

Paleo Fx 2016

The Warrior Gut: How to Build and Master the Most Wicked Microbiome

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Microbiome Medicine Live Training Dec 3-4th Oakland, CA

The Gut Institute

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Text to 33444
GUTLIVE
(not cap sensitive)



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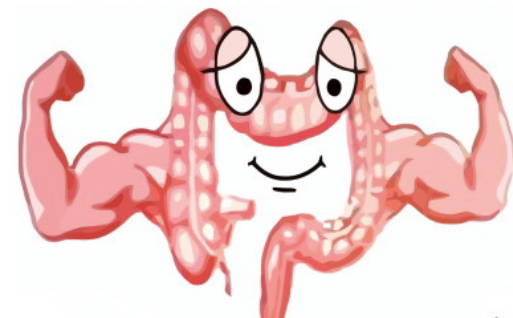
Year 2016
22-23% Body fat
BMI ~21 124 lbs
Size 2

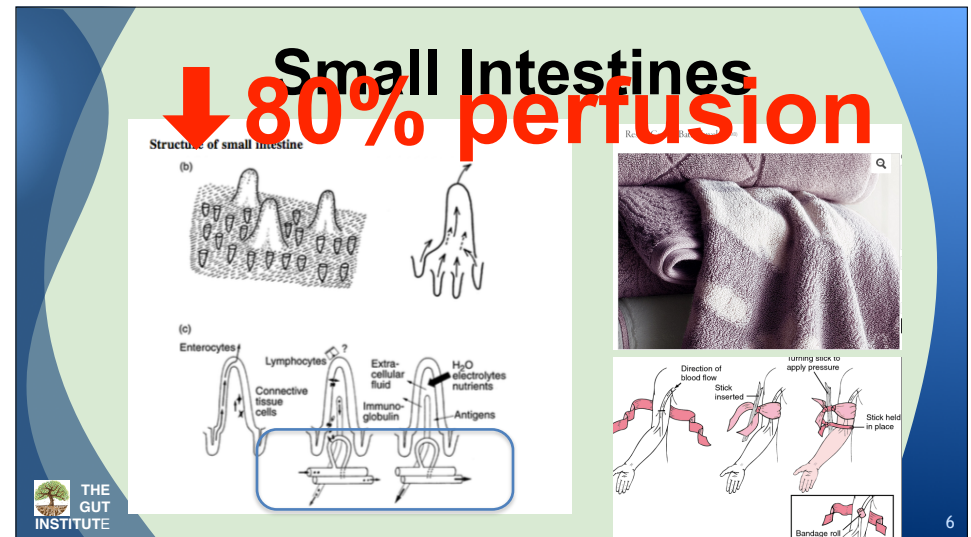
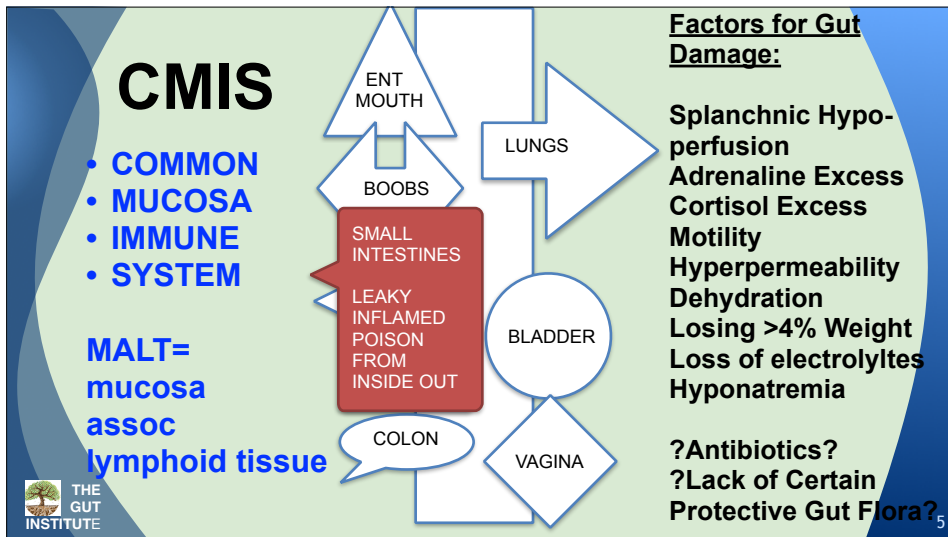
HALF MARATHONS
SPRINT TRIATHLONS

