84392136

00:04:41.616 --> 00:04:43.800 and also Yale Cancer Center,

NOTE Confidence: 0.84392136

00:04:43.800 --> 00:04:45.120 we obtained over

NOTE Confidence: 0.84392136

00:04:45.120 --> 00:04:47.320 200 tumor tissues from patients

NOTE Confidence: 0.84392136

00:04:47.320 --> 00:04:49.897 where these tumors had been obtained

NOTE Confidence: 0.84392136

00:04:49.897 --> 00:04:52.877 during surgery and we were able to

NOTE Confidence: 0.84392136

00:04:52.877 --> 00:04:55.739 analyze these tissues to examine which

NOTE Confidence: 0.84392136

00:04:55.739 --> 00:04:58.439 metabolites were present and how they

NOTE Confidence: 0.84392136

00:04:58.439 --> 00:05:00.554 were different between different patients.

NOTE Confidence: 0.84392136

00:05:00.560 --> 00:05:02.936 So how they were different between

NOTE Confidence: 0.84392136

00:05:02.936 --> 00:05:05.968 both women and men and from patients

NOTE Confidence: 0.84392136

00:05:05.968 --> 00:05:08.248 with right sided colorectal cancer

NOTE Confidence: 0.84392136

00:05:08.248 --> 00:05:11.260 and also from tumors that occurred in

NOTE Confidence: 0.84392136

00:05:11.260 --> 00:05:14.126 other regions of the colon as well?

00:05:14.550 --> 00:05:18.294 And if all of these patients had cancer,

NOTE Confidence: 0.8549831

00:05:18.300 --> 00:05:20.784 one would imagine that you're

NOTE Confidence: 0.8549831

00:05:20.784 --> 00:05:23.038 really looking at the metabolomic

NOTE Confidence: 0.8549831

00:05:23.038 --> 00:05:26.134 profile of tumors in these patients

NOTE Confidence: 0.8549831

00:05:26.140 --> 00:05:28.828 is that different than what you

NOTE Confidence: 0.8549831

00:05:28.828 --> 00:05:31.210 would expect in normal colon?

NOTE Confidence: 0.8549831

00:05:31.210 --> 00:05:33.450 So are there some metabolites

NOTE Confidence: 0.8549831

00:05:33.450 --> 00:05:36.243 that you would expect only in

NOTE Confidence: 0.8549831

00:05:36.243 --> 00:05:38.578 tumors versus in healthy tissue?

NOTE Confidence: 0.8549831

00:05:38.580 --> 00:05:39.969 Yeah, that's

NOTE Confidence: 0.8328215

00:05:39.970 --> 00:05:44.119 a great question, so we know that

NOTE Confidence: 0.8328215

00:05:44.120 --> 00:05:48.184 tumors have very sort of increased

NOTE Confidence: 0.8328215

00:05:48.190 --> 00:05:51.710 rapid growth, so we tend to see metabolites

NOTE Confidence: 0.8328215

00:05:51.710 --> 00:05:55.612 linked to energy metabolism and sort of

NOTE Confidence: 0.8328215

00:05:55.612 --> 00:05:58.504 making those or encouraging those building

NOTE Confidence: 0.8328215

00:05:58.504 --> 00:06:02.267 blocks to be built to build new cells so

NOTE Confidence: 0.8328215

00:06:02.267 --> 00:06:05.570 we know there's a lot of what they call

NOTE Confidence: 0.8328215

00:06:05.660 --> 00:06:08.220 metabolic rewiring that happens within

NOTE Confidence: 0.8328215

00:06:08.220 --> 00:06:12.070 a tumor compared to a normal tissue.

NOTE Confidence: 0.8328215

00:06:12.070 --> 00:06:14.040 Andwithin my research,

NOTE Confidence: 0.8328215

00:06:14.040 --> 00:06:17.368 we were really interested in looking at the

NOTE Confidence: 0.8328215

00:06:17.368 --> 00:06:19.996 tumors themselves and how they differed

NOTE Confidence: 0.8328215

00:06:19.996 --> 00:06:22.576 between male and female patients because

NOTE Confidence: 0.8328215

00:06:22.580 --> 00:06:24.590 what is quite interesting about

NOTE Confidence: 0.8328215

00:06:24.590 --> 00:06:26.640 colorectal cancer and all cancers,

NOTE Confidence: 0.8328215

00:06:26.640 --> 00:06:28.668 they tend to have a higher

NOTE Confidence: 0.8328215

00:06:28.668 --> 00:06:30.020 incidence in male patients,

NOTE Confidence: 0.8328215

00:06:30.020 --> 00:06:32.309 but what we see is that in

NOTE Confidence: 0.8328215

00:06:32.309 --> 00:06:34.410 the right side of the colon,

NOTE Confidence: 0.8328215

00:06:34.410 --> 00:06:37.754 women tend to have this higher incidence, so

NOTE Confidence: 0.8328215

00:06:37.760 --> 00:06:40.539 we wanted to see what was different

NOTE Confidence: 0.8328215

00:06:40.539 --> 00:06:42.571 metabolically about these tumors that

NOTE Confidence: 0.8328215

00:06:42.571 --> 00:06:45.259 occur specifically in in women with right

NOTE Confidence: 0.8328215

00:06:45.259 --> 00:06:47.707 sided colorectal cancer and what we saw

NOTE Confidence: 0.8328215

00:06:47.707 --> 00:06:50.378 was that they had this very different

NOTE Confidence: 0.8328215

00:06:50.378 --> 00:06:53.054 metabolic profile where they tended to

NOTE Confidence: 0.8328215

00:06:53.060 --> 00:06:54.656 generate energy differently

NOTE Confidence: 0.8328215

00:06:54.656 --> 00:06:57.050 and they use one metabolites where

NOTE Confidence: 0.8328215

00:06:57.113 --> 00:06:59.228 they produce one metabolite school,

NOTE Confidence: 0.8328215

00:06:59.230 --> 00:07:01.588 disparaging that seemed to be much

NOTE Confidence: 0.8328215

00:07:01.588 --> 00:07:04.082 higher within this set of patients

NOTE Confidence: 0.8328215

00:07:04.082 --> 00:07:06.620 than compared to male patients that had

NOTE Confidence: 0.8328215

00:07:06.620 --> 00:07:08.432 right sided colon cancer,

NOTE Confidence: 0.8328215

00:07:08.432 --> 00:07:11.150 and also patients that had tumors

NOTE Confidence: 0.8328215

00:07:11.229 --> 00:07:13.609 in the other side of the colon.

NOTE Confidence: 0.8328215

00:07:13.610 --> 00:07:16.454 So we've really gone after this

NOTE Confidence: 0.8328215

00:07:16.454 --> 00:07:18.350 metabolic pathway to understand

NOTE Confidence: 0.8328215

00:07:18.350 --> 00:07:21.262 more about this side of metabolism and

NOTE Confidence: 0.8328215

00:07:21.262 --> 00:07:24.248 potentially how it could in the future

NOTE Confidence: 0.8328215

00:07:24.248 --> 00:07:26.328 be potentially targeted for perhaps

NOTE Confidence: 0.8328215

00:07:26.328 --> 00:07:29.077 a precision medicine approach for

NOTE Confidence: 0.84086907

00:07:29.080 --> 00:07:30.740 these groups of patients.

NOTE Confidence: 0.84086907

00:07:30.740 --> 00:07:32.815 That's interesting that

NOTE Confidence: 0.84086907

00:07:32.815 --> 00:07:35.659 women have a metabolite that

NOTE Confidence: 0.84086907

00:07:35.659 --> 00:07:38.014 processes energy differently than men.

00:07:39.804 --> 00:07:43.388 I just wonder when I think about

NOTE Confidence: 0.84086907

00:07:43.388 --> 00:07:46.509 Asparagine I started thinking about

NOTE Confidence: 0.84086907

00:07:48.493 --> 00:07:53.120 nucleic acids and amino acids

NOTE Confidence: 0.84086907

00:07:53.242 --> 00:07:57.136 that form the building blocks of

NOTE Confidence: 0.84086907

00:07:57.136 --> 00:08:01.409 cells and whether these could be

NOTE Confidence: 0.84086907

00:08:01.409 --> 00:08:05.289 manipulated based on dietary factors,

NOTE Confidence: 0.84086907

00:08:05.290 --> 00:08:06.610 for example.

