



1
00:00:08,670 --> 00:00:02,630
[Applause]

2
00:00:44,779 --> 00:00:15,080
[Music]

3
00:00:48,200 --> 00:00:44,789
this is a toxin that causes the pain

4
00:00:52,549 --> 00:00:48,210
what we do is oxidize it so it's no

5
00:00:55,910 --> 00:00:52,559
longer toxic and what we find is that

6
00:00:59,209 --> 00:00:55,920
and we find this by accident is that it

7
00:01:03,009 --> 00:00:59,219
has tremendous activity with respect to

8
00:01:05,690 --> 00:01:03,019
scarring in terms of preventing scars or

9
00:01:08,149 --> 00:01:05,700
ameliorating scars we will worry about

10
00:01:13,100 --> 00:01:08,159
the spectrum of targets we were

11
00:01:15,170 --> 00:01:13,110
interested in in this molecule as I say

12
00:01:16,999 --> 00:01:15,180
by accident because in a patient that we

13
00:01:18,590 --> 00:01:17,009

were treating using this molecule

14

00:01:20,990 --> 00:01:18,600

treating for something else we found it

15

00:01:22,550 --> 00:01:21,000

her scars disappeared her superficial

16

00:01:24,859 --> 00:01:22,560

scars are wondering how on earth could

17

00:01:28,999 --> 00:01:24,869

that possibly be so we started doing

18

00:01:31,249 --> 00:01:29,009

some big-time science and we know that

19

00:01:34,789 --> 00:01:31,259

streptomycin among other things is a

20

00:01:37,880 --> 00:01:34,799

potent anti-inflammatory agent yet down

21

00:01:40,969 --> 00:01:37,890

regulates pro-inflammatory genes that

22

00:01:43,010 --> 00:01:40,979

second one mmp9 is especially important

23

00:01:45,469 --> 00:01:43,020

over the last decade between eight and

24

00:01:47,780 --> 00:01:45,479

nine billion dollars have been spent by

25

00:01:51,020 --> 00:01:47,790

the pharmaceutical industry looking for

26
00:01:52,569 --> 00:01:51,030
products that down-regulate mmp9 because

27
00:01:54,770 --> 00:01:52,579
it's involved in so many diseases

28
00:01:56,990 --> 00:01:54,780
several of those products have made it

29
00:02:01,850 --> 00:01:57,000
to formal clinical trials and they have

30
00:02:03,950 --> 00:02:01,860
all failed because of toxicity again

31
00:02:06,920 --> 00:02:03,960
strep the licen though in our hands is

32
00:02:08,930 --> 00:02:06,930
not toxic well it down regulates the

33
00:02:11,180 --> 00:02:08,940
pro-inflammatory genes it up regulates

34
00:02:12,890 --> 00:02:11,190
the anti-inflammatory ones these we're

35
00:02:14,059 --> 00:02:12,900
not going to get into the science of but

36
00:02:16,099 --> 00:02:14,069
it's important that it

37
00:02:18,199 --> 00:02:16,109
is an anti-inflammatory product but it

38
00:02:21,140 --> 00:02:18,209

does a lot more than that one of the

39

00:02:23,349 --> 00:02:21,150

things it does is disrupt the balance

40

00:02:26,420 --> 00:02:23,359

between collagen and collagenase

41

00:02:29,479 --> 00:02:26,430

collagen is the primary protein in scars

42

00:02:31,789 --> 00:02:29,489

scars are not stable some of you have

43

00:02:33,110 --> 00:02:31,799

had scars from accidents or surgery or

44

00:02:35,330 --> 00:02:33,120

whatever that have been with you for

45

00:02:37,099 --> 00:02:35,340

decades those are changing every day

46

00:02:38,959 --> 00:02:37,109

although they look the same to you there

47

00:02:42,140 --> 00:02:38,969

there's a constant turnover of the

48

00:02:44,300 --> 00:02:42,150

collagen the collagenase the enzyme is

49

00:02:47,839 --> 00:02:44,310

breaking down old collagen new collagen

50

00:02:51,199 --> 00:02:47,849

is being is replacing the old we upset

51
00:02:53,569 --> 00:02:51,209
the balance in favor of collagenase so

52
00:02:57,580 --> 00:02:53,579
that the old collagen is broken down and

53
00:03:01,789 --> 00:02:57,590
it's replaced by more vital tissue we

54
00:03:05,500 --> 00:03:01,799
have we started with looking at a series

55
00:03:08,990 --> 00:03:05,510
of superficial scars and we found that

56
00:03:11,899 --> 00:03:09,000
external scars would all respond to slo

57
00:03:13,819 --> 00:03:11,909
therapy this is just a kind of an

58
00:03:18,409 --> 00:03:13,829
example of some of the types of scars

59
00:03:20,869 --> 00:03:18,419
that we looked at here's a more graphic

60
00:03:23,300 --> 00:03:20,879
example this is a face of a girl that

61
00:03:25,789 --> 00:03:23,310
just went through the windshield if you

62
00:03:29,809 --> 00:03:25,799
look closely and get oriented you can

63
00:03:33,469 --> 00:03:29,819

see there's her chin her teeth her nose

64

00:03:37,429 --> 00:03:33,479

has been torn off and displaced so she's

65

00:03:38,809 --> 00:03:37,439

in trouble this is her in the emergency

66

00:03:41,599 --> 00:03:38,819

room at the Medical University of South

67

00:03:43,069 --> 00:03:41,609

Carolina in in Charleston

68

00:03:46,099 --> 00:03:43,079

you can see she's gonna have a bit of a

69

00:03:47,270 --> 00:03:46,109

scar on her left cheek her nose is back

70

00:03:49,219 --> 00:03:47,280