Year 2002
38% Body Fat; 160 lbs; BMI 27.0
Size 10-12
1 year postpartum (e.g. mommy-cow)



Your Gut is a Vital Organ





Incidence of Illness in Endurance Athletes

- 1 or more GI symptom, 30-50% (Brouns & Beckers, 1993)
- 43% triathletes, serious GI issue and 7% abandoned race (Jeukendrup et al, 2000)
- 70% elite endurance athletes reported GI symptoms (Peters et al, 1999)

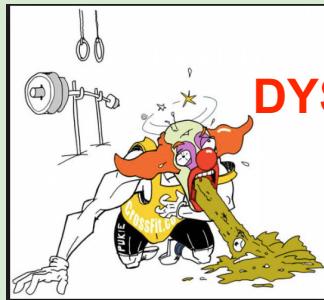
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Types of Illness in Endurance Athletes

- After race, upper respiratory infection, GI disorders, etc
- Pre and during race:
 - nausea, vomiting, reflux, bloody diarrhea, abdominal angina
 - mucosal erosions, ischemic colitis, blood loss, proximal/distal or pancolitis, small intestinal infarction requiring surgery

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“Puking” in Strongman or Crossfit Athletes



DYSBIOSIS?

**INFECTION INDUCING
PERFORMANCE-DRAINING
DECREASED FUEL EFFICIENCY**

Dysbiosis = ↑ Pathogens, LPS

E coli
Clostridium
Streptococcus
Shigella
Salmonella
Staphylococcus
Corynebacteria
Viruses
Parasites
Giardia
Blastocystis hominis
Fungi
Candida
Saccharomyces/Yeasts



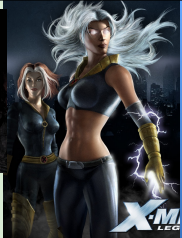
ABC's LEAN HAWT SEXY



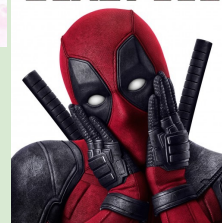
**Gut Barrier
Protective
Angels &
Warriors**

Akkermansia
Bifidobacteria longum
Christensenella

Bacteroides
Faecalibacterium
Roseburia
Lactobacilli



JUSTICE HAS A NEW FACE
DEADPOOL



Elite Irish Rugby Team



Clarke et al 2014

- All ABC's in Gut Microbiota
-*Akkermansia*, *Bifidobacteria longum*,
Christensenella
- Very Diverse Gut Hawwtness
- Rugby Players: 22 Phyla
- Low BMI Healthy Controls:
11 Phyla
- High BMI Healthy Controls:
9 Phyla

Semi Super Centenarians



Biagi et al 2016

- Age 105 to 115 years old
- All ABC's in Microbiota
 - Akkermansia*
 - Bifidobacteria longum*
 - Christensenella*
- All ABC's **SUPER ENRICHED**
- Very Diverse Gut



<https://www.pinterest.com/mycareangel/supercentenarians/>
<http://www.aplaceformom.com/blog/9-10-14-sally-peterson-centenarians/>

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Probiotics in Athletes

- *Lactobacillus fermentum*
 - Endurance athletes
 - Decr upper respiratory infxn
 - Incr mucosal immunity
- *Lactobacillus casei* Shirota
 - 4 months winter season
 - Endurance athletes
 - Incr immune markers
 - Less upper resp and GI symptoms
- *Lactobacillus casei*
 - 3 weeks combat training in army cadets
 - Improved immune markers



