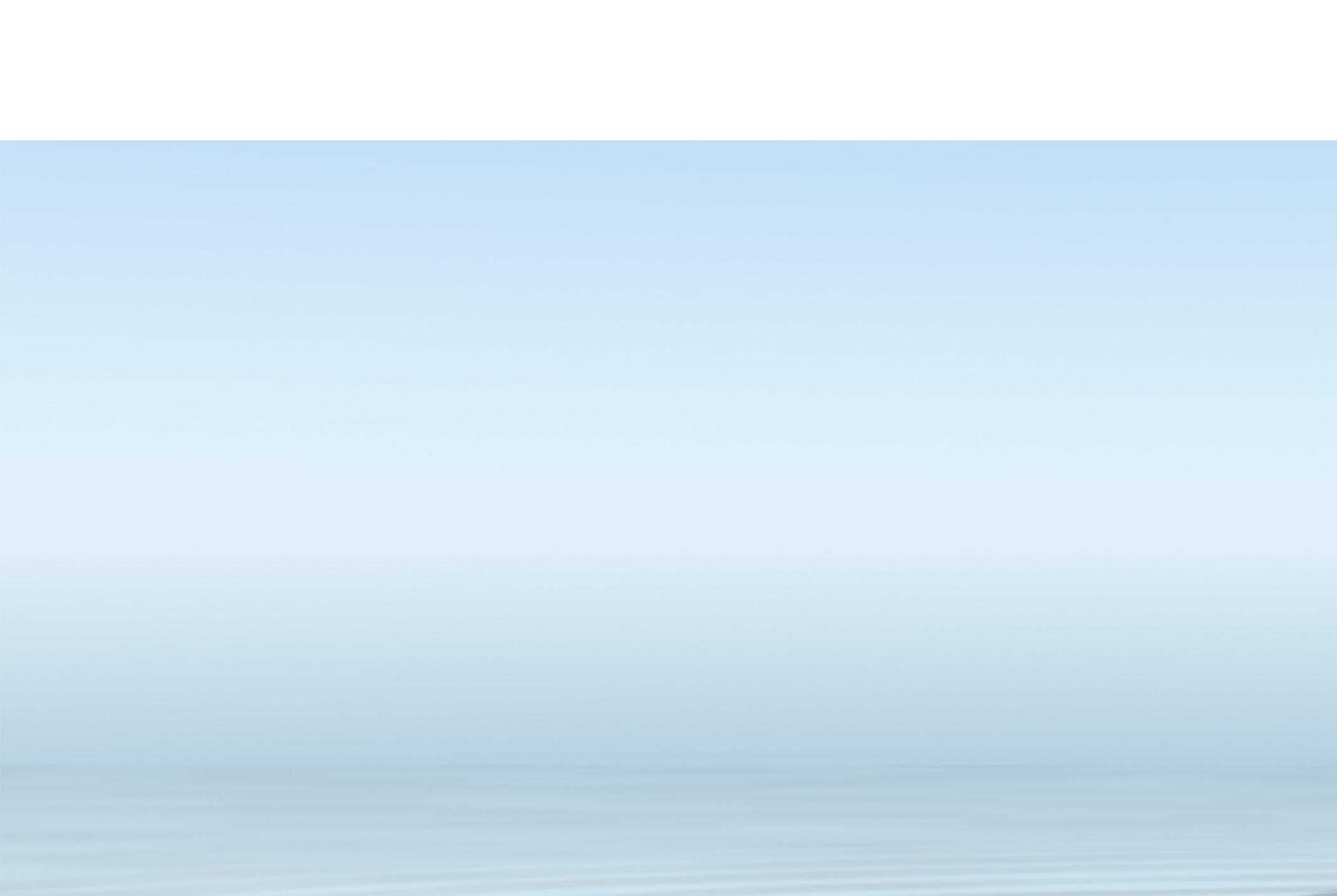


# The Mindful Developer

The Science of Stress Management

@MatthewRenze

#prdc18wpg

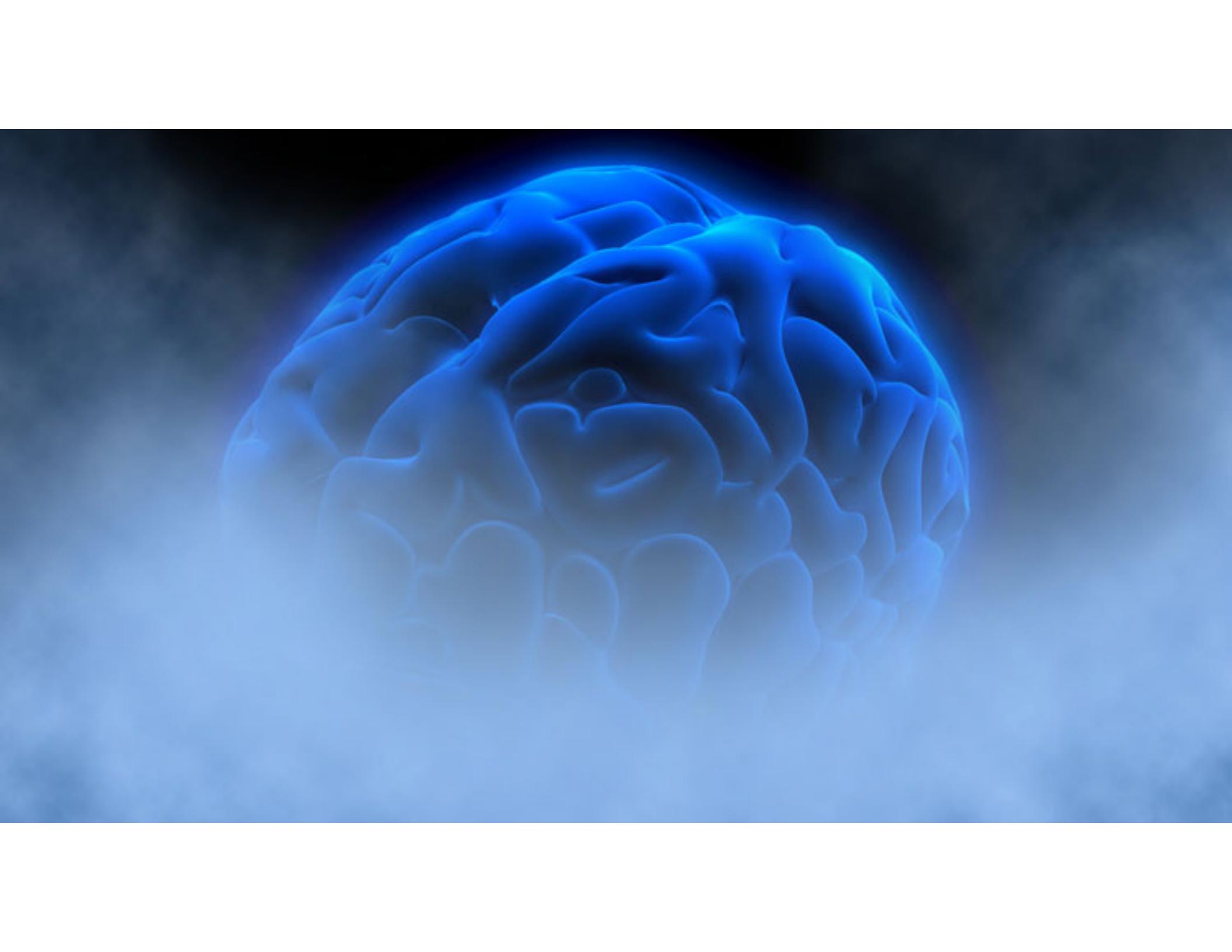


# Stress

# Stress Mindfulness

# Stress Mindfulness Science

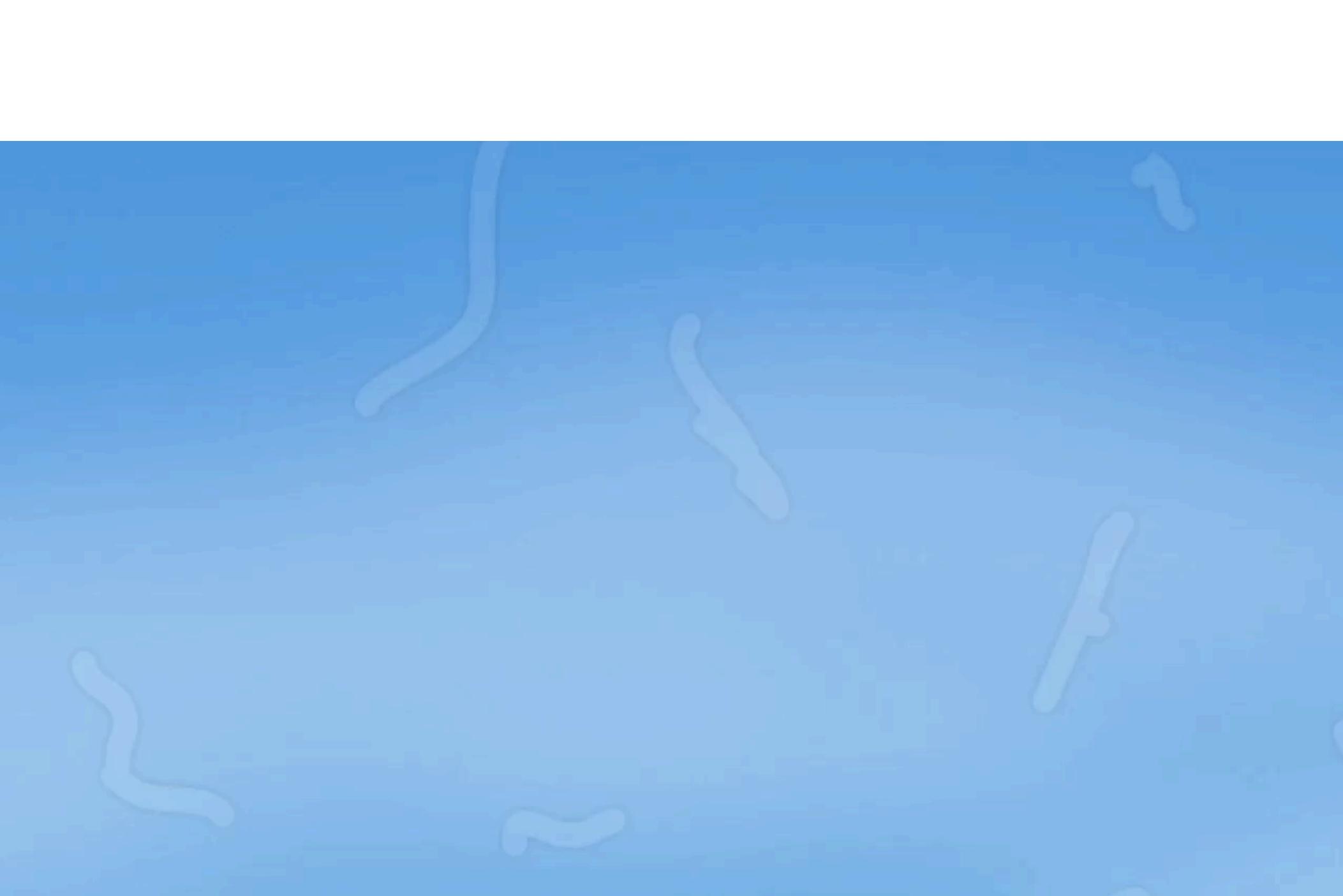
February 7, 2014

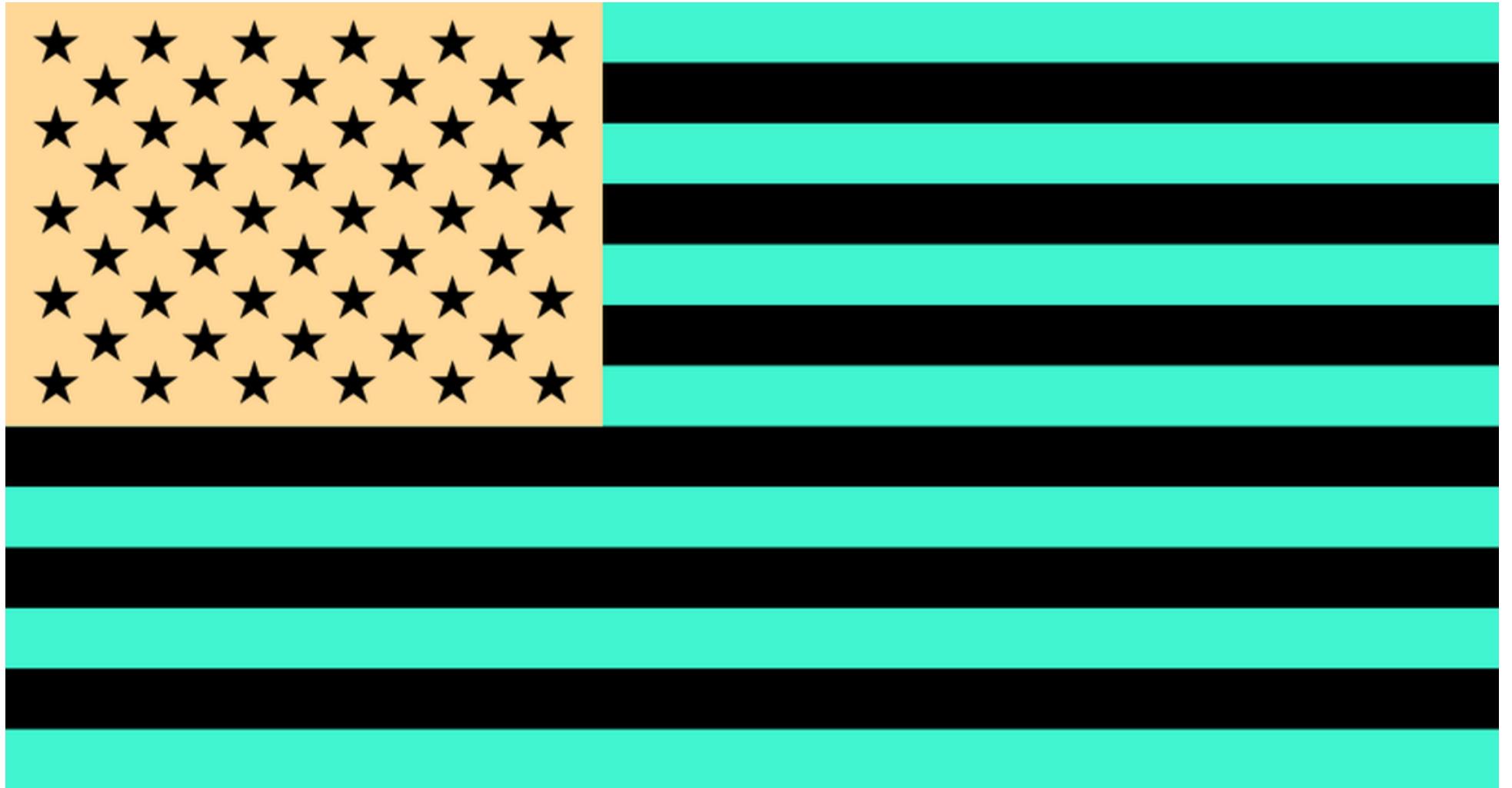


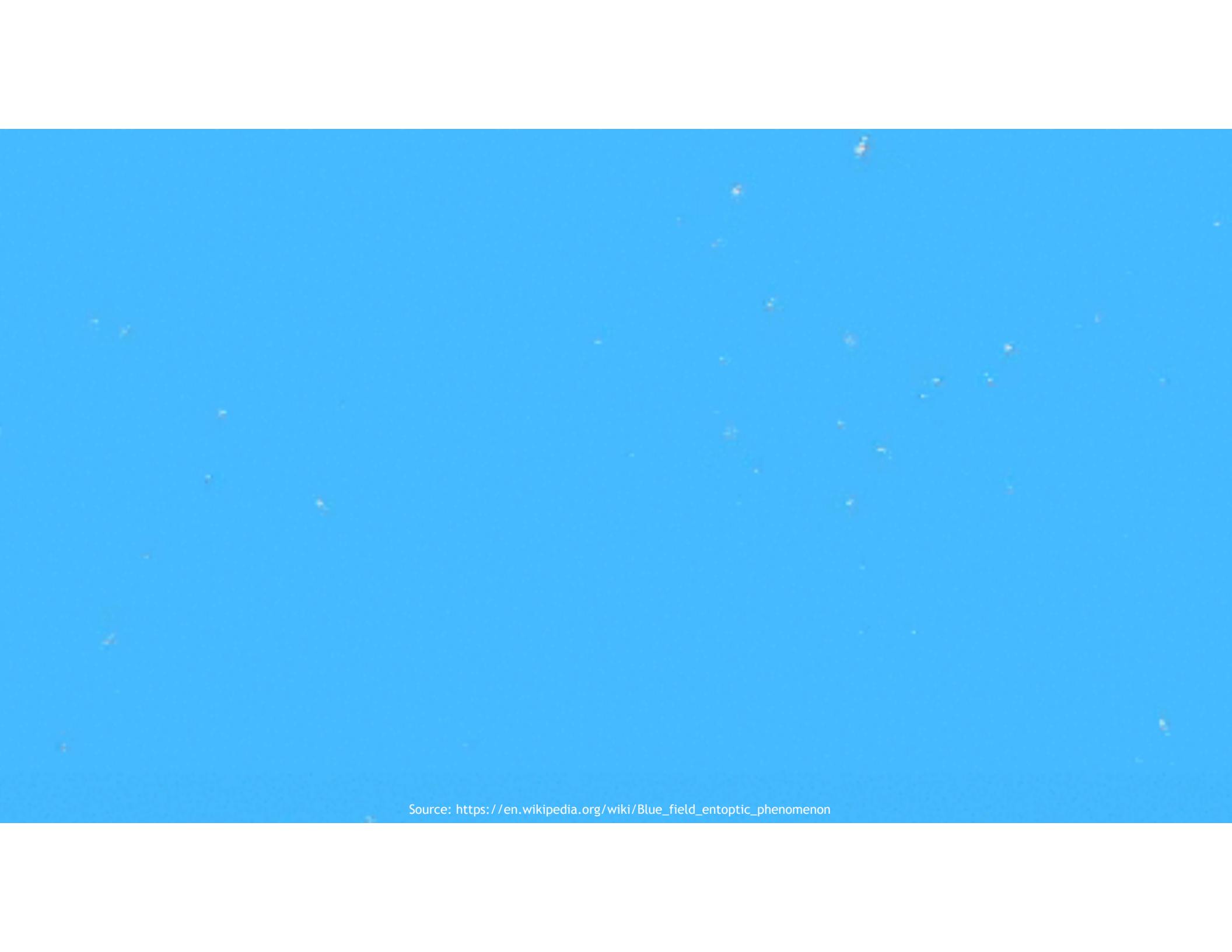












Source: [https://en.wikipedia.org/wiki/Blue\\_field\\_entoptic\\_phenomenon](https://en.wikipedia.org/wiki/Blue_field_entoptic_phenomenon)

# Other Symptoms

<b>Visual</b>	<b>Auditory</b>	<b>Tactile</b>
Vibration in text	Loud-noise issues	Pulsating buzzing
Trailing images	Conversation issues	Fine tremors
Bright-light issues	Environmental-noise issues	
Night-vision issues	Ear pop/click noise	
Halos at night		





Source: Mayo Clinic

# 'Visual snow' – a disorder distinct from persistent migraine aura

Christoph J. Schankin,<sup>1,2,\*</sup> Farooq H. Maniyar,<sup>1,2</sup> Kathleen B. Digre<sup>3</sup> and Peter J. Goadsby<sup>1,2</sup>

1 Headache Group, Department of Neurology, University of California, San Francisco, San Francisco, CA, USA

2 NIHR-Wellcome Trust Clinical Research Facility, King's College London, London, UK

3 Departments of Neurology, Ophthalmology, Moran Eye Centre, University of Utah, Salt Lake City, UT, USA

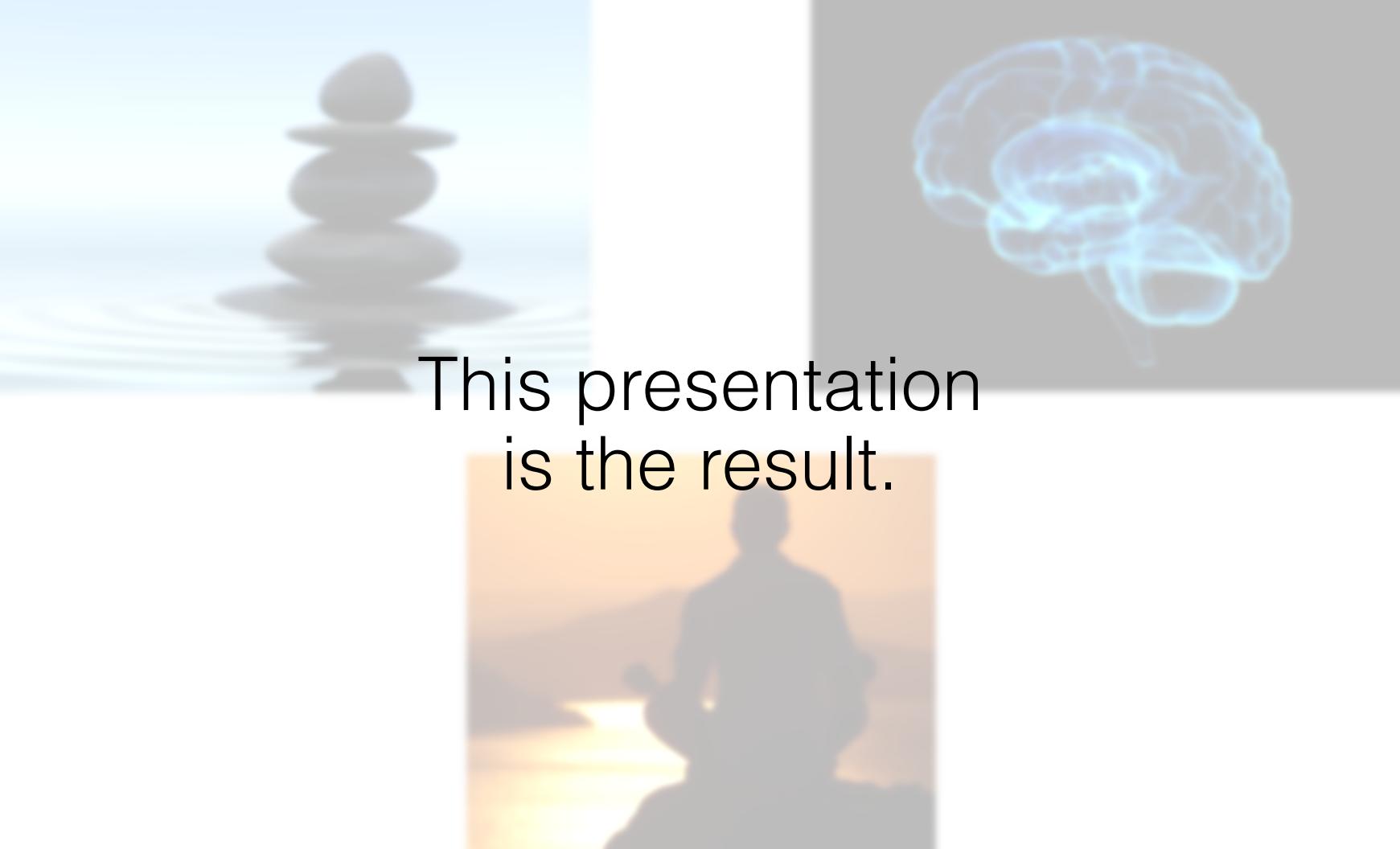
\*Present address: Department of Neurology, University of Munich Hospital - Großhadern, Munich, Germany



Source: Rochester Convention  
and Visitors Bureau







This presentation  
is the result.

