



1  
00:00:03,300 --> 00:00:09,380

[Music]

2  
00:00:15,420 --> 00:00:13,320

I'm gonna run you through a little bit

3  
00:00:18,510 --> 00:00:15,430

different scenario than we've had in

4  
00:00:20,519 --> 00:00:18,520

this convention so far but just give an

5  
00:00:22,260 --> 00:00:20,529

idea of what we're about we have a

6  
00:00:24,870 --> 00:00:22,270

technology platform that we call

7  
00:00:27,630 --> 00:00:24,880

resonant molecular signaling and it

8  
00:00:29,940 --> 00:00:27,640

ought to resonate with this group we're

9  
00:00:32,850 --> 00:00:29,950

convinced that good health depends on

10  
00:00:35,400 --> 00:00:32,860

typical communication between and

11  
00:00:37,620 --> 00:00:35,410

amongst within and among cells any

12  
00:00:39,720 --> 00:00:37,630

disruption of that signaling will result

13  
00:00:42,810 --> 00:00:39,730

in disease it can be acute like a stroke

14

00:00:45,150 --> 00:00:42,820

or chronic like rheumatoid arthritis our

15

00:00:47,850 --> 00:00:45,160

goal using resident molecular signaling

16

00:00:50,490 --> 00:00:47,860

is simply to use molecules and

17

00:00:52,230 --> 00:00:50,500

oftentimes fractions of molecules to

18

00:00:55,500 --> 00:00:52,240

restore communication and let the body

19

00:00:57,600 --> 00:00:55,510

do what it's supposed to do the

20

00:00:59,760 --> 00:00:57,610

therapeutic agents that we use in

21

00:01:02,430 --> 00:00:59,770

Resident leukocytes signaling are as a

22

00:01:04,229 --> 00:01:02,440

group selected after studying the

23

00:01:05,910 --> 00:01:04,239

pathophysiology of disease what we're

24

00:01:08,340 --> 00:01:05,920

interested in is we we look at a disease

25

00:01:09,929 --> 00:01:08,350

disease X whatever it might be look at

26

00:01:12,660 --> 00:01:09,939

the sequence of events leading from

27

00:01:14,700 --> 00:01:12,670

initiation of disease to occurrence of

28

00:01:17,010 --> 00:01:14,710

signs and symptoms and see where we can

29

00:01:18,960 --> 00:01:17,020

interfere with that then think about a

30

00:01:21,420 --> 00:01:18,970

molecule that might be able to do that

31

00:01:23,190 --> 00:01:21,430

interference and we come up with these

32

00:01:25,980 --> 00:01:23,200

molecules either just brainstorming

33

00:01:28,950 --> 00:01:25,990

maybe reading the literature or just by

34

00:01:31,469 --> 00:01:28,960

trial and error with one exception all

35

00:01:34,200 --> 00:01:31,479

the molecules we use therapeutically are

36

00:01:36,930 --> 00:01:34,210

naturally occurring they are often well

37

00:01:38,190 --> 00:01:36,940

studied but also with but one exception

38

00:01:40,560 --> 00:01:38,200

they've never been used therapeutically

39

00:01:43,710 --> 00:01:40,570

before so they're all together different

40

00:01:47,100 --> 00:01:43,720

than what's on the market now they are

41

00:01:50,010 --> 00:01:47,110

safe and we have done I think we're into

42

00:01:53,190 --> 00:01:50,020

our sixteenth phase to FDA trial we've

43

00:01:55,710 --> 00:01:53,200

done a couple USDA trials also in all of

44

00:01:57,630 --> 00:01:55,720

those trials to put the safety profile

45

00:01:59,310 --> 00:01:57,640

for the placebo placebo group is the

46

00:02:03,000 --> 00:01:59,320

same as for the treated group so these

47

00:02:04,500 --> 00:02:03,010

things are safe very interesting is they

48

00:02:05,910 --> 00:02:04,510

are stable at all these different

49

00:02:08,070 --> 00:02:05,920

temperatures that's interesting because

50

00:02:10,169 --> 00:02:08,080

some of these molecules are enzymes or

51  
00:02:12,809 --> 00:02:10,179  
hormones and those of you that work in

52  
00:02:15,960 --> 00:02:12,819  
biology know that those are not stable

53  
00:02:17,100 --> 00:02:15,970  
at room temperature or at pocket

54  
00:02:18,510 --> 00:02:17,110  
temperature things like that they are

55  
00:02:20,580 --> 00:02:18,520  
not stable with respect to their

56  
00:02:22,080 --> 00:02:20,590  
enzymatic or hormonal activity but

57  
00:02:23,100 --> 00:02:22,090  
that's not what we're looking at we're

58  
00:02:25,680 --> 00:02:23,110  
looking at a different kind of

59  
00:02:27,960 --> 00:02:25,690  
of activity and we administer these in

60  
00:02:33,840 --> 00:02:27,970  
what we call physiologic doses much more

61  
00:02:35,610 --> 00:02:33,850  
concentrated than a remedy that would be

62  
00:02:37,640 --> 00:02:35,620  
associated with homeopathy but less

63  
00:02:41,880 --> 00:02:37,650

concentrated there might be a normal

64

00:02:43,820 --> 00:02:41,890

physiologic rub allopathic dose we're

65

00:02:46,800 --> 00:02:43,830

convinced that these agents that we use

66

00:02:48,450 --> 00:02:46,810

act as nothing more than signals to

67

00:02:50,010 --> 00:02:48,460

stimulate a cascade of events that

68

00:02:51,900 --> 00:02:50,020

results in the desired outcome of

69

00:02:53,970 --> 00:02:51,910

interest is there's no relationship

70

00:02:57,000 --> 00:02:53,980

between patient mass and the dose that

71

00:02:59,790 --> 00:02:57,010

we use so a 2,000 pound horse gets the

72

00:03:03,150 --> 00:02:59,800

same dose as a 5 pound chihuahua or 150

73

00:03:06,240 --> 00:03:03,160

pound man the frequency of dosing can

74

00:03:08,310 --> 00:03:06,250

change but never the dose itself also of

75

00:03:10,860 --> 00:03:08,320

interest is we can use different routes

76  
00:03:12,270 --> 00:03:10,870  
of administration with the same dose get

77  
00:03:14,070 --> 00:03:12,280  
the same response in the same amount of

78  
00:03:16,320 --> 00:03:14,080  
time you can't think of very many

79  
00:03:17,970 --> 00:03:16,330  
medicines that do that that again give

80  
00:03:20,699 --> 00:03:17,980  
us a hint that these are simply acting

81  
00:03:23,250 --> 00:03:20,709  
as signals what I want to do today is

82  
00:03:25,199 --> 00:03:23,260  
focus on just one of these therapeutic

83  
00:03:27,630 --> 00:03:25,209  
agents as kind of the prototype for our

84  
00:03:29,370 --> 00:03:27,640  
platform and this is streptomycin oh

85  
00:03:31,620 --> 00:03:29,380  
that's scribble on the right is supposed

86  
00:03:32,910 --> 00:03:31,630  
to resemble three-dimensional structure

87  
00:03:34,920 --> 00:03:32,920  
of streptomycin though I don't know if

88  
00:03:36,770 --> 00:03:34,930

it does or not I've never seen it but

89

00:03:39,030 --> 00:03:36,780

that's what comes out of the literature

90

00:03:41,220 --> 00:03:39,040

this is a molecule that you're all

91

00:03:43,520 --> 00:03:41,230

familiar with one way or another this is

92

00:03:46,020 --> 00:03:43,530

the toxin from group a beta hemolytic

93

00:03:48,720 --> 00:03:46,030

streptococcus or throat and this is the

94

00:03:51,090 --> 00:03:48,730

toxin that causes a sore throat we use

95

00:03:55,530 --> 00:03:51,100

it as a therapeutic agent in a little

96

00:03:59,640 --> 00:03:55,540

bit a little bit different situation in

97

00:04:02,490 --> 00:03:59,650

that we modify the toxin we reduce it

98

00:04:04,080 --> 00:04:02,500

it's toxic in its I'm sorry it's toxic

99

00:04:06,570 --> 00:04:04,090

in its reduced state we modify it to the

100

00:04:09,120 --> 00:04:06,580

oxidized state it loses its toxicity and

101

00:04:13,580 --> 00:04:09,130

gains therapeutic activity of a

102

00:04:17,219 --> 00:04:13,590

different way that's the modification

103

00:04:18,630 --> 00:04:17,229

well there we go now one might wonder

104

00:04:20,699 --> 00:04:18,640

what the heck why would we ever use

105

00:04:22,350 --> 00:04:20,709

streptomycin o as a therapeutic agent in

106

00:04:24,960 --> 00:04:22,360

the first place there was a paper

107

00:04:26,730 --> 00:04:24,970

presented oh gosh she's gotta be eight

108

00:04:28,230 --> 00:04:26,740

or nine years ago now by a professor at

109

00:04:32,370 --> 00:04:28,240

Brown University at the Medical School

110

00:04:34,200 --> 00:04:32,380

and this gal did some epidemiological

111

00:04:35,760 --> 00:04:34,210

work to show that movement disorders

112

00:04:36,869 --> 00:04:35,770

like Tourette's and ticks and things

113

00:04:38,429 --> 00:04:36,879

like that

114

00:04:40,980 --> 00:04:38,439