in place there's gonna be some serious

71

00:03:50,719 --> 00:03:49,229

scarring there look at the angle of that

72

00:03:52,490 --> 00:03:50,729

tube it's ripped out the corner of her

73

00:03:55,099 --> 00:03:52,500

mouth gonna be some scars there and

74

00:03:58,789 --> 00:03:55,109

across her eyebrow also so she's gonna

75

00:04:01,520 --> 00:03:58,799

look like a pirate okay her mother was a

76

00:04:03,949 --> 00:04:01,530

nurse she started right away a nurse

77

00:04:06,099 --> 00:04:03,959

with us she got to the mother got to the

78

00:04:11,839 --> 00:04:06,109

emergency room started a solo therapy

79

00:04:14,659 --> 00:04:11,849

and there she is three weeks later and

80

00:04:18,949 --> 00:04:14,669

here she is a month after that last

81

00:04:20,870 --> 00:04:18,959

picture now you can see there's still a

82

00:04:22,670 --> 00:04:20,880

scar there that's going away it's not

83

00:04:24,950 --> 00:04:22,680

nearly what you might expect little or

84

00:04:26,060 --> 00:04:24,960

no scarring around the nose that corner

85

00:04:27,970 --> 00:04:26,070

of her mouth doesn't look too bad

86

00:04:32,730 --> 00:04:27,980

compared to what it did before

87

00:04:35,680 --> 00:04:32,740

jeez the good that'll be the next slide

88

00:04:38,140 --> 00:04:35,690

the point of all this is the important

89

00:04:40,900 --> 00:04:38,150

point is that nothing was given to her

90

00:04:43,120 --> 00:04:40,910

topically all right this is all systemic

91

00:04:44,710 --> 00:04:43,130

so there's nothing rubbed on her skin to

92

00:04:47,500 --> 00:04:44,720

make the scar go away or to prevent the

93

00:04:49,570 --> 00:04:47,510

scar so being clever scientists that we

94

00:04:51,220 --> 00:04:49,580

are we wondered well gosh if this is

95

00:04:54,100 --> 00:04:51,230

going systemically and working on

96

00:04:56,010 --> 00:04:54,110

external scars like this gals face what

97

00:04:58,930 --> 00:04:56,020

would happen with internal scars

98

00:05:01,870 --> 00:04:58,940

well first you ask what the heck are

99

00:05:06,220 --> 00:05:01,880

internal scars these are a few of the

100

00:05:08,770 --> 00:05:06,230

ones that we've treated successfully all

101

00:05:10,960 --> 00:05:08,780

of us have internal scars all the time

102

00:05:12,400 --> 00:05:10,970

and there is what's called the collagen

103

00:05:15,970 --> 00:05:12,410

theory of aging that would suggest that

104

00:05:17,470 --> 00:05:15,980

our longevity is determined by the

105

00:05:19,690 --> 00:05:17,480

collagen that accumulates in our body

106

00:05:22,270 --> 00:05:19,700

that is as a consequence of normal

107

00:05:23,440 --> 00:05:22,280

function of the organs there's constant

108

00:05:25,600 --> 00:05:23,450

inflammation which is followed by

109

00:05:27,820 --> 00:05:25,610

collagen deposition the collagen gets

110

00:05:29,620 --> 00:05:27,830

laid down cross-linked becomes less

111

00:05:31,990 --> 00:05:29,630

elastic that's what happens with

112

00:05:33,610 --> 00:05:32,000

cardiomyopathy for example that scar

113

00:05:35,440 --> 00:05:33,620

tissue forming in the heart the heart

114

00:05:38,380 --> 00:05:35,450

becomes less efficient as a consequence

115

00:05:40,420 --> 00:05:38,390

of that scar tissue and there is less

116

00:05:42,460 --> 00:05:40,430

efficient signaling between nodes of the

117

00:05:45,250 --> 00:05:42,470

heart likewise with the kidneys and the

118

00:05:47,800 --> 00:05:45,260

and the liver and so forth surgical

119

00:05:49,960 --> 00:05:47,810

adhesions big deal we had some fun with

120

00:05:51,970 --> 00:05:49,970

some patients that had circle surgical

121

00:05:55,300 --> 00:05:51,980

adhesions following gut surgery or a

122

00:05:57,370 --> 00:05:55,310

gynecological third surgery we know that

123

00:05:59,140 --> 00:05:57,380

one of the complications after those

124

00:06:01,960 --> 00:05:59,150

kinds of surgeries is often adhesions

125

00:06:03,400 --> 00:06:01,970

and what do you do for adhesions well

126
00:06:05,410 --> 00:06:03,410
the surgeon goes back in and cuts them

127
00:06:08,680 --> 00:06:05,420
out well guess what causes more

128
00:06:11,800 --> 00:06:08,690
adhesions so if we found that we could

129
00:06:14,260 --> 00:06:11,810
give streptomycin Oh in very low

130
00:06:16,390 --> 00:06:14,270
concentrations similar to the ones that

131
00:06:18,850 --> 00:06:16,400
dr. Ives was talking about and even

132
00:06:21,670 --> 00:06:18,860
lower and those adhesions would go away

133
00:06:26,260 --> 00:06:21,680
in two weeks no more surgery that's a

134
00:06:28,510 --> 00:06:26,270
big deal question came up to us more

135
00:06:31,900 --> 00:06:28,520
recently thinking back in the girl who

136
00:06:34,480 --> 00:06:31,910
went through the windshield could SL

137
00:06:37,840 --> 00:06:34,490
will be used to treat traumatic brain

138