NOTE Confidence: 0.84086907

00:08:06.610 --> 00:08:12.970 So when we think about how cells use energy,

NOTE Confidence: 0.84086907

00:08:12.970 --> 00:08:14.785 sometimes that may be

NOTE Confidence: 0.84086907

00:08:14.785 --> 00:08:19.020 mediated in part by people's dietary intake,

NOTE Confidence: 0.84086907

00:08:19.020 --> 00:08:21.785 did you look at that as a

NOTE Confidence: 0.84086907

00:08:21.785 --> 00:08:23.623 potential difference in male

NOTE Confidence: 0.84086907

00:08:23.623 --> 00:08:25.318 versus female patients?

00:08:25.770 --> 00:08:27.120 Within our cohort

NOTE Confidence: 0.8287141

00:08:27.120 --> 00:08:29.820 we didn't have information on diet,

NOTE Confidence: 0.8287141

00:08:29.820 --> 00:08:32.058 but that's very much something that

NOTE Confidence: 0.8287141

00:08:32.058 --> 00:08:34.758 would be useful to have something

NOTE Confidence: 0.8287141

00:08:34.758 --> 00:08:37.018 like a food frequency questionnaire,

NOTE Confidence: 0.8287141

00:08:37.020 --> 00:08:38.820 which is sometimes collected

NOTE Confidence: 0.8287141

00:08:38.820 --> 00:08:41.070 for different biobanks

NOTE Confidence: 0.8287141

00:08:41.070 --> 00:08:43.317 and in different cohorts.

NOTE Confidence: 0.8287141

00:08:43.320 --> 00:08:46.881 Yes, exactly I think it's

NOTE Confidence: 0.8287141

00:08:46.881 --> 00:08:48.629 really important here,

NOTE Confidence: 0.8287141

00:08:48.630 --> 00:08:52.014 but I think Asparagine does come from

NOTE Confidence: 0.8287141

00:08:52.014 --> 00:08:54.427 many many different dietary sources

NOTE Confidence: 0.8287141

00:08:54.427 --> 00:08:58.380 and it actually has been seen

NOTE Confidence: 0.8287141

00:08:58.380 --> 00:09:00.936 to be produced potentially,

NOTE Confidence: 0.8287141

00:09:00.940 --> 00:09:02.806 or metabolize by the microbiome as

NOTE Confidence: 0.8287141

00:09:02.806 --> 00:09:05.470 well and it can be produced internally

NOTE Confidence: 0.8287141

00:09:05.470 --> 00:09:07.725 through your own biochemical processing

NOTE Confidence: 0.8287141

00:09:07.725 --> 00:09:10.296 of other metabolites through an

NOTE Confidence: 0.8287141

00:09:10.296 --> 00:09:12.436 enzyme called Asparagine synthetase.

NOTE Confidence: 0.8287141

00:09:12.440 --> 00:09:13.290 So, biologically,

NOTE Confidence: 0.8287141

00:09:13.290 --> 00:09:16.265 it can come from your internal processing,

NOTE Confidence: 0.8287141

00:09:16.270 --> 00:09:19.678 but it can also come from dietary sources,

NOTE Confidence: 0.8287141

00:09:19.680 --> 00:09:22.230 and it can come from microbial

NOTE Confidence: 0.8287141

00:09:22.230 --> 00:09:23.505 processing as well.

NOTE Confidence: 0.8287141

00:09:23.510 --> 00:09:26.012 So, as with many metabolites that

NOTE Confidence: 0.8287141

00:09:26.012 --> 00:09:28.300 are present within

NOTE Confidence: 0.8287141

00:09:28.300 --> 00:09:31.316 tumors and also present within the colon,

NOTE Confidence: 0.8287141

00:09:31.320 --> 00:09:33.854 we always have to take into account

NOTE Confidence: 0.8287141

00:09:33.854 --> 00:09:35.392 all these different biological

NOTE Confidence: 0.8287141

00:09:35.392 --> 00:09:38.094 sources of where they can come from.

NOTE Confidence: 0.8287141

00:09:38.100 --> 00:09:40.356 So we can either

NOTE Confidence: 0.8287141

00:09:40.360 --> 00:09:42.999 manipulate them and try and sort of,

NOTE Confidence: 0.8287141

00:09:43.000 --> 00:09:44.131 potentially

NOTE Confidence: 0.8287141

00:09:44.131 --> 00:09:46.393 reduce the effects of the disease,

NOTE Confidence: 0.8287141

00:09:46.400 --> 00:09:47.904 or improve therapeutic response.

00:09:48.280 --> 00:09:49.040 And it seems

NOTE Confidence: 0.8555086

00:09:49.040 --> 00:09:50.845 to be so multifactorial when

NOTE Confidence: 0.8555086

00:09:50.845 --> 00:09:53.115 you think about where all of

NOTE Confidence: 0.8555086

00:09:53.115 --> 00:09:55.065 these metabolites can come from,

NOTE Confidence: 0.8555086

00:09:55.070 --> 00:09:57.566 and all of the different processes

NOTE Confidence: 0.8555086

00:09:57.566 --> 00:09:59.987 that could be going on

NOTE Confidence: 0.8555086

00:09:59.987 --> 00:10:02.222 both within normal cells as

NOTE Confidence: 0.8555086

00:10:02.222 --> 00:10:04.580 well as within cancer cells,

NOTE Confidence: 0.8555086

00:10:04.580 --> 00:10:06.368 which raises the question,

00:10:07.710 --> 00:10:10.380 do women normally have more of

NOTE Confidence: 0.8555086

00:10:10.380 --> 00:10:12.160 this metabolite even outside

NOTE Confidence: 0.8555086

00:10:12.235 --> 00:10:13.967 of their colon cancers?

00:10:14.860 --> 00:10:19.364 I think in this context what we've begun to see

NOTE Confidence: 0.89197695

00:10:19.370 --> 00:10:22.156 is that Asparagine might be increased in

NOTE Confidence: 0.89197695

00:10:22.156 --> 00:10:24.740 these patients because these tumors may be

NOTE Confidence: 0.89197695

00:10:24.740 --> 00:10:27.407 what we call nutrient deplete and this is

NOTE Confidence: 0.89197695

00:10:27.407 --> 00:10:29.895 something that we still have to look into,

NOTE Confidence: 0.89197695

00:10:29.900 --> 00:10:32.006 so we can't really confirm this,

NOTE Confidence: 0.89197695

00:10:32.010 --> 00:10:34.110 but just from our metabolomic studies,

NOTE Confidence: 0.89197695

00:10:34.110 --> 00:10:36.216 it seems to be indicating this.

NOTE Confidence: 0.89197695

00:10:36.220 --> 00:10:38.733 And this is maybe due to differences

NOTE Confidence: 0.89197695

00:10:38.733 --> 00:10:40.779 in blood supply to the tumor,

NOTE Confidence: 0.89197695

00:10:40.780 --> 00:10:41.833 or something else.

NOTE Confidence: 0.89197695

00:10:41.833 --> 00:10:43.943 Less oxygen

NOTE Confidence: 0.89197695

00:10:43.943 --> 00:10:46.400 that might be getting to the tumor.

NOTE Confidence: 0.89197695

00:10:46.400 --> 00:10:48.871 And when we look at the other

NOTE Confidence: 0.89197695

00:10:48.871 --> 00:10:50.669 processes that are going on

NOTE Confidence: 0.89197695

00:10:50.670 --> 00:10:53.337 within these samples we see

NOTE Confidence: 0.89197695

00:10:53.337 --> 00:10:55.734 that the generation of other energy

NOTE Confidence: 0.89197695

00:10:55.734 --> 00:10:58.092 metabolites is different as well,

NOTE Confidence: 0.89197695

00:10:58.100 --> 00:11:00.330 which could be indicating that

NOTE Confidence: 0.89197695

00:11:00.330 --> 00:11:02.560 there could be something particular

NOTE Confidence: 0.89197695

00:11:02.629 --> 00:11:04.735 about how these tumors might be

NOTE Confidence: 0.89197695

00:11:04.735 --> 00:11:07.090 growing in this area of the colon.