in adults could be related to a

115

00:04:43,589 --> 00:04:40,990

childhood history of chronic or repeated

116

00:04:45,239 --> 00:04:43,599

strep infections we wondered what the

117

00:04:47,699 --> 00:04:45,249

heck could that relationship be that is

118

00:04:49,199 --> 00:04:47,709

clearly the organism was no longer there

119

00:04:52,079 --> 00:04:49,209

in the adult and yet we had these

120

00:04:54,199 --> 00:04:52,089

symptoms what might be happening and we

121

00:04:58,889 --> 00:04:54,209

thought there might be a situation

122

00:05:01,010 --> 00:04:58,899

involved with an aberrant immune

123

00:05:03,119 --> 00:05:01,020

response to the original infection that

124

00:05:06,290 --> 00:05:03,129

persisted through our life and could

125

00:05:09,299 --> 00:05:06,300

cause these problems so what we did was

126  
00:05:11,939 --> 00:05:09,309  
obtained some very very highly purified

127  
00:05:13,769 --> 00:05:11,949  
strep to lichen though we oxidized it

128  
00:05:15,629 --> 00:05:13,779  
that's the modification step then we had

129  
00:05:18,389 --> 00:05:15,639  
to find a patient with this kind of a

130  
00:05:20,939 --> 00:05:18,399  
problem and we found one of a patient

131  
00:05:22,469 --> 00:05:20,949  
that was in the the practice of one of

132  
00:05:25,619 --> 00:05:22,479  
the physicians in our group who had a

133  
00:05:27,959 --> 00:05:25,629  
horrible tick of the neck and head she

134  
00:05:30,119 --> 00:05:27,969  
was always going like this about every 6

135  
00:05:31,739 --> 00:05:30,129  
or 7 seconds if you sat in the

136  
00:05:33,439 --> 00:05:31,749  
examination room with her within three

137  
00:05:36,419 --> 00:05:33,449  
or four minutes you're going like this -

138  
00:05:39,119 --> 00:05:36,429

everybody's doing this she was 34 years

139

00:05:41,449 --> 00:05:39,129

old at the at the time of initiation of

140

00:05:44,699 --> 00:05:41,459

therapy she was being treated by this

141

00:05:46,619 --> 00:05:44,709

physician for another problem but he

142

00:05:50,850 --> 00:05:46,629

contacted her and said listen Mary would

143

00:05:53,429 --> 00:05:50,860

you be interested in trying this kind of

144

00:05:54,929 --> 00:05:53,439

left-wing wacko approach to seeing if we

145

00:05:56,999 --> 00:05:54,939

could do anything with your tip we're

146

00:05:59,040 --> 00:05:57,009

confident it'll be safe we haven't the

147

00:05:59,429 --> 00:05:59,050

foggiest idea if it's gonna do you any

148

00:06:02,009 --> 00:05:59,439

good

149

00:06:04,439 --> 00:06:02,019

she said yep let's give it a try so she

150

00:06:06,809 --> 00:06:04,449

came to the clinic she was instructed to

151

00:06:09,329 --> 00:06:06,819

take one drop under her tongue of this

152

00:06:11,909 --> 00:06:09,339

modified strep - Lysa no four times a

153

00:06:14,159 --> 00:06:11,919

day come back in four weeks she did that

154

00:06:16,619 --> 00:06:14,169

and at the end of the four weeks she

155

00:06:18,899 --> 00:06:16,629

came back and clearly her tick was

156

00:06:20,429 --> 00:06:18,909

reduced but it was not gone the

157

00:06:21,989 --> 00:06:20,439

physician had the good sense to say well

158

00:06:23,790 --> 00:06:21,999

gosh Mary did you see anything else good

159

00:06:25,499 --> 00:06:23,800

or bad that occurred during this four a

160

00:06:27,899 --> 00:06:25,509

week period and she goes like this

161

00:06:30,839 --> 00:06:27,909

William just about pushes the guy out

162

00:06:33,480 --> 00:06:30,849

she said look at this well yeah close up

163

00:06:35,699 --> 00:06:33,490

and I said it very nice looking fist

164

00:06:38,189 --> 00:06:35,709

what am I looking at and she said well

165

00:06:39,959 --> 00:06:38,199

when I was eight or nine years old I was

166

00:06:42,839 --> 00:06:39,969

in my mother's kitchen and I pulled a

167

00:06:45,089 --> 00:06:42,849

sauce pan of boiling water off the stove

168

00:06:47,040 --> 00:06:45,099

onto my hand and I burned my knuckles

169

00:06:48,389 --> 00:06:47,050

very badly scarred we thought

170

00:06:51,210 --> 00:06:48,399

permanently and in four weeks those

171

00:06:53,610 --> 00:06:51,220

scars are gone well

172

00:06:55,200 --> 00:06:53,620

that's kind of interesting how do you

173

00:06:57,270 --> 00:06:55,210

makes cars go you're taking a drop out

174

00:07:00,410 --> 00:06:57,280

of the tongue and this cows cars

175

00:07:02,880 --> 00:07:00,420

disappear so we thought well geez oh man

176

00:07:06,690 --> 00:07:02,890

that might be kind of interesting all by

177

00:07:08,580 --> 00:07:06,700

itself and we brought other patients in

178

00:07:10,590 --> 00:07:08,590

who had superficial scars of this sort

179

00:07:12,630 --> 00:07:10,600

that we could see and we found that yes

180

00:07:14,730 --> 00:07:12,640

indeed without exception we could

181

00:07:16,110 --> 00:07:14,740

certainly reduce the scars and sometimes

182

00:07:18,570 --> 00:07:16,120

make them go away completely in a

183

00:07:20,880 --> 00:07:18,580

four-week period again taking sublingual

184

00:07:24,750 --> 00:07:20,890

drops and it didn't matter where the

185

00:07:26,820 --> 00:07:24,760

scars were as we got more and more into

186

00:07:29,340 --> 00:07:26,830

this we found that the spectrum of

187

00:07:32,160 --> 00:07:29,350

targets for SLO therapy expanded far

188

00:07:34,230 --> 00:07:32,170

beyond scars and we'll take a look at

189

00:07:36,860 --> 00:07:34,240

some of that you know a little bit later

190

00:07:39,120 --> 00:07:36,870

today but wanted to give you an idea of

191

00:07:40,140 --> 00:07:39,130

some of the problems that we had trying

192

00:07:43,070 --> 00:07:40,150

to get our heads around what the heck's

193

00:07:48,420 --> 00:07:43,080

going on here we said what does SLO do

194

00:07:50,250 --> 00:07:48,430

this little photo micrograph collection

195

00:07:53,310 --> 00:07:50,260

is from collaborative work we did with

196

00:07:54,480 --> 00:07:53,320

investigators at NYU and what we have

197

00:07:57,870 --> 00:07:54,490

here whoops

198

00:08:00,000 --> 00:07:57,880

whichever hand has the pointer what we

199

00:08:02,160 --> 00:08:00,010

have here is human tissue grown on a

200

00:08:04,650 --> 00:08:02,170

microscope slide we cut the tissue was

201  
00:08:06,180 --> 00:08:04,660  
with a scalpel and then you'll see that

202  
00:08:10,260 --> 00:08:06,190  
we've used two different concentrations

203  
00:08:11,910 --> 00:08:10,270  
of slo exposed some cells that is some

204  
00:08:14,370 --> 00:08:11,920  
microscope some cells on microscope

205  
00:08:16,170 --> 00:08:14,380  
flies to SLO and have controls here and

206  
00:08:19,080 --> 00:08:16,180  
what we're measuring is the rate at

207  
00:08:22,230 --> 00:08:19,090  
which the gap closes this is superficial

208  
00:08:24,930 --> 00:08:22,240  
healing and what we found was that there

209  
00:08:26,730 --> 00:08:24,940  
is an incredibly increased rate of

210  
00:08:28,800 --> 00:08:26,740  
activation mobilization of character

211  
00:08:30,030 --> 00:08:28,810  
sites that causes closing the gap much

212  
00:08:32,909 --> 00:08:30,040  
faster than what happened under normal

213  
00:08:35,250 --> 00:08:32,919

conditions well great let's go a little

214

00:08:36,839 --> 00:08:35,260

bit deeper in that and see what genes

215

00:08:40,320 --> 00:08:36,849

are up and downregulated is a

216

00:08:41,339 --> 00:08:40,330

consequence of SLO exposure and we're

217

00:08:43,500 --> 00:08:41,349

certainly not going to go through all

218

00:08:46,860 --> 00:08:43,510

this but there are a couple important

219

00:08:51,920 --> 00:08:46,870

things here that you maybe heard of cd44

220

00:08:56,100 --> 00:08:51,930

antigen especially important in aligning

221

00:08:58,290 --> 00:08:56,110

collagen in proper sequence for scar

222

00:09:01,530 --> 00:08:58,300

formation for wound repair and so forth

223

00:09:04,199 --> 00:09:01,540

and we are upregulating that that's an

224

00:09:05,910 --> 00:09:04,209

anti inflammatory cytokine also so

225

00:09:08,850 --> 00:09:05,920

we're getting anti-inflammatory effects

226

00:09:11,730 --> 00:09:08,860