00:06:41,360 --> 00:06:37,850

injury now clearly that's an internal

139

00:06:42,860 --> 00:06:41,370

type of scarring if it occurs but it's

140

00:06:47,530 --> 00:06:42,870

different than anything else we've ever

141

00:06:50,270 --> 00:06:47,540

done for a couple of reasons one is

142

00:06:53,450 --> 00:06:50,280

there's a question well let's first look

143

00:06:56,480 --> 00:06:53,460

at what traumatic brain injury is by

144

00:06:58,159 --> 00:06:56,490

definition its damage either temporary

145

00:07:02,120 --> 00:06:58,169

or permanent to the brain as a

146

00:07:03,800 --> 00:07:02,130

consequence of injury they're about a

147

00:07:07,280 --> 00:07:03,810

million and a half cases in this country

148

00:07:09,760 --> 00:07:07,290

per year of those 50,000 will die an

149

00:07:13,850 --> 00:07:09,770

80,000 are going to have some degree of

150

00:07:15,830 --> 00:07:13,860

permanent disability the most likely or

151
00:07:17,480 --> 00:07:15,840
the most common causes of traumatic

152
00:07:20,810 --> 00:07:17,490
brain injury in our country are

153
00:07:27,260 --> 00:07:20,820
accidents automobile bicycle pedestrian

154
00:07:28,879 --> 00:07:27,270
accidents second probably second is in

155
00:07:30,680 --> 00:07:28,889
the military with all the different

156
00:07:33,560 --> 00:07:30,690
things that the military personnel might

157
00:07:40,460 --> 00:07:33,570
be exposed to assault or a leading cause

158
00:07:43,640 --> 00:07:40,470
also we wondered still can we do

159
00:07:46,700 --> 00:07:43,650
anything about these kinds of injuries

160
00:07:48,409 --> 00:07:46,710
and the reasons are these we know that

161
00:07:50,930 --> 00:07:48,419
from the internal and external stars

162
00:07:53,719 --> 00:07:50,940
that seem to respond so successfully to

163
00:07:57,529 --> 00:07:53,729

slo therapy that those are those scars

164

00:08:00,140 --> 00:07:57,539

are involved with with collagen which

165

00:08:02,240 --> 00:08:00,150

comes from fibroblasts there are not

166

00:08:04,310 --> 00:08:02,250

fibroblasts in the brain and there's not

167

00:08:07,070 --> 00:08:04,320

collagen in the brain instead they're

168

00:08:09,529 --> 00:08:07,080

glial cells in the brain that people

169

00:08:11,750 --> 00:08:09,539

think have something to do with brain

170

00:08:15,050 --> 00:08:11,760

what might be called brain scarring so

171

00:08:19,100 --> 00:08:15,060

it's a question of collagen versus what

172

00:08:23,029 --> 00:08:19,110

well nobody really knows what another

173

00:08:25,430 --> 00:08:23,039

problem is you can't really scan and see

174

00:08:28,610 --> 00:08:25,440

by any imaging techniques that are

175

00:08:30,939 --> 00:08:28,620

available you can't see brain scars now

176

00:08:34,940 --> 00:08:30,949

there are four or five fda-approved

177

00:08:37,730 --> 00:08:34,950

methods for brain scans but none of them

178

00:08:39,130 --> 00:08:37,740

will show what we think a scar should

179

00:08:42,050 --> 00:08:39,140

look like so you can't see

180

00:08:45,050 --> 00:08:42,060

before-and-afters that's a lot different

181

00:08:46,550 --> 00:08:45,060

than internal and external scar external

182

00:08:49,040 --> 00:08:46,560

scars like the girls face it's easy

183

00:08:50,630 --> 00:08:49,050

doesn't measure internal scars you can

184

00:08:54,319 --> 00:08:50,640

also do we've published a couple papers

185

00:08:56,269 --> 00:08:54,329

using sonography for example with

186

00:08:58,489 --> 00:08:56,279

thoroughbred horses in Kentucky that

187

00:09:00,949 --> 00:08:58,499

we've done some work with and we can see

188

00:09:04,129 --> 00:09:00,959

very clearly nice objective measurements

189

00:09:05,840 --> 00:09:04,139

about what happens with scars as a

190

00:09:07,729 --> 00:09:05,850

consequence of SLO therapy you can watch

191

00:09:10,910 --> 00:09:07,739

them go away you can measure that you

192

00:09:13,069 --> 00:09:10,920

can't do that in the brain so what do we

193

00:09:18,590 --> 00:09:13,079

do instead we're going to have to focus

194

00:09:19,999 --> 00:09:18,600

on clinical outcomes well where are we

195

00:09:20,539 --> 00:09:20,009

going to find a few patients to fool

196

00:09:25,100 --> 00:09:20,549

around with

197

00:09:27,799 --> 00:09:25,110

guess what we'll go to some NFL players

198

00:09:30,949 --> 00:09:27,809

down in the Phoenix area and see if they

199

00:09:34,160 --> 00:09:30,959

might participate we started with six

200

00:09:36,139 --> 00:09:34,170

players one of them dropped out after

201
00:09:38,960 --> 00:09:36,149
just about two months disappeared we had

202
00:09:40,970 --> 00:09:38,970
no follow-up these others we followed

203
00:09:42,549 --> 00:09:40,980
for three years now these five and

204
00:09:46,069 --> 00:09:42,559
understand it's just a tiny tiny number

205
00:09:48,079 --> 00:09:46,079