NOTE Confidence: 0.89197695

00:11:07.090 --> 00:11:09.890 So at the moment we don't have normal

NOTE Confidence: 0.89197695

00:11:09.890 --> 00:11:12.179 colon tissues from from individuals,

NOTE Confidence: 0.89197695

00:11:12.180 --> 00:11:15.050 but that's something that we do want

NOTE Confidence: 0.89197695

00:11:15.050 --> 00:11:18.625 to look at to see if

NOTE Confidence: 0.89197695

00:11:18.625 --> 00:11:21.268 the patients that do not have

NOTE Confidence: 0.89197695

00:11:21.270 --> 00:11:24.926 colon cancer, if the colon tissues have these

NOTE Confidence: 0.89197695

00:11:24.930 --> 00:11:27.275 different metabolites that

NOTE Confidence: 0.89197695

00:11:27.275 --> 00:11:30.410 could be different between men and women,

NOTE Confidence: 0.89197695

00:11:32.700 --> 00:11:35.436 and could affect the development of these tumors.

NOTE Confidence: 0.8281183

00:11:35.440 --> 00:11:38.639 You kind of wonder as

NOTE Confidence: 0.8281183

00:11:38.639 --> 00:11:41.839 well whether this is cause or effect.

NOTE Confidence: 0.8281183

00:11:41.840 --> 00:11:44.952 So in other words, is it that you

NOTE Confidence: 0.8281183

00:11:44.952 --> 00:11:48.230 had a tumor which was growing,

NOTE Confidence: 0.8281183

00:11:48.230 --> 00:11:50.278 which then caused this

NOTE Confidence: 0.8281183

00:11:50.278 --> 00:11:51.814 altered metabolomic profile,

NOTE Confidence: 0.8281183

00:11:51.820 --> 00:11:54.492 or was it that you had some other

NOTE Confidence: 0.8281183

00:11:54.492 --> 00:11:57.047 processes that were going on that

NOTE Confidence: 0.8281183

00:11:57.047 --> 00:11:58.859 altered your metabolomic profile,

NOTE Confidence: 0.8281183

00:11:58.860 --> 00:12:01.200 which then spurred on the cancer?

NOTE Confidence: 0.8281183

00:12:01.200 --> 00:12:04.328 Did you gain any insight into that question?

NOTE Confidence: 0.9122841

00:12:05.860 --> 00:12:09.940 I think it's probably more of the latter.

NOTE Confidence: 0.9122841

00:12:09.940 --> 00:12:13.510 We see that Asparagine

NOTE Confidence: 0.9122841

00:12:13.510 --> 00:12:15.550 is produced internally.

NOTE Confidence: 0.9122841

00:12:15.550 --> 00:12:18.100 As I mentioned through this

NOTE Confidence: 0.9122841

00:12:18.100 --> 00:12:19.630 enzyme asparagine synthetase,

NOTE Confidence: 0.9122841

00:12:19.630 --> 00:12:23.291 and this enzyme is controlled somewhat by

NOTE Confidence: 0.9122841

00:12:23.291 --> 00:12:26.767 another gene mutation of aging mutant Kras,

NOTE Confidence: 0.9122841

00:12:26.770 --> 00:12:31.530 so it could be that these tumors

NOTE Confidence: 0.9122841

00:12:31.530 --> 00:12:33.847 have this oncogene and it could

NOTE Confidence: 0.9122841

00:12:33.847 --> 00:12:36.009 be affecting these metabolites,

NOTE Confidence: 0.9122841

00:12:36.010 --> 00:12:39.358 so it could be an effect that we're seeing,

NOTE Confidence: 0.9122841

00:12:39.360 --> 00:12:41.598 but it is probably a combination

NOTE Confidence: 0.9122841

00:12:41.598 --> 00:12:43.836 of many things, that includes this

NOTE Confidence: 0.9122841

00:12:43.836 --> 00:12:45.696 potential mutation to this gene.

NOTE Confidence: 0.9122841

00:12:45.700 --> 00:12:48.150 But also it could be the way

NOTE Confidence: 0.9122841

00:12:48.150 --> 00:12:50.180 that the tumor is growing

NOTE Confidence: 0.9122841

00:12:50.180 --> 00:12:51.870 as I mentioned within the

NOTE Confidence: 0.9122841

00:12:51.870 --> 00:12:54.280 colon as well and all together,

NOTE Confidence: 0.9122841

00:12:54.280 --> 00:12:56.428 all these different processes are

NOTE Confidence: 0.9122841

00:12:56.428 --> 00:12:58.760 causing this effect of this increase

NOTE Confidence: 0.9122841

00:12:58.760 --> 00:13:01.916 in Asparagine that seem to help

NOTE Confidence: 0.9122841

00:13:01.920 --> 00:13:03.866 propagate the tumor when it

NOTE Confidence: 0.9122841

00:13:03.866 --> 00:13:05.766 might be under these stress

NOTE Confidence: 0.9122841

00:13:05.766 --> 00:13:08.104 conditions where it's not able to obtain

NOTE Confidence: 0.9122841

00:13:08.110 --> 00:13:10.200 nutrients in a normal fashion,

NOTE Confidence: 0.9122841

00:13:10.200 --> 00:13:13.119 so I think this is what

NOTE Confidence: 0.9122841

00:13:13.119 --> 00:13:14.370 could be happening.

NOTE Confidence: 0.9122841

00:13:14.370 --> 00:13:17.275 And also as I mentioned as well,

NOTE Confidence: 0.9122841

00:13:17.280 --> 00:13:19.440 this combination of the microbiome

NOTE Confidence: 0.9122841

00:13:19.440 --> 00:13:22.060 present as well within the colon

NOTE Confidence: 0.9122841

00:13:22.060 --> 00:13:24.364 that could be affecting how this

NOTE Confidence: 0.8519883

00:13:24.370 --> 00:13:26.460 metabolite is being processed.

00:13:29.016 --> 00:13:31.050 And it's an interesting puzzle to

NOTE Confidence: 0.8519883

00:13:31.050 --> 00:13:33.310 think about how metabolomics works

NOTE Confidence: 0.8519883

00:13:33.310 --> 00:13:36.049 along with genetic mutations and so on

NOTE Confidence: 0.8519883

00:13:36.050 --> 00:13:38.738 when we think about colon cancer.

NOTE Confidence: 0.8519883

00:13:38.740 --> 00:13:40.954 We're going to take a short

NOTE Confidence: 0.8519883

00:13:40.954 --> 00:13:43.060 break for a medical minute.

NOTE Confidence: 0.8519883

00:13:43.060 --> 00:13:45.406 Please stay tuned to learn more

NOTE Confidence: 0.8519883

00:13:45.406 --> 00:13:46.970 about genetic and environmental

NOTE Confidence: 0.8519883

00:13:47.035 --> 00:13:48.960 influences in colon cancer with

NOTE Confidence: 0.85478395

00:13:48.960 --> 00:13:50.920 my guest Doctor Caroline Johnson.

NOTE Confidence: 0.85478395

00:13:50.920 --> 00:13:53.060 Support for Yale Cancer Answers

NOTE Confidence: 0.85478395

00:13:53.060 --> 00:13:55.617 comes from AstraZeneca, working to

NOTE Confidence: 0.85478395

00:13:55.617 --> 00:13:57.997 eliminate cancer as a cause of death.

NOTE Confidence: 0.85478395

00:13:58.000 --> 00:14:01.528 Learn more at astrazeneca-us.com.

NOTE Confidence: 0.85478395

00:14:01.530 --> 00:14:03.360 This is a medical minute

NOTE Confidence: 0.85478395

00:14:03.360 --> 00:14:05.190 about head and neck cancers,

NOTE Confidence: 0.85478395

00:14:05.190 --> 00:14:07.434 although the percentage of oral in

NOTE Confidence: 0.85478395

00:14:07.434 --> 00:14:09.702 head and neck cancer patients in

NOTE Confidence: 0.85478395

00:14:09.702 --> 00:14:11.790 the United States is only about

NOTE Confidence: 0.85478395

00:14:11.790 --> 00:14:13.712 5% of all diagnosed cancers,

NOTE Confidence: 0.85478395

00:14:13.712 --> 00:14:15.677 there are challenging side effects

NOTE Confidence: 0.85478395

00:14:15.677 --> 00:14:17.102 associated with these types

NOTE Confidence: 0.85478395

00:14:17.102 --> 00:14:18.727 of cancer and their treatment.