from SLO this one some of you might even

227

00:09:13,859 --> 00:09:11,740

take chondroitin nutritional supplement

228

00:09:16,340 --> 00:09:13,869

if you have arthritis in your knee or a

229

00:09:18,509 --> 00:09:16,350

sore elbow chondroitin is a typical

230

00:09:20,340 --> 00:09:18,519

nutritional supplement for that we think

231

00:09:22,259 --> 00:09:20,350

it's better to induce the body to

232

00:09:23,999 --> 00:09:22,269

generate its own and we can do it with

233

00:09:27,299 --> 00:09:24,009

SLO and a couple other molecules we use

234

00:09:29,299 --> 00:09:27,309

but complementary complementary Carolee

235

00:09:32,669 --> 00:09:29,309

to the upregulation in these

236

00:09:35,119 --> 00:09:32,679

anti-inflammatory cytokines was the down

237

00:09:37,949 --> 00:09:35,129

regulation of pro-inflammatory cytokines

238

00:09:40,739 --> 00:09:37,959

extremely important especially this guy

239

00:09:43,369 --> 00:09:40,749

which probably most of you have never

240

00:09:46,859 --> 00:09:43,379

heard of the matrix metalloproteinases

241

00:09:50,040 --> 00:09:46,869

these are collective group of enzymes

242

00:09:53,220 --> 00:09:50,050

that are implicated in a variety of

243

00:09:54,499 --> 00:09:53,230

diseases ranging and this is not being

244

00:09:57,530 --> 00:09:54,509

flippant about it

245

00:10:01,769 --> 00:09:57,540

ranging from sore throats to cancer

246

00:10:04,019 --> 00:10:01,779

these are really really dynamic proteins

247

00:10:06,210 --> 00:10:04,029

and when they are up regulated there's

248

00:10:07,619 --> 00:10:06,220

nothing but trouble the pharmaceutical

249

00:10:10,910 --> 00:10:07,629

industry over the last eight years has

250

00:10:12,499 --> 00:10:10,920

spent over six billion dollars to find

251

00:10:16,169 --> 00:10:12,509

inhibitors of

252

00:10:19,139 --> 00:10:16,179

mmp9 and MMP - they often go hand in

253

00:10:21,179 --> 00:10:19,149

hand - is not on this list because

254

00:10:22,859 --> 00:10:21,189

although we down regulated it in this

255

00:10:26,910 --> 00:10:22,869

experiment it wasn't to a statistically

256

00:10:29,369 --> 00:10:26,920

significant level the point is that we

257

00:10:31,439 --> 00:10:29,379

are simultaneously up regulating anti

258

00:10:32,819 --> 00:10:31,449

inflammatory cytokines down-regulating

259

00:10:36,059 --> 00:10:32,829

pro-inflammatory cytokines and

260

00:10:40,109 --> 00:10:36,069

down-regulating mmp-9 and we'll see what

261

00:10:42,600 --> 00:10:40,119

that means here a little while so let's

262

00:10:44,129 --> 00:10:42,610

look at some some practical applications

263

00:10:46,650 --> 00:10:44,139

of what we're finding with streptomycin

264

00:10:48,389 --> 00:10:46,660

though these four experiments are going

265

00:10:50,460 --> 00:10:48,399

to get about two minutes each these are

266

00:10:52,259 --> 00:10:50,470

all done in horses all done in with

267

00:10:54,059 --> 00:10:52,269

collaboration with investigators at the

268

00:10:55,499 --> 00:10:54,069

University of Kentucky or with

269

00:10:57,389 --> 00:10:55,509

practicing veterinarians and the large

270

00:10:59,519 --> 00:10:57,399

equine practices in the Lexington area

271

00:11:02,850 --> 00:10:59,529

all the animals are going to look at our

272

00:11:05,280 --> 00:11:02,860

extremely expensive thoroughbreds that

273

00:11:08,519 --> 00:11:05,290

have diseases for which there isn't much

274

00:11:11,249 --> 00:11:08,529

to offer first off the bat that's a

275

00:11:13,919 --> 00:11:11,259

horse's leg actually two legs of horses

276

00:11:16,199 --> 00:11:13,929

and what we're interested here is right

277

00:11:17,639 --> 00:11:16,209

here oftentimes a horse looking injured

278

00:11:24,929 --> 00:11:17,649

that

279

00:11:26,999 --> 00:11:24,939

horse limping and not being able to be

280

00:11:30,480 --> 00:11:27,009

athletic anymore is it the tendon will

281

00:11:32,759 --> 00:11:30,490

tighten up and the hoof will lose its

282

00:11:34,499 --> 00:11:32,769

normal orientation to the ground the

283

00:11:36,480 --> 00:11:34,509

horse will be unable to use that leg

284

00:11:38,189 --> 00:11:36,490

anymore it'll go down and it won't come

285

00:11:39,290 --> 00:11:38,199

back up that that'll be a horse that's

286

00:11:42,150 --> 00:11:39,300

going to be put to sleep

287

00:11:44,519 --> 00:11:42,160

what is done for therapy for this often

288

00:11:46,559 --> 00:11:44,529

times is to cut this tendon and what

289

00:11:48,150 --> 00:11:46,569

that does is release the pressure that's

290

00:11:49,889 --> 00:11:48,160

occurring as a result of the tightening

291

00:11:51,900 --> 00:11:49,899

after the injury scar tissue forms

292

00:11:54,449 --> 00:11:51,910

there's a tightening as cross linkage of

293

00:11:56,040 --> 00:11:54,459

collagen occurs if the tendon becomes

294

00:11:59,669 --> 00:11:56,050

less flexible now we're going to cut it

295

00:12:02,460 --> 00:11:59,679

that allows the hoof to regain its

296

00:12:03,600 --> 00:12:02,470

orientation a little bit better but what

297

00:12:05,249 --> 00:12:03,610

happens when you do something like that

298

00:12:10,259 --> 00:12:05,259

you actually generate scar tissue also

299

00:12:11,519 --> 00:12:10,269

and so we have a tenotomy that's the

300

00:12:15,629 --> 00:12:11,529

cutting of the tendon that's going to

301  
00:12:18,689 --> 00:12:15,639  
occur with this with this situation what

302  
00:12:20,639 --> 00:12:18,699  
we want to do is decrease or eliminate

303  
00:12:21,929 --> 00:12:20,649  
the scar tissue that forms after the

304  
00:12:25,139 --> 00:12:21,939  
tenotomy and we're going to do that

305  
00:12:27,809 --> 00:12:25,149  
using slo which we find alters the ratio

306  
00:12:30,150 --> 00:12:27,819  
of collagen to collagenase collagenous

307  
00:12:32,429 --> 00:12:30,160  
breaks down collagenase breaks down

308  
00:12:34,410 --> 00:12:32,439  
collagen allows it to be replaced by

309  
00:12:35,429 --> 00:12:34,420  
more vital tissue and here's what we

310  
00:12:37,379 --> 00:12:35,439  
have and we're certainly not going to go

311  
00:12:39,299 --> 00:12:37,389  
through all this stuff except look at

312  
00:12:42,480 --> 00:12:39,309  
the pretty colors what we're after in

313  
00:12:45,210 --> 00:12:42,490

this is we would like to see the dark

314

00:12:48,119 --> 00:12:45,220

the dark purple being shorter than the

315

00:12:51,119 --> 00:12:48,129

the light purple or the blue and this

316

00:12:53,100 --> 00:12:51,129

looks at post versus pre and what we're

317

00:12:55,350 --> 00:12:53,110

doing here is sonography where we're

318

00:12:57,389 --> 00:12:55,360

using a sonogram on the area of where

319

00:12:59,309 --> 00:12:57,399

the tenotomy is done so we get quite

320

00:13:01,259 --> 00:12:59,319

objective measurements of the amount of

321

00:13:02,910 --> 00:13:01,269

scar tissue by looking at three

322

00:13:04,590 --> 00:13:02,920

dimensional cross-sections of the tissue

323

00:13:07,199 --> 00:13:04,600

it all comes out that is the

324

00:13:09,960 --> 00:13:07,209

measurements come out of the computer so

325

00:13:13,499 --> 00:13:09,970

again its objective and what we want to

326  
00:13:17,489 --> 00:13:13,509  
have is smaller cross-sectional areas in

327  
00:13:18,809 --> 00:13:17,499  
the post this color versus the pre here

328  
00:13:20,730 --> 00:13:18,819  
looks pretty good this is after 30 days

329  
00:13:23,369 --> 00:13:20,740  
treatment that looks pretty good that's

330  
00:13:25,139 --> 00:13:23,379  
a turkey that's exactly wrong what went

331  
00:13:27,569 --> 00:13:25,149  
wrong dumb horse stepped in a hole

332  
00:13:31,170 --> 00:13:27,579  
during the four weeks of therapy and

333  
00:13:33,810 --> 00:13:31,180  
re-injured itself that's the way it goes

334  
00:13:36,060 --> 00:13:33,820  
this is a kind of a fun one in that you

335  
00:13:37,920 --> 00:13:36,070  
can see we're gaining a lot here we're

336  
00:13:40,110 --> 00:13:37,930  
starting to see something here after 30

337  
00:13:42,720 --> 00:13:40,120  
days the importance is this

338  
00:13:45,870 --> 00:13:42,730

animal-headed tenotomy seven years ago