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Ultra BIFIDO|MAXIMUS Probiotic 200 Billion CFU

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40% *Bifidobacterium longum*
 20% *Bifidobacterium lactis*/
Bifidobacterium bifidum/
Bifidobacterium infantis
 20% *Lactobacillus rhamnosus*
 20% *Lactobacillus salivarius*
 20% *Lactobacillus gasseri*

POTENTIAL EFFECTS

- Antifungal
- Antipathogenic
- ↓ Gliadin related enteropathy
- Seals Gut and CMIS
- ↓ Bloat, Brain Fog
- ↓ Fatigue
- ↓ Body Fat



Sound Probiotics

- 25 B CFU; *L. fermentum*



3 Wicked Things for a Warrior Gut

#1 Test Don't Guess

Urine Organic Acid
(Great Plains Lab OAT)

Burden of yeast and bacterial overgrowths
Oxalates, Mitochondrial Energy, Etc

Stool

CDSA (Genova, GPL)
GIFX (Genova)

Culture: facultative anaerobes
16S: identification 25 strains
Parasites, Pathogens, etc



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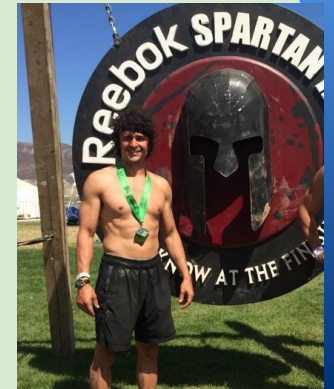
Spartan Warrior Eli Markstrom Pre-uBiome

- LOW ABUNDANCE 'warrior/angel' flora
 - Akkermansia 0 (undetectable)
 - Bifidobacteria longum (200x below optimal)
 - Christensenella 0 (undetectable))
- Increased potential opportunistic occupation
 - GAMMA:Salmonella, Shigella, E coli 100 to 10,000 above avg
 - Cronobacter (12%) 1,000 to 100,000 above avg
 - Proteobacteria pathogens (6-fold more than average)



ELITE-Spartan Warrior Eli Markstrom Post-uBiome

- Resurrection of Warriors/Angels
 - Akkermansia increased zero to 0.0011% (100+ fold increased)
 - Bifidobacteria longum increased **8x better**
 - Christensenella (**no change**)
- Debugging : Malware Removal
 - Gammaproteobacteria **15 fold less**
 - Cronobacter sakazakii **2000 fold less**



ELITE-Spartan Warrior Eli Markstrom Gut Biohack

- (1) "wake up with a pep in my step" Didn't know sleep was an issue
- (2) "my appetite is lower. I feel full all the time. My energy levels are good. There is marginal fluctuation throughout the day. In the past, I have struggled with being hungry all the time. I can see how this would come in handy for a person trying to eat less food in order to lose weight."
- (3) IBS-DIARRHEA "poop is more regular both in consistency and frequency."
- (4) KNEE PAIN GONE
- (5) Acne lesions and skin improved and less
- (6) Better endurance
- (7) Improved athletic performance; qualified ELITE Spartan race



Athlete: Kyle Kingsbury

- Mafia 3 Game Model
- Recent Rogan pod guest
- Powerlifter PR 525 deadlift
- UFC MMA (retired 2012)
- Ran first endurance Ultra
- Used our BIONIC FIBER
 - Inulin FOS acacia psyllium
 - PRESCRIPT ASSIST, Klaire4 (bifidus), Up4, GOL



Fan of Wim Hof breathing techniques



ABC's of Ancestral Core Microbiota

uBiome stool 16S rDNA sequencing
\$89

POST BIONIC FIBER
*Better Immunity
Improved Performance
(no gluten tolerance)*

POST Ultra B|M Probiotic
Gained gluten tolerance
After Ultra 55KM Race

Akkermansia is associated with improving intestinal permeability and protection against IBD, colorectal cancer, IBS, obesity, diabetes, appendectomy, fatty liver and dysbiosis.