A photograph of a vast savanna landscape under a clear blue sky with scattered white clouds. In the foreground, a large, spreading acacia tree stands prominently. Its canopy is filled with dense green leaves. Behind the tree, the landscape extends into rolling green hills. A single zebra is visible in the middle ground, grazing in the tall, golden-yellow grass. The overall scene is one of a natural, peaceful environment.

Stress









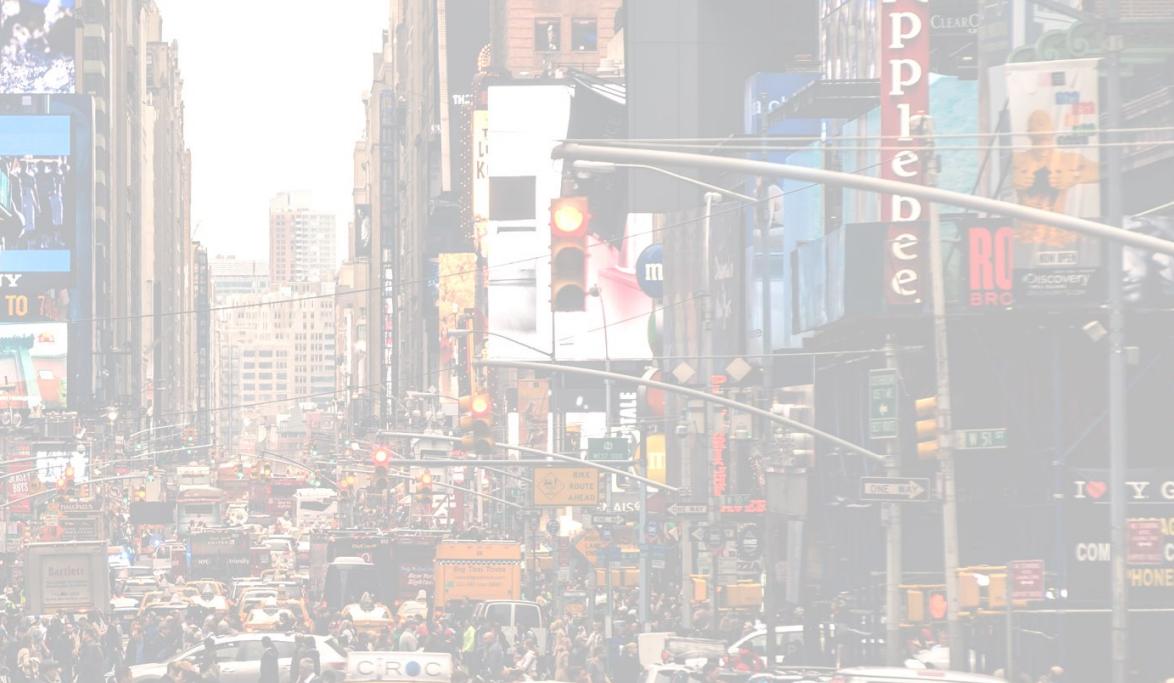


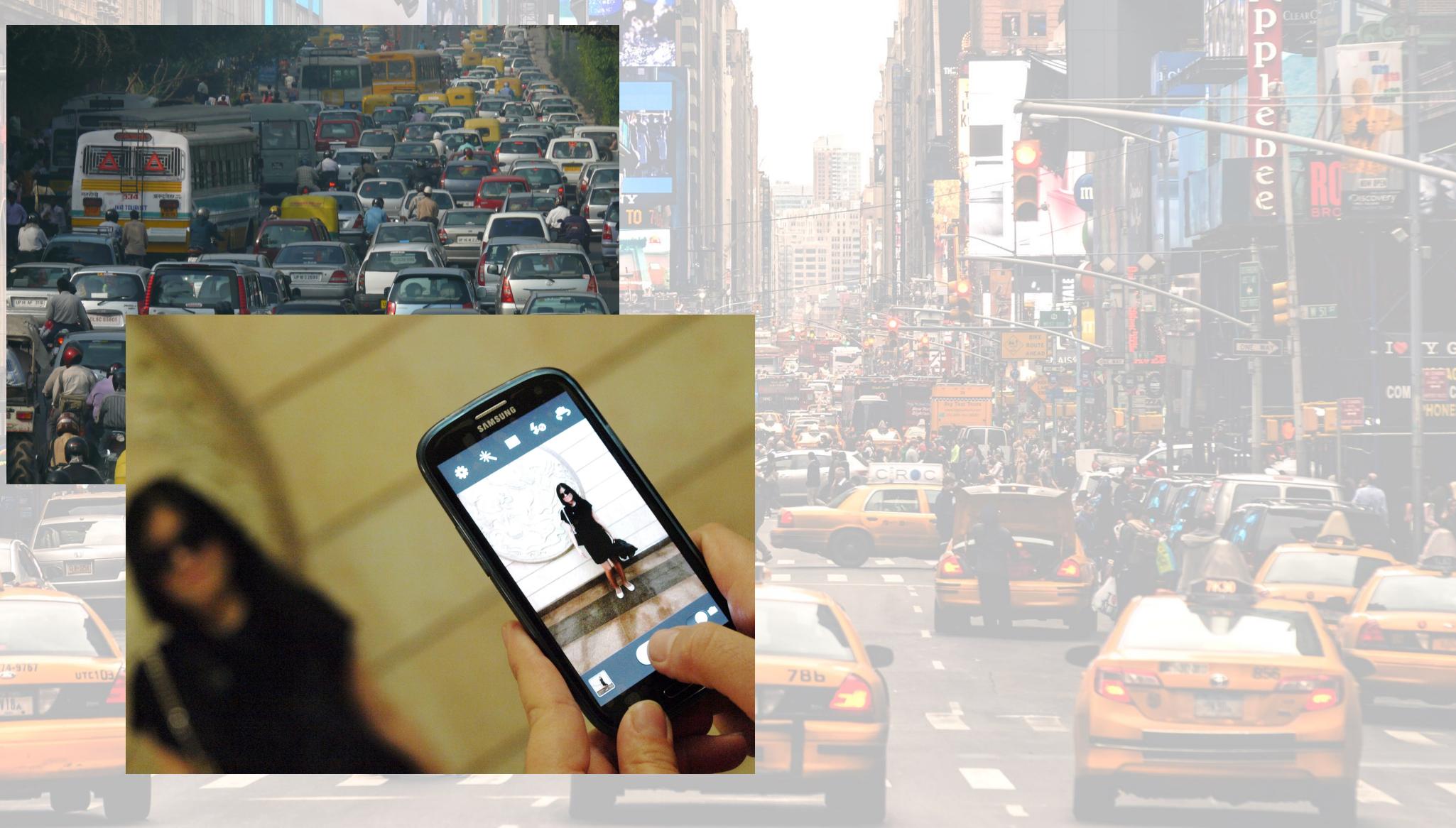






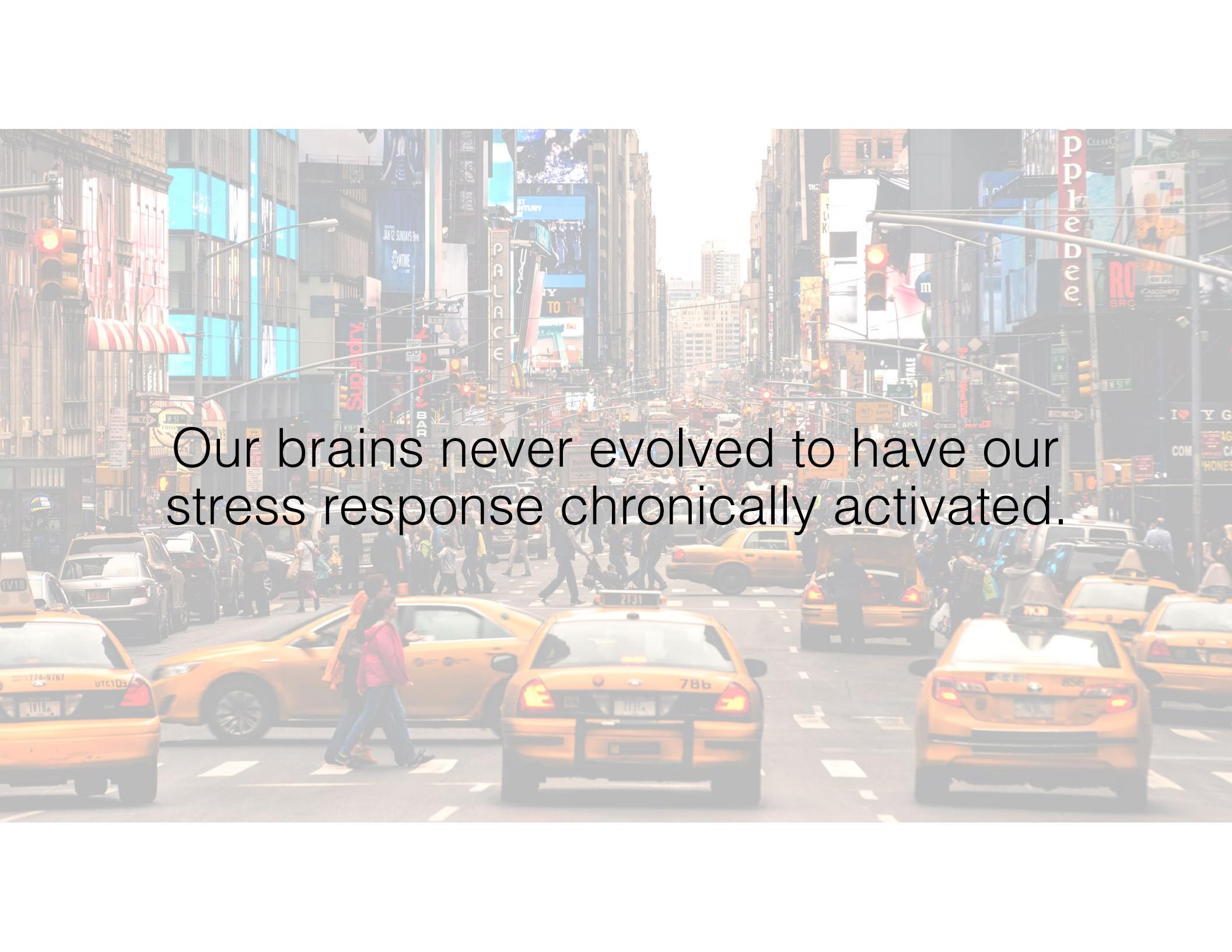




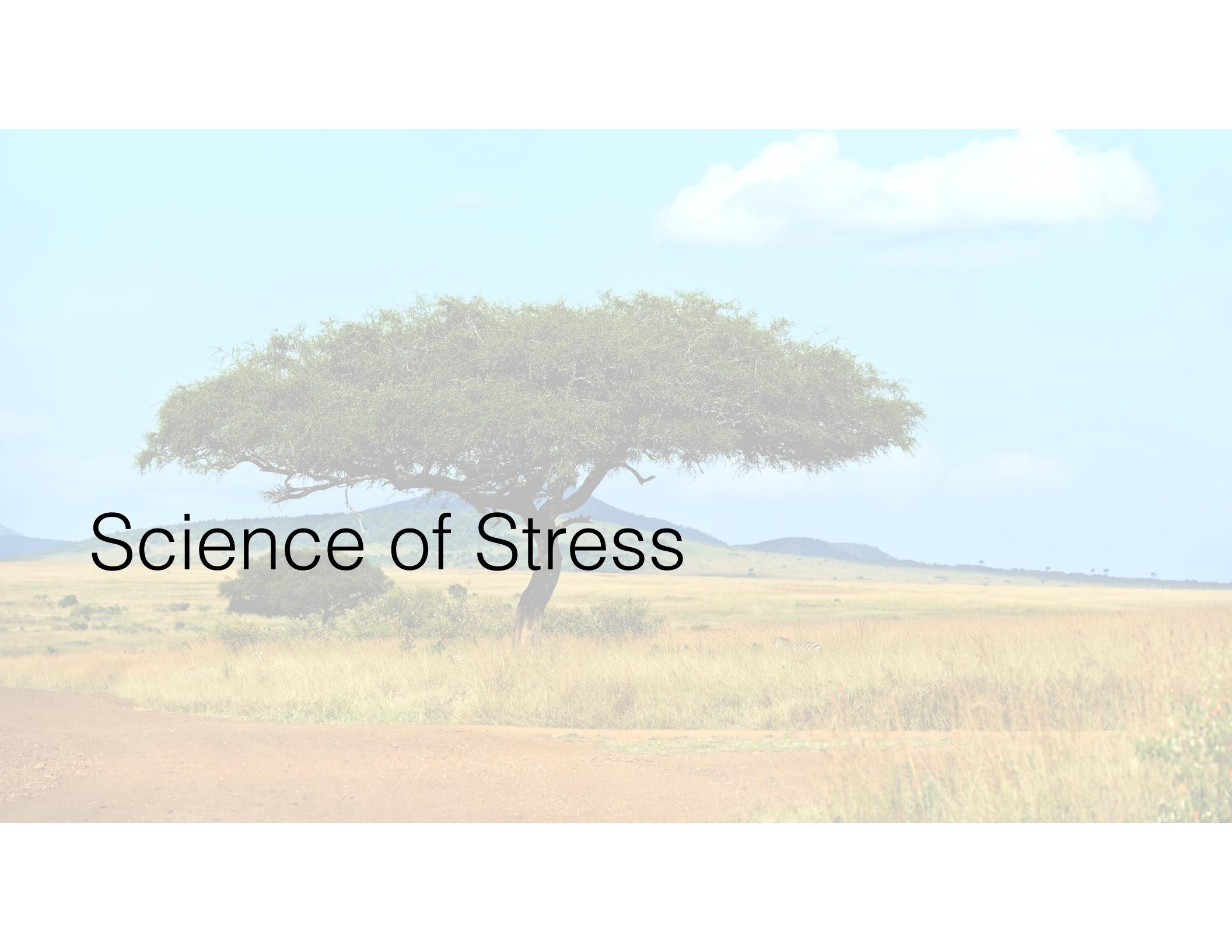






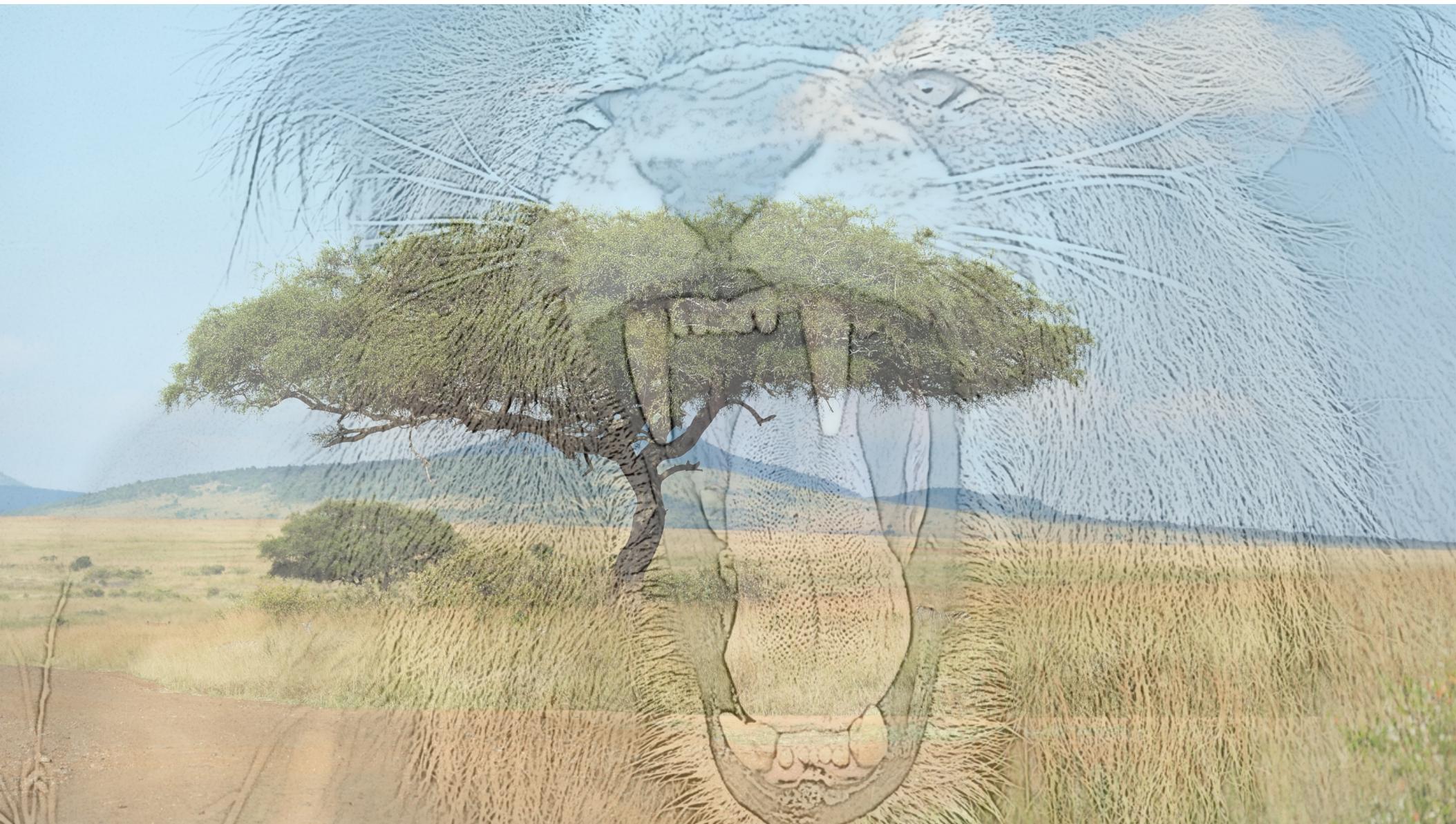


Our brains never evolved to have our stress response chronically activated.

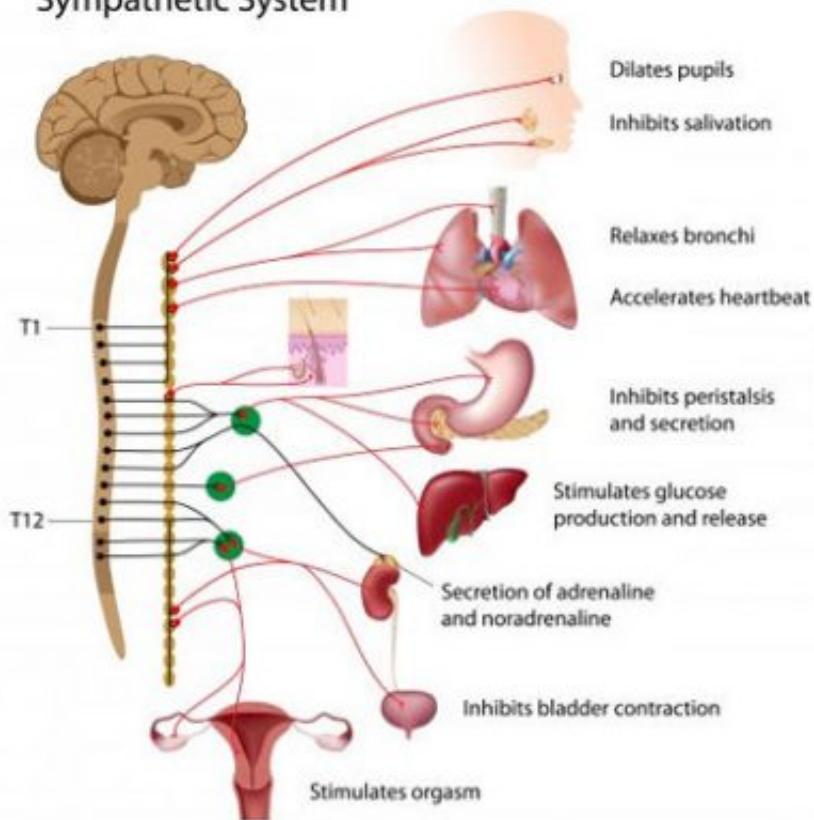
A photograph of a savanna landscape. In the foreground, there is dry, yellowish-brown grass. A large, spreading acacia tree with a thick trunk and dense green foliage stands prominently. In the background, there are rolling hills or mountains under a bright blue sky with scattered white clouds. A zebra is visible in the distance, grazing near the horizon.