339

00:13:47,820 --> 00:13:45,880

that's an old old scar and to get any

340

00:13:50,370 --> 00:13:47,830

resolution or a hint of resolution after

341

00:13:51,810 --> 00:13:50,380

that period is something that is fairly

342

00:13:53,160 --> 00:13:51,820

unheard of and you can see the stats

343

00:13:56,100 --> 00:13:53,170

here get fifty to thirty percent

344

00:13:58,490 --> 00:13:56,110

resolution in 30 days that's a start on

345

00:14:01,410 --> 00:13:58,500

something that could be quite useful

346

00:14:02,730 --> 00:14:01,420

another problem with horses again for

347

00:14:04,740 --> 00:14:02,740

which there's little therapy especially

348

00:14:07,710 --> 00:14:04,750

in these thoroughbreds it's a problem

349

00:14:09,990 --> 00:14:07,720

our cervical adhesions these adhesions

350

00:14:13,560 --> 00:14:10,000

occur after especially multiple births

351

00:14:16,560 --> 00:14:13,570

just the act of birthing results in scar

352

00:14:18,900 --> 00:14:16,570

tissue formation and what we have here

353

00:14:20,610 --> 00:14:18,910

are eleven mares these are all

354

00:14:23,130 --> 00:14:20,620

high-price there are bred mayors that

355

00:14:26,940 --> 00:14:23,140

are barren which means that they are

356

00:14:30,000 --> 00:14:26,950

really only good for dog food anymore we

357

00:14:33,180 --> 00:14:30,010

have a an accepted these are called

358

00:14:36,410 --> 00:14:33,190

Kinney scores here we've done biopsies

359

00:14:39,390 --> 00:14:36,420

prior to SLO therapy of the cervical

360

00:14:41,370 --> 00:14:39,400

region of the horse and the Kimi scores

361

00:14:43,110 --> 00:14:41,380

go from one to three and there's a to go

362

00:14:45,180 --> 00:14:43,120

to to be you'll see in here the higher

363

00:14:47,130 --> 00:14:45,190

the number the more seriously afflicted

364

00:14:49,260 --> 00:14:47,140

the horse here we have the years which

365

00:14:51,720 --> 00:14:49,270

the mirrors have been barren here's the

366

00:14:54,720 --> 00:14:51,730

expected Foley rate or the following

367

00:14:57,270 --> 00:14:54,730

percentage 38% look at this you get

368

00:14:58,920 --> 00:14:57,280

something like number 10 has a kidney

369

00:15:00,570 --> 00:14:58,930

score of 3 that's as bad as it gets it's

370

00:15:03,780 --> 00:15:00,580

barren for a year it only has a 10%

371

00:15:07,560 --> 00:15:03,790

chance of ever having a live full okay

372

00:15:09,570 --> 00:15:07,570

this is a \$500,000 mayor and she's not a

373

00:15:11,910 --> 00:15:09,580

racing mare she's a brood mare and she's

374

00:15:16,770 --> 00:15:11,920

not worth much if she can't have a foal

375

00:15:19,890 --> 00:15:16,780

so after 30 days of therapy with SLO she

376

00:15:22,020 --> 00:15:19,900

was bred the breeding was successful the

377

00:15:24,780 --> 00:15:22,030

fetus was maintained she had a live

378

00:15:27,300 --> 00:15:24,790

birth always well so bottom line is

379

00:15:29,880 --> 00:15:27,310

right down there in the corner

380

00:15:31,440 --> 00:15:29,890

we had a know just a dinky little study

381

00:15:34,470 --> 00:15:31,450

but it looks like SLO is doing something

382

00:15:36,330 --> 00:15:34,480

and remember this SLO is being

383

00:15:38,820 --> 00:15:36,340

introduced in these cases by a tiny

384

00:15:40,770 --> 00:15:38,830

injection in the neck to heal scarring

385

00:15:43,200 --> 00:15:40,780

in the uterus or in the cervix okay so

386

00:15:44,820 --> 00:15:43,210

we're getting a systemic reaction that

387

00:15:46,230 --> 00:15:44,830

way

388

00:15:48,150 --> 00:15:46,240

this is where it really gets exciting no

389

00:15:49,590 --> 00:15:48,160

this is kind of fun we're gonna look at

390

00:15:52,730 --> 00:15:49,600

a marriage uterus don't blush

391

00:15:55,400 --> 00:15:52,740

there's nothing pornographic about this

392

00:16:00,450 --> 00:15:55,410

what we're going to look at is this is a

393

00:16:03,660 --> 00:16:00,460

\$750,000 mayor that had a had a Colt a

394

00:16:07,590 --> 00:16:03,670

good healthy Colt and after giving birth

395

00:16:09,240 --> 00:16:07,600

had a horrible uterine infection so as

396

00:16:11,550 --> 00:16:09,250

is typical for treating that sort of a

397

00:16:14,220 --> 00:16:11,560

case the the uterus was drenched with

398

00:16:15,540 --> 00:16:14,230

antibiotic the problem was the attending

399

00:16:17,760 --> 00:16:15,550

veterinarian didn't realize the horse

400

00:16:19,950 --> 00:16:17,770

was allergic to that antibiotic so there

401  
00:16:22,650 --> 00:16:19,960  
was a terrible allergic reaction

402  
00:16:25,320 --> 00:16:22,660  
inflammatory reaction in this uterus as

403  
00:16:30,480 --> 00:16:25,330  
a consequence of therapy now what we're

404  
00:16:33,810 --> 00:16:30,490  
going to do if I can remember how to do

405  
00:16:36,180 --> 00:16:33,820  
it is this we have a camera inside the

406  
00:16:38,340 --> 00:16:36,190  
uterus and I know this isn't the sort of

407  
00:16:39,840 --> 00:16:38,350  
thing you pay big bucks for but what

408  
00:16:42,780 --> 00:16:39,850  
we're looking at is the degree of

409  
00:16:44,280 --> 00:16:42,790  
scarring in this uterus and we're gonna

410  
00:16:47,960 --> 00:16:44,290  
see in a second this thing only lasts

411  
00:16:51,210 --> 00:16:47,970  
for twenty or thirty seconds look those

412  
00:16:53,220 --> 00:16:51,220  
those strands in there that are white

413  
00:16:54,660 --> 00:16:53,230

that look some of them we'll see you

414

00:16:56,310 --> 00:16:54,670

kind of look like stalactites and

415

00:16:58,200 --> 00:16:56,320

stalagmites and they form columns that's

416

00:17:00,900 --> 00:16:58,210

all connective tissue and there's no way

417

00:17:03,720 --> 00:17:00,910

on earth that this mayor is ever going

418

00:17:07,230 --> 00:17:03,730

to be able to maintain a fetus with a

419

00:17:10,980 --> 00:17:07,240

uterus like that so we treated her with

420

00:17:12,720 --> 00:17:10,990

slo for 35 45 days she was bred

421

00:17:15,390 --> 00:17:12,730

successfully and she's had three live

422

00:17:18,449 --> 00:17:15,400

foals since that one treatment so again

423

00:17:20,550 --> 00:17:18,459

that's a that's a big deal in the horse

424

00:17:22,079 --> 00:17:20,560

industry the last thing to talk about

425

00:17:24,630 --> 00:17:22,089

horses is the last thing we want to look

426

00:17:26,630 --> 00:17:24,640

at is a recently completed study we did

427

00:17:29,670 --> 00:17:26,640

at the University of Kentucky

428

00:17:33,270 --> 00:17:29,680

Rhodococcus equi is a soil borne

429

00:17:34,320 --> 00:17:33,280

bacterium that infects young foals when

430

00:17:35,970 --> 00:17:34,330

they're out in the pasture kicking

431

00:17:37,920 --> 00:17:35,980

around and learning how to walk and

432

00:17:39,810 --> 00:17:37,930

things like that they breathe in dust

433

00:17:41,880 --> 00:17:39,820

that's contaminated with this organism

434

00:17:43,170 --> 00:17:41,890

and they get pneumonia and pneumonia can

435

00:17:48,120 --> 00:17:43,180

be fatal or it can be chronic

436

00:17:54,180 --> 00:17:48,130

what we did was artificially infect some

437

00:17:56,190 --> 00:17:54,190

foals with Rhodococcus equi and we

438

00:17:58,620 --> 00:17:56,200

divide them then into four groups those

439

00:18:01,080 --> 00:17:58,630

treated with just saline those treated

440

00:18:02,910 --> 00:18:01,090

SLO alone with the typical antibiotic

441

00:18:04,830 --> 00:18:02,920

therapy alone and the combination of

442

00:18:07,980 --> 00:18:04,840

antibiotics that's what the a B stands

443

00:18:11,490 --> 00:18:07,990

for and SLO now the reason for this is

444

00:18:12,510 --> 00:18:11,500

that in the usual route of in federal

445

00:18:14,760 --> 00:18:12,520

consequential infection the

446

00:18:15,960 --> 00:18:14,770

pathophysiology of this disease is that

447

00:18:18,270 --> 00:18:15,970

the organism gets in the lung of the

448

00:18:20,880 --> 00:18:18,280

horses it can cause immediate damage

449

00:18:22,740 --> 00:18:20,890

there to the point of fatality for the

450

00:18:24,420 --> 00:18:22,750

young foal or it can cause a chronic

451  