19.3610 Akkermansia

0.0122 Akkermansia

Low diversity and missing vital contributors high associated with optimal health for the mind, body, muscles and inflammation protection. In healthy guts, > 3-5 strains of bifido are present. Despite supplementation it appears the B. longum has not 'seeded' well (might be < detection if < .0001%)

NO BIFIDOBACTERIUM
[0.1308Actinobacteria]

0.0550 Bifidobacterium
0.0142 Bifidobacterium
longum
1.1238Actinobacteria (10X)

GLUTEN TOLERANCE
ULTRA B|M PROBIOTIC

Appears to enjoy diverse fiber. Highly correlated to low body fat and leanness. When administered to animals as a probiotic, animals lose weight and are protected from expected fat gain on a low fiber, fat promoting diet.

0.0846 Christensenellaceae

NO
CHRISTENSENELLACEAE



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MMA Kyle Kingsbury Gut-Heart Damaged By raw Potato Starch

- Uncooked HAM (corn starch) or Potato Starch not considered "human prebiotic fiber" for human gut flora by leading researchers (Justin Sonnenburg, Peter Turnbaugh, David Relman, Patrice Cani)
- Human studies etc show HAM, PS associated with
 - ↑ gut inflammation, LPS (Ordiz et al 2015)
 - ↓ diversity (Bhandari et al 2009, Ordiz et al 2015)
 - ↑ body fat, insulin, and fatty pancreas (Bodinham et al 2012, 2014)
 - ↑ anxiety (rodents, Lyte et al 2016)



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Gained Fat or Worse HRV, ↑ Heart Rate on raw Potato Starch

- Kyle and wife Tasha's were disturbed when they gained significant body fat "out of nowhere" or experienced "much higher HRV score" on potato starch/RUMP despite probiotics/fiber
- Stopped it, quickly lost weight and body fat; HRV normalized



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raw Potato Starch ('hamster food') Selectively Superfeeds Candida and Other Fungi/Yeasts

- Direct fermentation of potato starch wastewater to lactic acid by Rhizopus oryzae and Rhizopus arrhizus.
- Rhizopus arrhizus--fermentation of starch waste materials
- Production of ethanol directly from potato starch by mixed culture of Saccharomyces cerevisiae and Aspergillus niger using electrochemical bioreactor.
- Towards industrially feasible treatment of potato starch processing waste by mixed cultures.
- Direct fermentation of potato starch to **ethanol** by cocultures of Aspergillus niger and Saccharomyces cerevisiae.
- Simultaneous non-thermal saccharification of cassava pulp by multi-enzyme activity and ethanol fermentation by Candida tropicalis.
- A comparison of different dilute solution explosions pretreatment for conversion of distillers' grains into **ethanol**.



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MMA Kyle Kingsbury BIONIC FIBER

*"We take a combo of inulin FOS, acacia, and psyllium with magnesium citrate and green Vibrance (for probiotics and greens). We also take our probiotics with the **bionic fiber shake** and always in the evening. The probiotics change but include Klaire TherBiotic 4, Prescript Assist, and Up4. We recently add the GOF brand 50 billion.*



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MMA Kyle Kingsbury BIONIC FIBER

*"Since starting our **bionic fiber** shakes we had a noticeable improvement in the regularity especially in the mornings. We feel lighter and ready to go for our morning workouts. It has improved my immune function like nothing else. I usually get a common cold at least 3 times a year past due to lack of sleep and over training (a thing of the past)."*



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"Now even w/ lack sleep my immune is through the roof. If I feel like I'm getting run down or allergies are starting up I add more fiber and more probiotics and the symptoms are gone literally over night. I wish I had this information when I was still fighting. I have told many fighters about you & your protocol. Everyone that has implemented it loves the results.

Better sleep = better immunity = better training and better quality of life!"