but here are the original complaints not

206
00:09:49,579 --> 00:09:48,089
all the players had all these complaints

207
00:09:52,939 --> 00:09:49,589
but this is a pretty good cross-section

208
00:09:54,139 --> 00:09:52,949
of what happened it's interesting none

209
00:09:55,759 --> 00:09:54,149
of these would be a surprise to you

210
00:09:57,350 --> 00:09:55,769
especially to your psychiatrist and

211
00:09:59,479 --> 00:09:57,360
psychologists in the group none of these

212
00:10:03,499 --> 00:09:59,489
would be surprised a surprise for

213
00:10:05,600 --> 00:10:03,509

patients with repeated head injuries but

214

00:10:08,269 --> 00:10:05,610

all of these players were having real

215

00:10:10,460 --> 00:10:08,279

difficulty they couldn't hold jobs they

216

00:10:12,530 --> 00:10:10,470

were divorced they couldn't make it

217

00:10:14,600 --> 00:10:12,540

maintain a relationship with their

218

00:10:17,179 --> 00:10:14,610

girlfriends one of them is a very

219

00:10:18,979 --> 00:10:17,189

well-known sports broadcaster who was

220

00:10:21,169 --> 00:10:18,989

having trouble remembering names and

221

00:10:23,449 --> 00:10:21,179

numbers that's a problem for a

222

00:10:25,189 --> 00:10:23,459

sportscaster and he was certainly

223

00:10:27,259 --> 00:10:25,199

concerned about losing his job

224

00:10:30,350 --> 00:10:27,269

they couldn't concentrate they had

225

00:10:33,650 --> 00:10:30,360

headaches this is really really a tough

226

00:10:35,659 --> 00:10:33,660

situation so we asked these guys if they

227

00:10:37,519 --> 00:10:35,669

would be willing to take slo drops one

228

00:10:40,609 --> 00:10:37,529

drop four times a day one after each

229

00:10:42,769 --> 00:10:40,619

meal one before bed with all of our

230

00:10:45,259 --> 00:10:42,779

patients for whatever disorder or

231

00:10:46,970 --> 00:10:45,269

whatever therapeutic agent were using we

232

00:10:49,369 --> 00:10:46,980

find that for the first two weeks they

233

00:10:51,590 --> 00:10:49,379

are as compliant as can be after that to

234

00:10:52,850 --> 00:10:51,600

get bored taking drops and so forth so

235

00:10:54,949 --> 00:10:52,860

we're hoping that they would take at

236

00:10:57,049 --> 00:10:54,959

least two drops a day put the dart and

237

00:10:58,519 --> 00:10:57,059

drop a bottle by your toothbrush hope

238

00:11:00,350 --> 00:10:58,529

you do brush your teeth twice a day take

239

00:11:02,590 --> 00:11:00,360

one morning in one at night so they did

240

00:11:05,059 --> 00:11:02,600

within two weeks we usually saw a change

241

00:11:07,680 --> 00:11:05,069

or as a slight change they were

242

00:11:11,430 --> 00:11:07,690

reporting changes all the symptoms would

243

00:11:12,810 --> 00:11:11,440

resolved and the sportscaster had no

244

00:11:14,010 --> 00:11:12,820

trouble after two or three weeks

245

00:11:17,820 --> 00:11:14,020

remembering whatever you wanted to

246

00:11:20,940 --> 00:11:17,830

remember no more headaches it's not to

247

00:11:23,670 --> 00:11:20,950

say that all symptoms resolved in the

248

00:11:26,310 --> 00:11:23,680

equal rate of time or that all resolved

249

00:11:27,810 --> 00:11:26,320

completely but there was resolution to

250

00:11:29,970 --> 00:11:27,820

one degree or another of all of them and

251
00:11:33,090 --> 00:11:29,980
most of them now after three years are

252
00:11:36,360 --> 00:11:33,100
all resolved it was interesting that if

253
00:11:38,460 --> 00:11:36,370
the patient got excited about in their

254
00:11:41,010 --> 00:11:38,470
improvement and got tired of taking

255
00:11:43,640 --> 00:11:41,020
drops and stopped sometimes it would be

256
00:11:46,380 --> 00:11:43,650
a regression there would be a relapse

257
00:11:50,790 --> 00:11:46,390
but that relapse would be very quickly

258
00:11:54,210 --> 00:11:50,800
reversed by reinitiating the drops nice

259
00:11:57,810 --> 00:11:54,220
no adverse effects now typical with our

260
00:12:00,450 --> 00:11:57,820
group is if we have a new idea that we

261
00:12:02,460 --> 00:12:00,460
think would be useful clinically we try

262
00:12:04,080 --> 00:12:02,470
it on humans if it looks safe and

263
00:12:07,590 --> 00:12:04,090

there's some positive results then we do

264

00:12:10,560 --> 00:12:07,600

animal testing it's a little little bit

265

00:12:14,580 --> 00:12:10,570

backwards and then some people do but

266

00:12:17,490 --> 00:12:14,590

yeah that's worked out well for us so

267

00:12:20,130 --> 00:12:17,500

just in the last two or three months

268

00:12:21,780 --> 00:12:20,140

we've started working with a group from

269

00:12:23,910 --> 00:12:21,790

a university some of you have heard of

270

00:12:26,520 --> 00:12:23,920

it it's called Harvard that has an

271

00:12:28,860 --> 00:12:26,530

animal model for traumatic brain injury

272

00:12:31,440 --> 00:12:28,870

and they've agreed to cooperate with us

273