00:18:27,030 --> 00:18:24,430  
condition regardless of which it does

452  
00:18:28,860 --> 00:18:27,040  
well that's if there's if the foal

453  
00:18:30,180 --> 00:18:28,870  
survives it's going to be compromised

454  
00:18:33,000 --> 00:18:30,190  
the rest of its life because of a

455  
00:18:34,830 --> 00:18:33,010  
reduced respiratory capacity also of

456  
00:18:37,860 --> 00:18:34,840  
interest is that the organism becomes

457  
00:18:39,540 --> 00:18:37,870  
encapsulated within the lung later in

458  
00:18:41,310 --> 00:18:39,550  
life that capsule can breakdown live

459  
00:18:43,860 --> 00:18:41,320  
organisms can be spewed out underneath

460  
00:18:45,750 --> 00:18:43,870  
any time infection can occur again the

461  
00:18:47,250 --> 00:18:45,760  
reason we wanted to try slo in

462  
00:18:48,600 --> 00:18:47,260  
combination with the antibiotics was to

463  
00:18:51,090 --> 00:18:48,610

prevent that encapsulation

464

00:18:52,680 --> 00:18:51,100

because if encapsulation occurs the

465

00:18:53,940 --> 00:18:52,690

antibiotic can never reach the organism

466

00:18:56,670 --> 00:18:53,950

so you can't kill it

467

00:18:58,920 --> 00:18:56,680

so those are the results of this little

468

00:19:00,480 --> 00:18:58,930

experiment the clinical score is a

469

00:19:02,040 --> 00:19:00,490

determination made by the attending

470

00:19:04,410 --> 00:19:02,050

veterinarian who's blinded as to which

471

00:19:07,170 --> 00:19:04,420

horse is in which of the four groups I

472

00:19:10,110 --> 00:19:07,180

mentioned and we got a p-value not bad

473

00:19:11,760 --> 00:19:10,120

of 0.5 in the treated animals that is

474

00:19:13,560 --> 00:19:11,770

treated with the antibiotic process

475

00:19:16,860 --> 00:19:13,570

alone we're better off than those with

476

00:19:18,990 --> 00:19:16,870

antibiotic alone also we saw the 30 plus

477

00:19:21,440 --> 00:19:19,000

percent reduction in pneumonia scores in

478

00:19:23,700 --> 00:19:21,450

the combination another nice p-value but

479

00:19:26,190 --> 00:19:23,710

whoops wrong hand look at this guy down

480

00:19:29,280 --> 00:19:26,200

here this is really interesting here

481

00:19:30,630 --> 00:19:29,290

we're getting less collagen and that

482

00:19:32,610 --> 00:19:30,640

remember that's going to be the primary

483

00:19:35,670 --> 00:19:32,620

component in the capsulation process

484

00:19:36,870 --> 00:19:35,680

down here so that the organism that is

485

00:19:41,130 --> 00:19:36,880

causing the problem is going to be

486

00:19:45,060 --> 00:19:41,140

exposed more efficiently to the

487

00:19:47,520 --> 00:19:45,070

antibiotics and a nice p-value so what

488

00:19:50,280 --> 00:19:47,530

who cares about all these horses well we

489

00:19:53,820 --> 00:19:50,290

do in part because this is a recognized

490

00:19:55,850 --> 00:19:53,830

model for that TB in humans tuberculosis

491

00:19:57,990 --> 00:19:55,860

and humans has the same situation

492

00:19:59,580 --> 00:19:58,000

breathing the organism it can become

493

00:20:00,890 --> 00:19:59,590

encapsulated those capsules are called

494

00:20:04,440 --> 00:20:00,900

tube records you can pick them up on

495

00:20:05,400 --> 00:20:04,450

chest x-rays in this country though we

496

00:20:07,620 --> 00:20:05,410

don't get really excited about

497

00:20:10,230 --> 00:20:07,630

tuberculosis anymore there are between

498

00:20:12,169 --> 00:20:10,240

50 and 55 thousand new cases per year

499

00:20:13,820 --> 00:20:12,179

worldwide

500

00:20:16,519 --> 00:20:13,830

or not one-third of the world's

501  
00:20:18,830 --> 00:20:16,529  
population has tuberculosis that's a

502  
00:20:21,470 --> 00:20:18,840  
pretty big bunch now some of these

503  
00:20:23,299 --> 00:20:21,480  
people that have it are going to suffer

504  
00:20:25,159 --> 00:20:23,309  
the acute infection and die early on a

505  
00:20:27,799 --> 00:20:25,169  
lot of for a lot of people it's going to

506  
00:20:30,470 --> 00:20:27,809  
be a chronic infection that might become

507  
00:20:31,850 --> 00:20:30,480  
acute at any time as a result of

508  
00:20:34,070 --> 00:20:31,860  
breaking down the capsule or the

509  
00:20:36,919 --> 00:20:34,080  
tubercle in this case to release the

510  
00:20:40,279 --> 00:20:36,929  
organism we have a study planned in

511  
00:20:41,450 --> 00:20:40,289  
India where we will do in people that

512  
00:20:44,090 --> 00:20:41,460  
are afflicted with Mycobacterium

513  
00:20:45,230 --> 00:20:44,100

tuberculosis the cause evasion we're

514

00:20:47,600 --> 00:20:45,240

going to do the same experiment that we

515

00:20:51,499 --> 00:20:47,610

did in the horses in Kentucky we are

516

00:20:54,499 --> 00:20:51,509

going to combine antibiotics with slo to

517

00:20:56,480 --> 00:20:54,509

see if we can break down the the capsule

518

00:20:58,310 --> 00:20:56,490

it's forming the typical expose the

519

00:20:59,239 --> 00:20:58,320

organism to the antibiotic and clear the

520

00:21:01,789 --> 00:20:59,249

people so that they're no longer

521

00:21:05,210 --> 00:21:01,799

chronically infected the importance of

522

00:21:07,999 --> 00:21:05,220

that is twofold one is typical

523

00:21:11,570 --> 00:21:08,009

antibiotic therapy for TB now lasts six

524

00:21:13,789 --> 00:21:11,580

months it's hard to keep anybody on any

525

00:21:15,859 --> 00:21:13,799

regimen for six months so people are

526

00:21:18,499 --> 00:21:15,869

going to be chronic carriers for a long

527

00:21:20,299 --> 00:21:18,509

time second thing is the longer an

528

00:21:22,639 --> 00:21:20,309

organism exposed is exposed to an

529

00:21:24,499 --> 00:21:22,649

antibiotic the greater the chance of an

530

00:21:26,899 --> 00:21:24,509

antibiotic resistant strain developing

531

00:21:29,060 --> 00:21:26,909

so what we want to do is see if we can

532

00:21:33,320 --> 00:21:29,070

reduce the clinical time of treatment

533

00:21:35,060 --> 00:21:33,330

for tuberculosis from six months to one

534

00:21:37,070 --> 00:21:35,070

or two months just doing that

535

00:21:40,070 --> 00:21:37,080

understanding that slo has no

536

00:21:41,509 --> 00:21:40,080

antimicrobial activity of its own it's

537

00:21:43,129 --> 00:21:41,519

got to be used in conjunction with the

538

00:21:46,669 --> 00:21:43,139

antibiotics but we think we might be

539

00:21:49,039 --> 00:21:46,679

able to help now we've talked about some

540

00:21:50,600 --> 00:21:49,049

internal scarring associated diseases

541

00:21:52,399 --> 00:21:50,610

with horses we looked at the legs of the

542

00:21:55,549 --> 00:21:52,409

one horse on the uterus and the cervix

543

00:21:58,609 --> 00:21:55,559

and so forth what about humans these

544

00:21:59,989 --> 00:21:58,619

first four dot points represent some of

545

00:22:03,289 --> 00:21:59,999

the diseases we've treated successfully

546

00:22:06,350 --> 00:22:03,299

using slo these are all sky related

547

00:22:08,090 --> 00:22:06,360

diseases cardiomyopathy horrible disease

548

00:22:10,310 --> 00:22:08,100

we've had a couple patients that were on

549

00:22:12,529 --> 00:22:10,320

the cardiac transplant list that are no

550

00:22:14,899 --> 00:22:12,539

longer on it so that's that's a good

551  
00:22:17,060 --> 00:22:14,909  
sign polycystic kidney disease no

552  
00:22:18,649 --> 00:22:17,070  
responds quickly surgical adhesions are

553  
00:22:21,139 --> 00:22:18,659  
a big problem especially with gut

554  
00:22:23,090 --> 00:22:21,149  
surgery or gynecological surgery we can

555  
00:22:25,220 --> 00:22:23,100  
make those surgical adhesions pretty

556  
00:22:28,670 --> 00:22:25,230  
much disappear

557  
00:22:31,160 --> 00:22:28,680  
the range of motion for all of us

558  
00:22:34,100 --> 00:22:31,170  
decreases with age in part because of

559  
00:22:35,690 --> 00:22:34,110  
adhesions and we have little study

560  
00:22:37,070 --> 00:22:35,700  
actually a pretty good size study ready

561  
00:22:38,780 --> 00:22:37,080  
to start later this year at Yale

562  
00:22:40,310 --> 00:22:38,790  
University Medical School where we will

563  
00:22:42,260 --> 00:22:40,320

treat patients with complications of

564