# Science of Stress

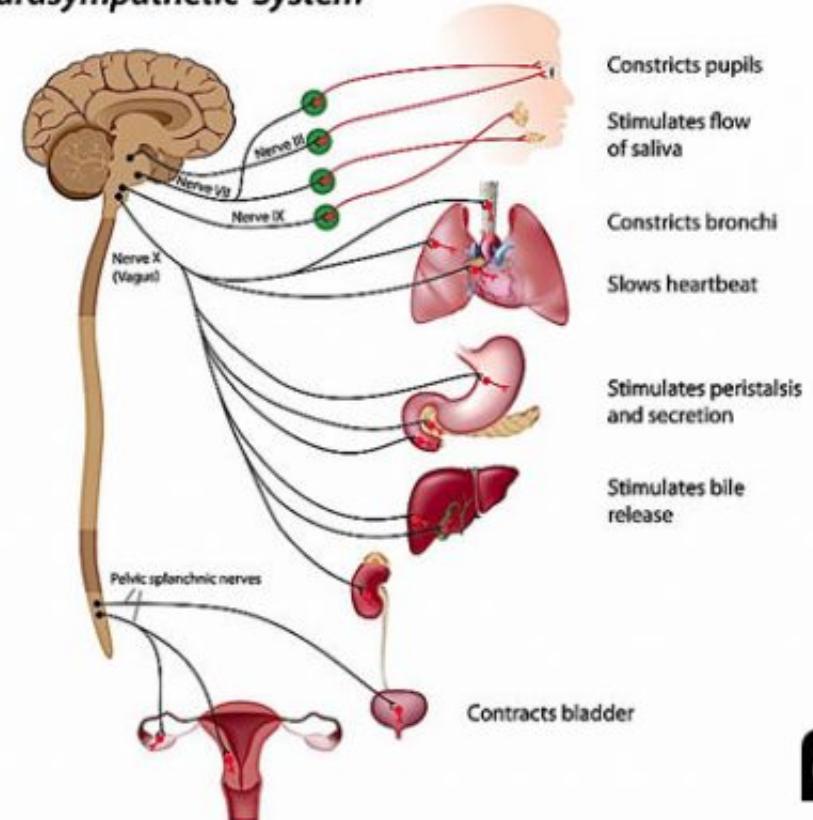




## Sympathetic System



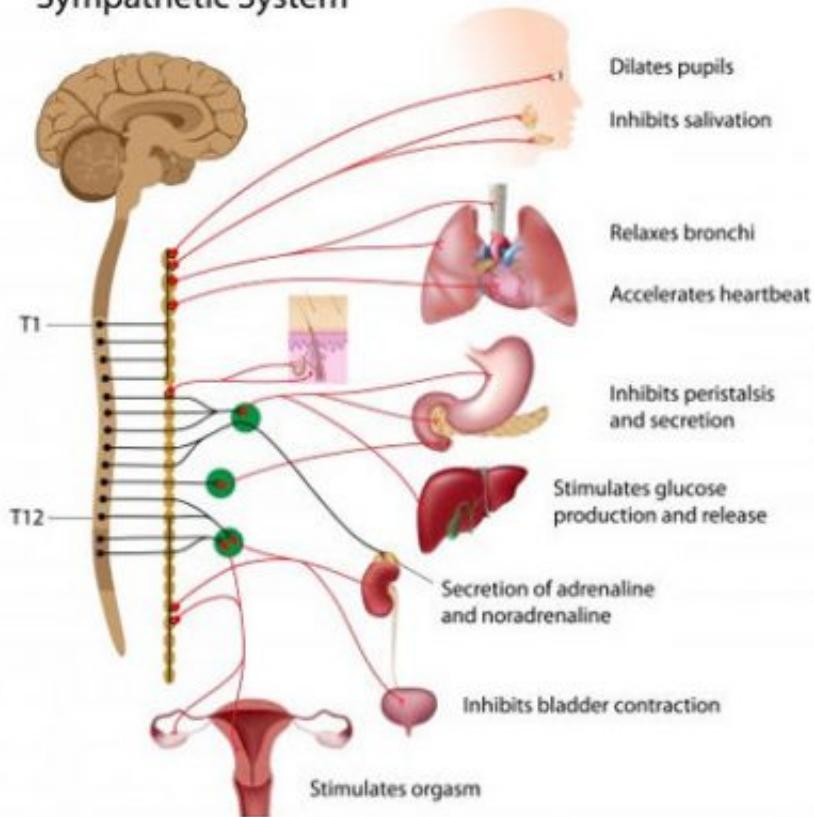
## Parasympathetic System



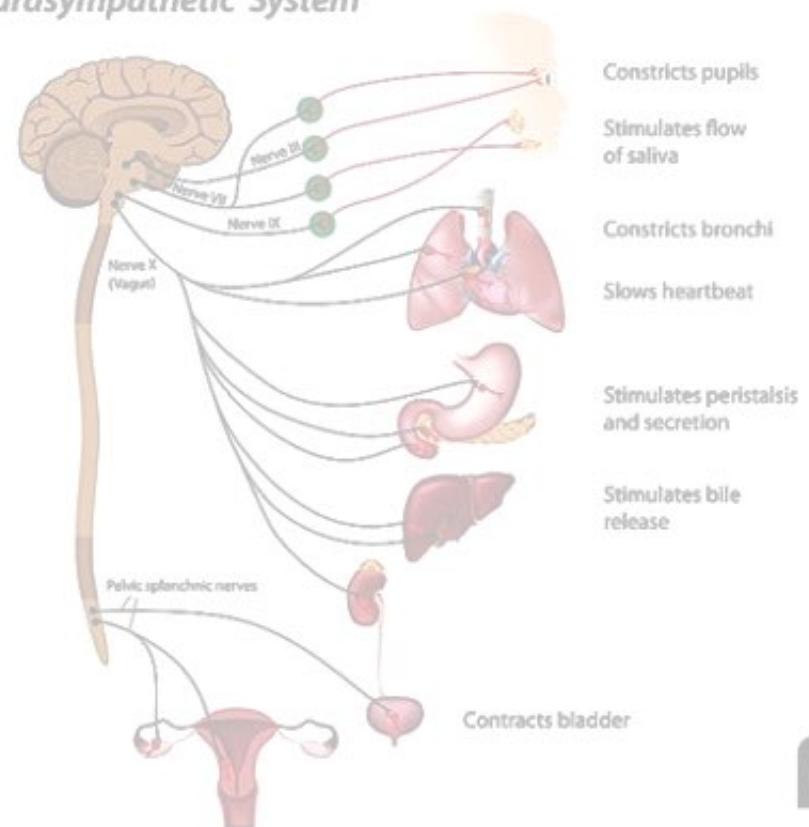
VS

Source: <http://www.differencebtw.com/wp-content/uploads/2016/06/sympathetic-nerve-system-vs-parasympathetic-nerve-system-990x495.jpg>

## Sympathetic System



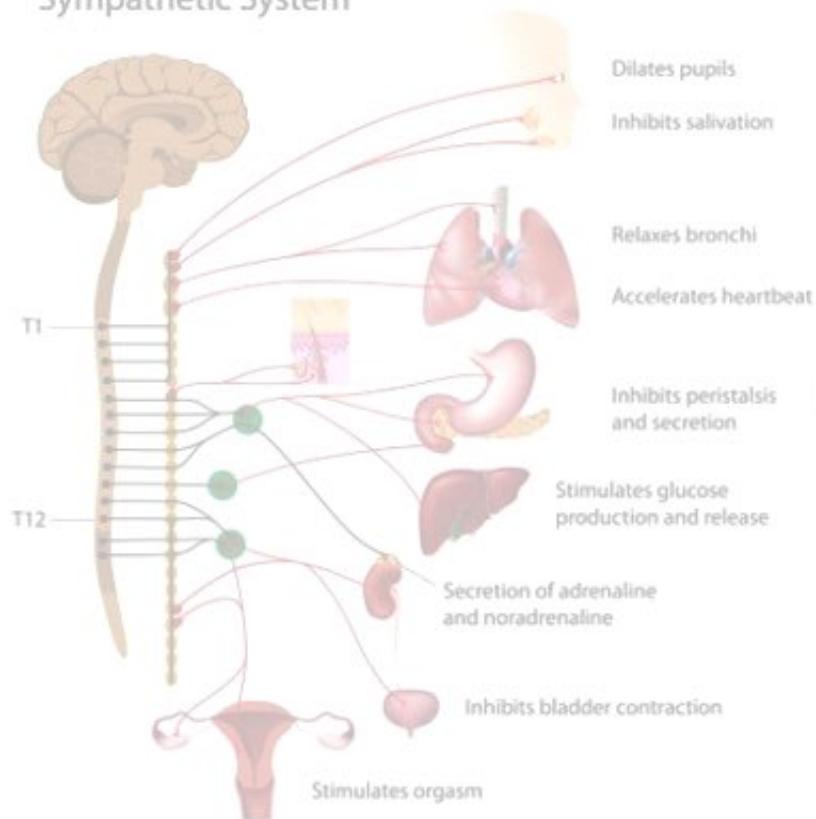
## Parasympathetic System



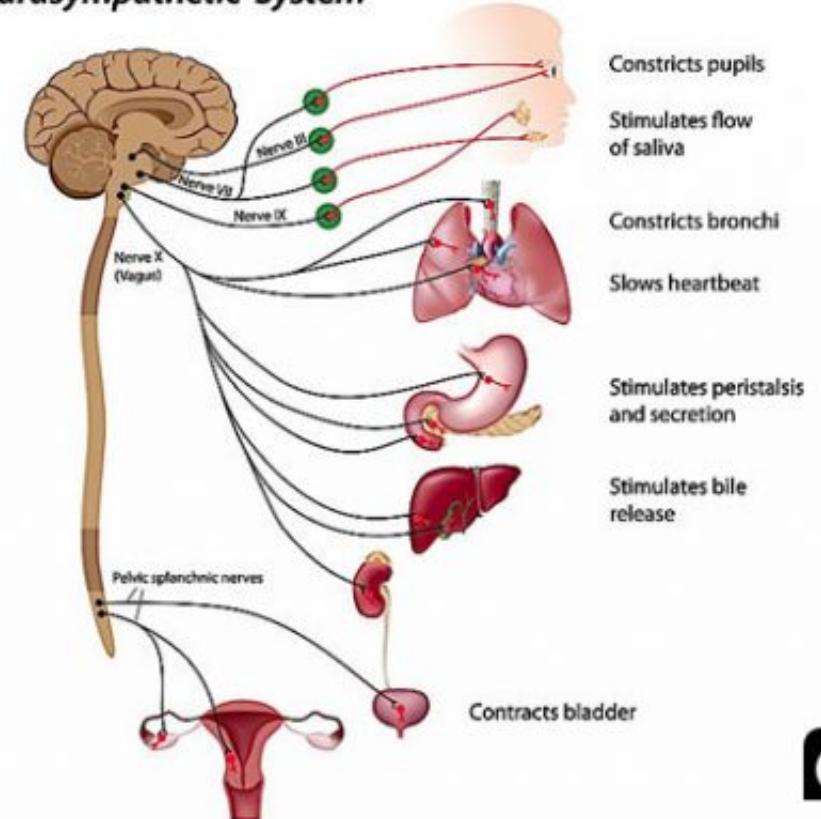
VS

Source: <http://www.differencebtw.com/wp-content/uploads/2016/06/sympathetic-nerve-system-vs-parasympathetic-nerve-system-990x495.jpg>

## Sympathetic System



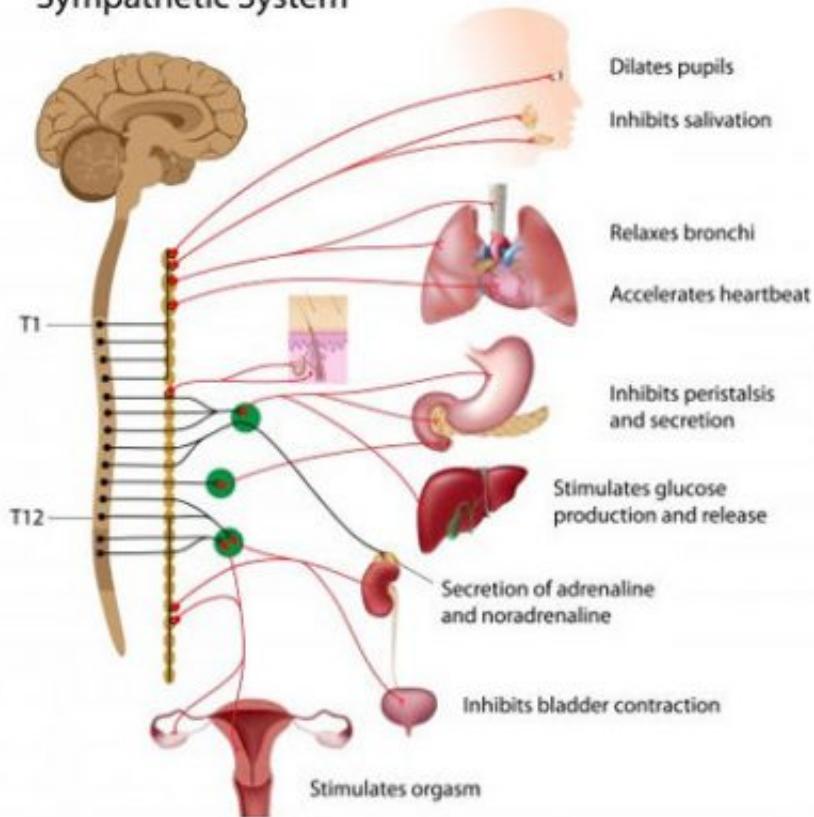
## Parasympathetic System



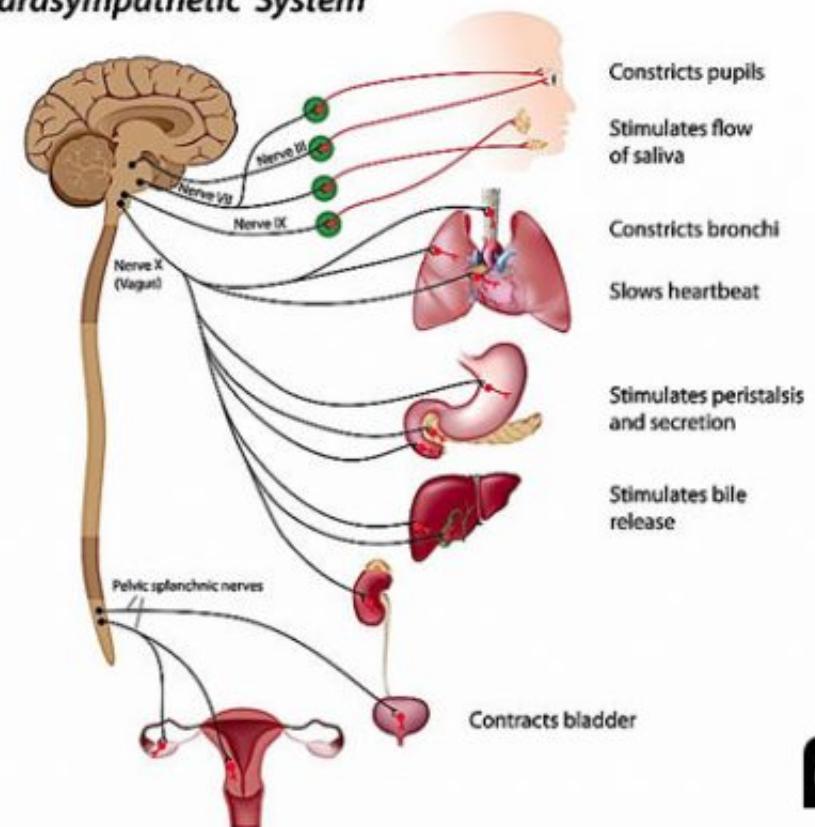
VS

Source: <http://www.differencebtw.com/wp-content/uploads/2016/06/sympathetic-nerve-system-vs-parasympathetic-nerve-system-990x495.jpg>

## Sympathetic System

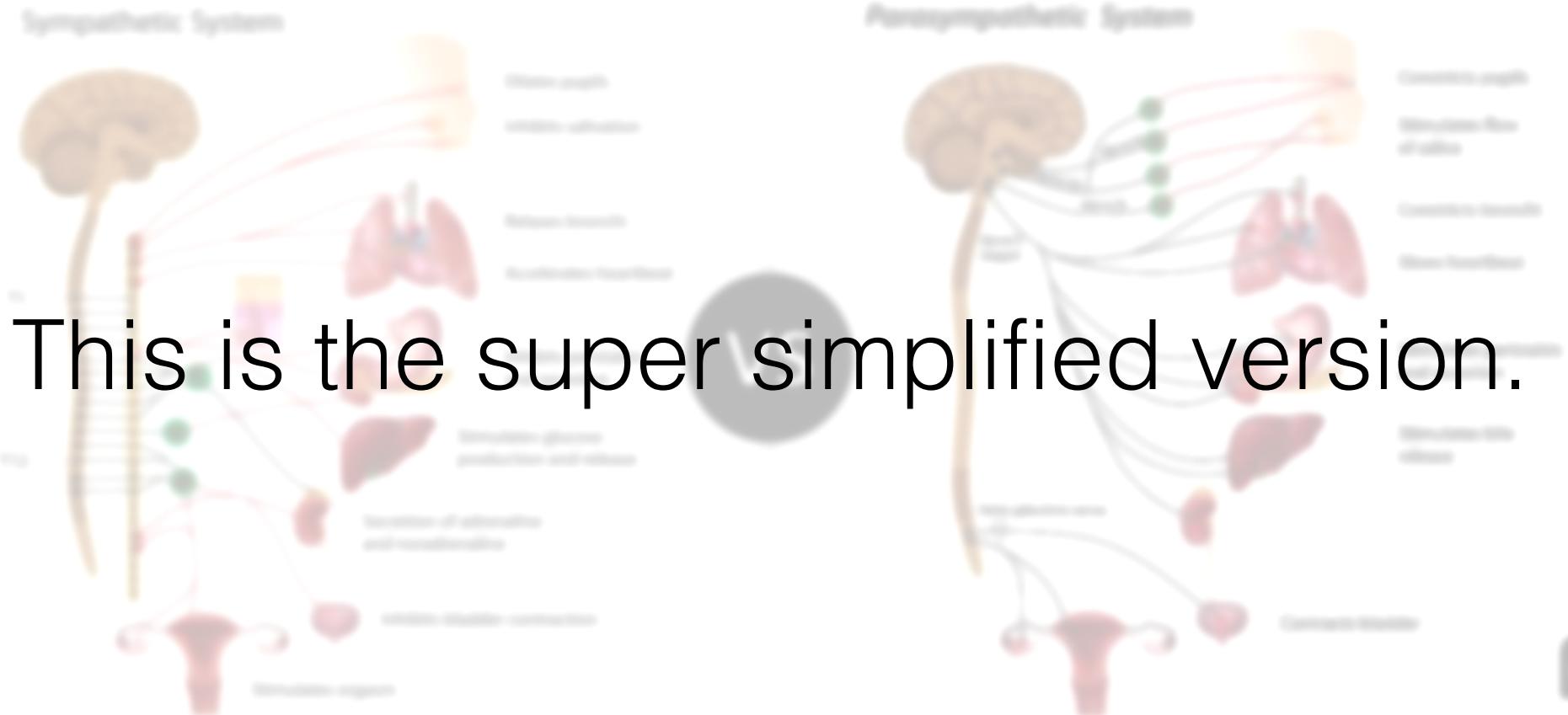


## Parasympathetic System



VS

Source: <http://www.differencebtw.com/wp-content/uploads/2016/06/sympathetic-nerve-system-vs-parasympathetic-nerve-system-990x495.jpg>



Source: <http://www.differencebtw.com/wp-content/uploads/2016/06/sympathetic-nerve-system-vs-parasympathetic-nerve-system-990x495.jpg>













# Negative Effects of Chronic Stress

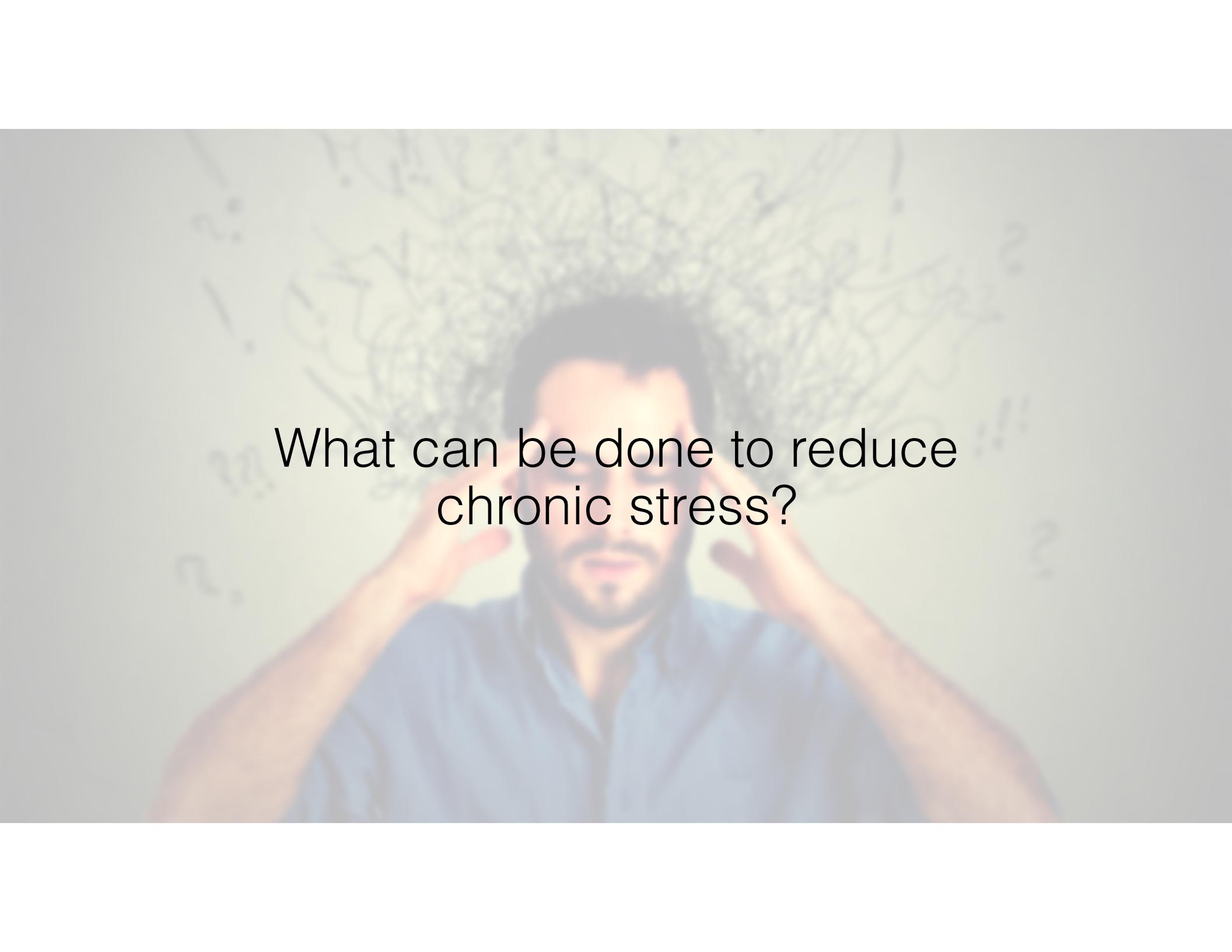
- Heart disease
- Metabolic syndrome
- Digestion issues
- Autoimmune system
- Immunosuppression

# Negative Effects of Chronic Stress

- Heart disease
- Metabolic syndrome
- Digestion issues
- Autoimmune system
- Immunosuppression

- Female reproduction issues
- Male reproduction issues
- Developmental disorders
- Cancer complications
- Mental health





What can be done to reduce  
chronic stress?

# Mindfulness





Mindful of  
the force,  
you must  
be.

What  
does that  
even  
mean?

...  
And why am I  
taking advice  
from a  
muppet?

Being aware of  
present experience  
with acceptance.