00:12:34,350 --> 00:12:31,450

and see what we can do what happens in

274

00:12:38,160 --> 00:12:34,360

this model is you induce brain injury

275

00:12:39,750 --> 00:12:38,170

you can do it at mild moderate or severe

276

00:12:42,750 --> 00:12:39,760

injury a pneumatically controlled

277

00:12:46,200 --> 00:12:42,760

metered force bang's of the mouse in the

278

00:12:48,000 --> 00:12:46,210

head you can do it once multiple times

279

00:12:49,620 --> 00:12:48,010

however you want to do it to try and

280

00:12:53,550 --> 00:12:49,630

reproduce what happens in a human

281

00:12:57,240 --> 00:12:53,560

situation so we had three groups of

282

00:12:59,579 --> 00:12:57,250

animals in our first round one we we

283

00:13:02,040 --> 00:12:59,589

damage and treat with SLO one group gets

284

00:13:05,010 --> 00:13:02,050

damaged and only saline then the third

285

00:13:08,160 --> 00:13:05,020

group gets into the retainer but is not

286

00:13:10,650 --> 00:13:08,170

damaged and then gets saline therapy

287

00:13:13,500 --> 00:13:10,660

okay so that's a sham control shame

288

00:13:14,820 --> 00:13:13,510

injury and these are the things we

289

00:13:16,260 --> 00:13:14,830

wanted to measure and again this is just

290

00:13:18,660 --> 00:13:16,270

a screen to see if it's worth pursuing

291

00:13:20,070 --> 00:13:18,670

just like really the five football

292

00:13:20,940 --> 00:13:20,080

players were a screen to see if it's

293

00:13:23,190 --> 00:13:20,950

worth pursuing this

294

00:13:26,070 --> 00:13:23,200

notion of treating traumatic brain

295

00:13:28,080 --> 00:13:26,080

injury with SLO so we wanted a major

296

00:13:29,460 --> 00:13:28,090

balanced spatial and performance memory

297

00:13:30,840 --> 00:13:29,470

and then look at the astrology

298

00:13:35,850 --> 00:13:30,850

sacrificed the animals and see what's

299

00:13:39,740 --> 00:13:35,860

happening in the brain here's what's

300

00:13:43,200 --> 00:13:39,750

happening all parameters improved

301
00:13:45,510 --> 00:13:43,210
balance improved in ten days after the

302
00:13:48,150 --> 00:13:45,520
after the start of therapy this next

303
00:13:50,730 --> 00:13:48,160
point is really interesting the treated

304
00:13:52,890 --> 00:13:50,740
animals improve with balance so that was

305
00:13:55,620 --> 00:13:52,900
even better than the Sham controls that

306
00:13:56,850 --> 00:13:55,630
had never been injured you know I don't

307
00:13:58,800 --> 00:13:56,860
know how you go figure that it doesn't

308
00:13:59,490 --> 00:13:58,810
really matter but the point is they were

309
00:14:01,650 --> 00:13:59,500
as good as new

310
00:14:05,940 --> 00:14:01,660
so to speak if not a little bit better

311
00:14:07,830 --> 00:14:05,950
than new memory parameters have improved

312
00:14:10,530 --> 00:14:07,840
and again they're back to normal after

313
00:14:12,570 --> 00:14:10,540

about three weeks of therapy and this is

314

00:14:16,320 --> 00:14:12,580

memory for both spatial and performance

315

00:14:18,540 --> 00:14:16,330

memory and this slide is about ten days

316

00:14:23,280 --> 00:14:18,550

old so that last dot point is incorrect

317

00:14:30,300 --> 00:14:23,290

we do have histology report results back

318

00:14:33,060 --> 00:14:30,310

now and the the result is that there is

319

00:14:38,010 --> 00:14:33,070

decrease gliosis in the treated animals

320

00:14:40,170 --> 00:14:38,020

now gliosis is defined as being an

321

00:14:42,480 --> 00:14:40,180

accumulation of nervous tissue in the

322

00:14:45,180 --> 00:14:42,490

central nervous system we're not

323

00:14:46,290 --> 00:14:45,190

convinced that that definition is

324

00:14:49,770 --> 00:14:46,300

accurate anymore

325

00:14:52,530 --> 00:14:49,780

we think that gliosis is going to refer

326

00:14:55,170 --> 00:14:52,540

to the accumulation really of brain scar

327

00:14:59,580 --> 00:14:55,180

tissue in the central nervous system as

328

00:15:05,210 --> 00:14:59,590

a consequence of injury and we're seeing

329

00:15:11,270 --> 00:15:08,340

again even with the mice no adverse

330

00:15:14,850 --> 00:15:11,280

effects so we have had patients with

331

00:15:18,000 --> 00:15:14,860

external and then internal scars on this

332

00:15:20,460 --> 00:15:18,010

therapy of slo for years and we've never

333

00:15:23,100 --> 00:15:20,470

seen an adverse effect we now have the

334

00:15:26,070 --> 00:15:23,110

traumatic brain injury patients who are

335

00:15:28,500 --> 00:15:26,080

few and Forwell three years for the

336

00:15:30,360 --> 00:15:28,510

football players no adverse effects and

337

00:15:32,700 --> 00:15:30,370

we have done animal work just on the

338

00:15:34,040 --> 00:15:32,710

toxicology and we have gone up to five

339

00:15:36,320 --> 00:15:34,050

thousand times our No

340

00:15:38,889 --> 00:15:36,330

dose given IV and still no adverse

341