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3 Wicked Things for a Warrior Gut

#1 Test Don't Guess

#2 Weed and Seed/Feed

- Weed
 - Gentle: Probiotics, Prebiotics, Fermented Foods
 - Moderate: Plant Botanicals + Above
 - Extra: All the above + *Biofilm Busters*
- Probiotics/Prebiotics



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Eli's Wicked Gut Program

Prebiotics (~23g):

1/4 tsp glucomannan
1 tsp acacia
1 tsp arabinogalactan
1 tsp modified citrus pectin
[1 tsp GOS Bimuno or Jarro
Baby Dophilus 1 tsp = 2.4 g
GOS]
1 tsp inulin-FOS
1 TBS psyllium
1 TBS cocoa

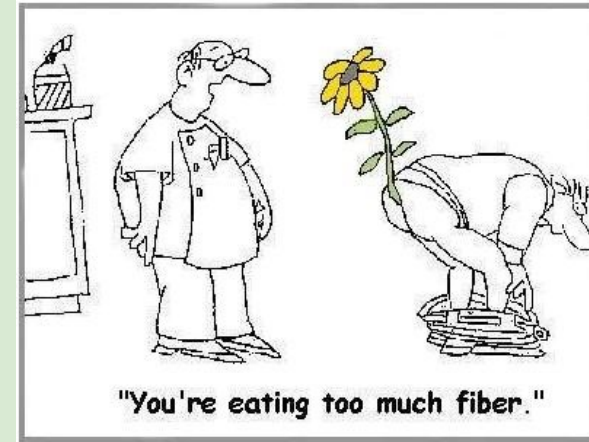
Diet: beans, rice, kale
smoothie, plenty of vegs

Probiotics:

Fermented foods
Bifidus Balance +FOS(Jarrow)
Soil probiotics

Weeding:

--Berberine 500mg twice daily
--Neem 2 caps daily
--Grape seed extract 100mg 2x/d
--Liver detoxifier 2 daily



Soil Probiotics

- Prescript Assist
 - * 29 Strains
 - * Works
 - * Incl *Bacteroides*
- Mother Dirt
 - * *Nitrosomonas*
 - * Studies ongoing
- Equilibrium
 - * 115 Strains
 - * *Enterobacter*



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55km Ultra Race Zion, UT

- Lost > 4% body weight
- Only 2 hydrations stops; race promised 4
- No lytes
- Ketogenic

—> Bloat, brain fog,
dandruff, body fat



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FUNGAL DYSBIOSIS

Intestinal Microbial Overgrowth

Yeast and Fungal Markers

Marker	Value	Unit	Reference	Score	Score Range	Score Interpretation
1 Citramalic	0.11	-	2.0	L	0.05	<0.05
2 5-Hydroxymethyl-2-furoic	≤	18			3.6	<3.6
3 3-Oxoglutaric	≤	0.11		0	0.00	<0.00
4 Furan-2,5-dicarboxylic	≤	13		3.0	3.0	<3.0
5 Furancarboxylglycine	≤	2.3		0	0.00	<0.00
6 Tartaric	≤	5.3		1.6	1.6	<1.6
7 Arabinose	≤	20	H	33	33	<33
8 Carboxycitric	≤	20		0.45	0.45	<0.45
9 Tricarballic	≤	0.58		0.06	0.06	<0.06

KYLE C/O:
DIARRHEA
DANDRUFF
BLOAT
BRAIN FOG
FAT
CANNOT
HOLD
BREATH

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Great Plains Urine OAT Bacterial Dysbiosis

Bacterial Markers			
10	Hippuric	≤ 241	H 514
11	2-Hydroxyphenylacetic	0.03 - 0.47	0.31
12	4-Hydroxybenzoic	0.01 - 0.73	H 1.2
13	4-Hydroxyhippuric	≤ 14	9.2
14	DHPPA (Beneficial Bacteria)	≤ 0.23	0.15