# Presence



Presence  
Awareness

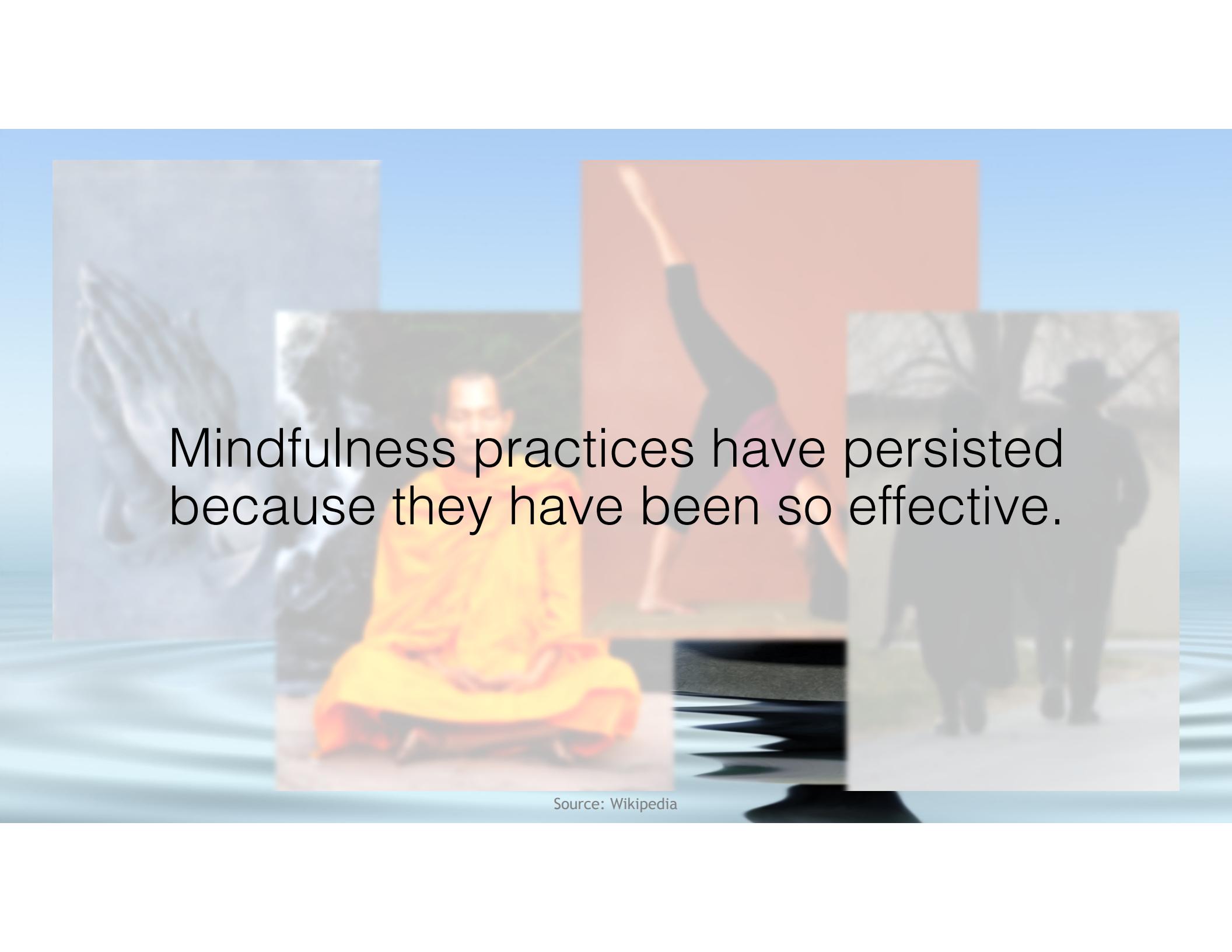


Presence  
Awareness  
Acceptance





Source: Wikipedia

A photograph of a person sitting cross-legged on a sandy beach, meditating. They are wearing a bright yellow vest over a dark shirt. In the background, there are other people and some beach umbrellas under a clear blue sky.

Mindfulness practices have persisted because they have been so effective.

Source: Wikipedia

# Meditation





Geek meditation session.

# How to Meditate



# How to Meditate

1. Sit in a comfortable position



# How to Meditate

1. Sit in a comfortable position
2. Position your hands



# How to Meditate

1. Sit in a comfortable position
2. Position your hands
3. Close your eyes



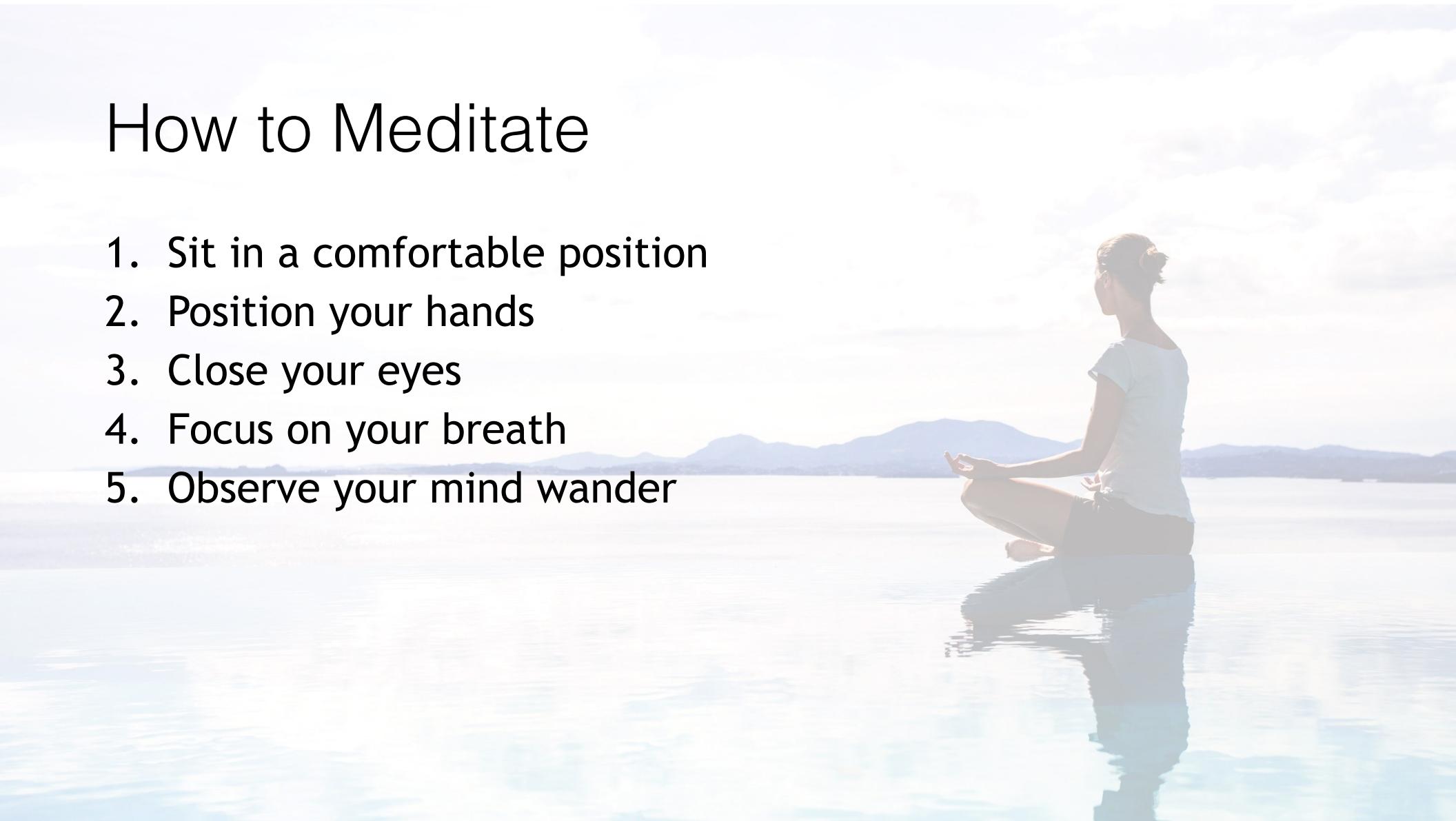
# How to Meditate

1. Sit in a comfortable position
2. Position your hands
3. Close your eyes
4. Focus on your breath



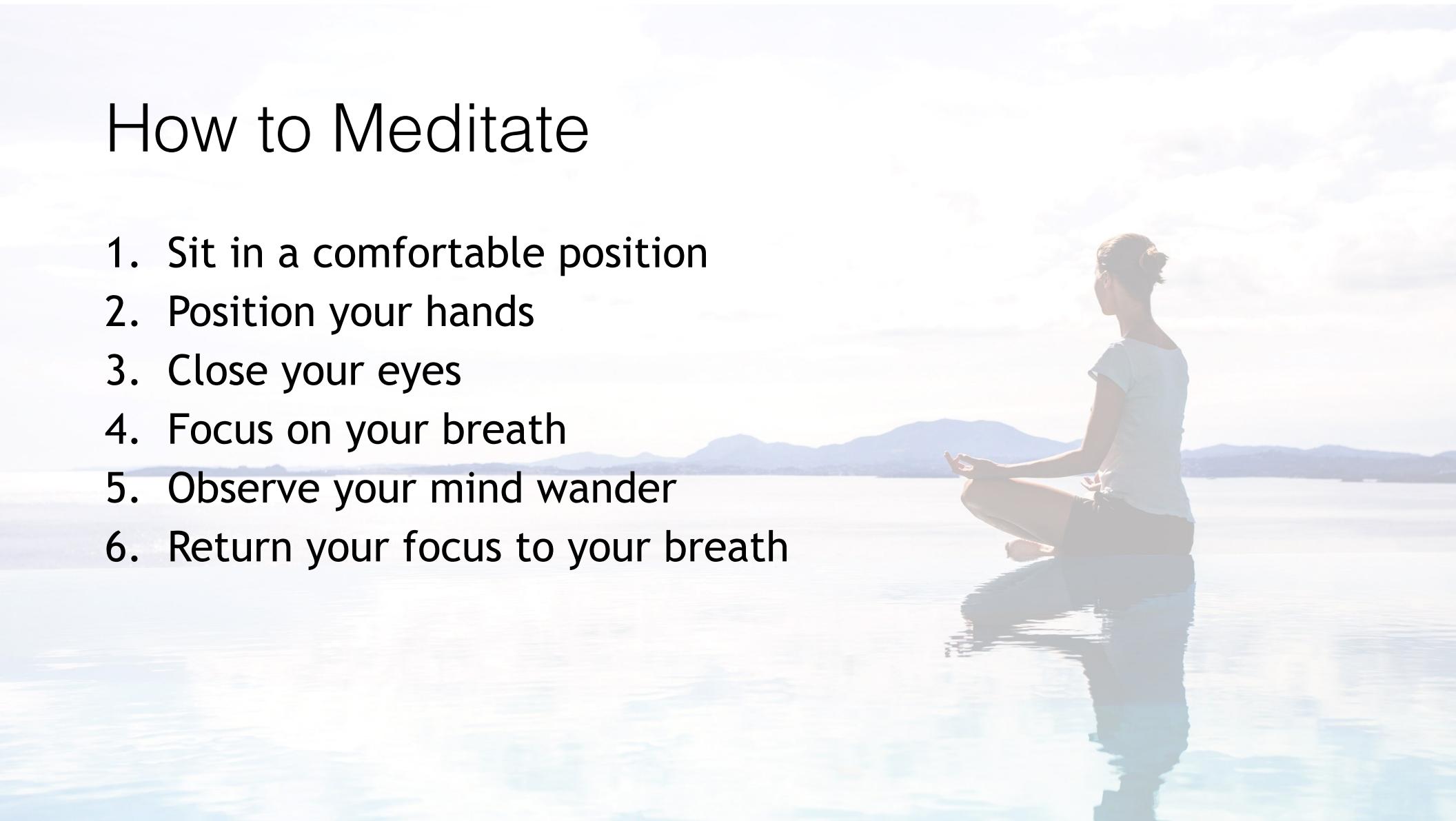
# How to Meditate

1. Sit in a comfortable position
2. Position your hands
3. Close your eyes
4. Focus on your breath
5. Observe your mind wander



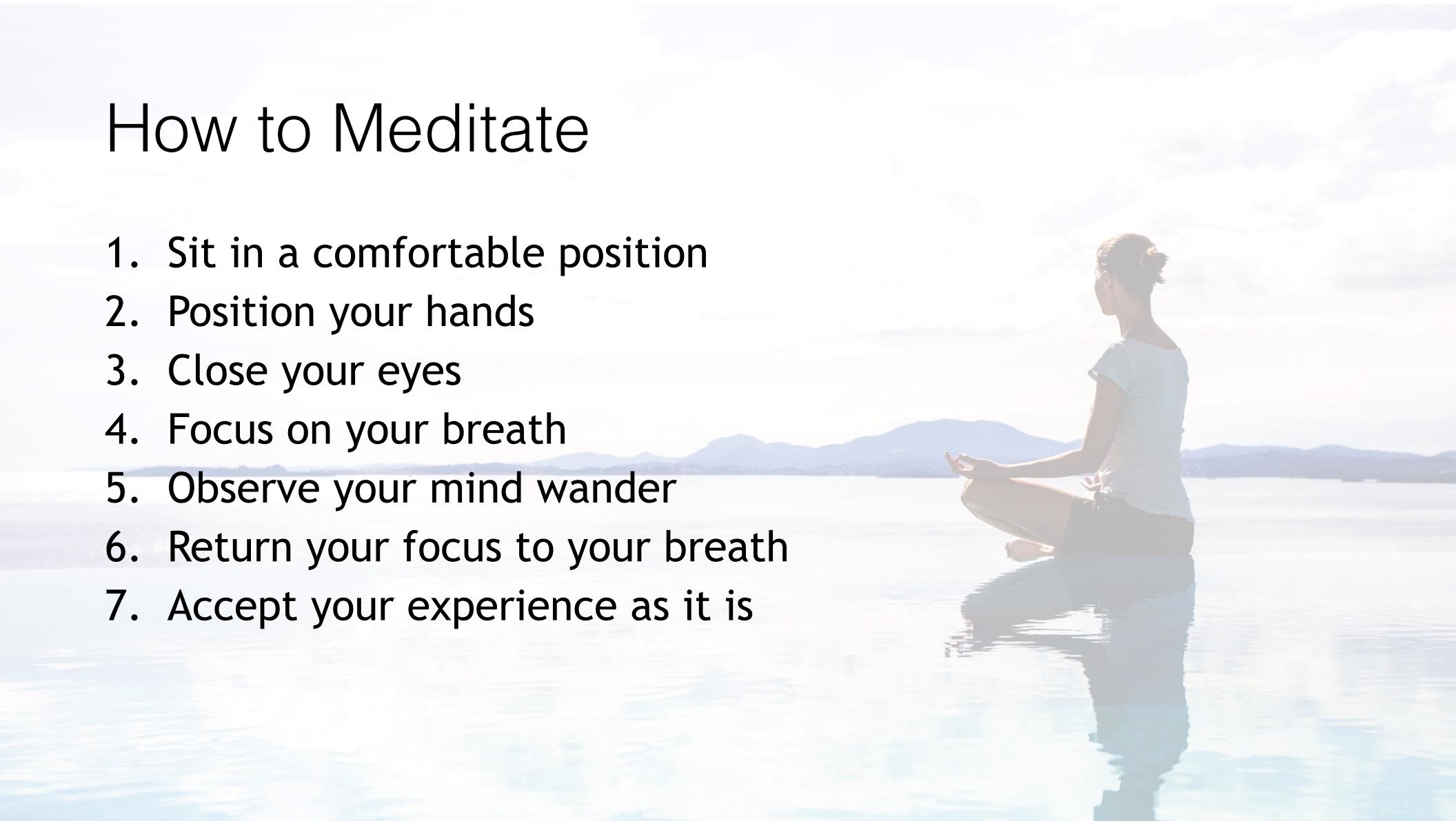
# How to Meditate

1. Sit in a comfortable position
2. Position your hands
3. Close your eyes
4. Focus on your breath
5. Observe your mind wander
6. Return your focus to your breath



# How to Meditate

1. Sit in a comfortable position
2. Position your hands
3. Close your eyes
4. Focus on your breath
5. Observe your mind wander
6. Return your focus to your breath
7. Accept your experience as it is



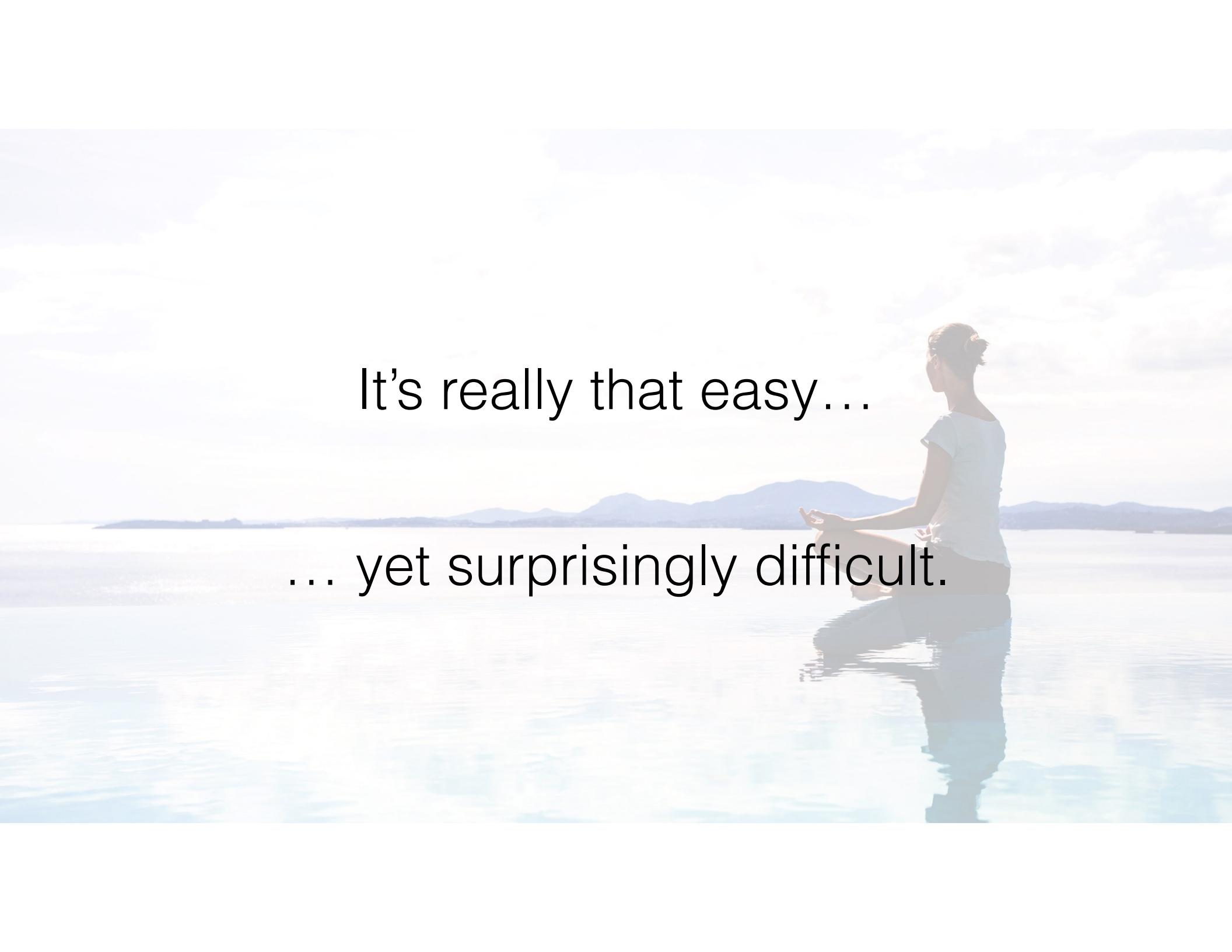
# How to Meditate

1. Sit in a comfortable position
2. Position your hands
3. Close your eyes
4. Focus on your breath
5. Observe your mind wander
6. Return your focus to your breath
7. Accept your experience as it is
8. Repeat



A photograph of a woman meditating in a shallow pool of water. She is sitting in a lotus position with her hands in a mudra. The water reflects her silhouette. In the background, there are distant mountains under a bright sky.

It's really that easy...

A photograph of a woman meditating on a beach at sunset. She is sitting cross-legged on a light-colored mat, her back straight, and her hands resting on her knees in a mudra position. Her eyes are closed, and she appears to be in deep concentration. The background features a calm sea, distant hills under a hazy sky, and a bright sun setting on the horizon.

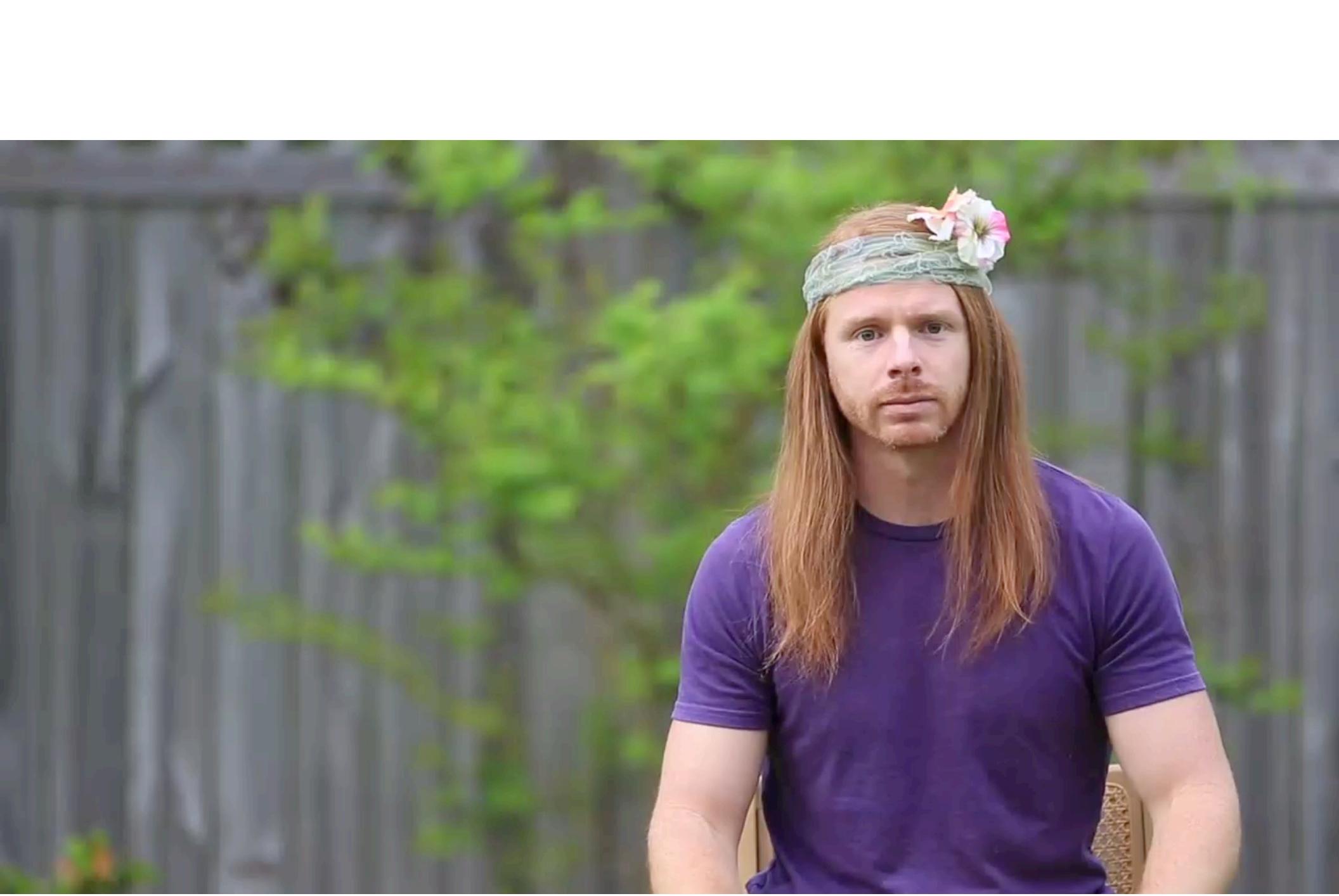
It's really that easy...