NOTE Confidence: 0.85478395

00:14:18.730 --> 00:14:20.326 Clinical trials are currently

NOTE Confidence: 0.85478395

00:14:20.326 --> 00:14:22.321 underway to test innovative new

NOTE Confidence: 0.85478395

00:14:22.321 --> 00:14:24.218 treatments for head and neck cancers,

NOTE Confidence: 0.85478395

00:14:24.220 --> 00:14:26.200 and in many cases less radical

NOTE Confidence: 0.85478395

00:14:26.200 --> 00:14:28.610 surgeries are able to preserve nerves,

NOTE Confidence: 0.85478395

00:14:28.610 --> 00:14:30.806 arteries and muscles in the neck,

NOTE Confidence: 0.85478395

00:14:30.810 --> 00:14:32.450 enabling patients to move,

NOTE Confidence: 0.85478395

00:14:32.450 --> 00:14:34.912 speak, breathe and eat normally

NOTE Confidence: 0.85478395

00:14:34.912 --> 00:14:35.938 after surgery.

NOTE Confidence: 0.85478395

00:14:35.940 --> 00:14:37.992 More information is available

NOTE Confidence: 0.85478395

00:14:37.992 --> 00:14:39.018 at yalecancercenter.org.

NOTE Confidence: 0.85478395

00:14:39.020 --> 00:14:42.098 You're listening to Connecticut Public Radio.

NOTE Confidence: 0.84102845

00:14:43.280 --> 00:14:45.578 Welcome back to Yale cancer answers.

NOTE Confidence: 0.84102845

00:14:45.580 --> 00:14:48.180 This is doctor Anees Chagpar and I'm

NOTE Confidence: 0.84102845

00:14:48.180 --> 00:14:50.487 joined tonight by my guest doctor

NOTE Confidence: 0.84102845

00:14:50.487 --> 00:14:52.472 Caroline Johnson and we're talking about

NOTE Confidence: 0.84102845

00:14:52.472 --> 00:14:54.599 genetic and environmental influences in

NOTE Confidence: 0.84102845

00:14:54.599 --> 00:14:57.440 colon cancer and right before the break,

NOTE Confidence: 0.84102845

00:14:57.440 --> 00:14:59.480 Caroline was telling us about her

NOTE Confidence: 0.84102845

00:14:59.480 --> 00:15:01.330 studies looking at metabolomics.

NOTE Confidence: 0.84102845

00:15:01.330 --> 00:15:03.628 That is to say the study

NOTE Confidence: 0.84102845

00:15:03.628 --> 00:15:04.777 of different metabolites.

NOTE Confidence: 0.84102845

00:15:04.780 --> 00:15:06.316 Looking at gender differences

NOTE Confidence: 0.84102845

00:15:06.316 --> 00:15:08.236 in right sided colon cancer.

NOTE Confidence: 0.84102845

00:15:08.240 --> 00:15:10.879 So Caroline, I wanted to dig into

NOTE Confidence: 0.84102845

00:15:10.879 --> 00:15:13.870 that a little bit more because we

NOTE Confidence: 0.84102845

00:15:13.870 --> 00:15:16.095 started to talk about whether

NOTE Confidence: 0.84102845

00:15:16.100 --> 00:15:18.510 these metabolomic changes

NOTE Confidence: 0.84102845

00:15:18.510 --> 00:15:21.853 are what drives the colon cancer or

NOTE Confidence: 0.84102845

00:15:21.853 --> 00:15:24.403 whether the colon cancer is what

NOTE Confidence: 0.84102845

00:15:24.403 --> 00:15:26.949 drives the metabolomic changes,

NOTE Confidence: 0.84102845

00:15:26.950 --> 00:15:30.106 and you had mentioned that the

NOTE Confidence: 0.84102845

00:15:30.106 --> 00:15:33.185 metabolomic changes may be in part

NOTE Confidence: 0.84102845

00:15:33.185 --> 00:15:35.813 related to mutations in KRas,

NOTE Confidence: 0.84102845

00:15:35.820 --> 00:15:39.708 but we know that Kras and oncogenes

NOTE Confidence: 0.84102845

00:15:39.708 --> 00:15:43.217 may spur on cancers as well.

NOTE Confidence: 0.84102845

00:15:43.220 --> 00:15:46.268 I wonder whether these two processes

NOTE Confidence: 0.84102845

00:15:46.270 --> 00:15:48.690 are independent of each other.

NOTE Confidence: 0.84102845

00:15:48.690 --> 00:15:50.326 That is to say,

NOTE Confidence: 0.84102845

00:15:50.326 --> 00:15:52.780 Kras causes metabolomic changes and

NOTE Confidence: 0.84102845

00:15:52.864 --> 00:15:55.499 also causes separately tumor development

NOTE Confidence: 0.84102845

00:15:55.499 --> 00:15:58.850 or whether these are Interrelated.

NOTE Confidence: 0.84102845

00:15:58.850 --> 00:16:02.238 Do you have any sense on that?

NOTE Confidence: 0.8153747

00:16:03.350 --> 00:16:06.830 I think they are interrelated and the

NOTE Confidence: 0.8153747

00:16:06.830 --> 00:16:09.674 findings that we have seen

NOTE Confidence: 0.8153747

00:16:09.674 --> 00:16:12.266 linking Mutant Kras and Asparagine

NOTE Confidence: 0.8153747

00:16:12.266 --> 00:16:15.529 have been seen in other cancers as well.

NOTE Confidence: 0.8153747

00:16:15.530 --> 00:16:18.666 So you know the mutant carriers is very

NOTE Confidence: 0.8153747

00:16:18.666 --> 00:16:22.248 common in pancreatic cancers and there is a

NOTE Confidence: 0.8153747

00:16:22.250 --> 00:16:24.770 clinical trial right now

NOTE Confidence: 0.8153747

00:16:24.770 --> 00:16:26.860 actually that I saw yesterday

NOTE Confidence: 0.8153747

00:16:26.860 --> 00:16:28.532 for targeting Asparagine by

NOTE Confidence: 0.8153747

00:16:28.532 --> 00:16:30.649 using a drug

NOTE Confidence: 0.8153747

00:16:30.650 --> 00:16:33.674 along with other first line chemo.

00:16:36.360 --> 00:16:39.370 So we do know that the mutant

NOTE Confidence: 0.8153747

00:16:39.370 --> 00:16:41.260 Kras does regulate other

NOTE Confidence: 0.8153747

00:16:41.260 --> 00:16:43.360 genes and signaling pathways that

NOTE Confidence: 0.8153747

00:16:43.360 --> 00:16:45.040 does affect Asparagine production.

NOTE Confidence: 0.8153747

00:16:45.040 --> 00:16:48.064 So I think it's probably a case of mutant

NOTE Confidence: 0.8153747

00:16:48.064 --> 00:16:50.498 Kras affecting Asparagine levels.

NOTE Confidence: 0.8153747

00:16:50.500 --> 00:16:53.440 But of course, as I mentioned before,

NOTE Confidence: 0.8153747

00:16:53.440 --> 00:16:56.380 asparagine can be modulated by other sources,

NOTE Confidence: 0.8153747

00:16:59.320 --> 00:17:01.840 and also from the microbiome,

NOTE Confidence: 0.8153747

00:17:01.840 --> 00:17:04.944 and we have analyzed the microbiome from some

NOTE Confidence: 0.8153747

00:17:04.944 --> 00:17:08.557 of the tumors from the right sided patients.

NOTE Confidence: 0.8153747

00:17:08.560 --> 00:17:11.500 So from both men and women,

NOTE Confidence: 0.8153747

00:17:11.500 --> 00:17:13.700 and we have a sense that

NOTE Confidence: 0.8153747

00:17:13.700 --> 00:17:16.507 there is some microbiota

NOTE Confidence: 0.8153747

00:17:16.507 --> 00:17:18.722 that are correlated with asparagine

NOTE Confidence: 0.8153747

00:17:18.722 --> 00:17:21.963 levels only in in the female patients.

NOTE Confidence: 0.8153747

00:17:21.970 --> 00:17:25.008 So we do believe there is a

NOTE Confidence: 0.8153747

00:17:25.880 --> 00:17:27.185 multifactorial effect

NOTE Confidence: 0.8153747

00:17:27.185 --> 00:17:28.490 on asparagine production

NOTE Confidence: 0.8153747

00:17:28.490 --> 00:17:30.974 that could be itself propagating

NOTE Confidence: 0.8153747

00:17:30.974 --> 00:17:33.637 the tumors as well by giving

NOTE Confidence: 0.8153747

00:17:33.637 --> 00:17:35.020 them more nutrients,

NOTE Confidence: 0.8153747

00:17:35.020 --> 00:17:37.702 we know that Asparagine can increase

NOTE Confidence: 0.8153747

00:17:37.702 --> 00:17:41.305 the uptake of other amino acids and can

NOTE Confidence: 0.8153747

00:17:41.305 --> 00:17:44.370 affect other processes such as even

NOTE Confidence: 0.8153747

00:17:44.370 --> 00:17:45.573 polymetabolite

NOTE Confidence: 0.8153747

00:17:45.573 --> 00:17:47.177 production or autophagy,

NOTE Confidence: 0.8153747

00:17:47.180 --> 00:17:49.180 another process is like that.