00:22:43,700 --> 00:22:42,270

total knee replacement surgery because

565

00:22:45,350 --> 00:22:43,710

anecdotally we've seen these patients

566

00:22:48,410 --> 00:22:45,360

get a heck of a lot better with slo

567

00:22:50,060 --> 00:22:48,420

therapy we are just now starting to put

568

00:22:52,180 --> 00:22:50,070

our foot in the water with respect to

569

00:22:54,590 --> 00:22:52,190

treating concussions

570

00:22:55,850 --> 00:22:54,600

we're not scarring in the brain is a

571

00:22:57,320 --> 00:22:55,860

little bit different than it then

572

00:22:58,550 --> 00:22:57,330

scarring elsewhere in the body we're not

573

00:23:00,800 --> 00:22:58,560

sure what will happen here but we're

574

00:23:03,650 --> 00:23:00,810

working with two groups on this project

575

00:23:05,500 --> 00:23:03,660

this proposed project one is the with

576

00:23:07,880 --> 00:23:05,510

the people at the Medical School in

577

00:23:09,560 --> 00:23:07,890

Johnson City Tennessee eastern Tennessee

578

00:23:11,930 --> 00:23:09,570

Medical School the other group is called

579

00:23:14,570 --> 00:23:11,940

the National Football League and we're

580

00:23:19,750 --> 00:23:14,580

going to see if if SLO can do anything

581

00:23:25,100 --> 00:23:23,180

we've talked a little bit about external

582

00:23:26,720 --> 00:23:25,110

scars in humans one of the first

583

00:23:29,840 --> 00:23:26,730

patients was well maybe I didn't tell

584

00:23:31,790 --> 00:23:29,850

you about that I told you about the gal

585

00:23:33,920 --> 00:23:31,800

that tried to punch out to the physician

586

00:23:37,340 --> 00:23:33,930

one of the other patients we brought in

587

00:23:41,170 --> 00:23:37,350

was a man in his in his mid-70s 75 76

588

00:23:44,600 --> 00:23:41,180

years old who had acne scars since since

589

00:23:47,450 --> 00:23:44,610

his teenage years and in four weeks

590

00:23:49,820 --> 00:23:47,460

those flattened out okay so this this is

591

00:23:51,320 --> 00:23:49,830

a hint of another use for this and prom

592

00:23:56,030 --> 00:23:51,330

and do scars stretch marks and all that

593

00:24:00,430 --> 00:23:56,040

that's great what about if we used slo

594

00:24:04,370 --> 00:24:00,440

to prevent scars rather than to just

595

00:24:06,200 --> 00:24:04,380

treat them well this is a picture of a

596

00:24:06,770 --> 00:24:06,210

gals face just after she went through a

597

00:24:10,220 --> 00:24:06,780

windshield

598

00:24:12,290 --> 00:24:10,230

there's her chin here's her teeth her

599

00:24:16,070 --> 00:24:12,300

nose has been torn off and displaced to

600

00:24:17,780 --> 00:24:16,080

the right she's in trouble at the time

601  
00:24:19,340 --> 00:24:17,790  
of the picture she's at the emergency

602  
00:24:23,720 --> 00:24:19,350  
room at the Medical University of South

603  
00:24:24,830 --> 00:24:23,730  
Carolina she's getting sewed up here you

604  
00:24:26,660 --> 00:24:24,840  
can see there gonna be a problem with

605  
00:24:28,640 --> 00:24:26,670  
the scar here look at the position this

606  
00:24:29,360 --> 00:24:28,650  
tube the right side of her mouth has

607  
00:24:31,850 --> 00:24:29,370  
been ripped out

608  
00:24:33,830 --> 00:24:31,860  
they got her nose back on now but there

609  
00:24:36,200 --> 00:24:33,840  
gonna be some scarring there some scar

610  
00:24:38,270 --> 00:24:36,210  
over the eyes and so forth her mother is

611  
00:24:39,020 --> 00:24:38,280  
a nurse and one of the practices that's

612  
00:24:41,540 --> 00:24:39,030  
in our group

613  
00:24:43,310 --> 00:24:41,550

when she got the call from the from the

614

00:24:44,570 --> 00:24:43,320

medical school saying that her daughter

615

00:24:46,040 --> 00:24:44,580

had been the accident she ran out the

616

00:24:49,760 --> 00:24:46,050

door and said can I take some SLO with

617

00:24:52,430 --> 00:24:49,770

me and of course she did and this

618

00:24:54,560 --> 00:24:52,440

patient then started SLO again just a

619

00:24:57,890 --> 00:24:54,570

drop under the tongue four times a day

620

00:25:01,280 --> 00:24:57,900

the day of her accident whoops wrong

621

00:25:02,540 --> 00:25:01,290

button here she is looking pretty great

622

00:25:04,520 --> 00:25:02,550

don't you think it looks like she might

623

00:25:07,550 --> 00:25:04,530

have a scar on her left cheek they're

624

00:25:08,120 --> 00:25:07,560

gonna get a scar on her nose she's in

625

00:25:12,170 --> 00:25:08,130

trouble

626

00:25:15,260 --> 00:25:12,180

there she is three weeks later and if

627

00:25:16,430 --> 00:25:15,270

you look she still has a scar something

628

00:25:17,630 --> 00:25:16,440

that by the way all these pictures are

629

00:25:20,630 --> 00:25:17,640

taken by her mother who's not a

630

00:25:23,270 --> 00:25:20,640

professional photographer there she is

631

00:25:25,340 --> 00:25:23,280

a month after after the last picture

632

00:25:26,690 --> 00:25:25,350

again that scar is still flattening out

633

00:25:28,430 --> 00:25:26,700

it's got a ways to go yet but that's not

634

00:25:30,470 --> 00:25:28,440

too bad you don't see much around the

635

00:25:33,950 --> 00:25:30,480

nose at all look at that that's coming

636

00:25:36,320 --> 00:25:33,960

right along this is a this is a step in

637

00:25:39,350 --> 00:25:36,330

the right direction now the physicians

638

00:25:41,180 --> 00:25:39,360

in our group use SLO routinely for

639

00:25:44,090 --> 00:25:41,190

patients before they go into therapy and

640

00:25:47,150 --> 00:25:44,100

what we have found is the patients heal

641

00:25:48,620 --> 00:25:47,160

with little or no scarring after I say

642

00:25:50,270 --> 00:25:48,630

after therapy after surgery before they

643

00:25:52,700 --> 00:25:50,280

go into surgery they're healing with

644

00:25:56,750 --> 00:25:52,710

little or no scarring they don't need as

645

00:25:58,580 --> 00:25:56,760

much analgesia after surgery and again

646

00:25:59,750 --> 00:25:58,590

we know some reason about that we saw

647

00:26:02,090 --> 00:25:59,760

the up regulation of the

648

00:26:04,550 --> 00:26:02,100

anti-inflammatory down regulation of

649

00:26:05,450 --> 00:26:04,560

pro-inflammatory cytokines and they heal

650

00:26:10,580 --> 00:26:05,460

much quicker and they heal without

651  
00:26:12,530 --> 00:26:10,590  
adhesions now now let's go back to this

652  
00:26:14,180 --> 00:26:12,540  
young lady for a second so I can

653  
00:26:15,800 --> 00:26:14,190  
introduce you that next slide this is

654  
00:26:17,600 --> 00:26:15,810  
all great stuff hooray you know great we

655  
00:26:18,950 --> 00:26:17,610  
can do something with scars but it still

656  
00:26:22,550 --> 00:26:18,960  
doesn't get to the point that we were

657  
00:26:25,340 --> 00:26:22,560  
asking at the very start of this tirade

658  
00:26:27,080 --> 00:26:25,350  
that I'm giving you that was we've

659  
00:26:29,120 --> 00:26:27,090  
mentioned that this platform the

660  
00:26:31,640 --> 00:26:29,130  
resident molecular signaling platform

661  
00:26:33,260 --> 00:26:31,650  
that we've developed is making an

662  
00:26:35,600 --> 00:26:33,270  
assumption that the therapeutic agents

663  
00:26:38,300 --> 00:26:35,610

that we use are simply acting as signals

664

00:26:40,580 --> 00:26:38,310

and again if you can use the same

665

00:26:43,340 --> 00:26:40,590

product for a 2,000 pound horse as a you

666

00:26:44,570 --> 00:26:43,350

know as a cat and which we do good it

667

00:26:46,430 --> 00:26:44,580

works just like that

668

00:26:48,320 --> 00:26:46,440

it works super but what's the nature of

669

00:26:50,390 --> 00:26:48,330

the signal well we're not smart enough

670

00:26:52,730 --> 00:26:50,400

to figure it out ourselves so we asked

671

00:26:54,230 --> 00:26:52,740

the help of the personnel

672

00:26:56,419 --> 00:26:54,240

what's called the center for cell

673

00:26:57,710 --> 00:26:56,429

signaling at the medical medical school

674

00:27:00,230 --> 00:26:57,720

at the University of Virginia

675

00:27:02,720 --> 00:27:00,240

David Brautigam is the director of that

676  
00:27:04,669 --> 00:27:02,730  
program down there we got in touch with

677  