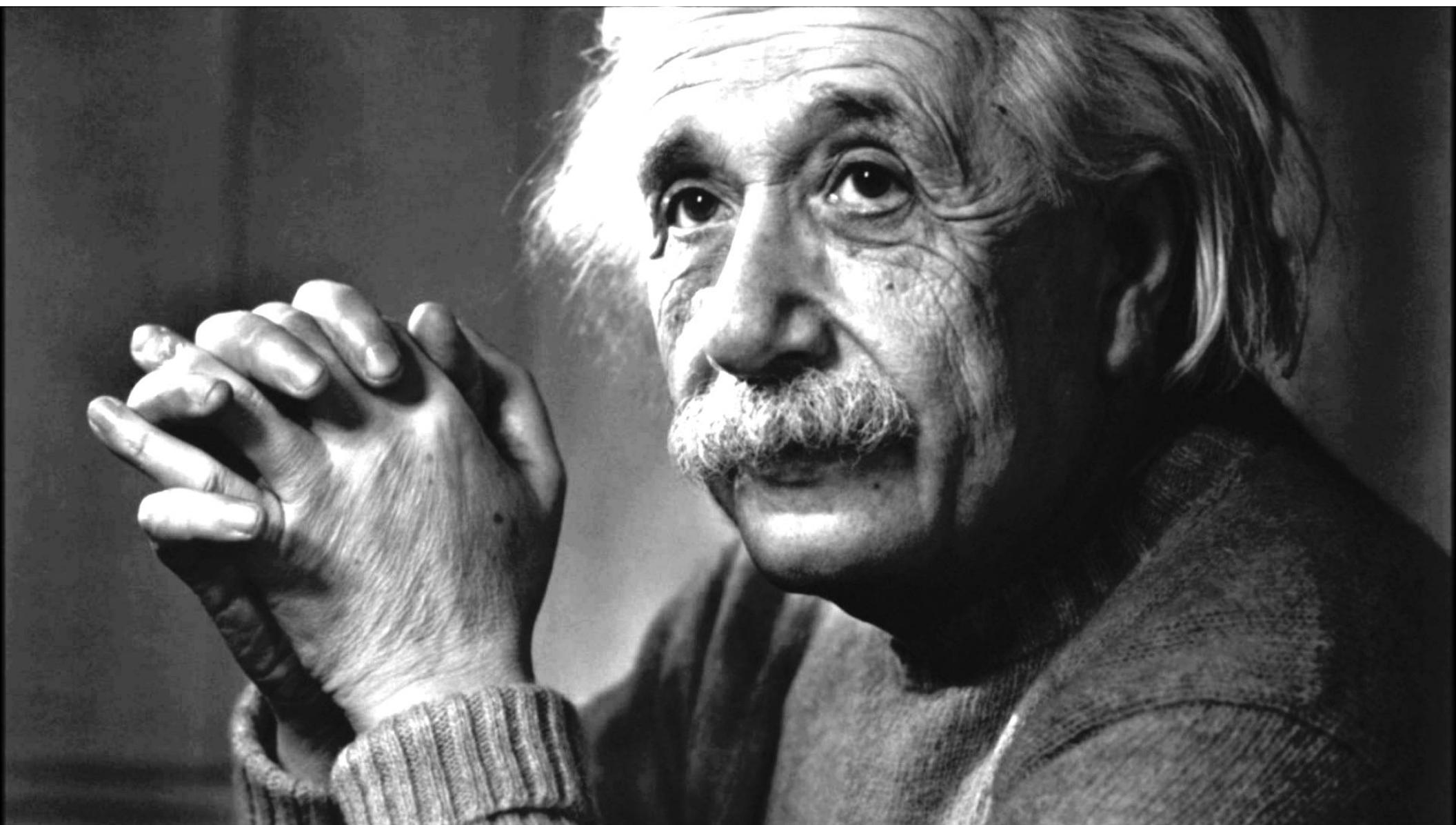
... yet surprisingly difficult.

# Neuroscience

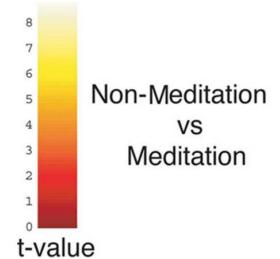
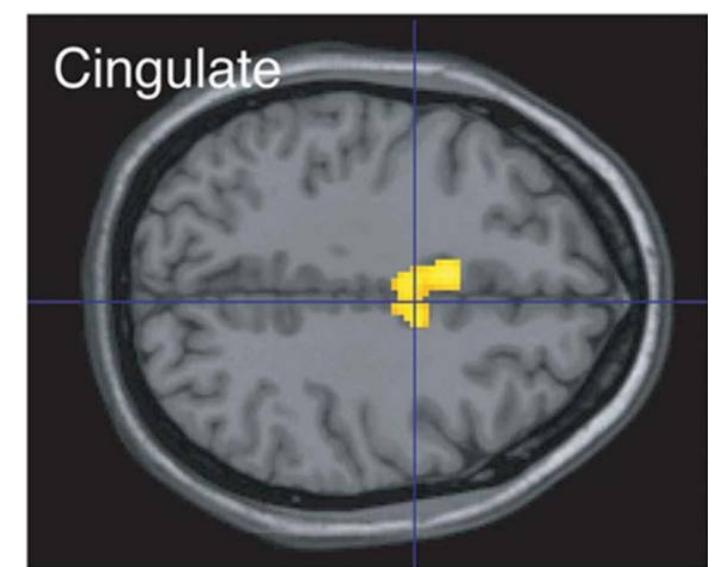
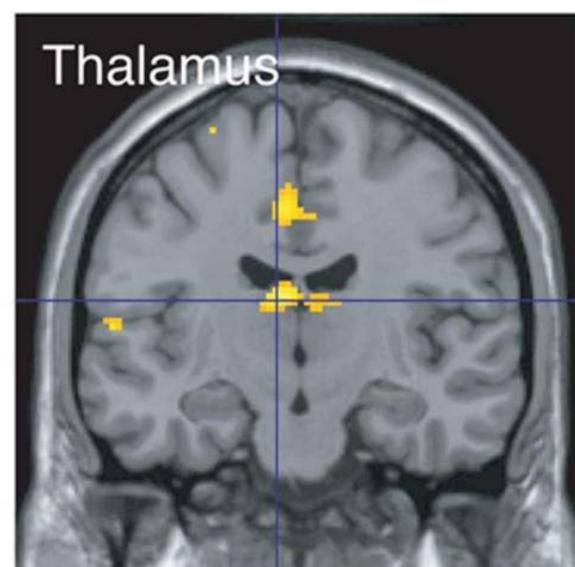
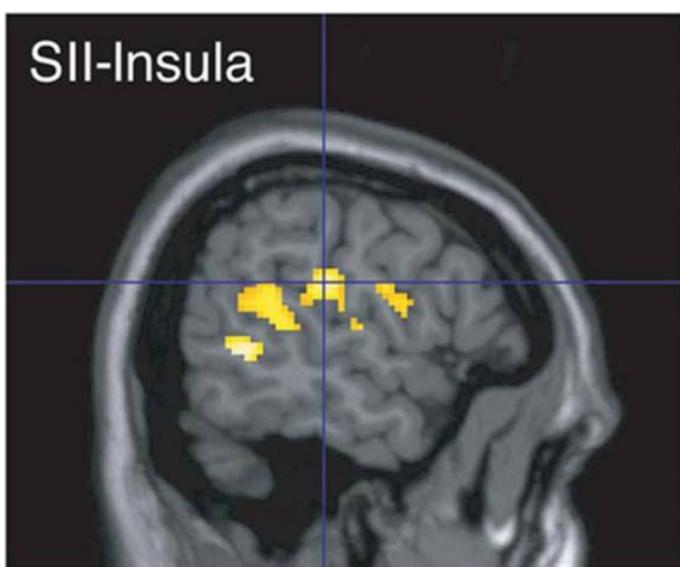


Source: How to Meditate with JP Sears





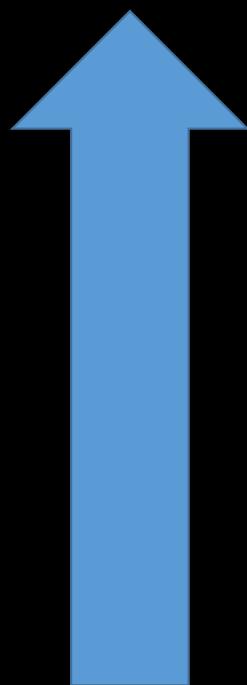
Meditation reduces pain-related neural activity in the anterior cingulate cortex, insula, secondary somatosensory cortex, and thalamus



Source: Frontiers in Neurology 2014;5:1489  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4460809/>



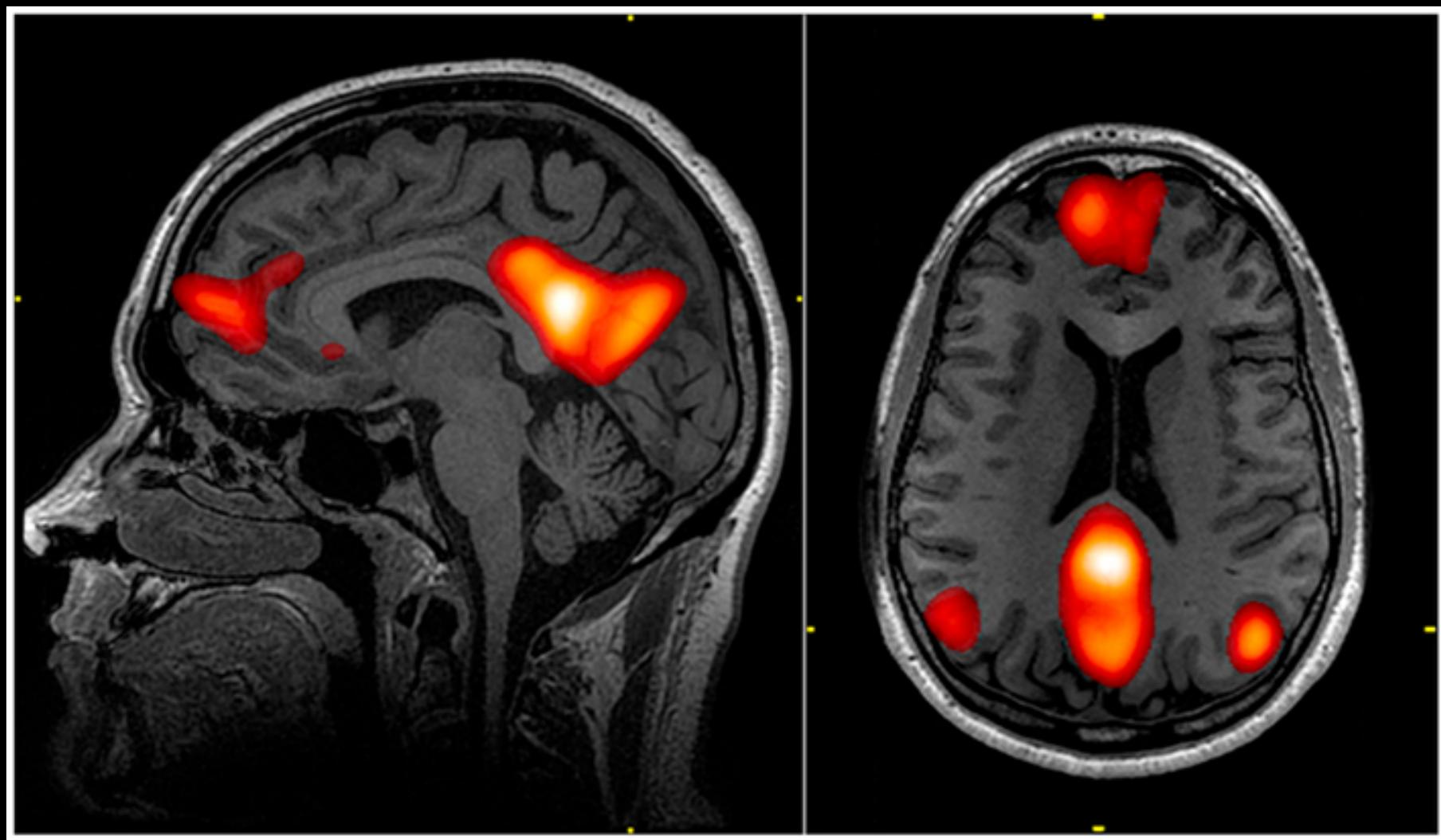
Source: <http://www.forbes.com/sites/alicegwalton/2015/02/09/7-ways-meditation-can-actually-change-the-brain>



Source: <http://www.forbes.com/sites/alicegwalton/2015/02/09/7-ways-meditation-can-actually-change-the-brain>

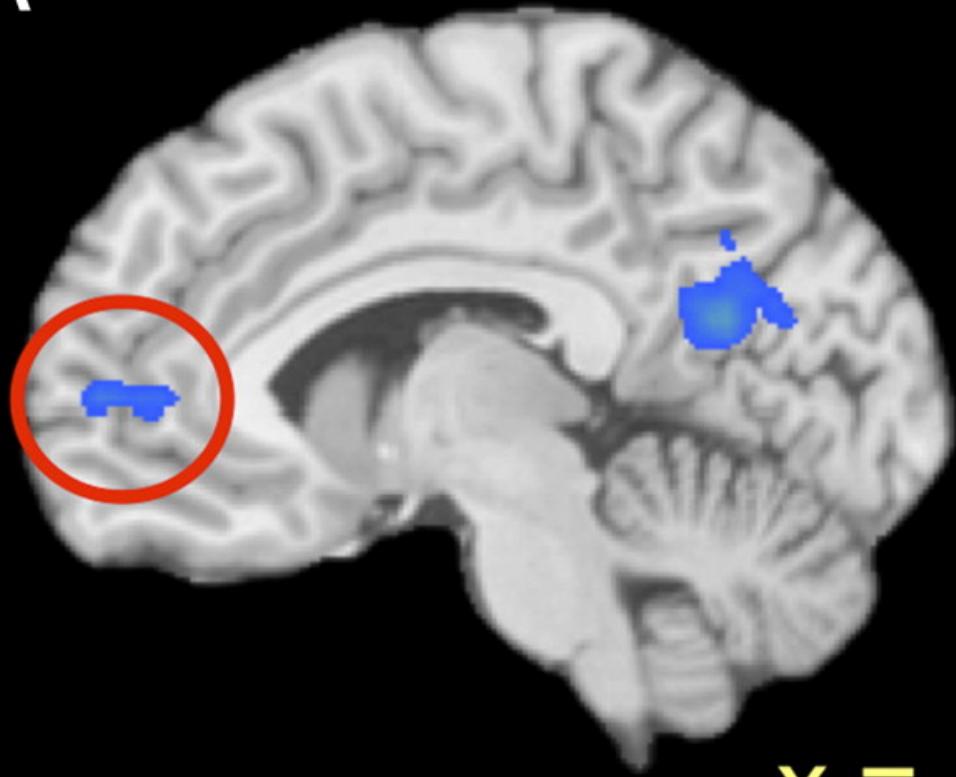


Source: <http://www.forbes.com/sites/alicegwalton/2015/02/09/7-ways-meditation-can-actually-change-the-brain>



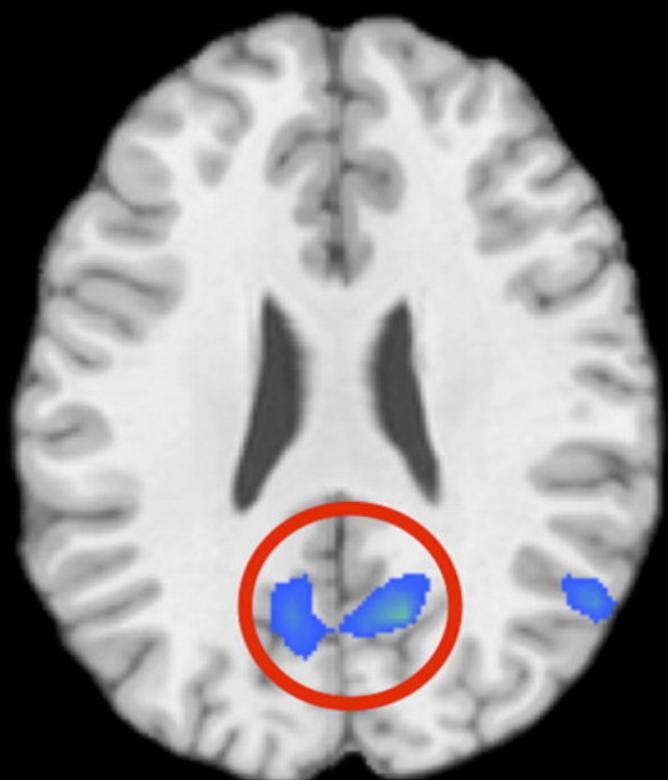
Source: Wikipedia

A



$x = -6$

B



$z = 21$

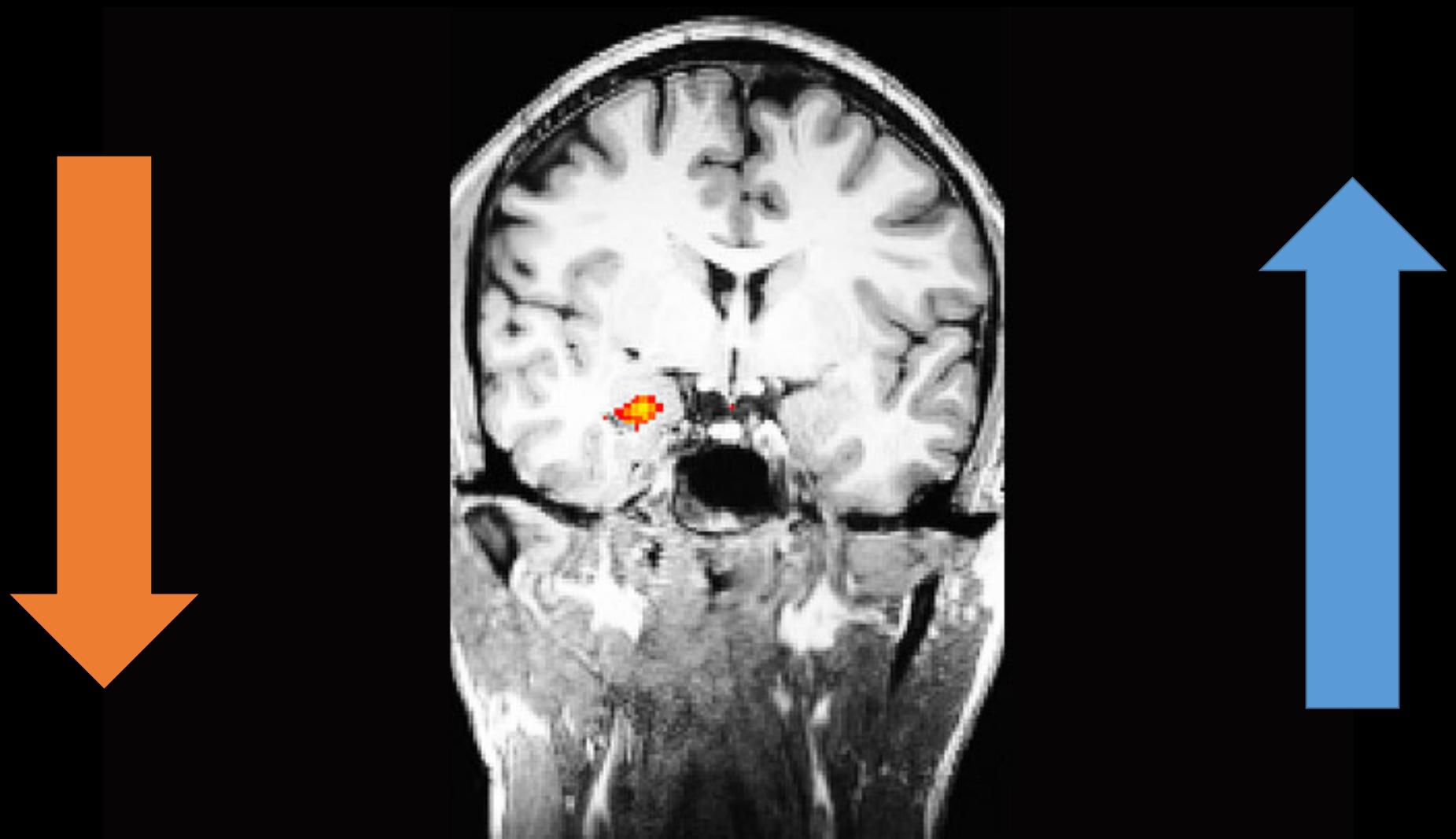
Source: <http://www.pnas.org/content/108/50/20254.short>