NOTE Confidence: 0.8153747

00:17:49.180 --> 00:17:52.388 So I believe this is

NOTE Confidence: 0.8153747

00:17:52.390 --> 00:17:54.400 very wide combined effect.

NOTE Confidence: 0.8153747

00:17:54.400 --> 00:17:56.595 And really the technology metabolomics

NOTE Confidence: 0.8153747

00:17:56.595 --> 00:17:59.919 has allowed us to get an insight into

NOTE Confidence: 0.8153747

00:17:59.919 --> 00:18:02.820 this because we can not only

NOTE Confidence: 0.8153747

00:18:02.820 --> 00:18:03.750 analyze Asparagine,

NOTE Confidence: 0.8153747

00:18:03.750 --> 00:18:06.540 we can analyze all the other

NOTE Confidence: 0.8153747

00:18:06.540 --> 00:18:08.179 metabolites that could be

NOTE Confidence: 0.8153747

00:18:08.180 --> 00:18:10.190 affected by asparagine levels as well,

NOTE Confidence: 0.8153747

00:18:10.190 --> 00:18:12.535 it could be affected by mutant Kras

NOTE Confidence: 0.8153747

00:18:12.540 --> 00:18:14.144 so it really is

NOTE Confidence: 0.8153747

00:18:14.144 --> 00:18:17.765 a wider scope or a magnifying

NOTE Confidence: 0.8153747

00:18:17.765 --> 00:18:21.119 glass really into looking more into

NOTE Confidence: 0.8153747

00:18:21.120 --> 00:18:23.004 how these pathways are regulated

NOTE Confidence: 0.8153747

00:18:23.004 --> 00:18:25.359 by both genes and metabolites.

NOTE Confidence: 0.7731498

00:18:26.040 --> 00:18:28.416 Have you found a difference in

NOTE Confidence: 0.7731498

00:18:28.416 --> 00:18:30.537 Asparagine between men and

NOTE Confidence: 0.7731498

00:18:30.537 --> 00:18:32.357 women who are Kras negative?

NOTE Confidence: 0.7731498

00:18:32.360 --> 00:18:34.580 That is to say, they don't

NOTE Confidence: 0.7731498

00:18:34.580 --> 00:18:36.990 have a Kras mutation.

NOTE Confidence: 0.7731498

00:18:36.990 --> 00:18:39.660 I wonder whether

NOTE Confidence: 0.7731498

00:18:39.660 --> 00:18:41.950 these two are directly linked,

NOTE Confidence: 0.7731498

00:18:41.950 --> 00:18:43.321 so for example,

NOTE Confidence: 0.7731498

00:18:43.321 --> 00:18:46.520 women may have more Kras mutations,

NOTE Confidence: 0.7731498

00:18:46.520 --> 00:18:48.998 and therefore you may be seeing

NOTE Confidence: 0.7731498

00:18:48.998 --> 00:18:50.237 these metabolomic differences

NOTE Confidence: 0.7731498

00:18:50.237 --> 00:18:52.755 or whether these are really

NOTE Confidence: 0.7731498

00:18:52.755 --> 00:18:54.279 separate processes altogether?

NOTE Confidence: 0.86162424

00:18:56.230 --> 00:19:01.410 We haven't looked at that specifically

00:19:04.586 --> 00:19:07.909 but what we have done is we've

NOTE Confidence: 0.86162424

00:19:07.910 --> 00:19:09.940 looked at survival, and actually

NOTE Confidence: 0.86162424

00:19:09.940 --> 00:19:12.200 there's many different

NOTE Confidence: 0.86162424

00:19:12.200 --> 00:19:14.008 publicly available data sources

NOTE Confidence: 0.86162424

00:19:14.008 --> 00:19:17.039 that we can look at to look at gene

NOTE Confidence: 0.86162424

00:19:17.039 --> 00:19:19.268 expression and also patient survival.

NOTE Confidence: 0.86162424

00:19:19.270 --> 00:19:21.496 So we looked at mutant Kras

NOTE Confidence: 0.86162424

00:19:21.496 --> 00:19:24.149 we looked at asparagine synthetase

NOTE Confidence: 0.86162424

00:19:24.150 --> 00:19:27.430 and we saw that patients with these

NOTE Confidence: 0.86162424

00:19:27.430 --> 00:19:30.421 genes had much poorer survival if

NOTE Confidence: 0.86162424

00:19:30.421 --> 00:19:34.010 they were female and they had a right sided

NOTE Confidence: 0.86162424

00:19:34.010 --> 00:19:35.786 tumor so we compared,

NOTE Confidence: 0.86162424

00:19:35.790 --> 00:19:37.560 the Kras mutant to the Kras

NOTE Confidence: 0.86162424

00:19:37.560 --> 00:19:39.261 wild type, and it was again

NOTE Confidence: 0.86162424

00:19:39.261 --> 00:19:41.110 in these different resources

NOTE Confidence: 0.86162424

00:19:41.110 --> 00:19:43.206 we saw that it was always the female

NOTE Confidence: 0.86162424

00:19:43.206 --> 00:19:44.772 patients of right sided colon

NOTE Confidence: 0.86162424

00:19:44.772 --> 00:19:46.740 cancer that had the poorer survival,

NOTE Confidence: 0.86162424

00:19:46.740 --> 00:19:48.220 and we looked at asparagine

NOTE Confidence: 0.86162424

00:19:48.220 --> 00:19:49.700 levels within our own cohorts.

NOTE Confidence: 0.86162424

00:19:49.700 --> 00:19:52.004 And we looked at the survival data because

NOTE Confidence: 0.86162424

00:19:52.004 --> 00:19:54.430 our tumors were collected in the 1990s,

NOTE Confidence: 0.86162424

00:19:54.430 --> 00:19:56.327 so we were able to follow up

NOTE Confidence: 0.86162424

00:19:56.327 --> 00:19:57.990 with survival of the patients.

NOTE Confidence: 0.86162424

00:19:57.990 --> 00:20:00.237 And we saw that it was again,

NOTE Confidence: 0.86162424

00:20:00.240 --> 00:20:01.046 the women with

NOTE Confidence: 0.86162424

00:20:01.046 --> 00:20:03.061 right sided tumors

NOTE Confidence: 0.86162424

00:20:03.061 --> 00:20:05.030 that had poor survival,

NOTE Confidence: 0.86162424

00:20:05.030 --> 00:20:07.232 and increased risk of recurrence if

NOTE Confidence: 0.86162424

00:20:07.232 --> 00:20:09.200 they had high asparagine levels.

NOTE Confidence: 0.85799515

00:20:11.080 --> 00:20:13.320 Interesting and did you

NOTE Confidence: 0.85799515

00:20:13.320 --> 00:20:15.110 look at whether these asparagine

NOTE Confidence: 0.85799515

00:20:15.110 --> 00:20:17.396 levels were higher in tumors that

NOTE Confidence: 0.85799515

00:20:17.396 --> 00:20:20.093 were larger versus smaller, or was it

NOTE Confidence: 0.85799515

00:20:20.093 --> 00:20:22.019 if you looked at two tumors

NOTE Confidence: 0.85799515

00:20:22.019 --> 00:20:24.029 that were identical in terms

NOTE Confidence: 0.85799515

00:20:24.029 --> 00:20:26.447 of their size and their grade,

NOTE Confidence: 0.85799515

00:20:26.450 --> 00:20:28.280 and the level of invasion

NOTE Confidence: 0.85799515

00:20:28.280 --> 00:20:30.110 and their lymph node status,

NOTE Confidence: 0.85799515

00:20:30.110 --> 00:20:31.694 and all of the other markers

NOTE Confidence: 0.85799515

00:20:31.694 --> 00:20:33.756 that we look at for prognosis

NOTE Confidence: 0.85799515

00:20:33.756 --> 00:20:35.648 was asparagine independently

NOTE Confidence: 0.85799515

00:20:35.648 --> 00:20:37.430 associated with prognosis?