00:15:41,150 --> 00:15:38,899

effects so er confident is fairly safe

342

00:15:43,100 --> 00:15:41,160

this is what we have planned in the near

343

00:15:46,610 --> 00:15:43,110

future we want to continue our

344

00:15:49,370 --> 00:15:46,620

collaborative work increase the size of

345

00:15:51,019 --> 00:15:49,380

the mouse experiments we want to look at

346

00:15:55,280 --> 00:15:51,029

animals with varying degrees of injury

347

00:15:58,490 --> 00:15:55,290

and we also want to have various start

348

00:16:00,079 --> 00:15:58,500

times for SLO therapy that is to say t0

349

00:16:01,970 --> 00:16:00,089

right after the time of injury maybe

350

00:16:05,420 --> 00:16:01,980

even before the time of injury and then

351
00:16:07,670 --> 00:16:05,430
30 60 90 days after injury to start

352
00:16:10,940 --> 00:16:07,680
therapy I should mention that there is

353
00:16:13,120 --> 00:16:10,950
an advantage in humans to starting SLO

354
00:16:15,199 --> 00:16:13,130
therapy before surgery for example

355
00:16:16,550 --> 00:16:15,209
knowing now that we've had years of

356
00:16:19,490 --> 00:16:16,560
experience and the physicians on our

357
00:16:22,730 --> 00:16:19,500
group will consistently report that

358
00:16:25,220 --> 00:16:22,740
patients on SLO therapy before surgery

359
00:16:27,650 --> 00:16:25,230
will heal more quickly than would be

360
00:16:30,410 --> 00:16:27,660
anticipated they need very little in the

361
00:16:32,690 --> 00:16:30,420
way of analgesics and you don't get any

362
00:16:37,639 --> 00:16:32,700
complications that would be associated

363
00:16:38,990 --> 00:16:37,649

with untoward scar tissue we're going to

364

00:16:41,260 --> 00:16:39,000

expand the human treated population

365

00:16:44,030 --> 00:16:41,270

we've had to turn away football players

366

00:16:46,670 --> 00:16:44,040

that want to get into this study we're

367

00:16:49,280 --> 00:16:46,680

working with a little more formal way

368

00:16:53,269 --> 00:16:49,290

now are setting up to where we will have

369

00:16:57,620 --> 00:16:53,279

we hope nearly a hundred patients

370

00:17:01,040 --> 00:16:57,630

involved and we badly need to do more in

371

00:17:03,440 --> 00:17:01,050

the way of full psychological and

372

00:17:05,240 --> 00:17:03,450

physiological work ups before during and

373

00:17:07,189 --> 00:17:05,250

after therapy what I've told you about

374

00:17:09,409 --> 00:17:07,199

our TBI work is really screening work

375

00:17:11,620 --> 00:17:09,419

but all the screening looks positive so

376

00:17:14,419 --> 00:17:11,630

we're we're fairly excited about this

377

00:17:17,659 --> 00:17:14,429

because as far as we know there's

378

00:17:20,150 --> 00:17:17,669

nothing else in the world literally that

379

00:17:22,730 --> 00:17:20,160

addresses this problem it is a big

380

00:17:24,740 --> 00:17:22,740

problem I've talked with directors of

381

00:17:27,530 --> 00:17:24,750

veteran administration hospitals who

382

00:17:28,909 --> 00:17:27,540

said who say come to our hospitals we

383

00:17:31,280 --> 00:17:28,919

have whole Ward's of people who can work

384

00:17:34,730 --> 00:17:31,290

with so this is what we are up to the

385

00:17:36,830 --> 00:17:34,740

last thing we want to do not last thing

386

00:17:38,990 --> 00:17:36,840

on a dot points not necessarily last in

387

00:17:41,510 --> 00:17:39,000

terms of importance is we're interested

388

00:17:44,480 --> 00:17:41,520

in what happens with SLO treatment for

389

00:17:47,600 --> 00:17:44,490

what might be called normal age-related

390

00:17:51,110 --> 00:17:47,610

dementia will it do anything

391

00:17:53,539 --> 00:17:51,120

we know that with normal aging the brain

392

00:17:55,430 --> 00:17:53,549

shrinks that's been nicely measured

393

00:17:57,799 --> 00:17:55,440

there's a question as to whether that

394

00:17:59,810 --> 00:17:57,809

shrinkage is directly associated with

395

00:18:02,450 --> 00:17:59,820

loss of cognition memory and things of

396

00:18:05,299 --> 00:18:02,460

that sort we want to know what happens

397

00:18:07,880 --> 00:18:05,309

with slo to the brain of the so-called

398

00:18:10,430 --> 00:18:07,890

normal person so that's the normal

399

00:18:20,050 --> 00:18:10,440

elderly person that's what we have in

400

00:18:24,830 --> 00:18:22,790

thank you John questions for John a

401
00:18:28,130 --> 00:18:24,840
quick anecdote as people go up to the

402
00:18:30,740 --> 00:18:28,140
mic I went through a glass window a

403
00:18:34,970 --> 00:18:30,750
glass door when I was 10 years old that

404
00:18:37,310 --> 00:18:34,980
was a few weeks ago and John gave me

405
00:18:39,050 --> 00:18:37,320
some s I had a big scar across my wrist

406
00:18:42,110 --> 00:18:39,060
I almost bled to death they couldn't

407
00:18:47,080 --> 00:18:42,120
stitch me back together I'll show you

408
00:18:56,950 --> 00:18:47,090
[Music]