Source: <http://journal.frontiersin.org/article/10.3389/fnhum.2012.00292/full>

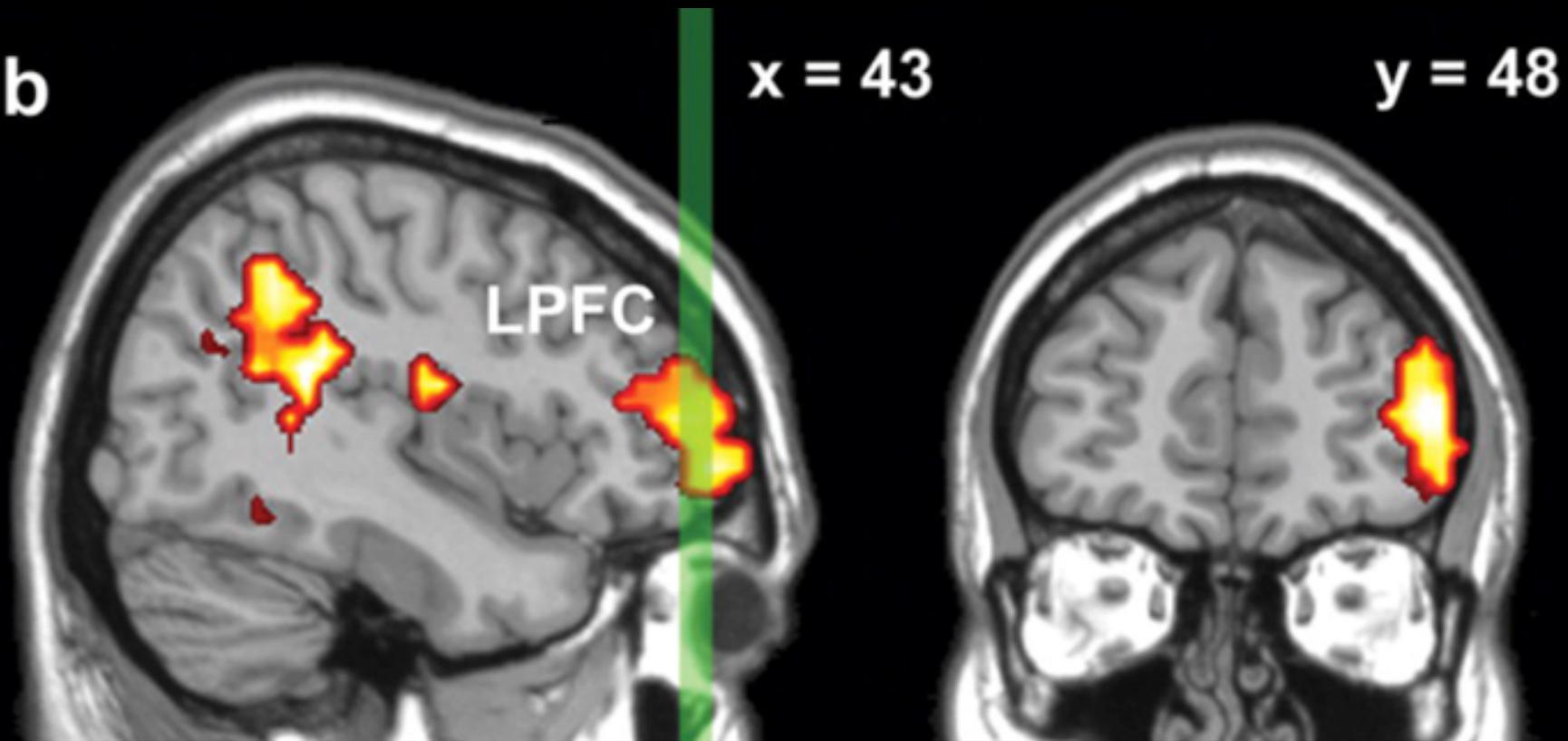


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Source: <http://journal.frontiersin.org/article/10.3389/fnhum.2012.00292/full>

**b**



Source: <https://academic.oup.com/scan/article/2/4/313/1676557/Attending-to-the-present-mindfulness-meditation>

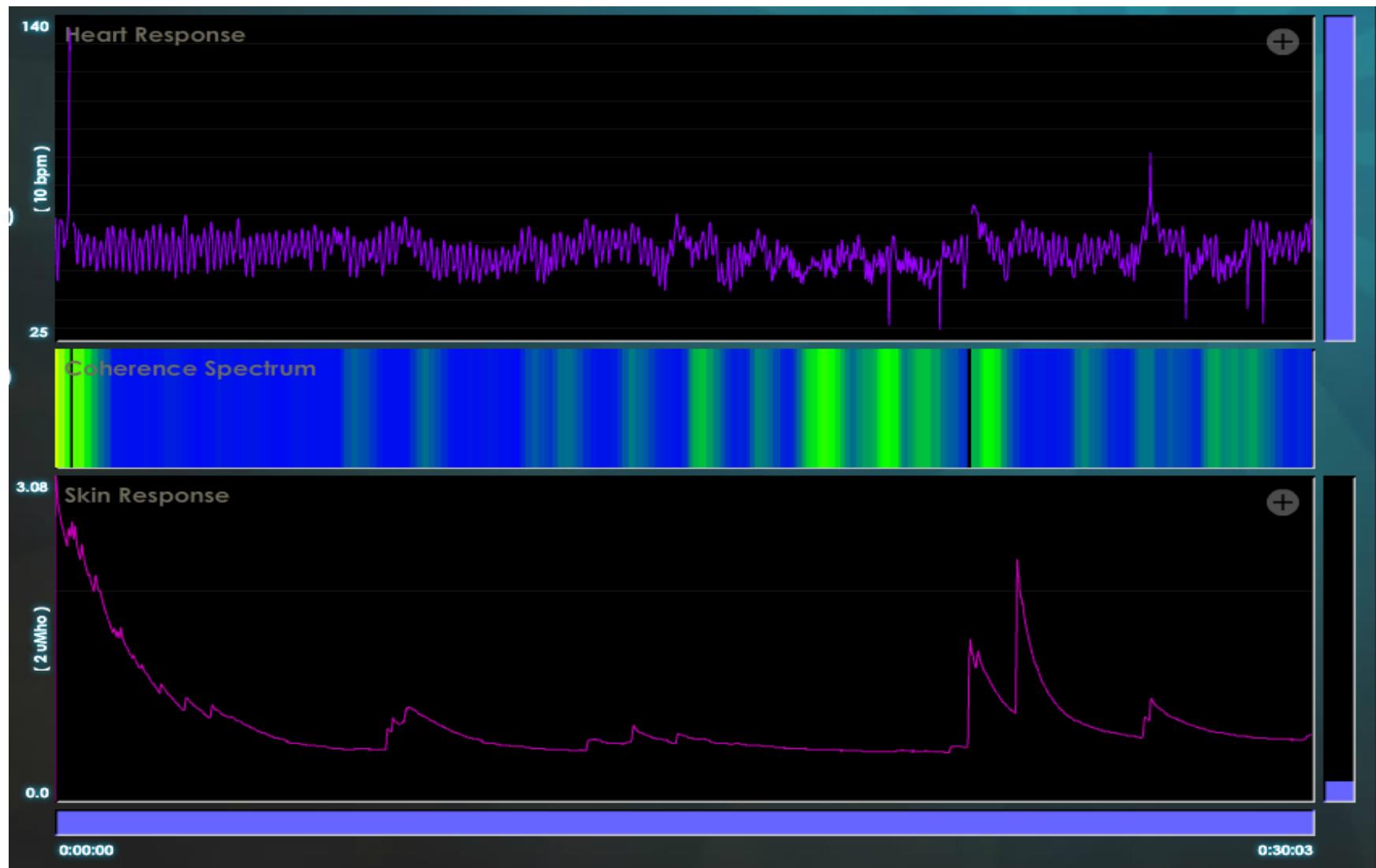
# Structural and Functional Changes

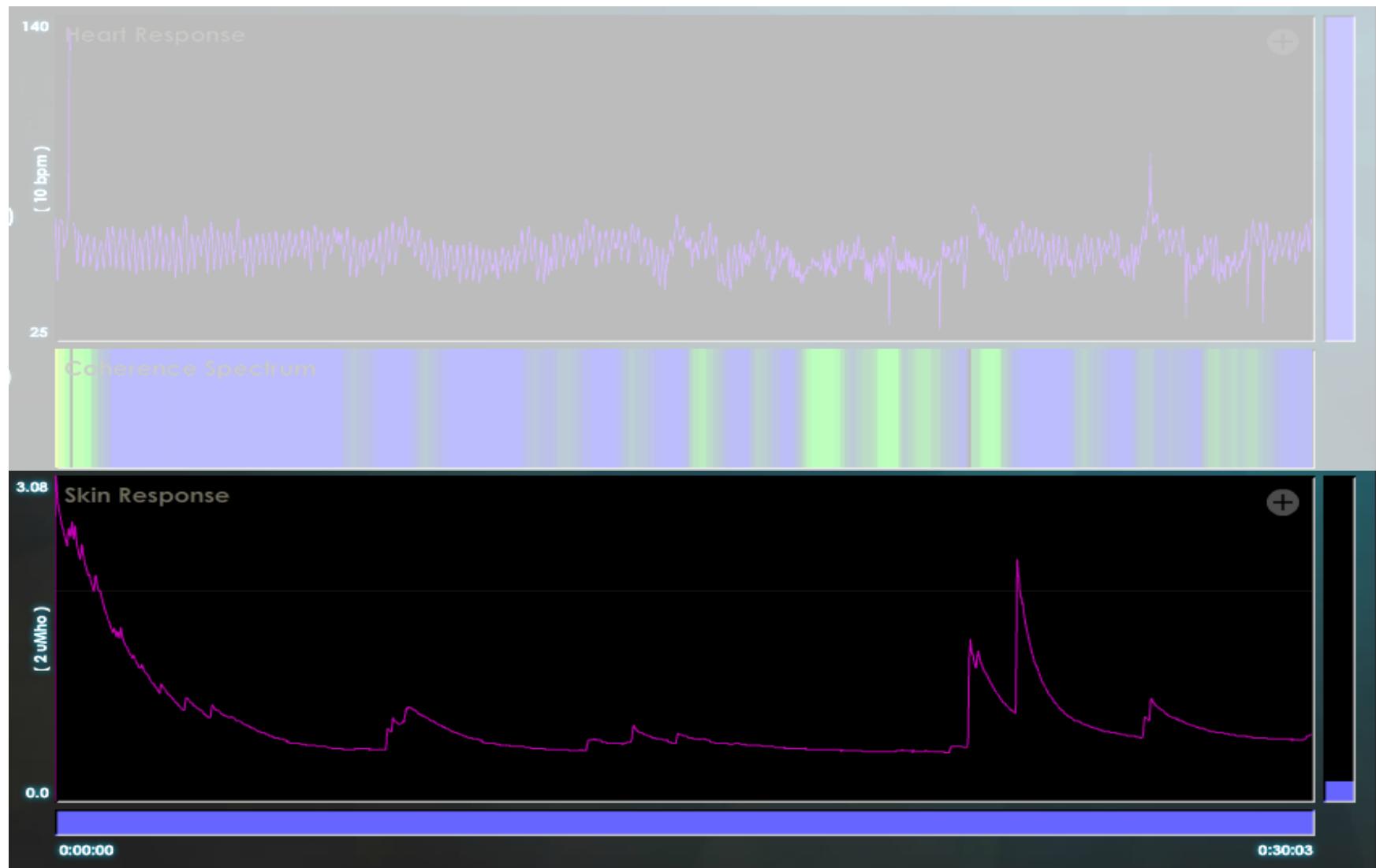
Amygdala  
Default-mode network  
Cortical thickness  
Anterior cingulate cortex  
Prefrontal cortex  
Hippocampus  
Insula