NOTE Confidence: 0.85799515

00:20:37.430 --> 00:20:40.034 We didn't have the size of the tumors

NOTE Confidence: 0.85799515

00:20:40.034 --> 00:20:42.140 to sort of understand that,

NOTE Confidence: 0.85799515

00:20:42.140 --> 00:20:44.120 but that's a very good question.

NOTE Confidence: 0.85799515

00:20:44.120 --> 00:20:46.860 What we did was we we had a very small

NOTE Confidence: 0.85799515

00:20:46.941 --> 00:20:49.395 amount of tumor from each patient,

NOTE Confidence: 0.85799515

00:20:49.400 --> 00:20:52.000 but it was the same size for each

NOTE Confidence: 0.85799515

00:20:52.000 --> 00:20:54.349 patient that the biopsy that we had.

NOTE Confidence: 0.85799515

00:20:54.350 --> 00:20:56.660 So we compared between those biopsy sizes.

NOTE Confidence: 0.85799515

00:20:56.660 --> 00:20:59.388 But we did take into account things like

NOTE Confidence: 0.85799515

00:20:59.388 --> 00:21:02.062 the stage of the patient and we saw

NOTE Confidence: 0.85799515

00:21:02.062 --> 00:21:04.579 across the board that it was stage one,

NOTE Confidence: 0.85799515

00:21:04.580 --> 00:21:07.226 stage two and three that had

NOTE Confidence: 0.85799515

00:21:07.230 --> 00:21:09.974 high levels of asparagine in the

NOTE Confidence: 0.85799515

00:21:09.974 --> 00:21:13.309 women with right sided colon cancer,

NOTE Confidence: 0.85799515

00:21:13.310 --> 00:21:15.212 but for men they didn't have

NOTE Confidence: 0.85799515

00:21:15.212 --> 00:21:17.041 these high levels of asparagine

NOTE Confidence: 0.85799515

00:21:17.041 --> 00:21:19.009 at these different stages,

NOTE Confidence: 0.85799515

00:21:19.010 --> 00:21:22.430 so it tended to be mostly in the

NOTE Confidence: 0.83655167

00:21:22.430 --> 00:21:23.570 women again.

NOTE Confidence: 0.83655167

00:21:23.570 --> 00:21:26.230 And so when you looked at prognosis,

NOTE Confidence: 0.83655167

00:21:26.230 --> 00:21:28.722 did you look at it and found that

NOTE Confidence: 0.83655167

00:21:28.722 --> 00:21:30.789 asparagine was correlated with prognosis?

NOTE Confidence: 0.83655167

00:21:30.790 --> 00:21:32.310 Was that independent of

NOTE Confidence: 0.83655167

00:21:32.310 --> 00:21:33.830 their stage at presentation?

NOTE Confidence: 0.77925295

00:21:34.530 --> 00:21:39.438 Yes, it seems to be

NOTE Confidence: 0.77925295

00:21:39.440 --> 00:21:41.170 independent of stages

NOTE Confidence: 0.77925295

00:21:41.170 --> 00:21:42.900 asparagine levels within the tumors.

NOTE Confidence: 0.77925295

00:21:42.900 --> 00:21:44.804 So what we really want to do

NOTE Confidence: 0.77925295

00:21:44.804 --> 00:21:47.109 next is we want to obtain blood

NOTE Confidence: 0.77925295

00:21:47.109 --> 00:21:49.233 samples from patients to see if

NOTE Confidence: 0.77925295

00:21:49.302 --> 00:21:51.547 we can measure asparagine levels.

NOTE Confidence: 0.77925295

00:21:51.550 --> 00:21:53.825 And if this could be potentially a

NOTE Confidence: 0.77925295

00:21:53.825 --> 00:21:56.048 biomarker as well for these patients.

NOTE Confidence: 0.77925295

00:21:56.050 --> 00:21:57.952 So that's something that we want

NOTE Confidence: 0.77925295

00:21:57.952 --> 00:22:00.200 to validate in a larger cohort.

NOTE Confidence: 0.77925295

00:22:00.200 --> 00:22:01.860 That's something we're looking into

NOTE Confidence: 0.77925295

00:22:01.860 --> 00:22:04.010 right now to collect these samples.

00:22:05.003 --> 00:22:06.989 When we were talking about cause

NOTE Confidence: 0.8433062

00:22:06.989 --> 00:22:09.546 versus effect, it really gets to

NOTE Confidence: 0.8433062

00:22:09.546 --> 00:22:12.144 your next steps, right?

NOTE Confidence: 0.8433062

00:22:12.144 --> 00:22:14.688 So if we think that

NOTE Confidence: 0.8433062

00:22:14.688 --> 00:22:16.899 asparagine is really an effect,

NOTE Confidence: 0.8433062

00:22:16.900 --> 00:22:20.196 in other words, you have a tumor that

NOTE Confidence: 0.8433062

00:22:20.196 --> 00:22:23.378 then causes asparagine levels to go up,

NOTE Confidence: 0.8433062

00:22:23.380 --> 00:22:25.540 such that those asparagine levels

NOTE Confidence: 0.8433062

00:22:25.540 --> 00:22:27.268 are predictive of prognosis,

NOTE Confidence: 0.8433062

00:22:27.270 --> 00:22:28.566 certainly thinking about,

NOTE Confidence: 0.8433062

00:22:28.566 --> 00:22:31.590 can we use this as a biomarker,

NOTE Confidence: 0.8433062

00:22:31.590 --> 00:22:35.542 especially if it can be found in something

NOTE Confidence: 0.8433062

00:22:35.542 --> 00:22:39.644 simple like a blood sample or a stool sample,

NOTE Confidence: 0.8433062

00:22:39.650 --> 00:22:40.946 might be helpful.

NOTE Confidence: 0.8433062

00:22:40.946 --> 00:22:42.674 On the other hand,

NOTE Confidence: 0.8433062

00:22:42.680 --> 00:22:47.010 if we think about it being more of a cause,

NOTE Confidence: 0.8433062

00:22:47.010 --> 00:22:48.466 that is to say,

NOTE Confidence: 0.8433062

00:22:48.466 --> 00:22:52.209 if you have high levels of asparagine that

NOTE Confidence: 0.8433062

00:22:52.210 --> 00:22:54.982 then sets off a cascade that leads

NOTE Confidence: 0.8433062

00:22:54.982 --> 00:22:57.838 to worse tumors and worse prognosis,

NOTE Confidence: 0.8433062

00:22:57.840 --> 00:22:59.750 then the concept might shift

NOTE Confidence: 0.8433062

00:22:59.750 --> 00:23:02.600 not only to be a biomarker,

NOTE Confidence: 0.8433062

00:23:02.600 --> 00:23:05.198 but to really think about

NOTE Confidence: 0.8433062

00:23:05.198 --> 00:23:06.930 this as a therapeutic target.

NOTE Confidence: 0.8433062

00:23:06.930 --> 00:23:11.320 So where where do you kind of come down on

NOTE Confidence: 0.8433062

00:23:11.320 --> 00:23:13.728 your next steps with regards to that?

NOTE Confidence: 0.8060469

00:23:14.510 --> 00:23:16.958 That's a really good question.

NOTE Confidence: 0.8060469

00:23:16.960 --> 00:23:18.990 We are currently designing

NOTE Confidence: 0.8060469

00:23:18.990 --> 00:23:21.899 studies to look at the effect of

NOTE Confidence: 0.8060469

00:23:21.899 --> 00:23:24.299 asparagine on tumor growth.

00:23:25.928 --> 00:23:27.963 Providing a different cell line,

NOTE Confidence: 0.8060469

00:23:27.970 --> 00:23:30.322 and animal models asparagine to see

NOTE Confidence: 0.8060469

00:23:30.322 --> 00:23:32.870 if it does propagate tumor growth.

NOTE Confidence: 0.8060469

00:23:32.870 --> 00:23:35.516 There was a study

NOTE Confidence: 0.8060469

00:23:35.516 --> 00:23:38.142 out in Nature a couple of

NOTE Confidence: 0.8060469

00:23:38.142 --> 00:23:40.841 years ago where they in a different

NOTE Confidence: 0.8060469

00:23:40.841 --> 00:23:44.285 cancer model, in a breast cancer model,

NOTE Confidence: 0.8060469

00:23:44.290 --> 00:23:44.950 they fed mice

NOTE Confidence: 0.8060469

00:23:44.950 --> 00:23:46.930 asparagine in their diet and

NOTE Confidence: 0.8060469

00:23:46.930 --> 00:23:49.257 they saw that it actually caused

NOTE Confidence: 0.8060469

00:23:49.257 --> 00:23:51.262 the primary tumor to metastasize.