409
00:19:00,920 --> 00:18:56,960
scars : I was reluctant to accept your

410
00:19:02,780 --> 00:19:00,930
it's interesting question individual

411
00:19:04,820 --> 00:19:02,790
physicians and veterinarians have been

412
00:19:06,320 --> 00:19:04,830
very eager to embrace it because they

413
00:19:08,720 --> 00:19:06,330

know number one it's safe and there are

414

00:19:10,340 --> 00:19:08,730

not many alternatives the Food and Drug

415

00:19:12,920 --> 00:19:10,350

Administration has been a little bit

416

00:19:17,720 --> 00:19:12,930

resistant because it's so darn new and a

417

00:19:20,090 --> 00:19:17,730

different approach but I think in in not

418

00:19:22,640 --> 00:19:20,100

being flippant to your question the

419

00:19:25,790 --> 00:19:22,650

mainstream has not had an opportunity to

420

00:19:28,790 --> 00:19:25,800

evaluate it to see we have published a

421

00:19:30,470 --> 00:19:28,800

few papers about this we do get requests

422

00:19:33,350 --> 00:19:30,480

every time we publish we get requests

423

00:19:36,070 --> 00:19:33,360

from practitioners to try it you know on

424

00:19:38,330 --> 00:19:36,080

patients not as part of any study

425

00:19:40,340 --> 00:19:38,340

frankly I think once we get it through

426

00:19:41,870 --> 00:19:40,350

the FDA and we do have what's called an

427

00:19:43,820 --> 00:19:41,880

IND in place with the Food and Drug

428

00:19:45,140 --> 00:19:43,830

Administration now I think once we get

429

00:19:46,610 --> 00:19:45,150

that through I don't I don't believe

430

00:19:48,830 --> 00:19:46,620

we're going to have much resistance in

431

00:19:53,350 --> 00:19:48,840

part because there just isn't much else

432

00:19:55,610 --> 00:19:53,360

and we have an ever older population and

433

00:19:59,230 --> 00:19:55,620

people are getting afraid and I think we

434

00:20:03,410 --> 00:19:59,240

could help yes sir

435

00:20:05,000 --> 00:20:03,420

thank you it's really fascinating but

436

00:20:09,560 --> 00:20:05,010

I'm wondering given what you did what

437

00:20:11,140 --> 00:20:09,570

you have told us about the the interest

438

00:20:15,830 --> 00:20:11,150

that people have in getting in on these

439

00:20:19,070 --> 00:20:15,840

experiments it seems to me that that

440

00:20:22,700 --> 00:20:19,080

further torturing and sacrificing of the

441

00:20:26,330 --> 00:20:22,710

animals is marginal in terms of its

442

00:20:28,750 --> 00:20:26,340

morality and I think the fact that we

443

00:20:31,030 --> 00:20:28,760

use the word sacrifice instead of kill

444

00:20:33,340 --> 00:20:31,040

indicates that we're trying to

445

00:20:36,190 --> 00:20:33,350

hope that in some sort of a religious

446

00:20:38,500 --> 00:20:36,200

patina so I wonder whether whether it be

447

00:20:41,110 --> 00:20:38,510

possible for you to consider not doing

448

00:20:45,130 --> 00:20:41,120

that part of it it's an interesting

449

00:20:50,230 --> 00:20:45,140

point and our interest is helping

450

00:20:54,880 --> 00:20:50,240

patients unfortunately in order for us

451
00:20:57,010 --> 00:20:54,890
as a dinky company to get something that

452
00:21:01,270 --> 00:20:57,020
as the previous question asked about

453
00:21:05,110 --> 00:21:01,280
getting something accepted the FDA and

454
00:21:07,270 --> 00:21:05,120
others asked for preclinical proof that

455
00:21:10,030 --> 00:21:07,280
this works and what they mean by

456
00:21:13,270 --> 00:21:10,040
preclinical is animal experimentation

457
00:21:14,950 --> 00:21:13,280
and you're right

458
00:21:17,500 --> 00:21:14,960
if these football players are getting

459
00:21:20,050 --> 00:21:17,510
better and other patients are doing well

460
00:21:22,210 --> 00:21:20,060
why on earth do you need to do any

461
00:21:24,790 --> 00:21:22,220
animal work from a practical standpoint

462
00:21:28,600 --> 00:21:24,800