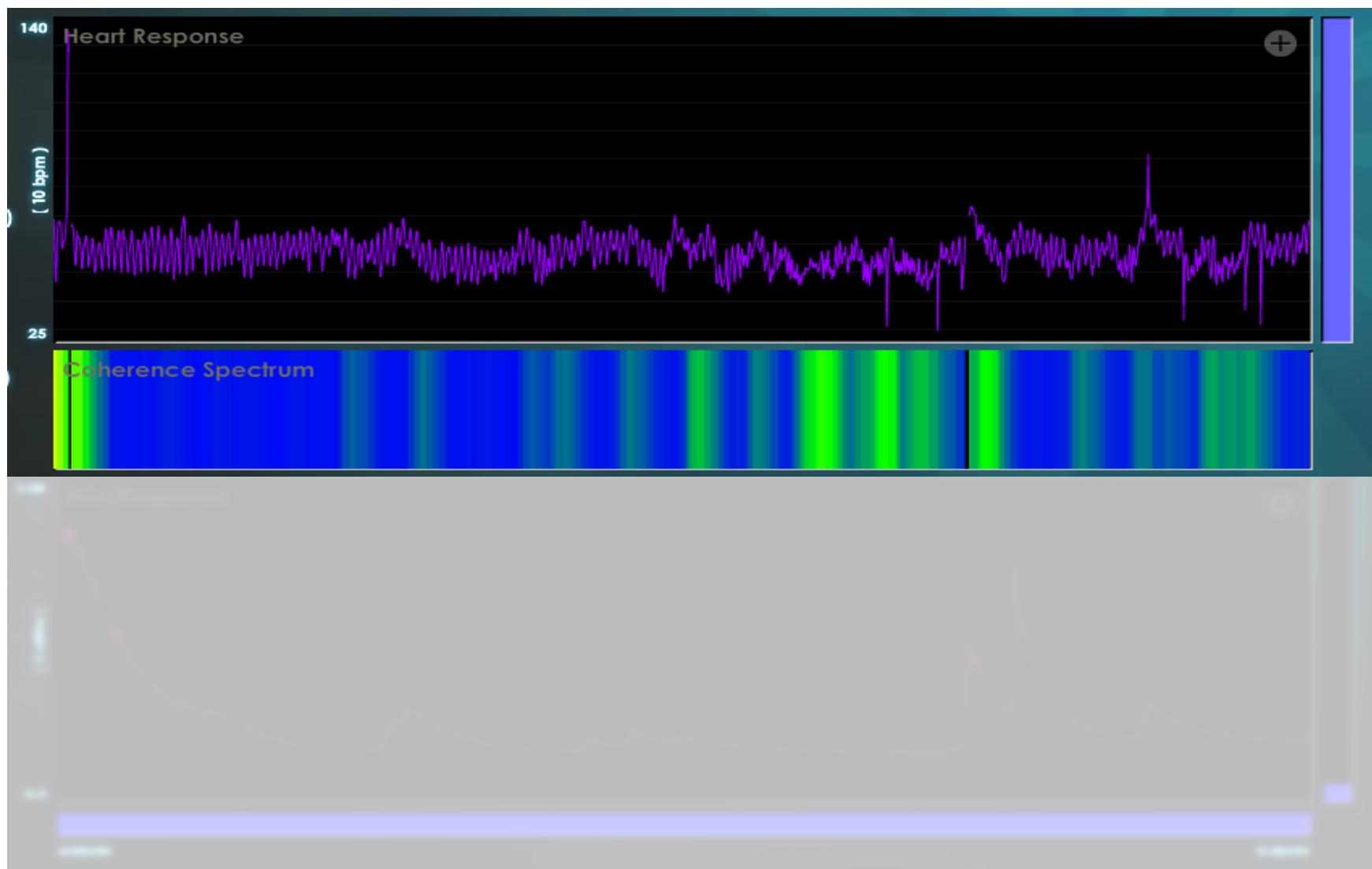


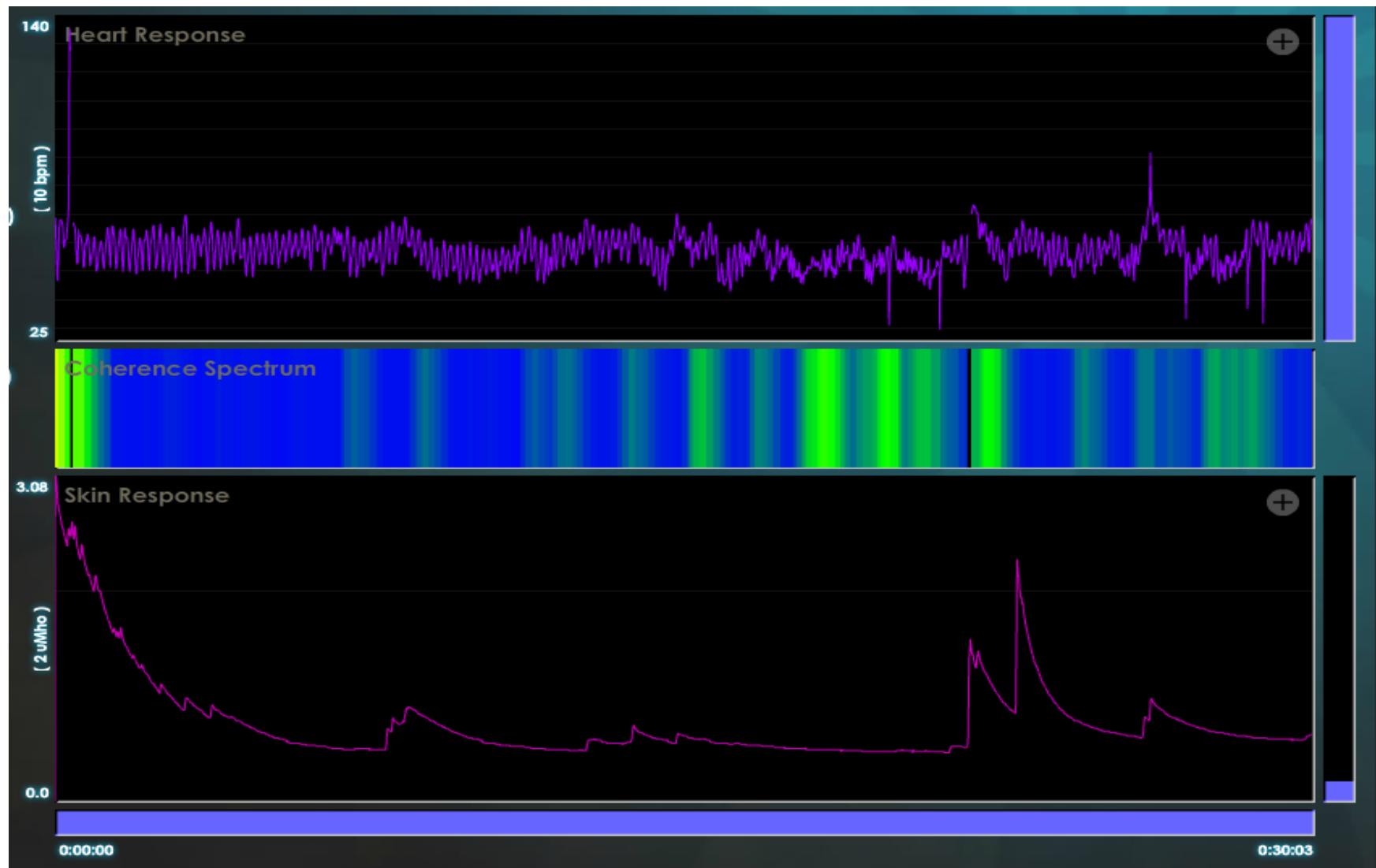




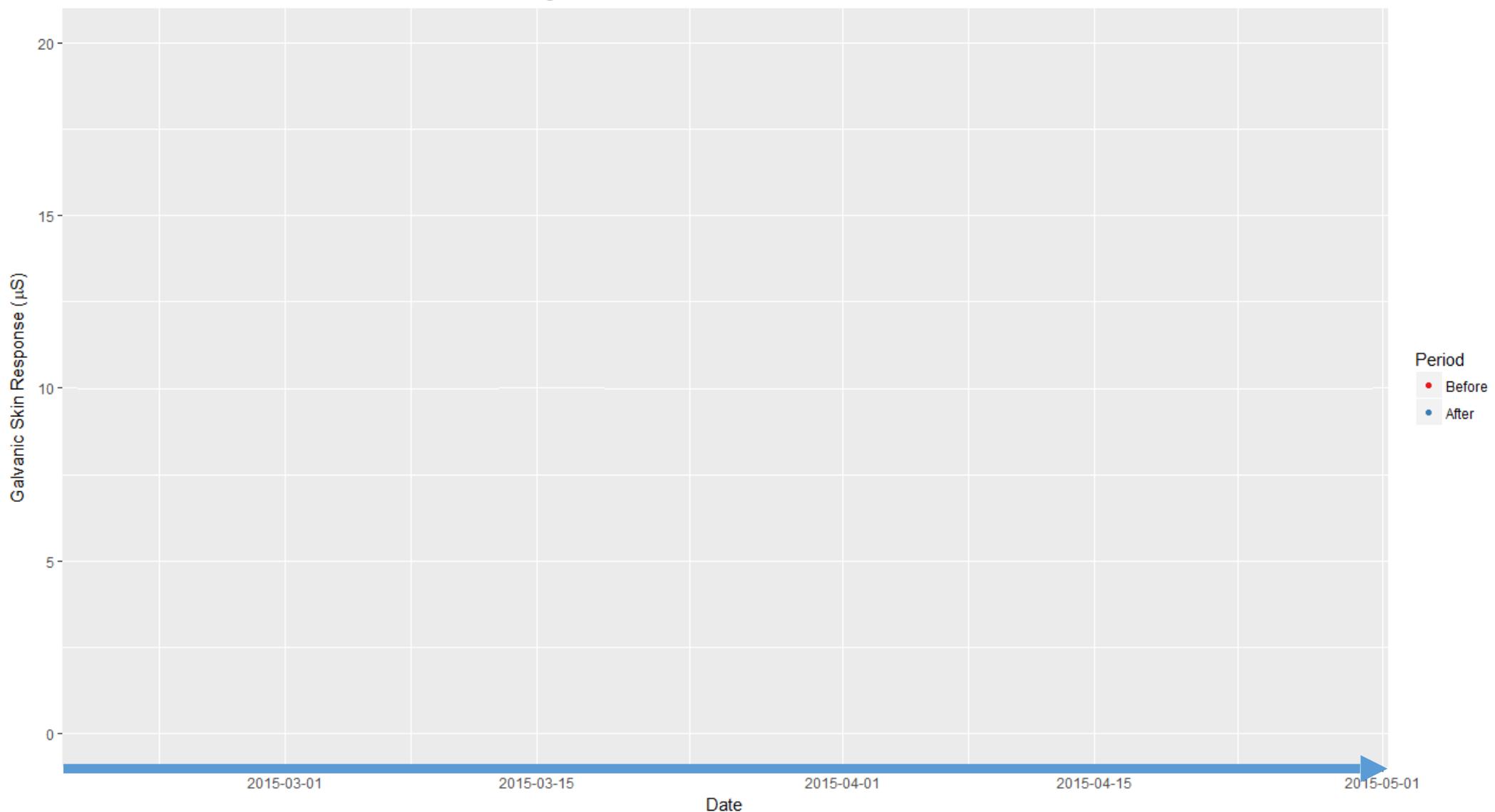




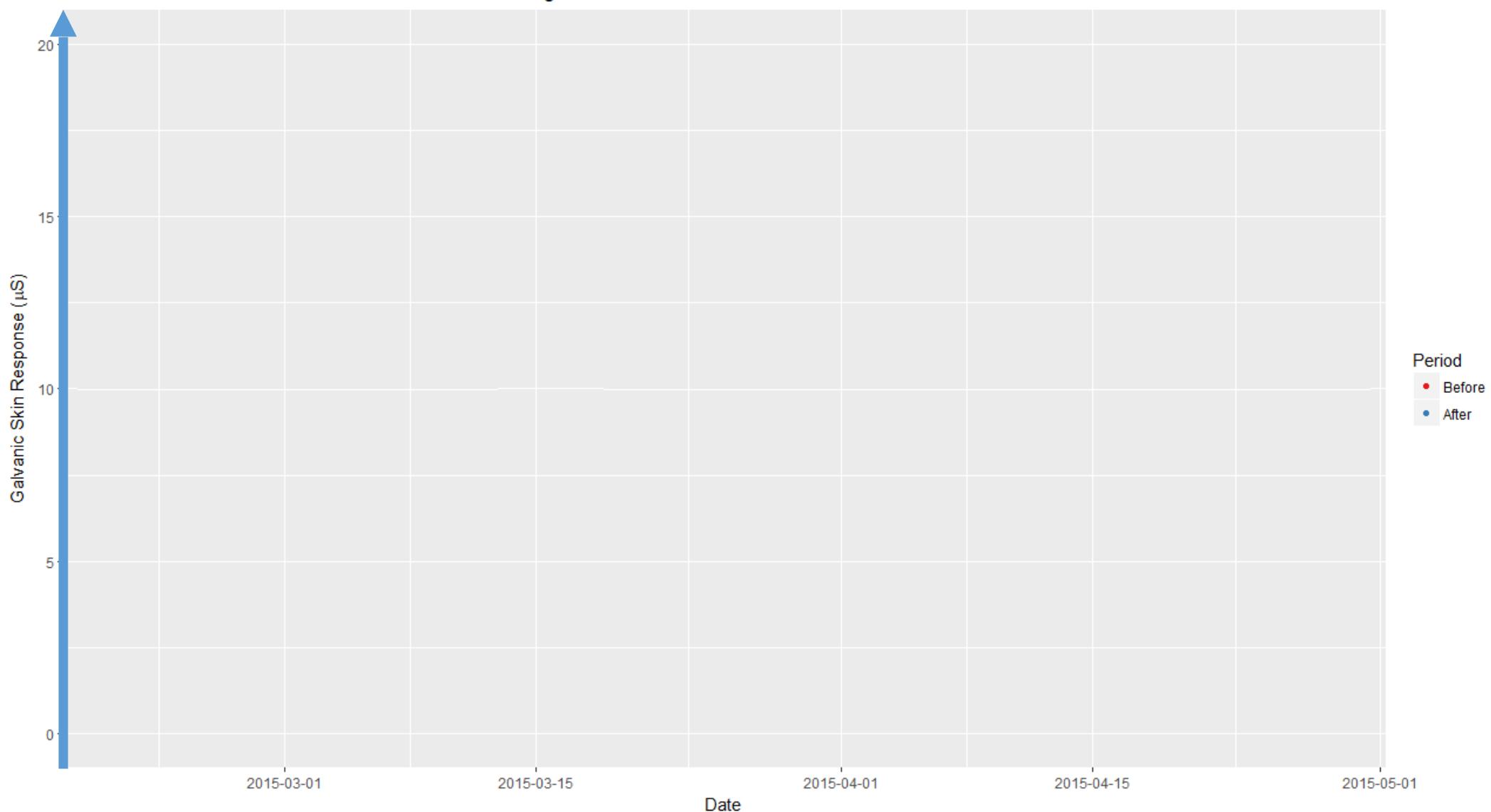




### Average GSR Before and After Meditation Retreat

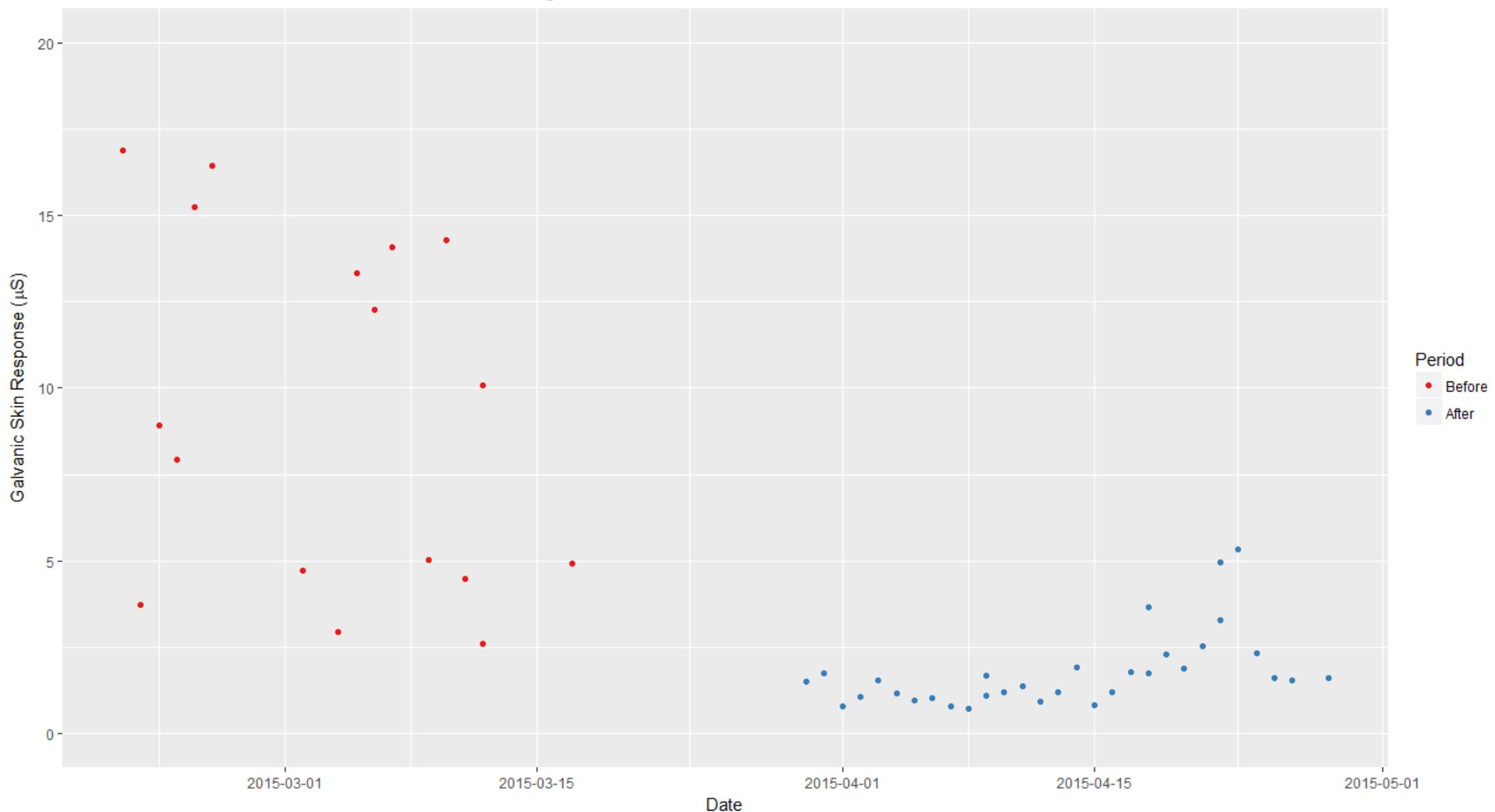


### Average GSR Before and After Meditation Retreat

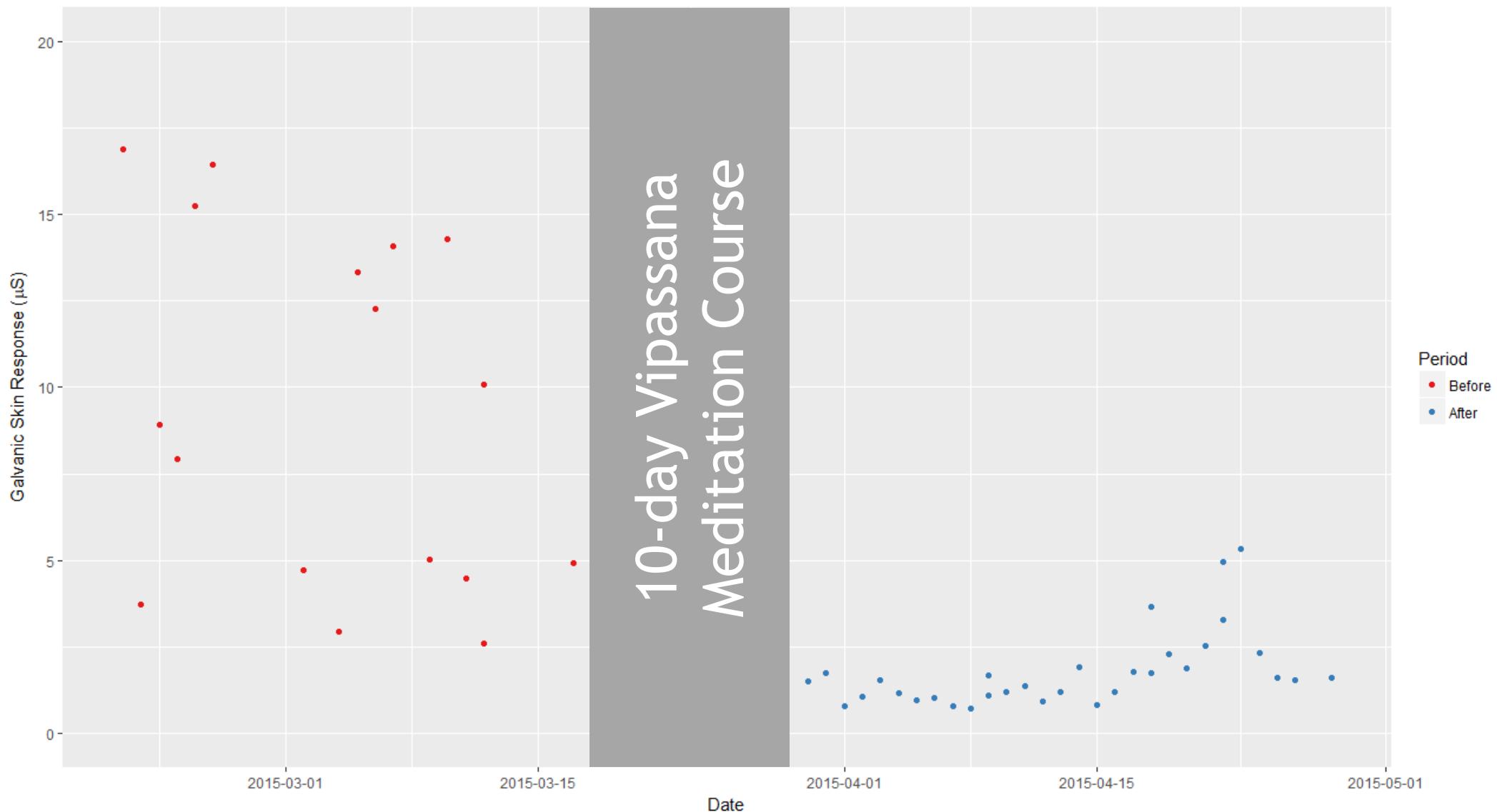


## Average GSR Before and After Meditation Retreat

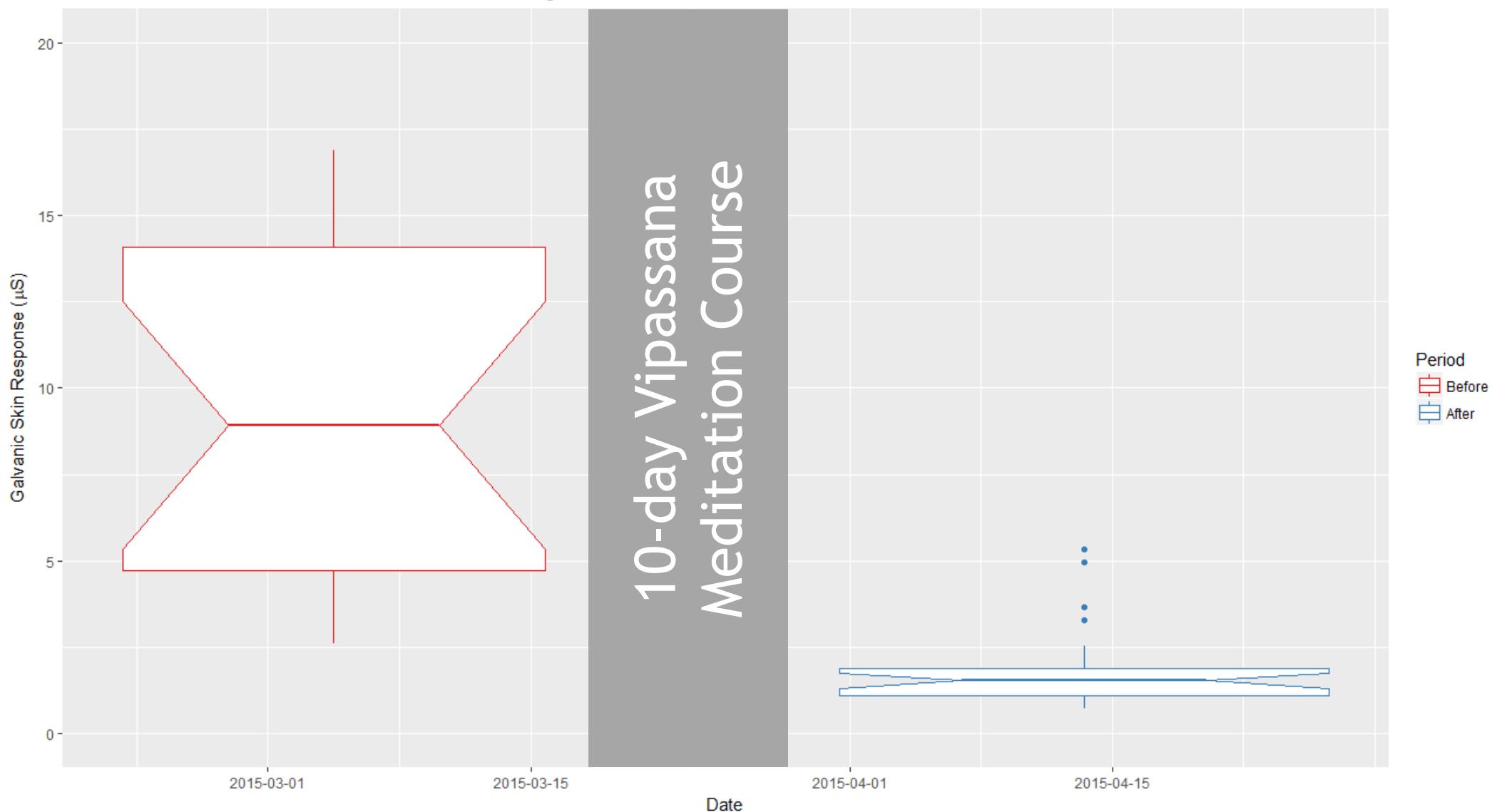
### Average GSR Before and After Meditation Retreat



Average GSR Before and After Meditation Retreat



Average GSR Before and After Meditation Retreat



Average CDRR Before and after Innovation - Forecast

# Disclaimer

# Benefits



# Benefits



# Benefits

## Equanimity



# Benefits

Equanimity  
Concentration



# Benefits

Equanimity  
Concentration  
Non-judgement



# Benefits

Equanimity  
Concentration  
Non-judgement  
Egolessness



# Benefits

Equanimity  
Concentration  
Non-judgement  
Egolessness  
Compassion



# Benefits

Equanimity  
Concentration  
Non-judgement  
Egolessness  
Compassion  
Sustainability



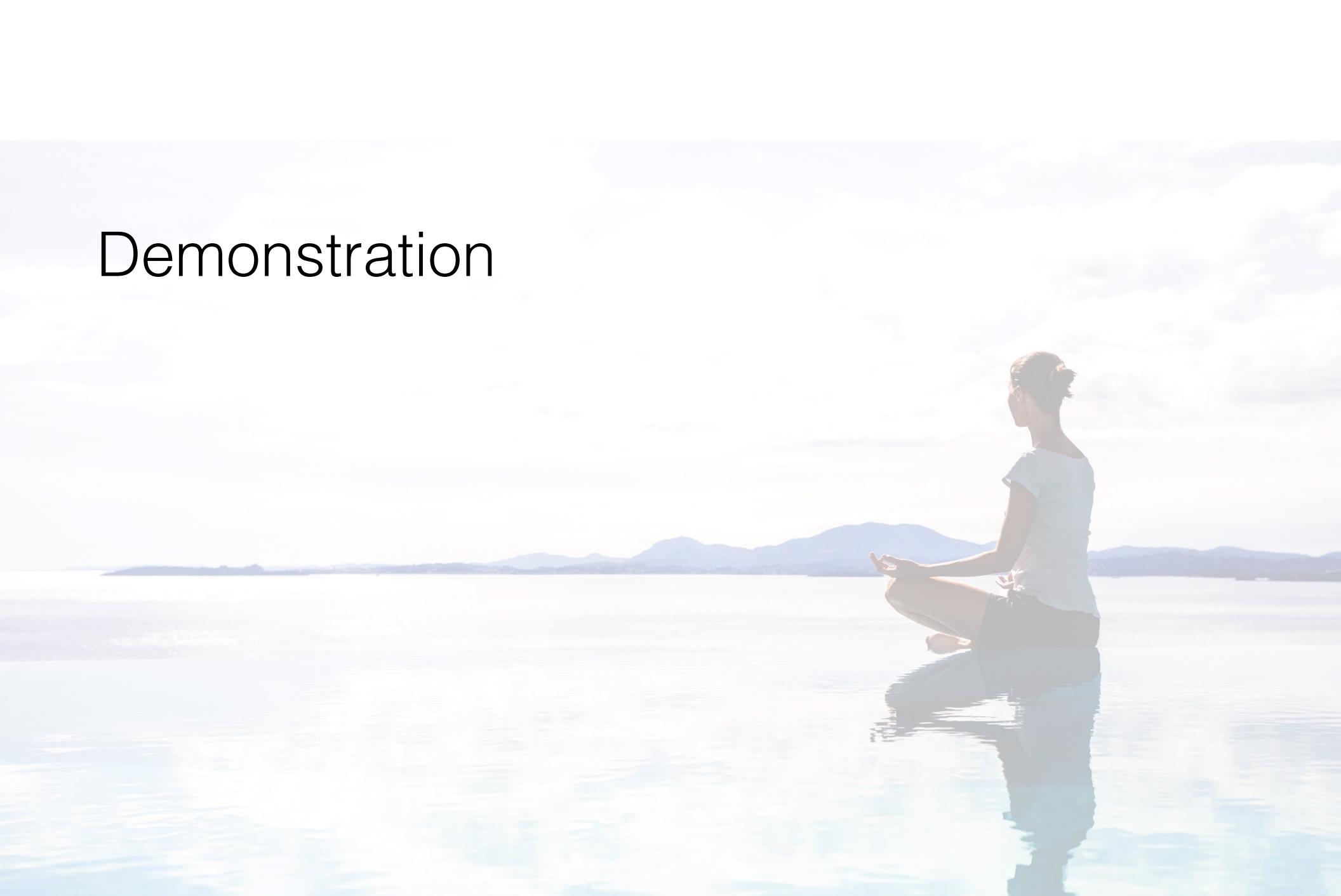
A large, semi-transparent silhouette of a person sitting cross-legged in a meditative pose occupies the right side of the frame. The background is a soft-focus photograph of a sunset or sunrise over a body of water, with warm orange and yellow hues blending into cooler blues.

Mindfulness can provide significant benefits  
for software developers and IT professionals