NOTE Confidence: 0.8060469

00:23:51.270 --> 00:23:53.580 So there's been a number of studies

NOTE Confidence: 0.8060469

00:23:53.580 --> 00:23:55.725 that have looked into asparagine and

NOTE Confidence: 0.8060469

00:23:55.725 --> 00:23:58.770 have seen that it can propagate tumor growth.

NOTE Confidence: 0.8060469

00:23:58.770 --> 00:24:03.070 So we had we have a study that has been

NOTE Confidence: 0.8060469

00:24:03.070 --> 00:24:05.164 funded by the American Cancer Society

NOTE Confidence: 0.8060469

00:24:05.164 --> 00:24:07.968 where we will be looking at the effect

NOTE Confidence: 0.8060469

00:24:07.968 --> 00:24:10.554 of both the gene that produces

NOTE Confidence: 0.8060469

00:24:10.554 --> 00:24:12.570 asparagine so asparagine synthetase,

NOTE Confidence: 0.8060469

00:24:12.570 --> 00:24:15.258 and we've developed some cell lines where

NOTE Confidence: 0.8060469

00:24:15.258 --> 00:24:18.269 we have the knockout of this gene,

NOTE Confidence: 0.8060469

00:24:18.270 --> 00:24:22.050 and we will be

NOTE Confidence: 0.8060469

00:24:22.050 --> 00:24:24.966 injecting this

NOTE Confidence: 0.8060469

00:24:24.966 --> 00:24:28.383 into mice and also to feed them

NOTE Confidence: 0.8060469

00:24:28.383 --> 00:24:31.596 asparagine to see if it will actually

NOTE Confidence: 0.8060469

00:24:31.687 --> 00:24:34.900 affect tumor growth so

NOTE Confidence: 0.8060469

00:24:34.900 --> 00:24:37.024 hopefully in the future

NOTE Confidence: 0.8060469

00:24:37.024 --> 00:24:39.641 down the line we can sort of test

NOTE Confidence: 0.8060469

00:24:39.641 --> 00:24:42.284 to see if any of the asparagine

NOTE Confidence: 0.8060469

00:24:42.284 --> 00:24:44.509 reducing drugs

NOTE Confidence: 0.8060469

00:24:44.509 --> 00:24:47.310 could be used as a therapeutic

NOTE Confidence: 0.8060469

00:24:47.310 --> 00:24:49.135 to reduce asparagine levels

NOTE Confidence: 0.8060469

00:24:49.140 --> 00:24:51.326 in colon cancer patients, potentially.

00:24:52.060 --> 00:24:54.980 iI's so interesting when you talk about that

NOTE Confidence: 0.80210626

00:24:54.980 --> 00:24:57.318 study in breast cancer where feeding

NOTE Confidence: 0.80210626

00:24:57.318 --> 00:24:59.720 asparagine led to increased metastasis.

NOTE Confidence: 0.80210626

00:24:59.720 --> 00:25:02.443 One of the obvious questions I'm sure

NOTE Confidence: 0.80210626

00:25:02.443 --> 00:25:05.797 all of our listeners want to know is

NOTE Confidence: 0.80210626

00:25:05.800 --> 00:25:10.128 what foods out there are high in asparagine?

NOTE Confidence: 0.8389733

00:25:11.370 --> 00:25:13.055 That's something

NOTE Confidence: 0.8389733

00:25:13.055 --> 00:25:14.740 we're looking into as well.

NOTE Confidence: 0.8389733

00:25:14.740 --> 00:25:17.764 As with any sort of food source,

NOTE Confidence: 0.8389733

00:25:17.770 --> 00:25:19.455 there are many different components

NOTE Confidence: 0.8389733

00:25:19.455 --> 00:25:21.448 within a

NOTE Confidence: 0.8389733

00:25:21.448 --> 00:25:23.893 vegetable or within

NOTE Confidence: 0.8389733

00:25:23.893 --> 00:25:26.734 anything that you eat.

00:25:29.300 --> 00:25:32.630 I think if it was going to be given

NOTE Confidence: 0.8389733

00:25:32.630 --> 00:25:36.050 as a therapeutic

NOTE Confidence: 0.8389733

00:25:36.050 --> 00:25:38.946 I don't know if diet is

NOTE Confidence: 0.8389733

00:25:38.946 --> 00:25:41.736 really the best way to approach it.

NOTE Confidence: 0.8389733

00:25:41.740 --> 00:25:44.008 It could be better to potentially

NOTE Confidence: 0.8389733

00:25:44.008 --> 00:25:45.142 try and reduce

NOTE Confidence: 0.8351811

00:25:45.150 --> 00:25:46.320 asparagine levels,

NOTE Confidence: 0.8351811

00:25:46.320 --> 00:25:49.492 and that's what I mean as using

NOTE Confidence: 0.8351811

00:25:49.492 --> 00:25:52.075 it as a preventative measure

NOTE Confidence: 0.8351811

00:25:52.075 --> 00:25:54.342 so encouraging people to eat less

NOTE Confidence: 0.8351811

00:25:54.342 --> 00:25:56.520 foods that are high in asparagine.

NOTE Confidence: 0.8351811

00:25:56.520 --> 00:25:58.415 Which brings us to the

NOTE Confidence: 0.8351811

00:25:58.415 --> 00:26:00.310 question which foods are those?

00:26:03.770 --> 00:26:06.038 At the moment we don't really know

NOTE Confidence: 0.80393267

00:26:06.038 --> 00:26:08.538 which foods have high asparagine levels.

NOTE Confidence: 0.80393267

00:26:08.540 --> 00:26:10.532 That's something that we

NOTE Confidence: 0.80393267

00:26:10.532 --> 00:26:13.333 would need to look into 'cause you know

NOTE Confidence: 0.80393267

00:26:13.333 --> 00:26:15.439 each food product does contain many

NOTE Confidence: 0.80393267

00:26:15.507 --> 00:26:18.075 different amino acids and other products,

NOTE Confidence: 0.80393267

00:26:18.080 --> 00:26:20.564 and it tends to be some food products that

NOTE Confidence: 0.80393267

00:26:20.564 --> 00:26:23.260 may have higher asparagine levels have

NOTE Confidence: 0.80393267

00:26:23.260 --> 00:26:25.790 other beneficial properties.

NOTE Confidence: 0.8334635

00:26:28.050 --> 00:26:29.838 Yeah, that's a

NOTE Confidence: 0.8334635

00:26:29.838 --> 00:26:31.179 really interesting point,

NOTE Confidence: 0.8334635

00:26:31.180 --> 00:26:33.286 but I think that perhaps

NOTE Confidence: 0.8334635

00:26:33.286 --> 00:26:35.839 targeting maybe

NOTE Confidence: 0.8334635

00:26:35.839 --> 00:26:37.975 a therapeutic standpoint from

NOTE Confidence: 0.8334635

00:26:37.975 --> 00:26:40.111 using something like asparagine.

NOTE Confidence: 0.8334635

00:26:40.120 --> 00:26:42.796 AIDS might perhaps be more effective,

NOTE Confidence: 0.8334635

00:26:42.800 --> 00:26:45.458 but definitely the diet would be

NOTE Confidence: 0.8334635

00:26:45.458 --> 00:26:47.753 something that would be useful

NOTE Confidence: 0.8334635

00:26:47.753 --> 00:26:50.399 to look into for these patients.