Clostridia Bacterial Markers			
15	4-Hydroxyphenylacetic (<i>C. difficile</i> , <i>C. stricklandii</i> , <i>C. lituseburens</i> & others)	≤ 18	6.8
16	HPHPA (<i>C. sporogenes</i> , <i>C. caloritolerans</i> , <i>C. botulinum</i> & others)	≤ 102	12
17	4-Cresol (<i>C. difficile</i>)	≤ 39	3.6
18	3-Indoleacetic (<i>C. stricklandii</i> , <i>C. lituseburens</i> , <i>C. subterminale</i> & others)	≤ 6.8	3.0

DIARRHEA
CONSTIPATION
BLOAT
BRAIN
FOG
FAT
ALLERGY
AUTO-
IMMUNITY

Clostridium
CONSTIPATION

Great Plains Urine OAT Adrenal Precursors

Neurotransmitter Metabolites

Phenylalanine and Tyrosine Metabolites

33 Homovanillic (HVA) (dopamine)	0.39 - 2.2	0.97	
34 Vanillylmandelic (VMA) (norepinephrine, epinephrine)	0.53 - 2.2 L	0.41	
35 HVA / VMA Ratio	0.32 - 1.4 H	2.4	

Tryptophan Metabolites

36 5-Hydroxyindoleacetic (5-HIAA) (serotonin)	≤ 2.9	0.56	
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MOOD
DIARRHEA
CONSTIPATION
BLOAT
BRAIN
FOG
FATIGUE
BODY FAT
ALLERGY
AUTO-IMMUNITY
CANCER

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ABC's of Opportunistic Pathogens

uBiome stool 16S rRNA sequencing \$89	POST BIONIC FIBER Better Immunity Improved Performance (no gluten tolerance)	POST Ultra B M Probioc Gained gluten tolerance After Ultra 55KM Race
<p>Associated with many human diseases, insulin resistance, obesity, metabolic syndrome, IBS, IBD, dysbiosis, autism/spectrum, etc</p> <p>Secretes TMA, toxic aldehydes, alcohol and damages mucosa. Probiotics and fiber lowers. Low diversity which in this case is preferred.</p>	<p>0.3540Proteobacteria</p> <p>NO GAMMAPROTEOBACTERIA</p>	<p>10+ FOLD INCREASED 4.5115Proteobacteria</p> <p>0.0040 Gammaproteobacteria 0.0040Enterobacteriaceae 0.0040 Enterobacter</p>
<p>Associated with insulin resistance, obesity, metabolic syndrome, IBS, IBD, dysbiosis, autism/spectrum, etc</p> <p>Secretes alcohol and neuromuscular toxins. Probiotics and fiber lowers. Low diversity which in this case is preferred.</p>	<p>NO CLOSTRIDIUM</p>	<p>NEW, COLONIZATION</p> <p>0.3365 Clostridium</p>
<p>High abundance associated with infection, dysbiosis, gluten intolerance/celiac</p>	<p>0.0154Lactobacillus 0.0154 Lactobacillus rogosae</p>	<p>4 FOLD INCREASED 0.0489Lactobacillaceae 0.0142Lactobacillus 0.0040Lactobacillus salivarius</p>


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3 Wicked Things for a Warrior Gut

#1 Test Don't Guess

#2 Weed and Seed/Feed

#3 Your Gut is an Athletic Organ

- Avoid Spraining or Injuring or Breaking It



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#3 Your Gut is an Athletic Organ *Avoid Sprain or Injure or Breaking*

- Avoid losing >4% body weight
- Hydration; adequate lytes
- Strategies decr adrenaline/cortisol spikes
 1. Avoid overtraining and undereating
 2. Nourishing Botanicals/Adaptogens
 3. Vagal tone exercises (gargling, cold water 'seal')
 4. Acupuncture ST36 point
 5. Meditation, yoga, kundalini breathing (Wim Hof)



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2016 ITU WORLD TRIATHLON ABU DHABI

MARIO MOLA, JODIE STIMPSON



2014 ITU WORLD TRIATHLON LONDON



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