00:27:06,380 --> 00:27:04,679  
him send him some of the data and a

678  
00:27:08,690 --> 00:27:06,390  
whole lot more some of the data you've

679  
00:27:11,240 --> 00:27:08,700  
seen here and an awful lot more and said

680  
00:27:13,159 --> 00:27:11,250  
can you help us figure out what's going

681  
00:27:14,389 --> 00:27:13,169  
on here he looked at all the data he

682  
00:27:16,669 --> 00:27:14,399  
says I've never seen anything like it

683  
00:27:18,440 --> 00:27:16,679  
and this is the guy that's director of

684  
00:27:20,720 --> 00:27:18,450  
cell signaling say well can you help us

685  
00:27:22,450 --> 00:27:20,730  
anyway he said let's do this we've got

686  
00:27:24,440 --> 00:27:22,460  
some in vitro assays we do a lot of

687  
00:27:26,029 --> 00:27:24,450  
cancer work down here at University of

688  
00:27:28,370 --> 00:27:26,039

Virginia we have some in vitro assays

689

00:27:30,320 --> 00:27:28,380

you'll recall one of the slides way back

690

00:27:34,070 --> 00:27:30,330

showed down-regulation of

691

00:27:35,840 --> 00:27:34,080

mmp9 that's one of the markers that's

692

00:27:38,180 --> 00:27:35,850

associated with cancer he said let's

693

00:27:41,090 --> 00:27:38,190

take a look since you've got this this

694

00:27:42,799 --> 00:27:41,100

date about mmp9 let's see if SLO does

695

00:27:44,269 --> 00:27:42,809

anything in one of our in vitro assays

696

00:27:46,639 --> 00:27:44,279

then that'll give us a handle on where

697

00:27:50,269 --> 00:27:46,649

to go next so now we get to look at this

698

00:27:51,350 --> 00:27:50,279

slide what we have here whoops in the in

699

00:27:52,190 --> 00:27:51,360

the top four little pictures are

700

00:27:56,690 --> 00:27:52,200

photomicrographs

701  
00:28:00,830 --> 00:27:56,700  
of cells that have passed through a gel

702  
00:28:03,529 --> 00:28:00,840  
matrix that that reflects the ability of

703  
00:28:07,669 --> 00:28:03,539  
those cells to metastasize in the human

704  
00:28:11,210 --> 00:28:07,679  
body these cells are of human breast

705  
00:28:13,549 --> 00:28:11,220  
cancer origin they are them the most

706  
00:28:16,310 --> 00:28:13,559  
aggressive form of breast cancer in

707  
00:28:18,560 --> 00:28:16,320  
humans okay now look all we're doing

708  
00:28:19,820 --> 00:28:18,570  
without getting into too much detail is

709  
00:28:20,960 --> 00:28:19,830  
counting the number of cells that have

710  
00:28:22,789 --> 00:28:20,970  
made it through the matrix that's an

711  
00:28:25,010 --> 00:28:22,799  
indication of their degree of metastatic

712  
00:28:27,380 --> 00:28:25,020  
ability okay and you look at different

713  
00:28:29,269 --> 00:28:27,390

concentrations of slo and you have

714

00:28:32,480 --> 00:28:29,279

progressively fewer cells making it

715

00:28:34,250 --> 00:28:32,490

through these bar graphs simply show in

716

00:28:36,970 --> 00:28:34,260

in this one what we're seeing in these

717

00:28:40,430 --> 00:28:36,980

pictures okay and each one of these is

718

00:28:42,350 --> 00:28:40,440

statistically significant so now we have

719

00:28:43,610 --> 00:28:42,360

a product that not only does something

720

00:28:44,419 --> 00:28:43,620

with scars that looks like it emits

721

00:28:47,600 --> 00:28:44,429

metastases

722

00:28:49,399 --> 00:28:47,610

when dr. Brautigan uva saw this the

723

00:28:52,639 --> 00:28:49,409

first thing he said was every woman over

724

00:28:54,830 --> 00:28:52,649

40 should be taking us hello that that's

725

00:28:56,779 --> 00:28:54,840

and this this is the guy that works with

726

00:29:00,169 --> 00:28:56,789

cancer all the time well maybe yes maybe

727

00:29:01,730 --> 00:29:00,179

no the point of it is that we are now in

728

00:29:04,899 --> 00:29:01,740

our laboratories and Providence Rhode

729

00:29:06,180 --> 00:29:04,909

Island doing some work to see if what

730

00:29:08,700 --> 00:29:06,190

brought

731

00:29:12,180 --> 00:29:08,710

saw in vitro in Virginia can reproduce

732

00:29:13,980 --> 00:29:12,190

can be reproduced in vivo will we really

733

00:29:20,070 --> 00:29:13,990

show that decrease in metastatic

734

00:29:22,409 --> 00:29:20,080

activity to round us all up resident

735

00:29:25,110 --> 00:29:22,419

molecular signaling is the platform that

736

00:29:27,419 --> 00:29:25,120

we've developed I'm confident that all

737

00:29:29,190 --> 00:29:27,429

we're doing is bridging biochemistry and

738

00:29:32,070 --> 00:29:29,200

biophysics we can explain everything we

739

00:29:32,639 --> 00:29:32,080

see biochemically but that's not the

740

00:29:34,980 --> 00:29:32,649

right answer

741

00:29:37,740 --> 00:29:34,990

there's more going at a different level

742

00:29:39,690 --> 00:29:37,750

which I'm calling biophysics and that

743

00:29:42,659 --> 00:29:39,700

gets us to this question of what's the

744

00:29:44,430 --> 00:29:42,669

nature of the signal the reason we're

745

00:29:46,440 --> 00:29:44,440

asking that question is not for academic

746

00:29:47,970 --> 00:29:46,450

purposes but we think that other

747

00:29:49,499 --> 00:29:47,980

modalities might be identified that

748

00:29:52,619 --> 00:29:49,509

could be more efficient than what we're

749

00:29:55,320 --> 00:29:52,629

doing maybe sound might be light mic the

750

00:29:57,029 --> 00:29:55,330

electromagnetic force any of those I

751  
00:29:58,799 --> 00:29:57,039  
have in parentheses bone healing they're

752  
00:30:00,629 --> 00:29:58,809  
just as kind of an aside to tell you

753  
00:30:02,340 --> 00:30:00,639  
that you all know that you can use

754  
00:30:04,200 --> 00:30:02,350  
magnets to stimulate bone healing right

755  
00:30:05,940 --> 00:30:04,210  
that's been in the literature hospitals

756  
00:30:06,749 --> 00:30:05,950  
use that all the time now we have a

757  
00:30:08,759 --> 00:30:06,759  
molecule

758  
00:30:11,940 --> 00:30:08,769  
it's called calmodulin that stimulates

759  
00:30:14,820 --> 00:30:11,950  
bone healing faster than magnet what's

760  
00:30:18,299 --> 00:30:14,830  
the common denominator between the

761  
00:30:21,240 --> 00:30:18,309  
calmodulin the biochemical approach and

762  
00:30:22,139 --> 00:30:21,250  
the magnet the biophysical we don't know

763  
00:30:25,259 --> 00:30:22,149

we need help

764

00:30:32,490 --> 00:30:25,269

that's why I'm here and for that I thank

765

00:30:37,090 --> 00:30:34,810

looking for questions I imagine they'll

766

00:30:39,100 --> 00:30:37,100

be one or two I have to tell you that

767

00:30:42,100 --> 00:30:39,110

I've spoken at John's annual conference

768

00:30:44,649 --> 00:30:42,110

of his Beechtree labs and it's a mini

769

00:30:45,370 --> 00:30:44,659

version of sse then he calls the members

770

00:30:52,120 --> 00:30:45,380

beechnuts

771

00:30:56,169 --> 00:30:52,130

yeah thank you war that was really

772

00:31:00,279 --> 00:30:56,179

inspiring I understand that one of the

773

00:31:03,250 --> 00:31:00,289

reasons why spinal cord injuries after a

774

00:31:05,590 --> 00:31:03,260

period of time you know cannot be healed

775

00:31:07,299 --> 00:31:05,600

is because of scar tissue is there a

776

00:31:08,710 --> 00:31:07,309

possibility that this will work well

777

00:31:11,259 --> 00:31:08,720

that kind of thing if applied

778

00:31:15,370 --> 00:31:11,269

immediately after an injury it does work

779

00:31:17,289 --> 00:31:15,380

we've done it one of the Articles that I

780

00:31:19,539 --> 00:31:17,299

make my students undergraduate students

781

00:31:21,730 --> 00:31:19,549

read is as an article on use of stem

782

00:31:25,299 --> 00:31:21,740

cells and in that very injury in horses

783

00:31:27,930 --> 00:31:25,309

and it reported that there was very good

784

00:31:31,090 --> 00:31:27,940

good results from it have you looked at

785

00:31:33,720 --> 00:31:31,100

the comparison with the use of stem

786

00:31:36,970 --> 00:31:33,730

cells or using stem cells in in

787

00:31:38,409 --> 00:31:36,980

connection with slo we've not done any

788

00:31:39,610 --> 00:31:38,419

comparative work other than through the

789

00:31:40,930 --> 00:31:39,620

experiences of the attending

790

00:31:42,310 --> 00:31:40,940