NOTE Confidence: 0.8334635

00:26:50.400 --> 00:26:53.034 Yeah, because they kind of wonder

NOTE Confidence: 0.8334635

00:26:53.034 --> 00:26:54.790 whether women just naturally

NOTE Confidence: 0.8334635

00:26:54.865 --> 00:26:56.817 gravitate towards eating foods

NOTE Confidence: 0.8334635

00:26:56.817 --> 00:26:59.257 that are higher in asparagine

NOTE Confidence: 0.8334635

00:26:59.260 --> 00:27:02.506 or whether they process those

NOTE Confidence: 0.8334635

00:27:02.506 --> 00:27:06.299 differently such that they end up with

NOTE Confidence: 0.8334635

00:27:06.299 --> 00:27:09.365 higher levels of asparagine versus men,

NOTE Confidence: 0.8334635

00:27:09.370 --> 00:27:12.278 and so understanding how

NOTE Confidence: 0.8334635

00:27:12.278 --> 00:27:15.186 they metabolize those foods

NOTE Confidence: 0.8334635

00:27:15.190 --> 00:27:17.962 might play a role, but can you

NOTE Confidence: 0.8334635

00:27:17.962 --> 00:27:21.367 comment that in looking at the

NOTE Confidence: 0.8334635

00:27:21.367 --> 00:27:23.887 enzymes that breakdown asparagine and

NOTE Confidence: 0.8334635

00:27:23.887 --> 00:27:26.747 also those that increase asparagine ,

NOTE Confidence: 0.8334635

00:27:26.750 --> 00:27:29.878 did you find a difference between men and

NOTE Confidence: 0.8334635

00:27:29.878 --> 00:27:33.168 women in terms of their natural enzymes?

NOTE Confidence: 0.8334635

00:27:33.170 --> 00:27:35.726 Even outside of the cancer patient?

NOTE Confidence: 0.8334635

00:27:35.730 --> 00:27:37.450 We haven't looked at

NOTE Confidence: 0.82178473

00:27:37.450 --> 00:27:39.590 the expression levels of those,

NOTE Confidence: 0.82178473

00:27:39.590 --> 00:27:42.579 but that's a really interesting point.

NOTE Confidence: 0.82178473

00:27:42.580 --> 00:27:45.639 We do know that the asparagine synthetase

NOTE Confidence: 0.82178473

00:27:45.640 --> 00:27:47.986 is associated with poor survival

NOTE Confidence: 0.82178473

00:27:47.990 --> 00:27:50.646 if it's a higher expression only in

NOTE Confidence: 0.82178473

00:27:50.646 --> 00:27:53.479 women with right sided colorectal cancer.

NOTE Confidence: 0.82178473

00:27:53.480 --> 00:27:55.872 But I think also having a

NOTE Confidence: 0.82178473

00:27:55.872 --> 00:27:58.031 look more deeply at the microbiome

NOTE Confidence: 0.82178473

00:27:58.031 --> 00:28:00.835 because we know that there are many

NOTE Confidence: 0.82178473

00:28:00.835 --> 00:28:03.280 species within the microbiome that

NOTE Confidence: 0.82178473

00:28:03.280 --> 00:28:05.236 can also metabolize asparagine.

NOTE Confidence: 0.82178473

00:28:05.240 --> 00:28:07.200 This could be, you know,

NOTE Confidence: 0.82178473

00:28:07.200 --> 00:28:08.768 another therapeutic that

NOTE Confidence: 0.82178473

00:28:08.768 --> 00:28:10.728 could be explored as well,

NOTE Confidence: 0.82178473

00:28:10.730 --> 00:28:13.166 and I think having a

NOTE Confidence: 0.82178473

00:28:13.166 --> 00:28:15.649 more in depth look at

NOTE Confidence: 0.82178473

00:28:15.650 --> 00:28:17.530 the microbiome that could be

NOTE Confidence: 0.82178473

00:28:17.530 --> 00:28:19.842 present within the stool sample or

NOTE Confidence: 0.82178473

00:28:19.842 --> 00:28:21.687 within the tissue samples within

NOTE Confidence: 0.82178473

00:28:21.687 --> 00:28:23.860 patients is also really important.

00:28:25.030 --> 00:28:27.196 The other question

NOTE Confidence: 0.83346504

00:28:27.196 --> 00:28:29.946 that comes to mind is while your

NOTE Confidence: 0.83346504

00:28:29.946 --> 00:28:32.406 research is really focused on the

NOTE Confidence: 0.83346504

00:28:32.406 --> 00:28:34.418 differences between men and women,

NOTE Confidence: 0.83346504

00:28:34.420 --> 00:28:36.430 one wonders, especially when you

NOTE Confidence: 0.83346504

00:28:36.430 --> 00:28:38.877 think about the potential role for

NOTE Confidence: 0.83346504

00:28:38.877 --> 00:28:41.067 asparagine in mediating prognosis.

NOTE Confidence: 0.83346504

00:28:41.070 --> 00:28:43.597 I'm going back to that study

NOTE Confidence: 0.83346504

00:28:43.597 --> 00:28:46.607 that you said was published in Nature

NOTE Confidence: 0.83346504

00:28:46.610 --> 00:28:49.426 in the breast cancer model,

NOTE Confidence: 0.83346504

00:28:49.430 --> 00:28:51.548 whether if you look at

NOTE Confidence: 0.83346504

00:28:51.548 --> 00:28:52.960 men with colon cancers,

NOTE Confidence: 0.83346504

00:28:52.960 --> 00:28:54.675 whether men with higher levels

NOTE Confidence: 0.83346504

00:28:54.675 --> 00:28:56.814 of asparagine do worse than men

NOTE Confidence: 0.83346504

00:28:56.814 --> 00:28:58.609 with lower levels of asparagine

NOTE Confidence: 0.83346504

00:28:58.610 --> 00:29:00.380 have you looked at that?

NOTE Confidence: 0.83346504

00:29:00.380 --> 00:29:02.140 We have and it doesn't

NOTE Confidence: 0.85276526

00:29:02.140 --> 00:29:03.910 seem to be the case,

NOTE Confidence: 0.85276526

00:29:03.910 --> 00:29:06.781 so it seems to be sort of what we've

NOTE Confidence: 0.85276526

00:29:06.781 --> 00:29:09.906 seen is the opposite way round.

NOTE Confidence: 0.85276526

00:29:09.910 --> 00:29:11.752 The with you for male patient

NOTE Confidence: 0.85276526

00:29:11.752 --> 00:29:13.790 has higher levels of disparaging.

NOTE Confidence: 0.85276526

00:29:13.790 --> 00:29:15.560 They tend to do better.

NOTE Confidence: 0.85276526

00:29:15.560 --> 00:29:18.176 So it's really perplexing

NOTE Confidence: 0.85276526

00:29:18.180 --> 00:29:19.044 Interesting, you know,

NOTE Confidence: 0.85276526

00:29:19.044 --> 00:29:20.196 and it's really fascinating,

NOTE Confidence: 0.85276526

00:29:20.200 --> 00:29:21.904 so it's something that you know

NOTE Confidence: 0.85276526

00:29:21.904 --> 00:29:23.388 where we're looking into within

NOTE Confidence: 0.85276526

00:29:23.388 --> 00:29:24.828 my lab in different models,

NOTE Confidence: 0.85276526

00:29:24.830 --> 00:29:26.558 so hopefully we'll get

NOTE Confidence: 0.85276526

00:29:26.560 --> 00:29:28.702 better insight into this in the

NOTE Confidence: 0.85276526

00:29:28.702 --> 00:29:30.610 the next couple of years or so.

NOTE Confidence: 0.8815004

00:29:31.290 --> 00:29:33.215 Doctor Caroline Johnson is assistant

NOTE Confidence: 0.8815004

00:29:33.215 --> 00:29:35.564 professor of Epidemiology in the Department

NOTE Confidence: 0.8815004

00:29:35.564 --> 00:29:37.379 of Environmental Health Sciences at

NOTE Confidence: 0.8815004

00:29:37.379 --> 00:29:39.670 the Yale School of Public Health.

NOTE Confidence: 0.8815004

00:29:39.670 --> 00:29:41.202 If you have questions,

NOTE Confidence: 0.8815004

00:29:41.202 --> 00:29:42.734 the address is canceranswers@yale.edu

NOTE Confidence: 0.8815004

00:29:42.734 --> 00:29:44.843 and past editions of the program

NOTE Confidence: 0.8815004

00:29:44.843 --> 00:29:46.775 are available in audio and written

NOTE Confidence: 0.8815004

00:29:46.830 --> 00:29:48.438 form at yalecancercenter.org.

NOTE Confidence: 0.8815004

00:29:48.440 --> 00:29:51.216 We hope you'll join us next week to

NOTE Confidence: 0.8815004

00:29:51.216 --> 00:29:53.925 learn more about the fight against

NOTE Confidence: 0.8815004

00:29:53.925 --> 00:29:56.823 cancer here on Connecticut Public Radio.