# Demonstration



# Demonstration



# Demonstration

1. Sit in a comfortable position



# Demonstration

1. Sit in a comfortable position
2. Position your hands



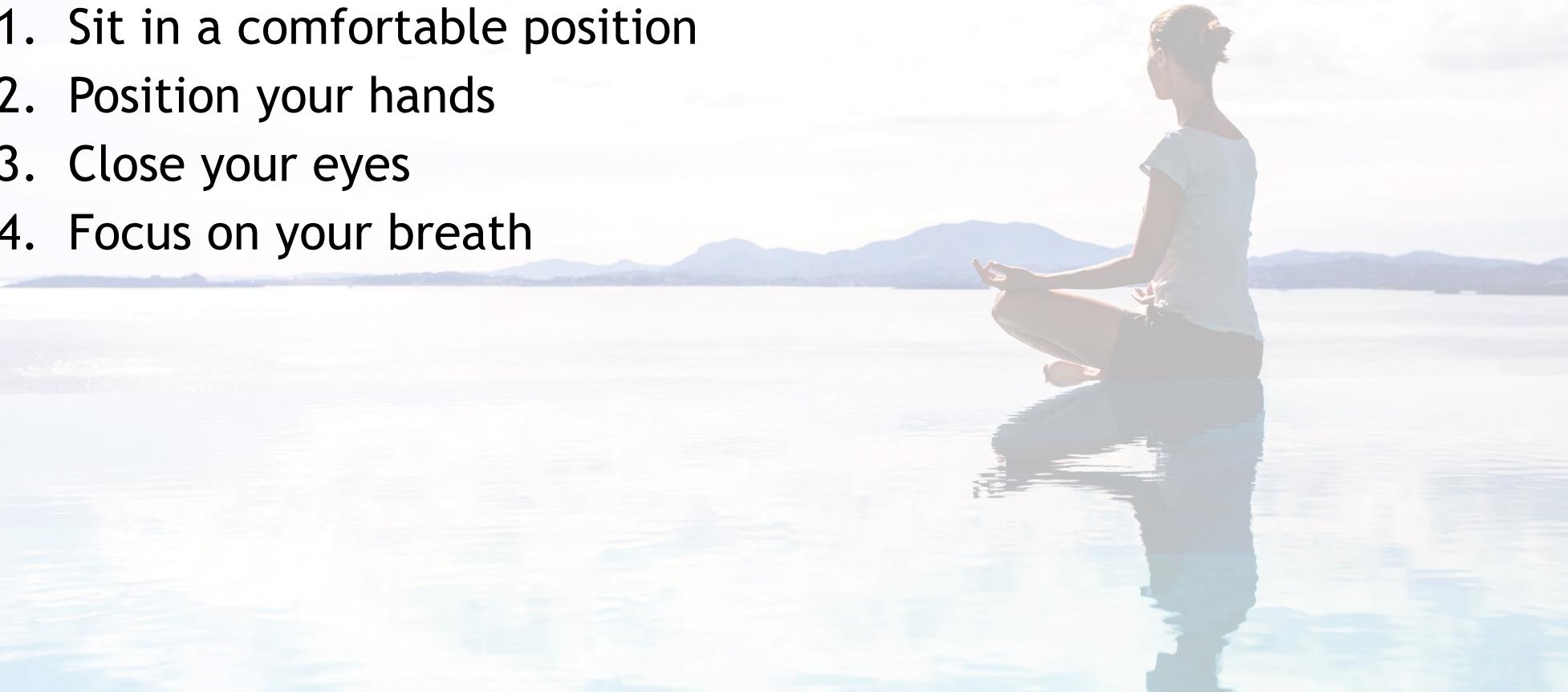
# Demonstration

1. Sit in a comfortable position
2. Position your hands
3. Close your eyes



# Demonstration

1. Sit in a comfortable position
2. Position your hands
3. Close your eyes
4. Focus on your breath



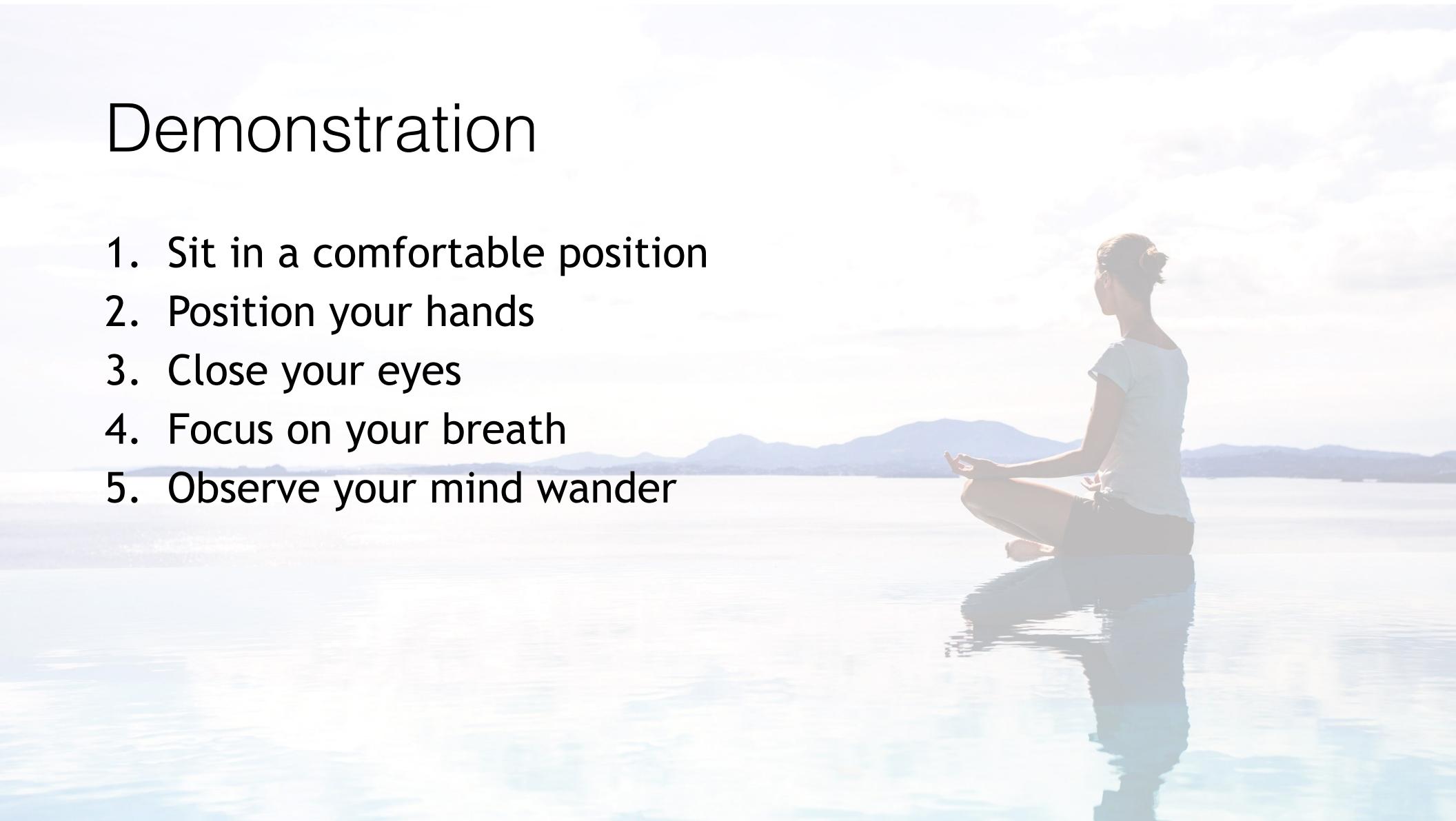
# Demonstration

1. Sit in a comfortable position
2. Position your hands
3. Close your eyes
4. Focus on your breath



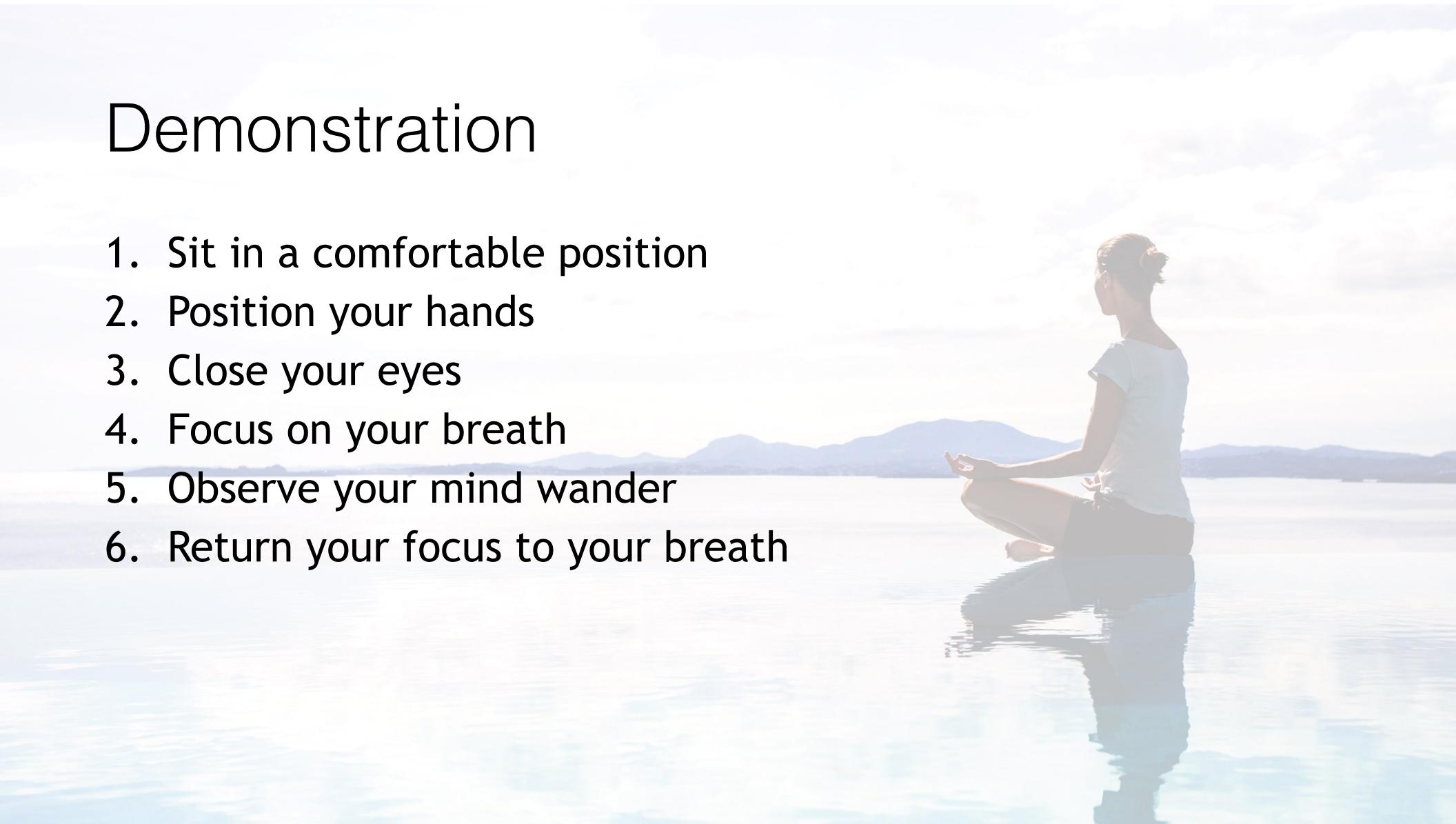
# Demonstration

1. Sit in a comfortable position
2. Position your hands
3. Close your eyes
4. Focus on your breath
5. Observe your mind wander



# Demonstration

1. Sit in a comfortable position
2. Position your hands
3. Close your eyes
4. Focus on your breath
5. Observe your mind wander
6. Return your focus to your breath



# Demonstration

1. Sit in a comfortable position
2. Position your hands
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6. Return your focus to your breath
7. Accept your experience as it is



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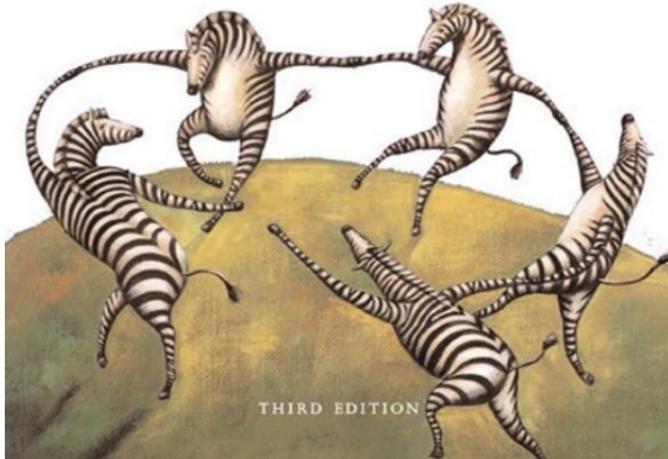
# Where to Go Next

ROBERT M. SAPOLSKY  
Author of *A Primate's Memoir*

# WHY ZEBRAS DON'T GET ULCERS

The Acclaimed Guide to Stress, Stress-Related Diseases, and Coping—Now Revised and Updated

"One of the best science writers of our time."  
—Oliver Sacks



THIRD EDITION

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Topic  
Better Living

Subtopic  
Health & Wellness

## Stress and Your Body

Professor Robert Sapolsky  
Stanford University



[www.thegreatcourses.com](http://www.thegreatcourses.com)

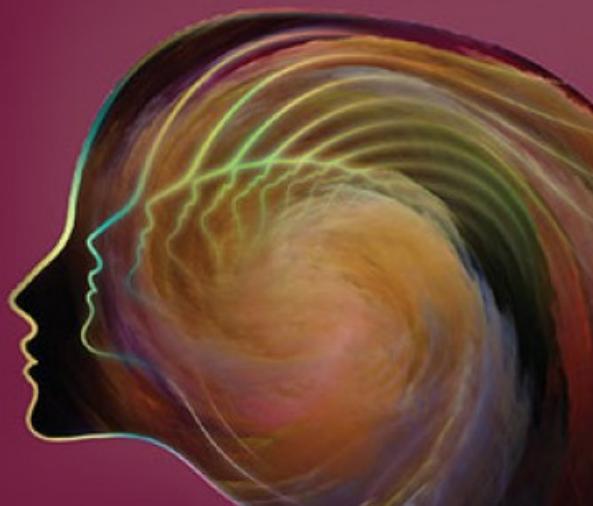


Topic  
Better Living

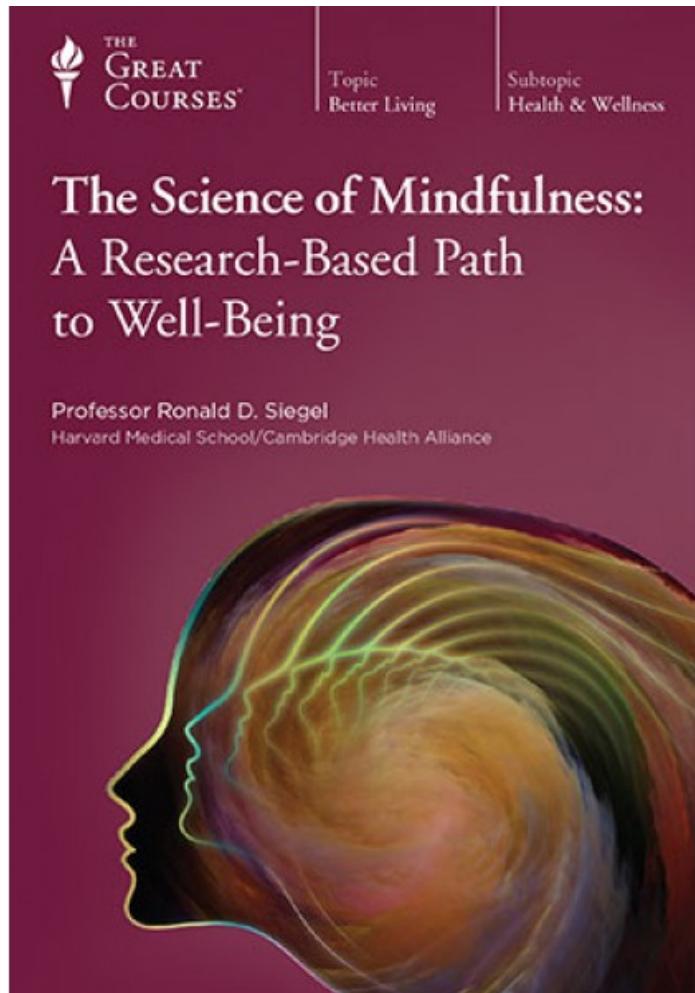
Subtopic  
Health & Wellness

# The Science of Mindfulness: A Research-Based Path to Well-Being

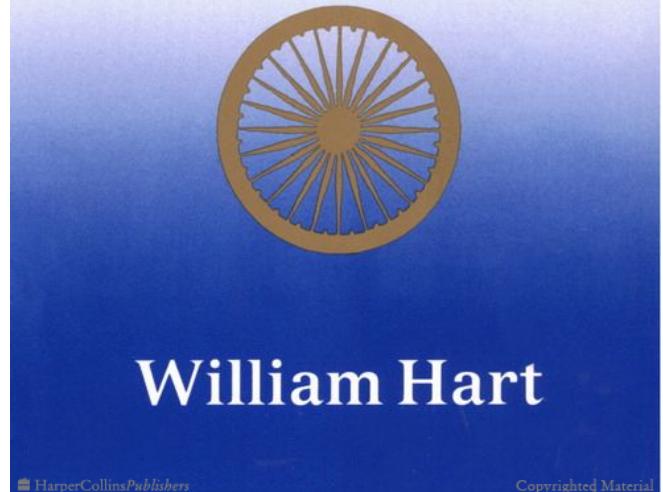
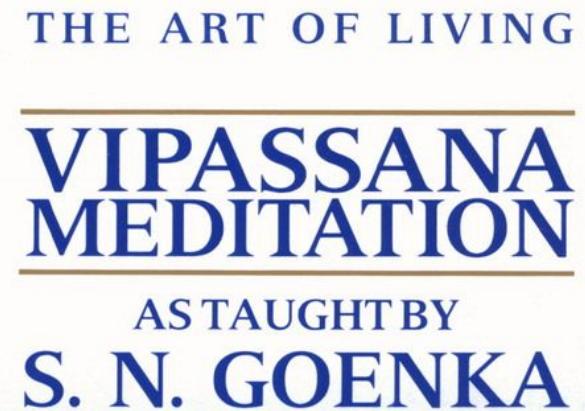
Professor Ronald D. Siegel  
Harvard Medical School/Cambridge Health Alliance



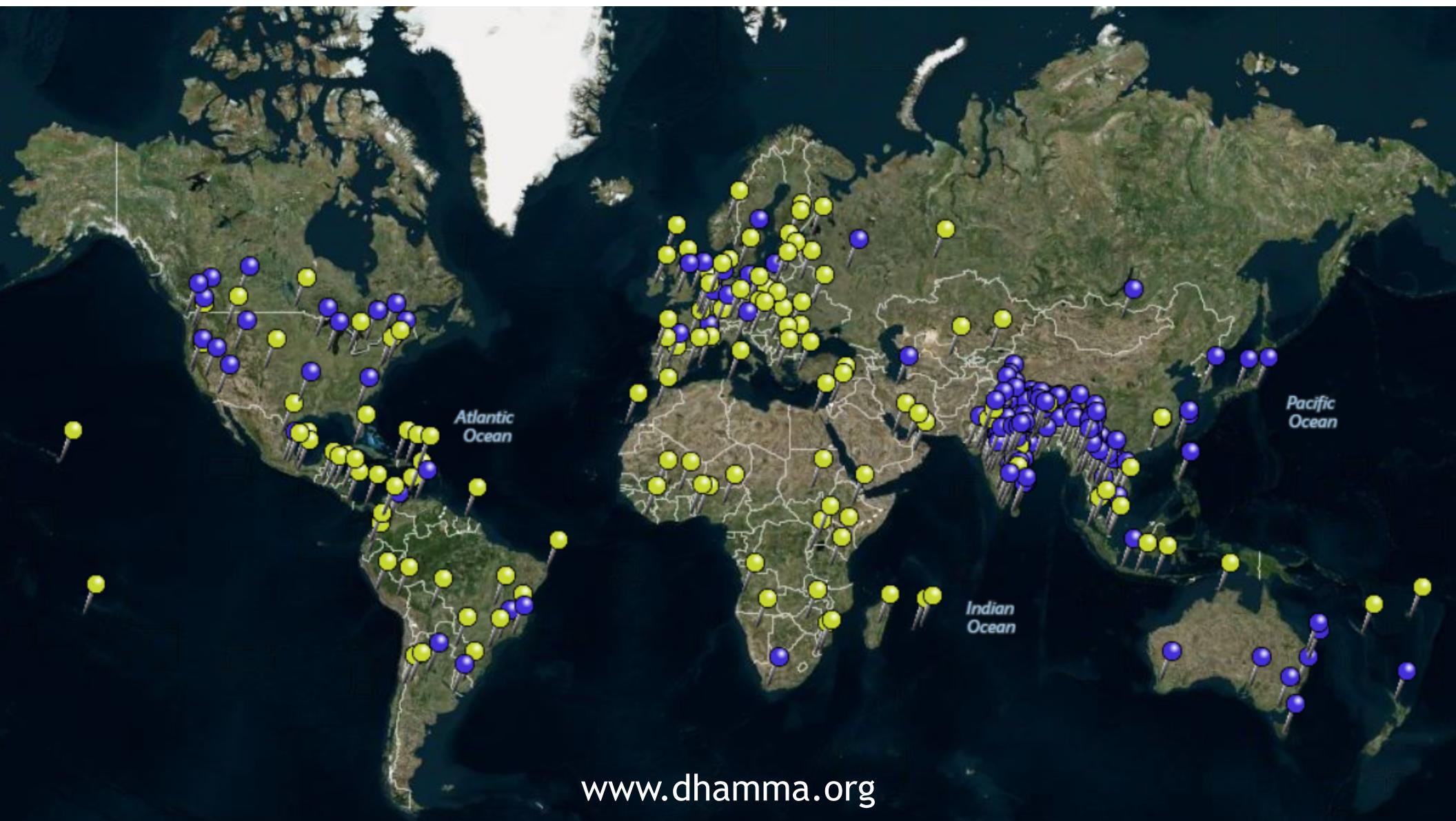
[www.thegreatcourses.com](http://www.thegreatcourses.com)



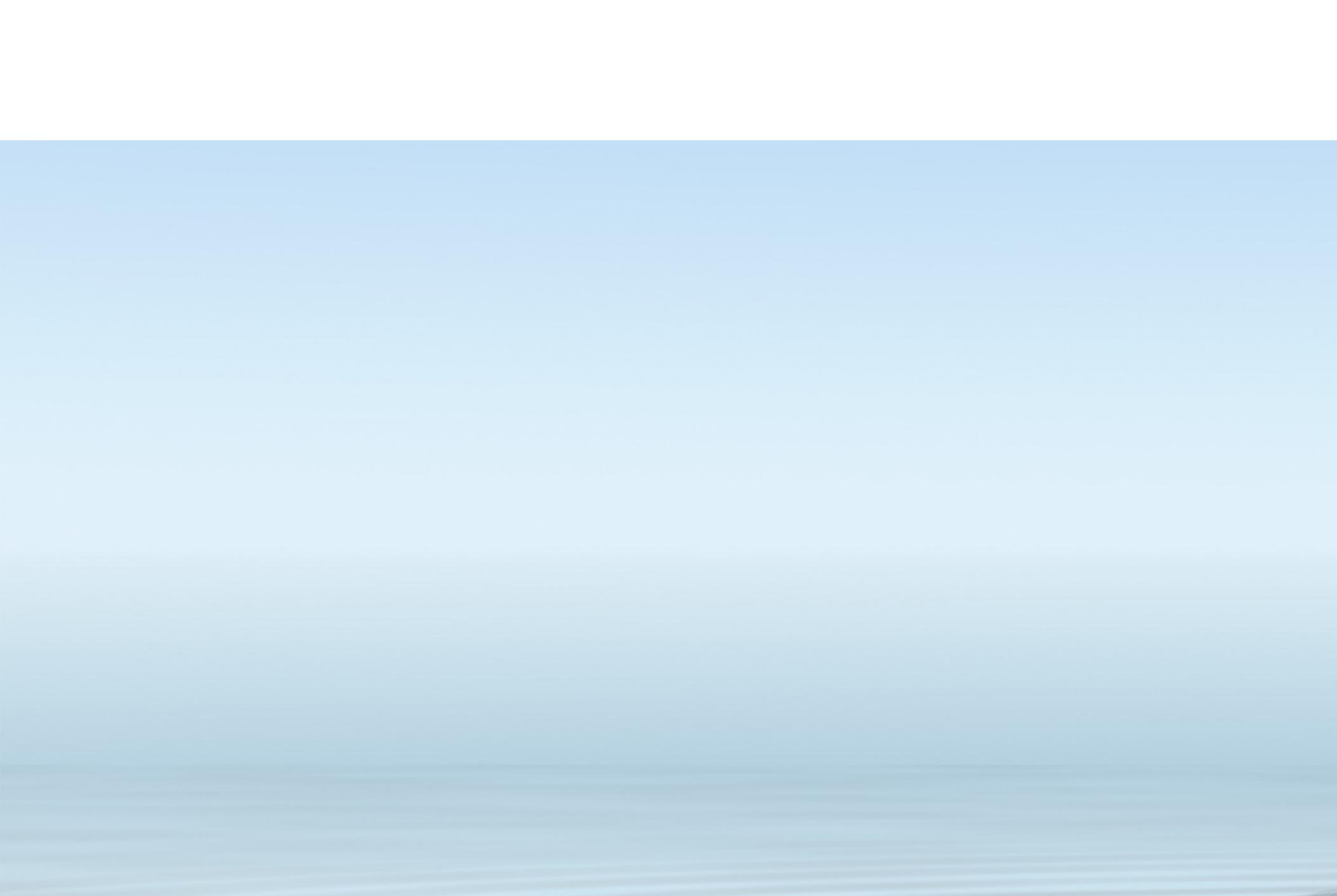
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It is possible to be in mental,  
physical, or emotional pain  
but to not be suffering.

Suffering is how we  
respond to pain.

# Thank You!

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