veterinarians that are come from some of

791

00:31:46,629 --> 00:31:42,320

these really big clinics in the

792

00:31:48,700 --> 00:31:46,639

Lexington area and they're from their

793

00:31:52,210 --> 00:31:48,710

experiences their observations the

794

00:31:53,649 --> 00:31:52,220

results are pretty much similar the they

795

00:31:58,480 --> 00:31:53,659

like the SLO because it's easier and

796

00:32:00,310 --> 00:31:58,490

cheaper John I'm wondering if you've

797

00:32:02,889 --> 00:32:00,320

tried you mentioned horses I'm wondering

798

00:32:04,810 --> 00:32:02,899

if you have tried anything with dairy

799

00:32:06,879 --> 00:32:04,820

cattle in particular mastitis or bangs

800

00:32:11,019 --> 00:32:06,889

disease you know nothing with bangs lots

801  
00:32:12,759 --> 00:32:11,029  
with staph aureus induced mastitis and I

802  
00:32:14,259 --> 00:32:12,769  
would say our success has been limited

803  
00:32:17,649 --> 00:32:14,269  
primarily because the farmers don't want

804  
00:32:19,240 --> 00:32:17,659  
to keep up the therapy but we have had

805  
00:32:20,680 --> 00:32:19,250  
some degree of success we have not done

806  
00:32:22,240 --> 00:32:20,690  
a real trial with it we have

807  
00:32:24,399 --> 00:32:22,250  
veterinarians in our group who do use it

808  
00:32:26,250 --> 00:32:24,409  
routinely and finally I think I can help

809  
00:32:29,759 --> 00:32:26,260  
you get some of your answers I

810  
00:32:31,810 --> 00:32:29,769  
appreciate it thank you I'm just on

811  
00:32:35,379 --> 00:32:31,820  
theory behind all this have you ever

812  
00:32:39,279 --> 00:32:35,389  
encountered papers on non-contact

813  
00:32:40,870 --> 00:32:39,289

friction no sound familiar you know this

814

00:32:42,970 --> 00:32:40,880

I think this you're on the bottom floor

815

00:32:44,350 --> 00:32:42,980

of a whole field of science that any

816

00:32:46,930 --> 00:32:44,360

animal molecule

817

00:32:49,570 --> 00:32:46,940

has a intense virtual photon field

818

00:32:51,280 --> 00:32:49,580

around it that's sort of like not not

819

00:32:53,830 --> 00:32:51,290

recognised by physics was just starting

820

00:32:56,370 --> 00:32:53,840

to to become that and that non-contact

821

00:32:59,110 --> 00:32:56,380

friction is that separate molecules

822

00:33:01,870 --> 00:32:59,120

hundred animals apart in nanometers

823

00:33:04,780 --> 00:33:01,880

apart have very strong friction between

824

00:33:06,760 --> 00:33:04,790

them for like AFM microscope stuff I

825

00:33:09,100 --> 00:33:06,770

would love to be introduced to it but

826

00:33:12,760 --> 00:33:09,110

look up non-contact friction will do it

827

00:33:13,560 --> 00:33:12,770

thank you I have a question and a

828

00:33:17,250 --> 00:33:13,570

comment

829

00:33:20,650 --> 00:33:17,260

I'm I'm interested in the dose response

830

00:33:22,180 --> 00:33:20,660

efficacy because if this is a molecular

831

00:33:24,940 --> 00:33:22,190

signaling kind of effect you might

832

00:33:27,820 --> 00:33:24,950

expect it to be those independent but I

833

00:33:31,510 --> 00:33:27,830

saw your dose response curve and in the

834

00:33:34,360 --> 00:33:31,520

last graph kind of indicating that it's

835

00:33:36,039 --> 00:33:34,370

acting like a ordinary biochemical kind

836

00:33:38,830 --> 00:33:36,049

of that's the first time we've ever seen

837

00:33:41,830 --> 00:33:38,840

anything like that so that's alone so

838

00:33:43,030 --> 00:33:41,840

nonetheless I wonder if you had done any

839

00:33:47,320 --> 00:33:43,040

experiments going the other direction

840

00:33:48,970 --> 00:33:47,330

like toward the ultra low light oceans

841

00:33:51,370 --> 00:33:48,980

we've done lots of that with the idea of

842

00:33:53,890 --> 00:33:51,380

hormesis involved yes right absolutely

843

00:33:55,960 --> 00:33:53,900

we have and it works at ultra low doses

844

00:33:57,909 --> 00:33:55,970

actually these are these are relatively

845

00:33:59,440 --> 00:33:57,919

ultra low doses and we get the classic

846

00:34:01,659 --> 00:33:59,450

u-shaped or J shaped curve that's

847

00:34:03,039 --> 00:34:01,669

associated with hormesis and these doses

848

00:34:05,620 --> 00:34:03,049

that I'm talking about are at the bottom

849

00:34:07,990 --> 00:34:05,630

of that you okay okay so that's they are

850

00:34:10,240 --> 00:34:08,000

it a higher dose clinically a higher

851

00:34:11,790 --> 00:34:10,250

dose will give us no response and a

852

00:34:14,169 --> 00:34:11,800

lower dose will give us no response

853

00:34:16,570 --> 00:34:14,179

there is a window with that new shape

854

00:34:19,060 --> 00:34:16,580

okay so that's encouraging and as far as

855

00:34:21,340 --> 00:34:19,070

testing hypothesis that there's some

856

00:34:23,349 --> 00:34:21,350

endogenous electromagnetic field which

857

00:34:27,099 --> 00:34:23,359

might carry the information like my

858

00:34:29,710 --> 00:34:27,109

laser last night I you could do

859

00:34:31,780 --> 00:34:29,720

experiments with looking for synergism

860

00:34:34,300 --> 00:34:31,790

between the chemical and an

861

00:34:36,450 --> 00:34:34,310

electromagnet exogenous electromagnetic

862

00:34:38,649 --> 00:34:36,460

field to see if there's any coupling or

863

00:34:39,909 --> 00:34:38,659

synergism between the two that's where

864

00:34:43,690 --> 00:34:39,919

we need help because we're too dumb to

865

00:34:47,560 --> 00:34:43,700

do those sorts of experiments Thank You

866

00:34:56,350 --> 00:34:53,830

bill didn't see you behind me thanks

867

00:34:59,590 --> 00:34:56,360

John I was wondering if you also have

868

00:35:02,440 --> 00:34:59,600

looked for a dose-response curve the

869

00:35:05,590 --> 00:35:02,450

u-shaped thing with respect to the

870

00:35:11,650 --> 00:35:05,600

frequency of repetition of the dose yes

871

00:35:13,750 --> 00:35:11,660

and it's interesting you ask the we can

872

00:35:16,510 --> 00:35:13,760

use a light switch as an example of what

873

00:35:17,950 --> 00:35:16,520

happens and all that you can you can

874

00:35:19,000 --> 00:35:17,960

turn a light switch on gently or can

875

00:35:20,980 --> 00:35:19,010

smash the heck out of it but you don't

876

00:35:23,620 --> 00:35:20,990

get any different response right either

877

00:35:28,630 --> 00:35:23,630

turns on or it doesn't what we find is

878

00:35:32,950 --> 00:35:28,640

that especially in acute diseases if we

879

00:35:35,620 --> 00:35:32,960

in a sense pulse therapy we get a better

880

00:35:37,000 --> 00:35:35,630

result early on and then we can reduce

881

00:35:38,680 --> 00:35:37,010

the frequency of administration but we

882

00:35:41,470 --> 00:35:38,690

keep the dose the same so it's like

883

00:35:43,170 --> 00:35:41,480

flicking the light switch on and off we

884

00:35:47,140 --> 00:35:43,180

think it's more important to have

885

00:35:51,880 --> 00:35:47,150

multiple endpoints in inputs than one

886

00:35:53,350 --> 00:35:51,890

big one and so yes and for example with

887

00:35:56,020 --> 00:35:53,360

rheumatoid arthritis we have a

888

00:35:57,340 --> 00:35:56,030

formulation that we use for that person

889

00:35:59,290 --> 00:35:57,350

is an extreme pain they're still going

890

00:36:01,690 --> 00:35:59,300

to take sublingual drops we would ask

891

00:36:03,670 --> 00:36:01,700

them to take a sublingual drop every 15

892

00:36:06,160 --> 00:36:03,680

minutes for an hour users in the hour

893

00:36:07,750 --> 00:36:06,170

that pain starts to resolve after they

894

00:36:10,480 --> 00:36:07,760

get over that threshold where pain

895

00:36:12,370 --> 00:36:10,490

reduction has begun they can decrease

896

00:36:15,460 --> 00:36:12,380

the frequency of drop maintain the same

897

00:36:17,500 --> 00:36:15,470

concentration and they'll be fine if

898

00:36:19,300 --> 00:36:17,510

they don't decrease the frequency

899

00:36:21,550 --> 00:36:19,310

it won't hurt them anything just wasted

900

00:36:22,930 --> 00:36:21,560

drops oh sorry it's just wasted drops

901

00:36:26,130 --> 00:36:22,940

you know it doesn't hurt them any so it

902

00:36:29,010 --> 00:36:26,140

doesn't doesn't overdose them okay nope