you don't from a regulatory standpoint

463
00:21:30,610 --> 00:21:28,610

you do and we're stuck it's it's a

464

00:21:34,180 --> 00:21:30,620

bummer but that's just the way it is I'm

465

00:21:35,710 --> 00:21:34,190

afraid John could you tell answer two

466

00:21:37,810 --> 00:21:35,720

questions one could you give me the

467

00:21:39,750 --> 00:21:37,820

molecular weight of SLO and two what is

468

00:21:43,150 --> 00:21:39,760

the dose you're giving to people yeah

469

00:21:47,980 --> 00:21:43,160

molecular weights about sixty nine

470

00:21:52,330 --> 00:21:47,990

thousand Dalton and the dose a dose is

471

00:21:54,220 --> 00:21:52,340

about I can't tell you I will tell you

472

00:21:58,480 --> 00:21:54,230

but this is gonna be false and I'll tell

473

00:22:03,010 --> 00:21:58,490

you why we when we make up the medicine

474

00:22:06,790 --> 00:22:03,020

it's made up to a dose of about 1.6 and

475

00:22:09,550 --> 00:22:06,800

nanograms per dose and I say that that

476

00:22:13,030 --> 00:22:09,560

is false because the vast majority of

477

00:22:16,720 --> 00:22:13,040

the SLO that goes into the vial adheres

478

00:22:19,150 --> 00:22:16,730

to the glass so we have spent two years

479

00:22:21,430 --> 00:22:19,160

and a bunch of numbers of hundreds of

480

00:22:23,980 --> 00:22:21,440

thousands of dollars to develop what's

481

00:22:26,560 --> 00:22:23,990

called a release assay which the FDA

482

00:22:28,210 --> 00:22:26,570

rightly requires to prove that what was

483

00:22:31,900 --> 00:22:28,220

in the vial at the start is still there

484

00:22:32,860 --> 00:22:31,910

at the end and for us it's not so we

485

00:22:34,420 --> 00:22:32,870

have to go with what's called a

486

00:22:37,560 --> 00:22:34,430

functional assay and as dr. Ives

487

00:22:39,850 --> 00:22:37,570

mentioned we're we're way below

488

00:22:40,820 --> 00:22:39,860

Avogadro's number I do believe in what's

489

00:22:42,710 --> 00:22:40,830

left in

490

00:22:46,070 --> 00:22:42,720

by oh that's why we're going to have to

491

00:22:48,529 --> 00:22:46,080

go to a functional assay instead of the

492

00:22:55,549 --> 00:22:48,539

typical chemical assay for for dosing

493

00:22:59,779 --> 00:22:55,559

thank you hello I don't know any of the

494

00:23:02,389 --> 00:22:59,789

a lot about 22 brain injury but there's

495

00:23:07,810 --> 00:23:02,399

a fellow who I a client that I work with

496

00:23:10,460 --> 00:23:07,820

who in a psychiatric program who has

497

00:23:13,129 --> 00:23:10,470

brain injury from a child that was hit

498

00:23:16,909 --> 00:23:13,139

by a car or something and he hears

499

00:23:19,039 --> 00:23:16,919

voices and his family says that that he

500

00:23:23,419 --> 00:23:19,049

said that the voices began after the

501
00:23:26,060 --> 00:23:23,429
injury number one is that a symptom and

502
00:23:29,720 --> 00:23:26,070
number two do you have you experienced

503
00:23:31,789 --> 00:23:29,730
any alleviation of that symptom we have

504
00:23:34,279 --> 00:23:31,799
and even in the small number of football

505
00:23:37,039 --> 00:23:34,289
players we have one of the reasons why a

506
00:23:39,440 --> 00:23:37,049
couple of them had trouble holding jobs

507
00:23:41,360 --> 00:23:39,450
or maintaining interpersonal

508
00:23:43,610 --> 00:23:41,370
relationships was just that sort of

509
00:23:45,919 --> 00:23:43,620
problem and that's not I don't mean to

510
00:23:49,279 --> 00:23:45,929
imply for a second that SLO is the

511
00:23:51,830 --> 00:23:49,289
panacea for all brain problems but if

512
00:23:53,960 --> 00:23:51,840
they are ones caused by traumatic brain

513
00:24:00,000 --> 00:23:53,970

injury at least we have a chance to help

514

00:24:05,030 --> 00:24:02,880

well I've got one small bottle and we

515

00:24:08,299 --> 00:24:05,040

can take bids